Module Handbook
Industrial Engineering and Management (M.Sc.)
SPO 2007/2015
Summer term 2017
Date: 05/17/2017
# Contents

I About this handbook  
1 New Wiwi-modules 15  
2 Notes and rules 16  
3 Online Version 18  
4 Contact 18  

II The Master’s degree program in Industrial Engineering and Management 20  
1 Qualification objectives 20  
2 SPO 2015 20  
3 SPO 2007 21  
4 Key Skills 21  

III Field structure 23  
1 Master Thesis 23  
2 Business Administration 23  
3 Economics 24  
4 Informatics 24  
5 Operations Research 24  
6 Engineering Sciences 25  
7 Compulsory Elective Modules 26  
  7.1 Seminars 26  
  7.2 Compulsory Modules 1 26  
  7.2.1 Business Administration 26  
  7.2.2 Economics 27  
  7.2.3 Informatics 28  
  7.2.4 Operations Research 28  
  7.2.5 Engineering Sciences 28  
  7.2.6 Statistics 29  
  7.3 Compulsory Modules 2 30  
  7.3.1 Business Administration 30  
  7.3.2 Economics 31  
  7.3.3 Informatics 31  
  7.3.4 Operations Research 31  
  7.3.5 Engineering Sciences 32  
  7.3.6 Statistics 33  
  7.3.7 Law 33  
  7.3.8 Sociology 33  
8 Additional Examinations 33
## IV Modules

<table>
<thead>
<tr>
<th>Module Master Thesis</th>
<th>M-WIWI-101650</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Economics</td>
<td>M-WIWI-103120</td>
<td>39</td>
</tr>
<tr>
<td>Finance 3</td>
<td>M-WIWI-101480</td>
<td>40</td>
</tr>
<tr>
<td>Data Science: Data-Driven Information Systems</td>
<td>M-WIWI-103117</td>
<td>42</td>
</tr>
<tr>
<td>Industrial Production III</td>
<td>M-WIWI-101412</td>
<td>44</td>
</tr>
<tr>
<td>Finance 1</td>
<td>M-WIWI-101482</td>
<td>46</td>
</tr>
<tr>
<td>Strategy, Communication, and Data Analysis</td>
<td>M-WIWI-101489</td>
<td>47</td>
</tr>
<tr>
<td>Industrial Production II</td>
<td>M-WIWI-101471</td>
<td>49</td>
</tr>
<tr>
<td>Energy Economics and Energy Markets</td>
<td>M-WIWI-101451</td>
<td>51</td>
</tr>
<tr>
<td>Management Accounting</td>
<td>M-WIWI-101498</td>
<td>53</td>
</tr>
<tr>
<td>Data Science: Evidence-based Marketing</td>
<td>M-WIWI-101647</td>
<td>54</td>
</tr>
<tr>
<td>Strategic Decision Making and Organization</td>
<td>M-WIWI-101509</td>
<td>56</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability</td>
<td>M-WIWI-101508</td>
<td>57</td>
</tr>
<tr>
<td>Data Science: Advanced CRM</td>
<td>M-WIWI-101470</td>
<td>59</td>
</tr>
<tr>
<td>Intelligent Risk and Investment Advisory</td>
<td>M-WIWI-103247</td>
<td>61</td>
</tr>
<tr>
<td>Computational Finance</td>
<td>M-WIWI-101512</td>
<td>62</td>
</tr>
<tr>
<td>Information Engineering</td>
<td>M-WIWI-101411</td>
<td>64</td>
</tr>
<tr>
<td>Service Economics and Management</td>
<td>M-WIWI-102754</td>
<td>66</td>
</tr>
<tr>
<td>Innovation Management</td>
<td>M-WIWI-101507</td>
<td>68</td>
</tr>
<tr>
<td>Service Innovation, Design &amp; Engineering</td>
<td>M-WIWI-102806</td>
<td>70</td>
</tr>
<tr>
<td>Insurance Management II</td>
<td>M-WIWI-101449</td>
<td>72</td>
</tr>
<tr>
<td>Energy Economics and Technology</td>
<td>M-WIWI-101452</td>
<td>74</td>
</tr>
<tr>
<td>Electronic Markets</td>
<td>M-WIWI-101409</td>
<td>76</td>
</tr>
<tr>
<td>Service Analytics</td>
<td>M-WIWI-101506</td>
<td>78</td>
</tr>
<tr>
<td>Quantitative Valuation</td>
<td>M-WIWI-103123</td>
<td>80</td>
</tr>
<tr>
<td>Finance 2</td>
<td>M-WIWI-101483</td>
<td>81</td>
</tr>
<tr>
<td>Sales Management</td>
<td>M-WIWI-101487</td>
<td>83</td>
</tr>
<tr>
<td>Insurance Management I</td>
<td>M-WIWI-101469</td>
<td>85</td>
</tr>
<tr>
<td>Entrepreneurship (EnTechnon)</td>
<td>M-WIWI-101488</td>
<td>87</td>
</tr>
<tr>
<td>Service Design Thinking</td>
<td>M-WIWI-101503</td>
<td>89</td>
</tr>
<tr>
<td>Services Marketing</td>
<td>M-WIWI-101649</td>
<td>91</td>
</tr>
<tr>
<td>Designing Interactive Systems</td>
<td>M-WIWI-103200</td>
<td>93</td>
</tr>
<tr>
<td>Market Engineering</td>
<td>M-WIWI-101446</td>
<td>95</td>
</tr>
<tr>
<td>Data Science: Data-Driven User Modeling</td>
<td>M-WIWI-103118</td>
<td>97</td>
</tr>
<tr>
<td>Marketing Management</td>
<td>M-WIWI-101490</td>
<td>99</td>
</tr>
<tr>
<td>Digital Service Systems in Industry</td>
<td>M-WIWI-102808</td>
<td>101</td>
</tr>
<tr>
<td>Business &amp; Service Engineering</td>
<td>M-WIWI-101410</td>
<td>103</td>
</tr>
<tr>
<td>Cross-functional Management Accounting</td>
<td>M-WIWI-101510</td>
<td>105</td>
</tr>
<tr>
<td>Financial Technology for Risk and Asset Management</td>
<td>M-WIWI-103121</td>
<td>106</td>
</tr>
<tr>
<td>Service Management</td>
<td>M-WIWI-101448</td>
<td>107</td>
</tr>
<tr>
<td>Quantitative Risk Management</td>
<td>M-WIWI-103122</td>
<td>109</td>
</tr>
<tr>
<td>Disruptive FinTech Innovations</td>
<td>M-WIWI-103261</td>
<td>110</td>
</tr>
<tr>
<td>Microeconomic Theory</td>
<td>M-WIWI-101500</td>
<td>111</td>
</tr>
<tr>
<td>Innovation Economics</td>
<td>M-WIWI-101514</td>
<td>112</td>
</tr>
<tr>
<td>Innovation and growth</td>
<td>M-WIWI-101478</td>
<td>114</td>
</tr>
<tr>
<td>Economic Theory and its Application in Finance</td>
<td>M-WIWI-101502</td>
<td>116</td>
</tr>
<tr>
<td>Collective Decision Making</td>
<td>M-WIWI-101504</td>
<td>118</td>
</tr>
<tr>
<td>Macroeconomic Theory</td>
<td>M-WIWI-101462</td>
<td>119</td>
</tr>
<tr>
<td>Growth and Agglomeration</td>
<td>M-WIWI-101496</td>
<td>120</td>
</tr>
<tr>
<td>Environmental Economics</td>
<td>M-WIWI-101468</td>
<td>121</td>
</tr>
<tr>
<td>Transport infrastructure policy and regional development</td>
<td>M-WIWI-101485</td>
<td>122</td>
</tr>
<tr>
<td>Network Economics</td>
<td>M-WIWI-101406</td>
<td>124</td>
</tr>
<tr>
<td>Applied Strategic Decisions</td>
<td>M-WIWI-101453</td>
<td>126</td>
</tr>
<tr>
<td>Experimental Economics</td>
<td>M-WIWI-101505</td>
<td>128</td>
</tr>
<tr>
<td>Advanced Topics in Public Finance</td>
<td>M-WIWI-101511</td>
<td>130</td>
</tr>
<tr>
<td>Economic Policy II</td>
<td>M-WIWI-101481</td>
<td>132</td>
</tr>
<tr>
<td>Agglomeration and Innovation</td>
<td>M-WIWI-101497</td>
<td>133</td>
</tr>
<tr>
<td>Course Title</td>
<td>Course Code</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------</td>
</tr>
<tr>
<td>Control Engineering II - M-ETIT-101157</td>
<td></td>
<td>211</td>
</tr>
<tr>
<td>Automated Manufacturing Systems - M-MACH-101298</td>
<td></td>
<td>209</td>
</tr>
<tr>
<td>Mobile Machines - M-MACH-101267</td>
<td></td>
<td>207</td>
</tr>
<tr>
<td>Material Flow in Networked Logistic Systems - M-MACH-101277</td>
<td></td>
<td>205</td>
</tr>
<tr>
<td>Technical Logistics - M-MACH-101266</td>
<td></td>
<td>203</td>
</tr>
<tr>
<td>Global Production and Logistics - M-MACH-101282</td>
<td></td>
<td>201</td>
</tr>
<tr>
<td>Material Flow in Logistic Systems - M-MACH-101277</td>
<td></td>
<td>199</td>
</tr>
<tr>
<td>Microoptics - M-MACH-101292</td>
<td></td>
<td>197</td>
</tr>
<tr>
<td>Highway Engineering - M-BGU-100999</td>
<td></td>
<td>196</td>
</tr>
<tr>
<td>Environmental Management - M-BGU-101000</td>
<td></td>
<td>195</td>
</tr>
<tr>
<td>Water Supply and Sanitation - M-BGU-101001</td>
<td></td>
<td>194</td>
</tr>
<tr>
<td>BioMEMS - M-MACH-101290</td>
<td></td>
<td>192</td>
</tr>
<tr>
<td>Water Chemistry and Water Technology I - M-CIWVT-101121</td>
<td></td>
<td>190</td>
</tr>
<tr>
<td>Specialization in Production Engineering - M-MACH-101284</td>
<td></td>
<td>188</td>
</tr>
<tr>
<td>Specialization in Food Process Engineering - M-CIWVT-101120</td>
<td></td>
<td>186</td>
</tr>
<tr>
<td>Manufacturing Technology - M-MACH-101276</td>
<td></td>
<td>184</td>
</tr>
<tr>
<td>High-Voltage Technology - M-ETIT-101163</td>
<td></td>
<td>182</td>
</tr>
<tr>
<td>Combustion Engines II - M-MACH-101303</td>
<td></td>
<td>181</td>
</tr>
<tr>
<td>Optoelectronics and Optical Communication - M-MACH-101295</td>
<td></td>
<td>179</td>
</tr>
<tr>
<td>Project in Public Transportation - M-BGU-101113</td>
<td></td>
<td>177</td>
</tr>
<tr>
<td>Microfabrication - M-MACH-101291</td>
<td></td>
<td>175</td>
</tr>
<tr>
<td>Energy and Process Technology I - M-MACH-101296</td>
<td></td>
<td>173</td>
</tr>
<tr>
<td>Introduction to Logistics - M-MACH-101263</td>
<td></td>
<td>171</td>
</tr>
<tr>
<td>Virtual Engineering A - M-MACH-101283</td>
<td></td>
<td>169</td>
</tr>
<tr>
<td>Project Management in Construction - M-BGU-101888</td>
<td></td>
<td>167</td>
</tr>
<tr>
<td>Specific Topics in Materials Science - M-MACH-101268</td>
<td></td>
<td>165</td>
</tr>
<tr>
<td>Vehicle Development - M-MACH-101265</td>
<td></td>
<td>163</td>
</tr>
<tr>
<td>Fundamentals of Transportation - M-BGU-101064</td>
<td></td>
<td>161</td>
</tr>
<tr>
<td>Natural Hazards and Risk Management 1 - M-WIWI-101642</td>
<td></td>
<td>159</td>
</tr>
<tr>
<td>Natural Hazards and Risk Management 2 - M-WIWI-101644</td>
<td></td>
<td>157</td>
</tr>
<tr>
<td>Specialization in Food Process Engineering - M-CIWVT-101119</td>
<td></td>
<td>155</td>
</tr>
<tr>
<td>Generation and transmission of renewable power - M-ETIT-101164</td>
<td></td>
<td>153</td>
</tr>
<tr>
<td>Nanotechnology - M-MACH-101294</td>
<td></td>
<td>151</td>
</tr>
<tr>
<td>Public Transportation Operations - M-BGU-101111</td>
<td></td>
<td>149</td>
</tr>
<tr>
<td>Integrated Production Planning - M-MACH-101272</td>
<td></td>
<td>147</td>
</tr>
<tr>
<td>Principles of Food Process Engineering - M-CIWVT-101120</td>
<td></td>
<td>145</td>
</tr>
<tr>
<td>Microsystems Technology - M-MACH-101287</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>Water Chemistry and Water Technology II - M-CIWVT-101122</td>
<td></td>
<td>141</td>
</tr>
<tr>
<td>Sensor Technology I - M-ETIT-101158</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>BioMEMS - M-MACH-101290</td>
<td></td>
<td>137</td>
</tr>
<tr>
<td>Water Supply and Sanitation - M-BGU-101001</td>
<td></td>
<td>135</td>
</tr>
<tr>
<td>Environmental Management - M-BGU-101000</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>Highway Engineering - M-BGU-100999</td>
<td></td>
<td>131</td>
</tr>
<tr>
<td>Microoptics - M-MACH-101292</td>
<td></td>
<td>129</td>
</tr>
<tr>
<td>Logistics in Value Chain Networks - M-MACH-101280</td>
<td></td>
<td>127</td>
</tr>
<tr>
<td>Global Production and Logistics - M-MACH-101282</td>
<td></td>
<td>125</td>
</tr>
<tr>
<td>Technical Logistics - M-MACH-101279</td>
<td></td>
<td>123</td>
</tr>
<tr>
<td>Material Flow in Networked Logistic Systems - M-MACH-101278</td>
<td></td>
<td>121</td>
</tr>
<tr>
<td>Mobile Machines - M-MACH-101267</td>
<td></td>
<td>119</td>
</tr>
<tr>
<td>Automated Manufacturing Systems - M-MACH-101298</td>
<td></td>
<td>117</td>
</tr>
<tr>
<td>Sensor Technology II - M-ETIT-101159</td>
<td></td>
<td>115</td>
</tr>
<tr>
<td>Control Engineering II - M-ETIT-101157</td>
<td></td>
<td>113</td>
</tr>
<tr>
<td>Handling Characteristics of Motor Vehicles - M-MACH-101264</td>
<td></td>
<td>111</td>
</tr>
</tbody>
</table>
## CONTENTS

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Module ID</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety, Computing and Law in Highway Engineering</td>
<td>M-BGU-101066</td>
<td>213</td>
</tr>
<tr>
<td>Energy and Process Technology II</td>
<td>M-MACH-101297</td>
<td>214</td>
</tr>
<tr>
<td>Lean Management in Construction</td>
<td>M-BGU-101884</td>
<td>215</td>
</tr>
<tr>
<td>Seminar Module</td>
<td>M-WIWI-101808</td>
<td>217</td>
</tr>
<tr>
<td>Electives in Informatics</td>
<td>M-WIWI-101630</td>
<td>220</td>
</tr>
<tr>
<td>Emphasis in Informatics</td>
<td>M-WIWI-101628</td>
<td>222</td>
</tr>
<tr>
<td>Analytics and Statistics</td>
<td>M-WIWI-101637</td>
<td>224</td>
</tr>
<tr>
<td>Econometrics and Statistics I</td>
<td>M-WIWI-101638</td>
<td>226</td>
</tr>
<tr>
<td>Econometrics and Statistics II</td>
<td>M-WIWI-101639</td>
<td>227</td>
</tr>
<tr>
<td>Commercial Law</td>
<td>M-INFO-101191</td>
<td>228</td>
</tr>
<tr>
<td>Governance, Risk &amp; Compliance</td>
<td>M-INFO-101242</td>
<td>229</td>
</tr>
<tr>
<td>Public Business Law</td>
<td>M-INFO-101217</td>
<td>230</td>
</tr>
<tr>
<td>Private Business Law</td>
<td>M-INFO-101216</td>
<td>231</td>
</tr>
<tr>
<td>Intellectual Property Law</td>
<td>M-INFO-101215</td>
<td>232</td>
</tr>
<tr>
<td>Sociology</td>
<td>M-GEISTSOZ-101169</td>
<td>233</td>
</tr>
<tr>
<td>Strategic Corporate Management and Organization</td>
<td>M-WIWI-101450</td>
<td>234</td>
</tr>
</tbody>
</table>

### V Module component exams

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Module ID</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildcard Key Competences Seminar 2</td>
<td>T-WIWI-104681</td>
<td>235</td>
</tr>
<tr>
<td>Advanced Game Theory</td>
<td>T-WIWI-102861</td>
<td>236</td>
</tr>
<tr>
<td>Advanced Lab Informatics</td>
<td>T-WIWI-103523</td>
<td>237</td>
</tr>
<tr>
<td>Advanced Management Accounting</td>
<td>T-WIWI-102885</td>
<td>240</td>
</tr>
<tr>
<td>Advanced Statistics</td>
<td>T-WIWI-103123</td>
<td>241</td>
</tr>
<tr>
<td>Advanced Stochastic Optimization</td>
<td>T-WIWI-106548</td>
<td>242</td>
</tr>
<tr>
<td>Advanced Topics in Economic Theory</td>
<td>T-WIWI-102609</td>
<td>243</td>
</tr>
<tr>
<td>Airport Logistics</td>
<td>T-MACH-105175</td>
<td>244</td>
</tr>
<tr>
<td>Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines</td>
<td>T-MACH-105173</td>
<td>245</td>
</tr>
<tr>
<td>Analysis Tools for Combustion Diagnostics</td>
<td>T-MACH-105167</td>
<td>246</td>
</tr>
<tr>
<td>Applied Ecology and Water Quality</td>
<td>T-BGU-103647</td>
<td>247</td>
</tr>
<tr>
<td>Applied Informatics II - IT Systems for eCommerce</td>
<td>T-WIWI-102651</td>
<td>248</td>
</tr>
<tr>
<td>Asset Pricing</td>
<td>T-WIWI-102647</td>
<td>249</td>
</tr>
<tr>
<td>Auction Theory</td>
<td>T-WIWI-102613</td>
<td>250</td>
</tr>
<tr>
<td>Automated Financial Advisory</td>
<td>T-WIWI-106495</td>
<td>251</td>
</tr>
<tr>
<td>Automated Manufacturing Systems</td>
<td>T-MACH-102162</td>
<td>252</td>
</tr>
<tr>
<td>Automation of Discrete Event and Hybrid Systems</td>
<td>T-ETIT-100981</td>
<td>254</td>
</tr>
<tr>
<td>Automotive Engineering I -</td>
<td>T-MACH-100092</td>
<td>255</td>
</tr>
<tr>
<td>Automotive Engineering I -</td>
<td>T-MACH-102203</td>
<td>257</td>
</tr>
<tr>
<td>Automotive Engineering II -</td>
<td>T-MACH-102117</td>
<td>259</td>
</tr>
<tr>
<td>Automotive Logistics</td>
<td>T-MACH-105165</td>
<td>260</td>
</tr>
<tr>
<td>Basics of Liberalised Energy Markets</td>
<td>T-WIWI-102690</td>
<td>261</td>
</tr>
<tr>
<td>Basics of Technical Logistics</td>
<td>T-MACH-102163</td>
<td>263</td>
</tr>
<tr>
<td>Bayesian Methods for Financial Economics</td>
<td>T-WIWI-106191</td>
<td>264</td>
</tr>
<tr>
<td>Bayesian Risk Analytics and Machine Learning</td>
<td>T-WIWI-106494</td>
<td>265</td>
</tr>
<tr>
<td>Behavioral Approaches in Marketing</td>
<td>T-WIWI-102619</td>
<td>266</td>
</tr>
<tr>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I</td>
<td>T-MACH-100966</td>
<td>267</td>
</tr>
<tr>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</td>
<td>T-MACH-100967</td>
<td>268</td>
</tr>
<tr>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</td>
<td>T-MACH-100968</td>
<td>270</td>
</tr>
<tr>
<td>Bionics for Engineers and Natural Scientists</td>
<td>T-MACH-102172</td>
<td>271</td>
</tr>
<tr>
<td>Building Laws</td>
<td>T-BGU-103429</td>
<td>272</td>
</tr>
<tr>
<td>BUS-Controls</td>
<td>T-MACH-102150</td>
<td>273</td>
</tr>
<tr>
<td>Business Administration in Information Engineering and Management</td>
<td>T-WIWI-102886</td>
<td>274</td>
</tr>
<tr>
<td>Business and IT Service Management</td>
<td>T-WIWI-102881</td>
<td>276</td>
</tr>
<tr>
<td>Business data strategy</td>
<td>T-WIWI-106187</td>
<td>277</td>
</tr>
<tr>
<td>Business Dynamics</td>
<td>T-WIWI-102762</td>
<td>278</td>
</tr>
<tr>
<td>Business Intelligence Systems</td>
<td>T-WIWI-105777</td>
<td>280</td>
</tr>
<tr>
<td>Business Models in the Internet: Planning and Implementation</td>
<td>T-WIWI-102639</td>
<td>281</td>
</tr>
<tr>
<td>Business Planning</td>
<td>T-WIWI-102865</td>
<td>282</td>
</tr>
<tr>
<td>Course Title</td>
<td>Code</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>------</td>
</tr>
<tr>
<td>Business Process Modelling</td>
<td>T-WIWI-102697</td>
<td>283</td>
</tr>
<tr>
<td>Business Strategies of Banks</td>
<td>T-WIWI-102626</td>
<td>285</td>
</tr>
<tr>
<td>CAD-NX Training Course</td>
<td>T-MACH-102187</td>
<td>286</td>
</tr>
<tr>
<td>Case Studies in Sales and Pricing</td>
<td>T-WIWI-102834</td>
<td>287</td>
</tr>
<tr>
<td>Case Studies Seminar: Innovation Management</td>
<td>T-WIWI-102852</td>
<td>288</td>
</tr>
<tr>
<td>CATIA CAD Training Course</td>
<td>T-MACH-102185</td>
<td>289</td>
</tr>
<tr>
<td>Ceramic Processing Technology</td>
<td>T-MACH-102182</td>
<td>290</td>
</tr>
<tr>
<td>Challenges in Supply Chain Management</td>
<td>T-WIWI-102872</td>
<td>291</td>
</tr>
<tr>
<td>Characteristics of Transportation Systems</td>
<td>T-BGU-106609</td>
<td>293</td>
</tr>
<tr>
<td>Chemical, Physical and Material Scientific Aspects of Polymers in Microsystem Technologies</td>
<td>T-MACH-102169</td>
<td>294</td>
</tr>
<tr>
<td>Civil Law for Advanced</td>
<td>T-INFO-101994</td>
<td>295</td>
</tr>
<tr>
<td>Combustion Engines I</td>
<td>T-MACH-102194</td>
<td>296</td>
</tr>
<tr>
<td>Combustion Engines II</td>
<td>T-MACH-104609</td>
<td>297</td>
</tr>
<tr>
<td>Communication Systems and Protocols</td>
<td>T-ETIT-101938</td>
<td>298</td>
</tr>
<tr>
<td>Competition in Networks</td>
<td>T-WIWI-100005</td>
<td>299</td>
</tr>
<tr>
<td>Computational Economics</td>
<td>T-WIWI-102680</td>
<td>300</td>
</tr>
<tr>
<td>Computational FinTech with Python and C++</td>
<td>T-WIWI-106496</td>
<td>302</td>
</tr>
<tr>
<td>Computational Risk and Asset Management</td>
<td>T-WIWI-102878</td>
<td>303</td>
</tr>
<tr>
<td>Computer Contract Law</td>
<td>T-INFO-102036</td>
<td>304</td>
</tr>
<tr>
<td>Computer Integrated Planning of New Products</td>
<td>T-MACH-102125</td>
<td>305</td>
</tr>
<tr>
<td>Constitution and Properties of Protective Coatings</td>
<td>T-MACH-105150</td>
<td>306</td>
</tr>
<tr>
<td>Constitution and Properties of Wearresistant Materials</td>
<td>T-MACH-102141</td>
<td>308</td>
</tr>
<tr>
<td>Construction and Maintenance of Guided Track Infrastructure</td>
<td>T-BGU-101851</td>
<td>310</td>
</tr>
<tr>
<td>Construction Equipment</td>
<td>T-BGU-101845</td>
<td>311</td>
</tr>
<tr>
<td>Consumer Behavior</td>
<td>T-WIWI-106569</td>
<td>312</td>
</tr>
<tr>
<td>Control of Linear Multivariable Systems</td>
<td>T-ETIT-100666</td>
<td>313</td>
</tr>
<tr>
<td>Control Technology</td>
<td>T-MACH-105185</td>
<td>314</td>
</tr>
<tr>
<td>Convex Analysis</td>
<td>T-WIWI-102856</td>
<td>315</td>
</tr>
<tr>
<td>Copyright</td>
<td>T-INFO-101308</td>
<td>316</td>
</tr>
<tr>
<td>Corporate Compliance</td>
<td>T-INFO-101288</td>
<td>317</td>
</tr>
<tr>
<td>Corporate Financial Policy</td>
<td>T-WIWI-102622</td>
<td>318</td>
</tr>
<tr>
<td>Country Manager Simulation</td>
<td>T-WIWI-106137</td>
<td>319</td>
</tr>
<tr>
<td>Credit Risk</td>
<td>T-WIWI-102645</td>
<td>320</td>
</tr>
<tr>
<td>Current Issues in Innovation Management</td>
<td>T-WIWI-102873</td>
<td>321</td>
</tr>
<tr>
<td>Current Issues in the Insurance Industry</td>
<td>T-WIWI-102637</td>
<td>322</td>
</tr>
<tr>
<td>Current Topics on BioMEMS</td>
<td>T-MACH-102176</td>
<td>323</td>
</tr>
<tr>
<td>Data Mining and Applications</td>
<td>T-WIWI-103066</td>
<td>324</td>
</tr>
<tr>
<td>Data Protection Law</td>
<td>T-INFO-101303</td>
<td>325</td>
</tr>
<tr>
<td>Database Systems and XML</td>
<td>T-WIWI-102661</td>
<td>326</td>
</tr>
<tr>
<td>Derivatives</td>
<td>T-WIWI-102643</td>
<td>327</td>
</tr>
<tr>
<td>Design Basics in Highway Engineering</td>
<td>T-BGU-106613</td>
<td>328</td>
</tr>
<tr>
<td>Design Thinking</td>
<td>T-WIWI-102866</td>
<td>329</td>
</tr>
<tr>
<td>Developing Business Models for the Semantic Web</td>
<td>T-WIWI-102851</td>
<td>330</td>
</tr>
<tr>
<td>Digital Service Design</td>
<td>T-WIWI-105773</td>
<td>331</td>
</tr>
<tr>
<td>Digital Transformation of Organizations</td>
<td>T-WIWI-106201</td>
<td>332</td>
</tr>
<tr>
<td>Disassembly Process Engineering</td>
<td>T-BGU-101850</td>
<td>333</td>
</tr>
<tr>
<td>Discrete-Event Simulation in Production and Logistics</td>
<td>T-WIWI-102718</td>
<td>334</td>
</tr>
<tr>
<td>Document Management and Groupware Systems</td>
<td>T-WIWI-102663</td>
<td>335</td>
</tr>
<tr>
<td>Economic Efficiency of Guided Transport Systems</td>
<td>T-BGU-101794</td>
<td>336</td>
</tr>
<tr>
<td>Economic Integration in Europe</td>
<td>T-WIWI-102896</td>
<td>337</td>
</tr>
<tr>
<td>eEnergy: Markets, Services, Systems</td>
<td>T-WIWI-102794</td>
<td>338</td>
</tr>
<tr>
<td>Efficient Energy Systems and Electric Mobility</td>
<td>T-WIWI-102793</td>
<td>339</td>
</tr>
<tr>
<td>eFinance: Information Engineering and Management for Securities Trading</td>
<td>T-WIWI-102600</td>
<td>340</td>
</tr>
<tr>
<td>Electrical Railway Traction Systems</td>
<td>T-MACH-102121</td>
<td>341</td>
</tr>
<tr>
<td>Elements and Systems of Technical Logistics</td>
<td>T-MACH-102159</td>
<td>342</td>
</tr>
<tr>
<td>Elements of Technical Logistics and Project</td>
<td>T-MACH-102178</td>
<td>343</td>
</tr>
<tr>
<td>Emissions into the Environment</td>
<td>T-WIWI-102634</td>
<td>344</td>
</tr>
<tr>
<td>Course Title</td>
<td>Course Code</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------</td>
</tr>
<tr>
<td>Logistics - Organisation, Design and Control of Logistic Systems</td>
<td>T-MACH-102089</td>
<td>494</td>
</tr>
<tr>
<td>Long-distance and Air Traffic</td>
<td>T-BGU-106301</td>
<td>496</td>
</tr>
<tr>
<td>Machine Learning 1 - Basic Methods</td>
<td>T-WIWI-106340</td>
<td>497</td>
</tr>
<tr>
<td>Machine Learning 2 – Advanced Methods</td>
<td>T-WIWI-106341</td>
<td>498</td>
</tr>
<tr>
<td>Machine Learning in Finance</td>
<td>T-WIWI-106195</td>
<td>500</td>
</tr>
<tr>
<td>Machine Tools and Industrial Handling</td>
<td>T-MACH-102158</td>
<td>501</td>
</tr>
<tr>
<td>Macro-Finance</td>
<td>T-WIWI-106194</td>
<td>503</td>
</tr>
<tr>
<td>Management Accounting 1 - T-WIWI-102800</td>
<td></td>
<td>504</td>
</tr>
<tr>
<td>Management Accounting 2 - T-WIWI-102801</td>
<td></td>
<td>505</td>
</tr>
<tr>
<td>Management and Strategy</td>
<td>T-WIWI-102629</td>
<td>506</td>
</tr>
<tr>
<td>Management in Public Transport</td>
<td>T-BGU-101795</td>
<td>507</td>
</tr>
<tr>
<td>Management of IT-Projects</td>
<td>T-WIWI-102667</td>
<td>508</td>
</tr>
<tr>
<td>Managing New Technologies</td>
<td>T-WIWI-102612</td>
<td>509</td>
</tr>
<tr>
<td>Managing Organizations</td>
<td>T-WIWI-102630</td>
<td>510</td>
</tr>
<tr>
<td>Manufacturing Technology</td>
<td>T-MACH-102105</td>
<td>511</td>
</tr>
<tr>
<td>Market Engineering: Information in Institutions</td>
<td>T-WIWI-102640</td>
<td>512</td>
</tr>
<tr>
<td>Market Research</td>
<td>T-WIWI-102611</td>
<td>513</td>
</tr>
<tr>
<td>Marketing Analytics</td>
<td>T-WIWI-103139</td>
<td>514</td>
</tr>
<tr>
<td>Marketing Communication</td>
<td>T-WIWI-102902</td>
<td>515</td>
</tr>
<tr>
<td>Marketing Strategy Business Game</td>
<td>T-WIWI-102835</td>
<td>516</td>
</tr>
<tr>
<td>Markets and Organizations: Principles</td>
<td>T-WIWI-102821</td>
<td>517</td>
</tr>
<tr>
<td>Markov Decision Models I</td>
<td>T-WIWI-102710</td>
<td>518</td>
</tr>
<tr>
<td>Markov Decision Models II</td>
<td>T-WIWI-102711</td>
<td>519</td>
</tr>
<tr>
<td>Mass Fluxes in River Basins</td>
<td>T-BGU-103648</td>
<td>520</td>
</tr>
<tr>
<td>Master Thesis</td>
<td>T-WIWI-103142</td>
<td>521</td>
</tr>
<tr>
<td>Material Flow in Logistic Systems</td>
<td>T-MACH-102151</td>
<td>522</td>
</tr>
<tr>
<td>Mathematical Models and Methods for Production Systems</td>
<td>T-MACH-105189</td>
<td>523</td>
</tr>
<tr>
<td>Mathematical Theory of Democracy</td>
<td>T-WIWI-102617</td>
<td>524</td>
</tr>
<tr>
<td>Metal Forming</td>
<td>T-MACH-105177</td>
<td>525</td>
</tr>
<tr>
<td>Methods and Models in Transportation Planning</td>
<td>T-BGU-101797</td>
<td>526</td>
</tr>
<tr>
<td>Methods in Economic Dynamics</td>
<td>T-WIWI-102906</td>
<td>527</td>
</tr>
<tr>
<td>Microactuators</td>
<td>T-MACH-101910</td>
<td>528</td>
</tr>
<tr>
<td>Microoptics and Lithography</td>
<td>T-MACH-105176</td>
<td>529</td>
</tr>
<tr>
<td>Mixed Integer Programming I</td>
<td>T-WIWI-102719</td>
<td>530</td>
</tr>
<tr>
<td>Mixed Integer Programming I and II</td>
<td>T-WIWI-102733</td>
<td>531</td>
</tr>
<tr>
<td>Mixed Integer Programming II</td>
<td>T-WIWI-102720</td>
<td>532</td>
</tr>
<tr>
<td>Mobile Machines</td>
<td>T-MACH-105168</td>
<td>533</td>
</tr>
<tr>
<td>Mobility Services and new Forms of Mobility</td>
<td>T-BGU-103425</td>
<td>534</td>
</tr>
<tr>
<td>Model Based Application Methods</td>
<td>T-MACH-102199</td>
<td>535</td>
</tr>
<tr>
<td>Modeling and Analyzing Consumer Behavior with R</td>
<td>T-WIWI-102899</td>
<td>536</td>
</tr>
<tr>
<td>Modeling and OR-Software: Advanced Topics</td>
<td>T-WIWI-106200</td>
<td>537</td>
</tr>
<tr>
<td>Modeling Mass Fluxes in River Basins</td>
<td>T-BGU-106681</td>
<td>538</td>
</tr>
<tr>
<td>Modeling Mass Fluxes in River Basins</td>
<td>T-BGU-103649</td>
<td>539</td>
</tr>
<tr>
<td>Modeling Strategic Decision Making</td>
<td>T-WIWI-102803</td>
<td>540</td>
</tr>
<tr>
<td>Modelling, Measuring and Managing of Extreme Risks</td>
<td>T-WIWI-102841</td>
<td>541</td>
</tr>
<tr>
<td>Morphodynamics</td>
<td>T-BGU-101859</td>
<td>542</td>
</tr>
<tr>
<td>Multivariate Statistical Methods</td>
<td>T-WIWI-103124</td>
<td>543</td>
</tr>
<tr>
<td>Nanotechnology for Engineers and Natural Scientists</td>
<td>T-MACH-105180</td>
<td>544</td>
</tr>
<tr>
<td>Nanotechnology with Clusterbeams</td>
<td>T-MACH-102080</td>
<td>545</td>
</tr>
<tr>
<td>Nanotrilebrony and -Mechanics</td>
<td>T-MACH-102167</td>
<td>546</td>
</tr>
<tr>
<td>Nature-Inspired Optimisation Methods</td>
<td>T-WIWI-102679</td>
<td>547</td>
</tr>
<tr>
<td>Non- and Semiparametrics</td>
<td>T-WIWI-103126</td>
<td>548</td>
</tr>
<tr>
<td>Nonlinear Optimization I</td>
<td>T-WIWI-102724</td>
<td>549</td>
</tr>
<tr>
<td>Nonlinear Optimization I und II</td>
<td>T-WIWI-103637</td>
<td>550</td>
</tr>
<tr>
<td>Nonlinear Optimization II</td>
<td>T-WIWI-102725</td>
<td>551</td>
</tr>
<tr>
<td>Novel Actuators and Sensors</td>
<td>T-MACH-102152</td>
<td>552</td>
</tr>
<tr>
<td>Online Marketing</td>
<td>T-WIWI-103141</td>
<td>553</td>
</tr>
</tbody>
</table>
Open Innovation - Concepts, Methods and Best Practices - T-WIWI-102901
Operation Methods for Earthmoving - T-BGU-101801
Operation Methods for Foundation and Marine Construction - T-BGU-101832
Operation Systems and Track Guided Infrastructure Capacity - T-BGU-101824
Operations Research in Health Care Management - T-WIWI-102884
Operations Research in Supply Chain Management - T-WIWI-102715
Optical Transmitters and Receivers - T-ETIT-100639
Optical Waveguides and Fibers - T-ETIT-101945
Optimization in a Random Environment - T-WIWI-102628
Optoelectronic Components - T-ETIT-101907
OR-Oriented Modeling and Analysis of Real Problems (Project) - T-WIWI-102730
P&C Insurance Simulation Game - T-WIWI-102797
Panel Data - T-WIWI-103127
Parametric Optimization - T-WIWI-102855
Patent Law - T-INFO-101310
Personalization and Services - T-WIWI-102848
PH APL-ING-TL01 - T-WIWI-106291
PH APL-ING-TL02 - T-WIWI-106292
PH APL-ING-TL03 - T-WIWI-106293
PH APL-ING-TL04 ub - T-WIWI-106294
PH APL-ING-TL05 ub - T-WIWI-106295
PH APL-ING-TL06 ub - T-WIWI-106296
Photovoltaics - T-ETIT-100724
Physical Basics of Laser Technology - T-MACH-102102
Physics for Engineers - T-MACH-100530
Planning and Management of Industrial Plants - T-WIWI-102631
PLM for Product Development in Mechatronics - T-MACH-102181
PLM-CAD Workshop - T-MACH-102153
Polymer Engineering I - T-MACH-102137
Polymer Engineering II - T-MACH-102138
Polymers in MEMS A: Chemistry, Synthesis and Applications - T-MACH-102192
Polymers in MEMS B: Physics, Microstructuring and Applications - T-MACH-102191
Polymers in MEMS C: Biopolymers and Bioplastics - T-MACH-102200
Portfolio and Asset Liability Management - T-WIWI-103128
Power Network - T-ETIT-100830
Power Transmission and Power Network Control - T-ETIT-101941
Practical Course Polymers in MEMS - T-MACH-105556
Practical Course Technical Ceramics - T-MACH-105178
Practical Seminar Digital Service Systems - T-WIWI-106563
Practical Seminar Service Innovation - T-WIWI-102799
Practical Seminar: Crowd Analytics - T-WIWI-106214
Practical Seminar: Data-Driven Information Systems - T-WIWI-106207
Practical Seminar: Digital Service Design - T-WIWI-105774
Practical Seminar: Health Care Management (with Case Studies) - T-WIWI-102716
Practical Training in Basics of Microsystem Technology - T-MACH-102164
Predictive Mechanism and Market Design - T-WIWI-102862
Price Management - T-WIWI-105946
Price Negotiation and Sales Presentations - T-WIWI-102891
Pricing - T-WIWI-102883
Principles of Ceramic and Powder Metallurgy Processing - T-MACH-102111
Principles of Food Process Engineering - T-CIWT-101874
Principles of Information Engineering and Management - T-WIWI-102638
Principles of Insurance Management - T-WIWI-102603
Problem Solving, Communication and Leadership - T-WIWI-102871
Process Engineering - T-BGU-101844
Product and Innovation Management - T-WIWI-102812
Production and Logistics Controlling - T-WIWI-103091
Production and Logistics Management - T-WIWI-102632
<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Technology and Management in Automotive Industry - T-MACH-102189</td>
</tr>
<tr>
<td>Programming Internship: Solving Computational Risk and Asset Management Problems - T-WIWI-103110</td>
</tr>
<tr>
<td>Project Management - T-WIWI-103134</td>
</tr>
<tr>
<td>Project Management in Construction and Real Estate Industry I - T-BGU-103432</td>
</tr>
<tr>
<td>Project Management in Construction and Real Estate Industry II - T-BGU-103433</td>
</tr>
<tr>
<td>project paper Lean Construction - T-BGU-101007</td>
</tr>
<tr>
<td>Project Studies - T-BGU-101847</td>
</tr>
<tr>
<td>Project Workshop: Automotive Engineering - T-MACH-102156</td>
</tr>
<tr>
<td>Projectseminar - T-GEISTSOZ-101958</td>
</tr>
<tr>
<td>Public Management - T-WIWI-102740</td>
</tr>
<tr>
<td>Public Media Law - T-INFO-101311</td>
</tr>
<tr>
<td>Public Revenues - T-WIWI-102739</td>
</tr>
<tr>
<td>Quality Control I - T-WIWI-102728</td>
</tr>
<tr>
<td>Quality Control II - T-WIWI-102729</td>
</tr>
<tr>
<td>Quality Management - T-MACH-102107</td>
</tr>
<tr>
<td>Quantitative Methods in Energy Economics - T-WIWI-102889</td>
</tr>
<tr>
<td>Quantum Functional Devices and Semiconductor Technology - T-ETIT-100740</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability Part 1: Basics and Valuation - T-WIWI-102838</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability Part 2: Reporting and Rating - T-WIWI-102839</td>
</tr>
<tr>
<td>Recommender Systems - T-WIWI-102847</td>
</tr>
<tr>
<td>Regulation Theory and Practice - T-WIWI-102712</td>
</tr>
<tr>
<td>Regulatory Management and Grid Management - Economic Efficiency of Network Operation - T-WIWI-103131</td>
</tr>
<tr>
<td>Replication Technologies in Micro System Technology - T-MACH-102168</td>
</tr>
<tr>
<td>Report Urban Water Infrastructure and Management - T-BGU-106667</td>
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<td>River and Floodplain Ecology - T-BGU-102997</td>
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<td>Roadmapping - T-WIWI-102853</td>
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<td>Safe mechatronic systems - T-MACH-105277</td>
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<td>Safe structures for machines in material handling - T-MACH-105200</td>
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<td>Sensors and Actuators Laboratory - T-ETIT-100706</td>
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<td>Service Analytics B - Enterprise Data Reduction and Prediction - T-WIWI-105779</td>
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<td>Vehicle Ride Comfort &amp; Acoustics I</td>
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<td>Wastewater and Storm Water Treatment</td>
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</tbody>
</table>

VI  Appendix: Study- and Examination Regulation SPO 2015 (2015/09/29 in german)847

VII Appendix: Study- and Examination Regulation SPO 2007 (2007/03/06 in german)863
Part I

About this handbook

1 New Wiwi-modules

M-WIWI-10335 Machine Learning

Responsible: J. Marius Zöllner
Credits: 9

Part of:

- Information Engineering and Management Master: Informatics

M-WIWI-103278/M-WIWI-103337 Optimization under Uncertainty

Responsible: Steffen Rebennack
Credits: 9

Part of:

- Economics Engineering Bachelor: Compulsory Elective Modules/Compulsory Modules 1+2/Operations Research
- Industrial Engineering and Management Bachelor: Operations Research/Specialisation program, Compulsory Elective Modules/Compulsory Modules 2/Operations Research

M-WIWI-103289 Stochastic Optimization

Responsible: Steffen Rebennack
Credits: 9

Part of:

- Information Engineering and Management Master: Economics and Management/Elective Modules in Economics and Management
- Economathematics Master: Operations Management - Data Analysis - Informatics, Elective Field

M-WIWI-103243 Optimization under uncertainty in Information Engineering and Management

Responsible: Steffen Rebennack
Credits: 5

Part of:

- Information Engineering and Management Master: Economics and Management/Compulsory Modules

M-WIWI-103200 Designing Interactive Systems

Responsible: Alexander Mädche
Credits: 9

Part of:

- Industrial Engineering and Management Master: Business Administration, Compulsory Elective Modules/Compulsory Modules 1+2/Business Administration
The program exists of several subjects (e.g. business administration, economics, operations research). Every subject is split into modules and every module itself exists of one or more interrelated module component exams. The extent of every module is indicated by credit points (CP), which will be credited after the successful completion of the module. Some of the modules are obligatory. According to the interdisciplinary character of the program, a great variety of individual specialization and deepening possibilities exists for a large number of modules. This enables the student to customize content and time schedule of the program according to personal needs, interest and job perspective. The module handbook describes the modules belonging to the program. It describes particularly:

- the structure of the modules
- the extent (in CP),
- the dependencies of the modules,
- the learning outcomes,
- the assessment and examinations.

The module handbook serves as a necessary orientation and as a helpful guide throughout the studies. The module handbook does not replace the course catalog, which provides important information concerning each semester and variable course details (e.g. time and location of the course).
Begin and completion of a module

Each module and each examination can only be selected once. The decision on the assignment of an examination to a module (if, for example, an examination in several modules is selectable) is made by the student at the moment when he/she is registered for the appropriate examination. A module was completed or passed when the module examination was passed (grade 4.0 or better). For modules in which the module examination is carried out over several partial examinations, the following applies: The module is completed when all necessary module partial examinations have been passed. In the case of modules which offer alternative partial examinations, the module examination is concluded with the examination with which the required total credits points are reached or exceeded. The module grade, however, is combined with the weight of the predefined credit points for the module in the overall grade calculation.

Module versions

It is not uncommon for modules to be revised due to, for example, new courses or cancelled examinations. As a rule, a new module version is created, which applies to all students who are new to the module. On the other hand, students who have already started the module enjoy confidence and remain in the old module version. This students can complete the module on the same conditions as at the beginning of the module (exceptions are regulated by the examination committee). The date of the student’s “binding declaration” on the choice of the module in the sense of §5(2) of the Study and Examination Regulation is decisive. This binding declaration is made by registering for the first examination in this module.

In the module handbook, all modules are presented in their current version. The version number is given in the module description. Older module versions can be accessed via the previous module handbooks in the archive at http://www.wiwi.kit.edu/Archiv_MHB.php.

General and partial examinations

Module examinations can be either taken in a general examination or in partial examinations. If the module examination is offered as a general examination, the entire learning content of the module will be examined in a single examination. If the module examination is subdivided into partial examinations, the content of each course will be examined in corresponding partial examinations. Registration for examinations can be done online at the campus management portal. The following functions can be accessed on https://campus.studium.kit.edu/exams/index.php:
- Register/unregister for examinations
- Check for examination results
- Create transcript of records

For further and more detailed information, see https://studium.kit.edu/Seiten/FAQ.aspx.

Types of exams

Following SPO 2015 exams are split into written exams, oral exams and alternative exam assessments. Exams are always graded. Non exam assessments can be repeated several times and are not graded. According to SPO 2007/2009 exams are split into written exams, oral exams and non exam assessments. Non exam assessments are graded or not.

Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a second repetition has to be made in written form to the examination comitee two months after loosing the examination claim. A counseling interview is mandatory.

For further information see http://www.wiwi.kit.edu/hinweiseZweitwdh.php.

Additional accomplishments

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Additional accomplishments with at most 30 CP may appear additionally in the certificate.
Further information

More detailed information about the legal and general conditions of the program can be found in the examination regulation of the program (http://www.sle.kit.edu/amtlicheBekanntmachungen.php).

3 Online Version

A new webbased version of the module handbook is now available. This online handbook offers more comfort in browsing modules and courses and allows a smart switching between the english and german version. Try it out!

- Industrial Engineering and Management (B.Sc.): http://www.wiwi.kit.edu/english/mhbWiingBsc_en.php
- Industrial Engineering and Management (M.Sc.): http://www.wiwi.kit.edu/english/mhbWiingMsc_en.php
- Economics Engineering (B.Sc.): http://www.wiwi.kit.edu/english/mhbTVWLbsc_eng.php
- Economics Engineering (M.Sc.): http://www.wiwi.kit.edu/english/mhbTVWLMsc_en.php
- Information Engineering and Management (B.Sc.): http://www.wiwi.kit.edu/english/mhbInwiBsc_en.php
- Information Engineering and Management (M.Sc.): http://www.wiwi.kit.edu/english/mhbInwiMsc_en.php
- Economathematics (M.Sc.): http://www.wiwi.kit.edu/english/mhbWimaMsc_en.php

Screenshot of the webbased module handbook

4 Contact

If you have any questions about modules or exams, please contact the examination office of the KIT Department of Economics and Management:

Ralf Hilser
Anabela Relvas
Phone +49 721 608-43768
E-Mail: pruefungssekretariat@wiwi.kit.edu
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Part II
The Master’s degree program in Industrial Engineering and Management

1 Qualification objectives

Graduates of the interdisciplinary Master’s program in Industrial Engineering have advanced and in-depth knowledge in business administration, economics, computer science, operations research and engineering. This mainly has its focus on business administration and engineering. The areas of specialization depend on individual interests. Additional knowledge in statistics, law or sociology is also offered depending on one’s interests.

They have generalized or specialized expertise in the different disciplines.

The graduates are in a position to define, describe and interpret the specifics, limits, terminologies and doctrines in these subjects, reproduce the current state of research and selectively use this as a basis for further development.

Their extensive know-how enables them to think across the various disciplines and approach issues from different angles.

They are able to select and combine appropriate courses of action for research-related topics. They can then transfer and apply these to specific problems.

They can separately analyze extensive problems such as information and current challenges and review, compare and evaluate these using appropriate methods and concepts.

They evaluate the complexity and risks, identify improvement potentials and choose sustainable solution processes and improvement methods. This puts them in a position where they are able to make responsible and science-based decisions. They are able to come up with innovative ideas and apply them accordingly.

They can oversee these approaches either independently or in teams. They are able to explain and discuss their decisions. They can independently interpret, validate and illustrate the obtained results.

The interdisciplinary use of knowledge also takes account of social, scientific and ethical insights. The graduates can communicate with expert representatives on a scientific level and assume prominent responsibility in a team.

Karlsruhe’s industrial engineers are characterized by their interdisciplinary thinking as well as their innovation and management capability. They are particularly qualified for industrial occupations, service sector or in public administration as well as a downstream scientific career (PhD).

2 SPO 2015

The Master’s degree program in Industrial Engineering and Management (M.Sc.) has 4 terms and consists of 120 credits (CP) including Master’s thesis. The master programme further deepens or complements the scientific qualifications acquired in the bachelor programme. The students should be made capable of independently applying scientific knowledge and methods and evaluate their implications and scope concerning solutions of complex scientific and social problems. Furthermore, the student has to attend two seminars with a minimum of six CP within the seminar module. In addition to the key skills gained in the seminars (3 CP), the student has to acquire additional key skills totalling at least 3 credits. Figure 2 shows the structure of the subjects and the credits allocated to the subjects. The student has to choose two elective modules of the following disciplines: Business science, economics, informatics, operations research, engineering science, statistics, law and sociology. In principle, both elective modules are also available in one discipline. Thereby it is only allowed to choose either one module in law or in sociology.

It is left to the student’s individual curriculum (taking into account the examination and module regulations), in which terms the chosen modules will be started and completed. However, it is highly recommended to complete all courses and seminars before beginning the Master’s thesis.
The master program Industrial Engineering and Management (M.Sc.) at the KIT Department of Economics and Management distinguishes itself by an exceptionally high level of interdisciplinarity. With the combination of business science, economics, informatics, operations research, mathematics as well as engineering and natural science, the integration of knowledge of different disciplines is an inherent element of the programme. As a result, interdisciplinary and connected thinking is encouraged in a natural way. Furthermore, the seminar courses in the master degree programme contribute significantly to the development of key skills by practicing to elaborate and write scientifically sound papers and presentations about special topics. The integrative taught key skills, which are acquired throughout the entire programme, can be classified into the following fields:
## Structure of the Master’s degree program in Industrial Engineering and Management SPO 2007 (recommended)

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<th>Semester</th>
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<td>2</td>
<td>9 CP 9 CP 9 CP 9 CP 9 CP 9 CP 6 + 3 CP</td>
<td>9 CP 9 CP</td>
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<td>3</td>
<td>Master Thesis 30 CP</td>
<td>120 CP</td>
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(8 compulsory modules + 2 elective modules + Master Thesis)

### Soft skills
1. Team work, social communication and creativity techniques
2. Presentations and presentation techniques
3. Logical and systematical arguing and writing
4. Structured problem solving and communication

### Enabling skills
1. Decision making in business context
2. Project management competences
3. Fundamentals of business science
4. English as a foreign language

### Orientational knowledge
1. Acquisition of interdisciplinary knowledge
2. Institutional knowledge about economic and legal systems
3. Knowledge about international organisations
4. Media, technology and innovation

The integrative acquisition of key skills especially takes place in several obligatory courses during the master programme, namely
1. Seminar module
2. Mentoring of the Master’s thesis
3. Business science, economics and informatics modules

Besides the integrated key skills, the additive acquisition of key skills, which are totalling at least three credits within the seminar module, is scheduled. Students may choose freely among the offered courses of HoC, ZAK and Sprachenzentrum.
## Part III

### Field structure

#### 1 Master Thesis

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<th>Identifier</th>
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<tr>
<td>M-WIWI-101650</td>
<td>Module Master Thesis (S. 37)</td>
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#### 2 Business Administration

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<td>M-WIWI-101410</td>
<td>Business &amp; Service Engineering (S. 103)</td>
<td>9</td>
<td>Christof Weinhardt</td>
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<tr>
<td>M-WIWI-101512</td>
<td>Computational Finance (S. 62)</td>
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<td>Maxim Ulrich</td>
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<td>M-WIWI-101510</td>
<td>Cross-functional Management Accounting (S. 105)</td>
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<td>Marcus Wouters</td>
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<tr>
<td>M-WIWI-101470</td>
<td>Data Science: Advanced CRM (S. 59)</td>
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5 Operations Research
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<td>Global Production and Logistics (S. 201)</td>
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7 Compulsory Elective Modules

7.1 Seminars

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<td>M-WIWI-101808</td>
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7.2 Compulsory Modules 1

7.2.1 Business Administration

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### COMPULSORY ELECTIVE MODULES

#### 7.2 Compulsory Modules 1

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#### 7.2.2 Economics

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<th>Module</th>
<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>M-WIWI-101511 Advanced Topics in Public Finance (S. 130)</td>
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<td>M-WIWI-101453 Applied Strategic Decisions (S. 126)</td>
<td>9</td>
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<td>M-WIWI-101504 Collective Decision Making (S. 118)</td>
<td>9</td>
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<td>M-WIWI-101481 Economic Policy II (S. 132)</td>
<td>9</td>
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<td>M-WIWI-101502 Economic Theory and its Application in Finance (S. 116)</td>
<td>9</td>
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<td>M-WIWI-101468 Environmental Economics (S. 121)</td>
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<td>M-WIWI-101514 Innovation Economics (S. 112)</td>
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### 7.2 Compulsory Modules 1

#### 7.2.3 Informatics

<table>
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<td>M-WIWI-101630</td>
<td>Electives in Informatics (S. 220)</td>
<td>9</td>
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<td>M-WIWI-101628</td>
<td>Emphasis in Informatics (S. 222)</td>
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#### 7.2.4 Operations Research

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<td>Mathematical Programming (S. 136)</td>
<td>9</td>
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<td>Operations Research in Supply Chain Management (S. 146)</td>
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<td>M-WIWI-101415</td>
<td>Operations Research in Supply Chain Management and Health Care Management (S. 140)</td>
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<td>Service Operations (S. 144)</td>
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<td>Stochastic Modelling and Optimization (S. 138)</td>
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<td>M-WIWI-103289</td>
<td>Stochastic Optimization (S. 142)</td>
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#### 7.2.5 Engineering Sciences

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<td>M-BGU-100998</td>
<td>Design, Construction, Operation and Maintenance of Highways (S. 162)</td>
<td>9</td>
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<td>M-BGU-103308</td>
<td>Environmental Management (S. 152)</td>
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<td>Environmental Management (S. 195)</td>
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<td>Fundamentals of Transportation (S. 179)</td>
<td>9</td>
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<td>Highway Engineering (S. 196)</td>
<td>9</td>
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<td>Lean Management in Construction (S. 215)</td>
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<td>M-BGU-101110</td>
<td>Process Engineering in Construction (S. 157)</td>
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<td>Project in Public Transportation (S. 167)</td>
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<td>Public Transportation Operations (S. 185)</td>
<td>9</td>
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<td>Safety, Computing and Law in Highway Engineering (S. 213)</td>
<td>9</td>
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<tr>
<td>M-BGU-101112</td>
<td>Track Guided Transport Systems / Engineering (S. 155)</td>
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### COMPULSORY ELECTIVE MODULES

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Module</th>
<th>ECTS</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>M-BGU-101065</td>
<td>Transportation Modelling and Traffic Management (S. 149)</td>
<td>9</td>
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<tr>
<td>M-BGU-101001</td>
<td>Water Supply and Sanitation (S. 194)</td>
<td>10</td>
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<td>Principles of Food Process Engineering (S. 187)</td>
<td>9</td>
<td>Volker Gaukel</td>
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<td>Specialization in Food Process Engineering (S. 182)</td>
<td>9</td>
<td>Volker Gaukel</td>
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<td>Water Chemistry and Water Technology I (S. 159)</td>
<td>9</td>
<td>Harald Horn</td>
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<td>Control Engineering II (S. 211)</td>
<td>9</td>
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<td>M-ETIT-101164</td>
<td>Generation and transmission of renewable power (S. 183)</td>
<td>9</td>
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<td>High-Voltage Technology (S. 164)</td>
<td>9</td>
<td>Wolfgang Menesklou</td>
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<td>Sensor Technology I (S. 191)</td>
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<td>9</td>
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<td>9</td>
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<td>BioMEMS (S. 192)</td>
<td>9</td>
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<td>9</td>
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<td>9</td>
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<td>Energy and Process Technology I (S. 170)</td>
<td>9</td>
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<td>Global Production and Logistics (S. 201)</td>
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<td>Handling Characteristics of Motor Vehicles (S. 212)</td>
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<td>Integrated Production Planning (S. 186)</td>
<td>9</td>
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<td>Introduction to Logistics (S. 171)</td>
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<td>Logistics in Value Chain Networks (S. 199)</td>
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<td>Machine Tools and Industrial Handling (S. 161)</td>
<td>9</td>
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<td>Material Flow in Networked Logistic Systems (S. 205)</td>
<td>9</td>
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<td>M-MACH-101291</td>
<td>Microfabrication (S. 168)</td>
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<td>M-MACH-101292</td>
<td>Microprobes (S. 197)</td>
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<td>9</td>
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<td>Nanotechnology (S. 184)</td>
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<td>Optoelectronics and Optical Communication (S. 166)</td>
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<td>9</td>
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<td>Extracurricular Module in Engineering (S. 163)</td>
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<td>Natural Hazards and Risk Management 2 (S. 181)</td>
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#### 7.2.6 Statistics

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<tr>
<td>M-WIWI-101637</td>
<td>Analytics and Statistics (S. 224)</td>
<td>9</td>
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### 7.3 Compulsory Modules 2

#### 7.3.1 Business Administration

<table>
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<td>Business &amp; Service Engineering (S. 103)</td>
<td>9</td>
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<td>M-WIWI-101512</td>
<td>Computational Finance (S. 62)</td>
<td>9</td>
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<td>Cross-functional Management Accounting (S. 105)</td>
<td>9</td>
<td>Marcus Wouters</td>
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<td>M-WIWI-101470</td>
<td>Data Science: Advanced CRM (S. 59)</td>
<td>9</td>
<td>Andreas Geyer-Schulz</td>
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<td>Data Science: Data-Driven Information Systems (S. 42)</td>
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<td>M-WIWI-103118</td>
<td>Data Science: Data-Driven User Modeling (S. 97)</td>
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<td>Data Science: Evidence-based Marketing (S. 54)</td>
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<td>Designing Interactive Systems (S. 93)</td>
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<td>Digital Service Systems in Industry (S. 101)</td>
<td>9</td>
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<td>Disruptive FinTech Innovations (S. 110)</td>
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<td>M-WIWI-101409</td>
<td>Electronic Markets (S. 76)</td>
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<td>Energy Economics and Technology (S. 74)</td>
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<td>Entrepreneurship (EnTechnon) (S. 87)</td>
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<td>Finance 1 (S. 46)</td>
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<td>M-WIWI-101483</td>
<td>Finance 2 (S. 81)</td>
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<td>Finance 3 (S. 40)</td>
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<td>Financial Technology for Risk and Asset Management (S. 106)</td>
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<td>Industrial Production II (S. 49)</td>
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<td>Industrial Production III (S. 44)</td>
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<td>Information Engineering (S. 64)</td>
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<td>Innovation Management (S. 68)</td>
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<td>Marion Weissenberger-Eibl</td>
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<td>Insurance Management I (S. 85)</td>
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<td>Intelligent Risk and Investment Advisory (S. 61)</td>
<td>9</td>
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<td>Quantitative Valuation (S. 80)</td>
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<td>Real Estate Economics and Sustainability (S. 57)</td>
<td>9</td>
<td>David Lorenz</td>
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<td>9</td>
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<td>Service Analytics (S. 78)</td>
<td>9</td>
<td>Hansjörg Fromm, Christof Weinhardt</td>
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<td>Service Design Thinking (S. 89)</td>
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<td>Gerhard Satzger, Christof Weinhardt</td>
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<td>M-WIWI-102754</td>
<td>Service Economics and Management (S. 66)</td>
<td>9</td>
<td>Gerhard Satzger, Christof Weinhardt</td>
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<td>M-WIWI-102806</td>
<td>Service Innovation, Design &amp; Engineering (S. 70)</td>
<td>9</td>
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<td>Service Management (S. 107)</td>
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7.3 Compulsory Modules 2

### 7.3.2 Economics

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Module</th>
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<tr>
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<td>Agglomeration and Innovation (S. 133)</td>
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<td>Growth and Agglomeration (S. 120)</td>
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### 7.3.3 Informatics

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<td>M-WIWI-101630</td>
<td>Electives in Informatics (S. 220)</td>
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<td>M-WIWI-101628</td>
<td>Emphasis in Informatics (S. 222)</td>
<td>9</td>
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### 7.3.4 Operations Research

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<td>Mathematical Programming (S. 136)</td>
<td>9</td>
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<td>M-WIWI-101415</td>
<td>Operations Research in Supply Chain Management and Health Care Management (S. 140)</td>
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<td>Stochastic Optimization (S. 142)</td>
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### 7.3.5 Engineering Sciences

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<td>Design, Construction, Operation and Maintenance of Highways</td>
<td>9</td>
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<td>M-BGU-103308</td>
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<td>Microoptics (S. 197)</td>
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### ADDITIONAL EXAMINATIONS

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<td>Mobile Machines (S. 207)</td>
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<td>Vehicle Development (S. 178)</td>
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#### 7.3.6 Statistics

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<td>Analytics and Statistics (S. 224)</td>
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#### 7.3.7 Law

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<td>Governance, Risk &amp; Compliance (S. 229)</td>
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#### 7.3.8 Sociology

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<td>Sociology (S. 233)</td>
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#### 8 Additional Examinations

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ADDITIONAL EXAMINATIONS

M-BGU-101000 Environmental Management (S. 195) 9 Stephan Fuchs, Erhard Hoffmann
M-BGU-101064 Fundamentals of Transportation (S. 179) 9 Peter Vortisch
M-BGU-100999 Highway Engineering (S. 196) 9 Ralf Roos
M-BGU-101884 Lean Management in Construction (S. 215) 9 Shervin Haghseno
M-BGU-101110 Process Engineering in Construction (S. 157) 9 Shervin Haghseno
M-BGU-101113 Project in Public Transportation (S. 167) 9 Eberhard Hohnecker
M-BGU-101888 Project Management in Construction (S. 215) 9 Shervin Haghseno
M-BGU-101111 Public Transportation Operations (S. 185) 9 Eberhard Hohnecker
M-BGU-101066 Safety, Computing and Law in Highway Engineering (S. 213) 9 Ralf Roos
M-BGU-101112 Track Guided Transport Systems / Engineering (S. 155) 9 Eberhard Hohnecker
M-BGU-101065 Transportation Modelling and Traffic Management (S. 149) 9 Peter Vortisch
M-BGU-101001 Water Supply and Sanitation (S. 194) 10 Stephan Fuchs
M-CIWVT-101120 Principles of Food Process Engineering (S. 187) 9 Volker Gaukel
M-CIWVT-101119 Specialization in Food Process Engineering (S. 182) 9 Volker Gaukel
M-CIWVT-101121 Water Chemistry and Water Technology I (S. 159) 9 Harald Horn
M-CIWVT-101122 Water Chemistry and Water Technology II (S. 190) 9 Harald Horn
M-ETIT-101157 Control Engineering II (S. 211) 9 Sören Hohmann
M-ETIT-101164 High-Voltage Technology (S. 164) 9 Bernd Hoferer, Thomas Leibfried
M-ETIT-101158 Sensor Technology I (S. 191) 9 Wolfgang Menesklou
M-ETIT-101159 Sensor Technology II (S. 210) 9 Wolfgang Menesklou
M-MACH-101298 Automated Manufacturing Systems (S. 209) 9 Jürgen Fleischer
M-MACH-101266 Automotive Engineering (S. 151) 9 Frank Gauterin
M-MACH-101290 BioMEMS (S. 192) 9 Jan Gerrit Korvink
M-MACH-101275 Combustion Engines I (S. 156) 9 Thomas Koch, Heiko Kubach
M-MACH-101303 Combustion Engines II (S. 165) 9 Heiko Kubach
M-MACH-101296 Energy and Process Technology I (S. 170) 9 Heiner Wirsber
M-MACH-101297 Energy and Process Technology II (S. 214) 9 Heiner Wirsber
M-MACH-101282 Global Production and Logistics (S. 201) 9 Volker Schulze
M-MACH-101264 Handling Characteristics of Motor Vehicles (S. 212) 9 Frank Gauterin
M-MACH-101272 Integrated Production Planning (S. 186) 9 Gisela Lanza
M-MACH-101263 Introduction to Logistics (S. 171) 9 Kai Furmans
M-MACH-101280 Logistics in Value Chain Networks (S. 199) 9 Kai Furmans
M-MACH-101286 Machine Tools and Industrial Handling (S. 161) 9 Jürgen Fleischer
M-MACH-101276 Manufacturing Technology (S. 158) 9 Volker Schulze
M-MACH-101277 Material Flow in Logistic Systems (S. 150) 9 Kai Furmans
M-MACH-101287 Material Flow in Networked Logistic Systems (S. 205) 9 Kai Furmans
M-MACH-101291 Micromachining (S. 168) 9 Jan Gerrit Korvink
M-MACH-101292 Microsystems (S. 197) 9 Jan Gerrit Korvink
M-MACH-101287 Microsystem Technology (S. 188) 9 Jan Gerrit Korvink
M-MACH-101267 Mobile Machines (S. 207) 9 Marcus Geimer
M-MACH-101294 Nanotechnology (S. 184) 9 Jan Gerrit Korvink
M-MACH-101295 Optoelectronics and Optical Communication (S. 166) 9 Jan Gerrit Korvink
M-MACH-101284 Specialization in Production Engineering (S. 160) 9 Volker Schulze
M-MACH-101268 Specific Topics in Materials Science (S. 176) 9 Michael Hoffmann
M-MACH-101279 Technical Logistics (S. 203) 9 Kai Furmans
M-MACH-101265 Vehicle Development (S. 178) 9 Frank Gauterin
M-MACH-101283 Virtual Engineering A (S. 173) 9 Jivka Ovtcharova
M-MACH-101281 Virtual Engineering B (S. 153) 9 Jivka Ovtcharova

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
<table>
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<tr>
<td>M-WIWI-101511</td>
<td>Advanced Topics in Public Finance</td>
<td>S. 130</td>
<td>Berthold Wigger</td>
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<td>S. 103</td>
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<td>S. 62</td>
<td>Maxim Ulrich</td>
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<td>S. 105</td>
<td>Marcus Wouters</td>
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<td>Data Science: Advanced CRM</td>
<td>S. 59</td>
<td>Alexander Geyer-Schulz, Christof Weinhardt</td>
</tr>
<tr>
<td>M-WIWI-103117</td>
<td>Data Science: Data-Driven Information Systems</td>
<td>S. 42</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-103118</td>
<td>Data Science: Data-Driven User Modeling</td>
<td>S. 97</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-101647</td>
<td>Data Science: Evidence-based Marketing</td>
<td>S. 54</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-103200</td>
<td>Designing Interactive Systems</td>
<td>S. 93</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-102808</td>
<td>Digital Service Systems in Industry</td>
<td>S. 101</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-103261</td>
<td>Disruptive FinTech Innovations</td>
<td>S. 110</td>
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<tr>
<td>M-WIWI-101638</td>
<td>Econometrics and Statistics I</td>
<td>S. 226</td>
<td></td>
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<tr>
<td>M-WIWI-101639</td>
<td>Econometrics and Statistics II</td>
<td>S. 227</td>
<td></td>
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<tr>
<td>M-WIWI-101481</td>
<td>Economic Policy II</td>
<td>S. 132</td>
<td></td>
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<tr>
<td>M-WIWI-101502</td>
<td>Economic Theory and its Application in Finance</td>
<td>S. 116</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-101630</td>
<td>Electives in Informatics</td>
<td>S. 220</td>
<td></td>
</tr>
<tr>
<td>M-WIWI-101409</td>
<td>Electronic Markets</td>
<td>S. 76</td>
<td>Andreas Geyer-Schulz</td>
</tr>
<tr>
<td>M-WIWI-101628</td>
<td>Emphasis in Informatics</td>
<td>S. 222</td>
<td>Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner</td>
</tr>
<tr>
<td>M-WIWI-101452</td>
<td>Energy Economics and Technology</td>
<td>S. 74</td>
<td>Wolf Fichtner</td>
</tr>
<tr>
<td>M-WIWI-101488</td>
<td>Entrepreneurship (EnTechnon)</td>
<td>S. 87</td>
<td>Orestis Terzidis</td>
</tr>
<tr>
<td>M-WIWI-101468</td>
<td>Environmental Economics</td>
<td>S. 121</td>
<td>Kay Mitusch</td>
</tr>
<tr>
<td>M-WIWI-101505</td>
<td>Experimental Economics</td>
<td>S. 128</td>
<td>Johannes Philipp Reiß</td>
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<tr>
<td>M-WIWI-101482</td>
<td>Finance 1</td>
<td>S. 46</td>
<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
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<td>M-WIWI-101483</td>
<td>Finance 2</td>
<td>S. 81</td>
<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
</tr>
<tr>
<td>M-WIWI-101480</td>
<td>Finance 3</td>
<td>S. 40</td>
<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
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<tr>
<td>M-WIWI-103120</td>
<td>Financial Economics</td>
<td>S. 39</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>M-WIWI-103121</td>
<td>Financial Technology for Risk and Asset Management</td>
<td>S. 106</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>M-WIWI-101496</td>
<td>Growth and Agglomeration</td>
<td>S. 120</td>
<td>Ingrid Ott</td>
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<td>M-WIWI-101471</td>
<td>Industrial Production II</td>
<td>S. 49</td>
<td>Frank Schultmann</td>
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<tr>
<td>M-WIWI-101412</td>
<td>Industrial Production III</td>
<td>S. 44</td>
<td>Frank Schultmann</td>
</tr>
<tr>
<td>M-WIWI-101472</td>
<td>Informatics</td>
<td>S. 134</td>
<td>Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner</td>
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<tr>
<td>M-WIWI-101411</td>
<td>Information Engineering</td>
<td>S. 64</td>
<td>Christof Weinhardt</td>
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<tr>
<td>M-WIWI-101478</td>
<td>Innovation and growth</td>
<td>S. 114</td>
<td>Ingrid Ott</td>
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<td>M-WIWI-101514</td>
<td>Innovation Economics</td>
<td>S. 112</td>
<td>Ingrid Ott</td>
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<td>M-WIWI-101507</td>
<td>Innovation Management</td>
<td>S. 68</td>
<td>Marion Weissenberger-Eibl</td>
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<tr>
<td>M-WIWI-101469</td>
<td>Insurance Management I</td>
<td>S. 85</td>
<td>Ute Werner</td>
</tr>
<tr>
<td>M-WIWI-101449</td>
<td>Insurance Management II</td>
<td>S. 72</td>
<td>Ute Werner</td>
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<tr>
<td>M-WIWI-103247</td>
<td>Intelligent Risk and Investment Advisory</td>
<td>S. 61</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>M-WIWI-101462</td>
<td>Macroeconomic Theory</td>
<td>S. 119</td>
<td>Marten Hillebrand</td>
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<td>Management Accounting (S. 53)</td>
<td>9</td>
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<tr>
<td>M-WIWI-101446</td>
<td>Market Engineering (S. 95)</td>
<td>9</td>
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<tr>
<td>M-WIWI-101490</td>
<td>Marketing Management (S. 99)</td>
<td>9</td>
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<td>M-WIWI-101473</td>
<td>Mathematical Programming (S. 136)</td>
<td>9</td>
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<tr>
<td>M-WIWI-101500</td>
<td>Microeconomic Theory (S. 111)</td>
<td>9</td>
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<td>M-WIWI-101642</td>
<td>Natural Hazards and Risk Management 1 (S. 180)</td>
<td>9</td>
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<td>Natural Hazards and Risk Management 2 (S. 181)</td>
<td>9</td>
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<td>M-WIWI-101406</td>
<td>Network Economics (S. 124)</td>
<td>9</td>
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<td>M-WIWI-102832</td>
<td>Operations Research in Supply Chain Management (S. 146)</td>
<td>9</td>
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<td>M-WIWI-101415</td>
<td>Operations Research in Supply Chain Management and Health Care Management (S. 140)</td>
<td>9</td>
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<tr>
<td>M-WIWI-103122</td>
<td>Quantitative Risk Management (S. 109)</td>
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<td>M-WIWI-103123</td>
<td>Quantitative Valuation (S. 80)</td>
<td>9</td>
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<td>Real Estate Economics and Sustainability (S. 57)</td>
<td>9</td>
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<td>M-WIWI-101487</td>
<td>Sales Management (S. 83)</td>
<td>9</td>
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<td>M-WIWI-101506</td>
<td>Service Analytics (S. 78)</td>
<td>9</td>
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<td>M-WIWI-101503</td>
<td>Service Design Thinking (S. 89)</td>
<td>9</td>
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<td>M-WIWI-102754</td>
<td>Service Economics and Management (S. 66)</td>
<td>9</td>
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<td>M-WIWI-102806</td>
<td>Service Innovation, Design &amp; Engineering (S. 70)</td>
<td>9</td>
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<td>Service Management (S. 107)</td>
<td>9</td>
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<td>M-WIWI-102805</td>
<td>Service Operations (S. 144)</td>
<td>9</td>
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<td>M-WIWI-101649</td>
<td>Services Marketing (S. 91)</td>
<td>9</td>
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<td>M-WIWI-101454</td>
<td>Stochastic Modelling and Optimization (S. 138)</td>
<td>9</td>
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<td>M-WIWI-103289</td>
<td>Stochastic Optimization (S. 142)</td>
<td>9</td>
<td></td>
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<tr>
<td>M-WIWI-101450</td>
<td>Strategic Corporate Management and Organization (S. 234)</td>
<td>9</td>
<td></td>
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<td>M-WIWI-101509</td>
<td>Strategic Decision Making and Organization (S. 56)</td>
<td>9</td>
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<td>M-WIWI-101489</td>
<td>Strategy, Communication, and Data Analysis (S. 47)</td>
<td>9</td>
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<tr>
<td>M-WIWI-101485</td>
<td>Transport infrastructure policy and regional development (S. 122)</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
**Part IV**

**Modules**

<table>
<thead>
<tr>
<th>Module: Module Master Thesis [M-WIWI-101650]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsibility:</strong> Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften</td>
</tr>
<tr>
<td><strong>Organisation:</strong> KIT-Fakultät für Wirtschaftswissenschaften</td>
</tr>
<tr>
<td><strong>Curricular Anchorage:</strong> Compulsory</td>
</tr>
<tr>
<td><strong>Contained in:</strong> Master Thesis</td>
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<table>
<thead>
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<th>ECTS</th>
<th>Language</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-WIWI-103142</td>
<td>Master Thesis (S. 524)</td>
<td>30</td>
<td>Deutsch</td>
<td>1</td>
</tr>
</tbody>
</table>

**Learning Control / Examinations**

The Master Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Industrial Engineering and Management. The Master Thesis is described in detail in § 11 of the examination regulation. The review is carried out by at least one examiner of the Department of Economics and Management, or, after approval by at least one examiner of another faculty. The examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.

The regular processing time takes six months. On a reasoned request of the student, the examination board can extend the processing time of a maximum of three month. If the Master Thesis is not completed in time, this exam is “failed”, unless the student is not being responsible (e.g. maternity leave).

With consent of the examiner the thesis can be written in English as well. Other languages require besides the consent of the examiner the approval of the examination board. The issue of the Master Thesis may only returned once and only within the first month of processing time. A new topic has to be released within four weeks.

The module grade is the grade for the Master Thesis.

**Conditions**

Prerequisite for admission to the Master thesis is that 50 percent of the credit points has to be completed.

A written confirmation of the examiner about supervising the Master Thesis is required.

Please pay regard to the institute specific rules for supervising a Master Thesis.

The Master Thesis has to contain the following declaration: “I hereby declare that I produced this thesis without external assistance, and that no other than the listed references have been used as sources of information. Passages taken literally or analogously from published or non published sources is marked as this.” If this declaration is not given, the Master Thesis will not be accepted.

**Qualification Objectives**

The student can independently handle a complex and unfamiliar subject based on scientific criteria and on the current state of research.

He/she is in a position to critically analyze and structure the researched information as well as derive principles and regularities. He/she knows how to apply the thereby achieved results to solve the task at hand. Taking into account this knowledge and his/her interdisciplinary knowledge, he/she can draw own conclusions, derive improvement potentials,
propose and implement science-based decisions.
This is basically also done under consideration of social and/or ethical aspects.
He/she can interpret, evaluate and if required, graphically present the obtained results.
He/she is in a position to sensibly structure a research paper, document them and clearly communicate the results in scientific form.

Content
The Master Thesis is a major scientific work. The topic of the Master Thesis will be chosen by the student themselves and adjusted with the examiner. The topic has to be related to Industrial Engineering and Management and has to refer to subject-specific or interdisciplinary problems.

Workload
The total workload for this module is approximately 900 hours. For further information see German version.
Module: Financial Economics  [M-WIWI-103120]

Responsibility: Maxim Ulrich

Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective

Contained in: Business Administration
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

ECTS
Recurrence
Jedes Wintersemester
Duration
1 Semester
Language
Englisch
Version
1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

<table>
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<tr>
<th>Identifier</th>
<th>Course</th>
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<th>Responsibility</th>
</tr>
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<tbody>
<tr>
<td>T-WIWI-102878</td>
<td>Computational Risk and Asset Management (S. 303)</td>
<td>4.5</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>T-WIWI-106194</td>
<td>Macro-Finance (S. 503)</td>
<td>4.5</td>
<td>Maxim Ulrich</td>
</tr>
</tbody>
</table>

Learning Control / Examinations
The module has been cancelled.
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students apply statistical methods to estimate expected returns, risk and risk densities of different investment instruments. They will know how to apply maximum likelihood and expectation maximization algorithms to estimate linear and non-linear asset pricing models from the fixed-income, equity or option pricing literature. Besides a conceptual understanding, students will implement the estimation algorithms using modern software and learn about current innovations in the macro-finance literature, aiming to price bonds, equity and option markets with explicitly accounting for fundamental economic and monetary policy related risks under no-arbitrage.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
Module: Finance 3  [M-WIWI-101480]

Responsibility:  Martin Ruckes, Marliese Uhrig-Homburg

Organisation:  KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage:  Compulsory Elective

Contained in:  Business Administration
               Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
               Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
               Additional Examinations

ECTS  | Recurrence    | Duration  | Level | Version
9     | Jedes Semester| 1 Semester| 4     | 2

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Course</th>
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<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-WIWI-102647</td>
<td>Asset Pricing (S. 249)</td>
<td>4,5</td>
<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
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<tr>
<td>T-WIWI-102621</td>
<td>Valuation (S. 810)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
</tr>
<tr>
<td>T-WIWI-102643</td>
<td>Derivatives (S. 330)</td>
<td>4,5</td>
<td>Marliese Uhrig-Homburg</td>
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<tr>
<td>T-WIWI-102644</td>
<td>Fixed Income Securities (S. 396)</td>
<td>4,5</td>
<td>Marliese Uhrig-Homburg</td>
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<tr>
<td>T-WIWI-102645</td>
<td>Credit Risk (S. 321)</td>
<td>4,5</td>
<td>Marliese Uhrig-Homburg</td>
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<tr>
<td>T-WIWI-102622</td>
<td>Corporate Financial Policy (S. 319)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
</tr>
<tr>
<td>T-WIWI-102623</td>
<td>Financial Intermediation (S. 395)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
</tr>
<tr>
<td>T-WIWI-102625</td>
<td>Exchanges (S. 377)</td>
<td>1,5</td>
<td>Jörg Franke</td>
</tr>
<tr>
<td>T-WIWI-102626</td>
<td>Business Strategies of Banks (S. 285)</td>
<td>3</td>
<td>Wolfgang Müller</td>
</tr>
<tr>
<td>T-WIWI-102646</td>
<td>International Finance (S. 470)</td>
<td>3</td>
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<td>T-WIWI-102600</td>
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<td>4,5</td>
<td>Christof Weinhardt</td>
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<td>T-WIWI-102900</td>
<td>Financial Analysis (S. 393)</td>
<td>4,5</td>
<td>Torsten Luedecke</td>
</tr>
</tbody>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
It is only possible to choose this module in combination with the module Finance 1 and Finance 2. The module is passed only after the final partial exams of Finance 1 and Finance 2 are additionally passed.

Modeled Conditions
The following conditions must be met:
1. The module [M-WIWI-101482] Finance 1 must have been started.
2. The module [M-WIWI-101483] Finance 2 must have been started.

Qualification Objectives
The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.
Content
The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

Remarks
The courses eFinance: Information Engineering and Management for Securities Trading [2540454] and Financial Analysis [2530205] can be chosen from summer term 2015 on.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Data Science: Data-Driven Information Systems [M-WIWI-103117]

Responsibility: Alexander Mädche, Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

Compulsory

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<th>Version</th>
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<td>4,5</td>
<td>Jedes Semester</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 4,5 credits.

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</thead>
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<tr>
<td>T-WIWI-105777</td>
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<td>4,5</td>
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<tr>
<td>T-WIWI-106207</td>
<td>Practical Seminar: Data-Driven Information Systems (S. 616)</td>
<td>4,5</td>
<td>Alexander Mädche, Thomas Setzer, Christof Weinhardt</td>
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<tr>
<td>T-WIWI-105778</td>
<td>Service Analytics A (S. 726)</td>
<td>4,5</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

Conditions
The course “Business Data Strategy” is compulsory and must be examined.

Qualification Objectives
The student
- understands the strategic role of integrating, transforming, and analyzing large and complex enterprise data in modern business information systems and is capable of comparing and assessing strategic alternatives
- has the core skills to design, model, and control complex, inter-organisational analytical, processes, including various business functions as well as customers and markets
- understands the usage of performance indicators for a variety of controlling and management issues and is able to define models for generating the relevant performance indicators under considerations of data availability
- distinguishes different analytics methods and concepts and learn when to apply to better understand and anticipate business relationships and developments of industrial and in particular service companies to derive fact- and data-founded managerial actions and strategies.
- knows how to capture uncertainty in the data and how to appropriately consider and visualize uncertainty in decision support or business intelligence systems and analytical processes as a whole.

Content
The amount of business-related data available in modern enterprise information systems grows exponentially, and the
various data sources are more and more integrated, transformed, and analyzed jointly to gain valuable business insights, pro-actively control and manage business processes, to leverage planning and decision making, and to provide appropriate, potentially novel services to customers based on relationships and developments observed in the data.

Also, data sources are more and more connected and single business unit that used to operate on separate data pools are now becoming highly integrated, providing tremendous business opportunities but also challenges regarding how the data should be represented, integrated, preprocessed, transformed, and finally used in analytics planning and decision processes.

The courses of this module equip the students with core skills to understands the strategic role of integrating, transforming, and analyzing large and complex enterprise data in modern business information systems. Students will be capable to designing, comparing, and evaluating strategic alternatives. Also, students will learn how to design, model, and control complex analytical processes, including various business functions of industrial and service companies including customers and markets. Students learn core skills to understand fundamental strategies for integrating analytic models and operative controlling mechanisms while ensuring the technical feasibility of the resulting information systems.

Furthermore, the student can distinguish different methods and concepts in the realm of data science and learns when to apply. She/he will know the means of characterizing and analyzing heterogeneous, high-dimensional data available data in data warehouses and external data sources to gain additional insights valuable for enterprise planning and decision making. Also, the students know how to capture uncertainty in the data and how to appropriately consider and visualize uncertainty in business information and business intelligence systems.

The module offers the opportunity to apply and deepen this knowledge in a seminar and hands-on tutorials that are offered with all lectures.

Texteintrag

Recommendations
Basic knowledge of Information Management, Operations Research, Descriptive Statistics, and Inferential Statistics is assumed.

Remarks
The course „Business Data Strategy“ can be chosen from winter term 2016 on.
Module: Industrial Production III [M-WIWI-101412]

Responsibility: Frank Schultmann

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration

Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
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Compulsory

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<tr>
<td>T-WIWI-102632</td>
<td>Production and Logistics Management (S. 634)</td>
<td>5,5</td>
<td>Frank Schultmann</td>
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Ergänzungsangebot aus dem Modul Industrielle Produktion II

Non-Compulsory Block; You must choose at most 1 courses.

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<tbody>
<tr>
<td>T-WIWI-102634</td>
<td>Emissions into the Environment (S. 350)</td>
<td>3,5</td>
<td>Ute Karl</td>
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<tr>
<td>T-WIWI-102882</td>
<td>International Management in Engineering and Production (S. 471)</td>
<td>3,5</td>
<td>Henning Sasse</td>
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<tr>
<td>T-WIWI-103133</td>
<td>Life Cycle Assessment (S. 492)</td>
<td>3,5</td>
<td>Heiko Keller</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose at most 1 courses.

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<tr>
<td>T-WIWI-102763</td>
<td>Supply Chain Management with Advanced Planning Systems (S. 772)</td>
<td>3,5</td>
<td>Claus J. Bosch, Mathias Göbelt</td>
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<tr>
<td>T-WIWI-102826</td>
<td>Risk Management in Industrial Supply Networks (S. 668)</td>
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<td>T-WIWI-102828</td>
<td>Supply Chain Management in the Automotive Industry (S. 769)</td>
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<td>Tilman Heupel, Hendrik Lang</td>
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<tr>
<td>T-WIWI-103134</td>
<td>Project Management (S. 638)</td>
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<td>Frank Schultmann</td>
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</table>

Learning Control / Examinations

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course Production and Logistics Management [2581954] and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course Production and Logistics Management [2581954] and at least one additional activity are compulsory and must be examined.

Qualification Objectives
• Students describe the tasks concerning general problems of an operative production and logistics management.
• Students describe the planning tasks of supply chain management.
• Students use proficiently approaches to solve general planning problems.
• Students explain the existing interdependencies between planning tasks and applied methods.
• Students describe the mail goals and set-up of software supporting tools in production and logistics management (i.e. APS, PPS-, ERP- and SCM Systems).
• Students discuss the scope of these software tools and their general disadvantages.

Content

• Planning tasks and exemplary methods of production planning and control in supply chain management.
• Supporting software tools in production and logistics management (APS, PPS- and ERP Systems).
• Project management in the field of production and supply chain management.

Remarks
Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production II.

Workload
The course Production and Logistics Management [2581954] and at least one additional activity are compulsory and must be examined.
Module: Finance 1 [M-WIWI-101482]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<tr>
<td>T-WIWI-102643</td>
<td>Derivatives (S. 330)</td>
<td>4,5</td>
<td>Marliese Uhrig-Homburg</td>
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<tr>
<td>T-WIWI-102621</td>
<td>Valuation (S. 810)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<tr>
<td>T-WIWI-102647</td>
<td>Asset Pricing (S. 249)</td>
<td>4,5</td>
<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
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</table>

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The student
- has core skills in economics and methodology in the field of finance
- assesses corporate investment projects from a financial perspective
- is able to make appropriate investment decisions on financial markets

Content
The courses of this module equip the students with core skills in economics and methodology in the field of modern finance. Securities which are traded on financial and derivative markets are presented, and frequently applied trading strategies are discussed. A further focus of this module is on the assessment of both profits and risks in security portfolios and corporate investment projects from a financial perspective.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Strategy, Communication, and Data Analysis [M-WIWI-101489]

Responsibility: Martin Klarmann
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

<table>
<thead>
<tr>
<th>Identifier</th>
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<td>T-WIWI-106569</td>
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<td>T-WIWI-106137</td>
<td>Country Manager Simulation (S. 320)</td>
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<td>T-WIWI-102639</td>
<td>Business Models in the Internet: Planning and Implementation (S. 281)</td>
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<td>T-WIWI-102635</td>
<td>Information Technology and Business Information (S. 452)</td>
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<tr>
<td>T-WIWI-102618</td>
<td>Strategic and Innovative Decision Making in Marketing (S. 757)</td>
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<tr>
<td>T-WIWI-102619</td>
<td>Behavioral Approaches in Marketing (S. 266)</td>
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The module is not offered from summer term 2018.

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Qualification Objectives

**Students**

- are familiar with general procedures and characteristics to develop new products and services under conditions of market orientation,
- can analyse customer needs, learn to realize competitive advantages and to work out interdisciplinary solutions,
- improve their statistic skills to cope with applied Marketing issues.

### Content

The core product is everything a customer or business consumer receives. Marketers must understand what it takes to develop a new product successfully. It is important to understand that innovations differ in their degree of newness (up to radical innovations). This helps to determine how quickly the products will be adopted by a target market. Market orientation is on the front side of the medal, the reverse side includes meeting the needs of diverse stakeholders. To find out the critical drivers of success a deep understanding of analytical and statistical methods is essential. As a result, the developing of an effective marketing strategy is discussed as an empirical, scientific process. In addition, consumer
behavior approaches in marketing are discussed as an important research area with a strong interdisciplinary and empirical orientation.

**Recommendations**
None

**Remarks**
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Industrial Production II [M-WIWI-101471]

Responsibility: Frank Schultmann
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

Compulsory

<table>
<thead>
<tr>
<th>Identifier</th>
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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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<tr>
<td>T-WIWI-102631</td>
<td>Planning and Management of Industrial Plants (S. 597)</td>
<td>5,5</td>
<td>Jedes Wintersemester</td>
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Ergänzungsangebot aus dem Modul Industrielle Produktion III
Non-Compulsory Block; You must choose at most 1 courses.

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<td>T-WIWI-102763</td>
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<td>Project Management (S. 638)</td>
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<td>Frank Schultmann</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

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<td>T-WIWI-102634</td>
<td>Emissions into the Environment (S. 350)</td>
<td>3,5</td>
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<td>T-WIWI-102882</td>
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<td>Life Cycle Assessment (S. 492)</td>
<td>3,5</td>
<td>Heiko Keller</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course Planning and Managing of Industrial Plants [2581952] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course Planning and Managing of Industrial Plants [2581952] and at least one additional activity are compulsory and must be examined.
Qualification Objectives

- Students shall be able to describe the tasks of tactical production management with special attention drawn upon industrial plants.
- Students shall understand the relevant tasks in plant management (projection, realisation and supervising tools for industrial plants).
- Students shall be able to describe the special need of a techno-economic approach to solve problems in the field of tactical production management.
- Students shall be proficient in using selected techno-economic methods like investment and cost estimates, plant layout, capacity planning, evaluation principles of production techniques, production systems as well as methods to design and optimize production systems.
- Students shall be able to evaluate techno-economical approaches in planning tactical production management with respect to their efficiency, accuracy and relevance for industrial use.

Content

- Planning and Management of Industrial Plants: Basics, circulation flow starting from projecting to techno-economic evaluation, construction and operating up to plant dismantling.

Remarks

Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production III.

Workload

Total effort will account to 270 hours (9 credit points) and can be allocated according to the credit point rating. Therefore, a course with 3.5 credits requires an effort of approximately 105h and a course with 5.5 credits 165h. The total effort for each course consists of attending lectures and tutorials, examination times and the time an average student needs to prepare himself in order to pass the exam with an average grade.

Responsibility: Wolf Fichtner
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

<table>
<thead>
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<th>Level</th>
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**Compulsory**

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<tr>
<td>T-WIWI-102690</td>
<td>Basics of Liberalised Energy Markets (S. 261)</td>
<td>3</td>
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**Ergänzungsangebot**

Non-Compulsory Block; You must choose at least 6 credits.

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<tr>
<td>T-WIWI-102691</td>
<td>Energy Trade and Risk Management (S. 360)</td>
<td>4</td>
<td>Clemens Cremer, Wolf Fichtner, Dogan Keles</td>
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<tr>
<td>T-WIWI-102607</td>
<td>Energy Policy (S. 358)</td>
<td>3,5</td>
<td>Martin Wietschel</td>
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<tr>
<td>T-WIWI-102692</td>
<td>Gas-Markets (S. 416)</td>
<td>3</td>
<td>Andrej Marko Pustisek</td>
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<tr>
<td>T-WIWI-102693</td>
<td>Simulation Game in Energy Economics (S. 733)</td>
<td>3</td>
<td>Massimo Genoese</td>
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<td>T-WIWI-102712</td>
<td>Regulation Theory and Practice (S. 662)</td>
<td>4,5</td>
<td>Kay Mitusch</td>
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<tr>
<td>T-WIWI-102794</td>
<td>eEnergy: Markets, Services, Systems (S. 342)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102889</td>
<td>Quantitative Methods in Energy Economics (S. 653)</td>
<td>4</td>
<td>Dogan Keles, Patrick Plötz</td>
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**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. Additional courses might be accredited upon request.

**Conditions**

The lecture Basics of Liberalised Energy Markets [2581998] has to be examined.

**Qualification Objectives**

The student

- gains detailed knowledge about the new requirements of liberalised energy markets,
- describes the planning tasks on the different energy markets,
- knows solution approaches to respective planning tasks.

**Content**

**Basics of Liberalised Energy Markets:** The European liberalisation process, energy markets, pricing, market failure, investment incentives, market power

**Energy Trade and Risk Management:** trade centres, trade products, market mechanisms, position and risk management
Gas-Markets: producing countries, provision structures, market places, pricing
Energy Policy: Management of energy flows, energy-political targets and instruments (emission trading etc.)
Simulation Game in Energy Economics: Simulation of the German electricity system

Recommendations
The courses are conceived in a way that they can be attended independently from each other. Therefore, it is possible to start the module in winter and summer term.

Remarks
The course “Basics of Liberalised Energy Markets” [2581998] will be reduced to 3 credits in winter term 2015/2016.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Management Accounting  [M-WIWI-101498]

Responsibility: Marcus Wouters

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

<table>
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Compulsory

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<td>T-WIWI-102801</td>
<td>Management Accounting 2 (S. 505)</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students
- are familiar with various management accounting methods,
- can apply these methods for cost estimation, profitability analysis, and product costing,
- are able to analyze short-term and long-decisions with these methods,
- have the capacity to devise instruments for organizational control.

Content
The module consists of two courses “Management Accounting 1” and “Management Accounting 2”. The emphasis is on structured learning of management accounting techniques.

Remarks
The following courses are part of this module:
- The course Management Accounting 1, which is offered in every summer semester
- The course Management Accounting 2, which is offered in every winter semester

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Data Science: Evidence-based Marketing  [M-WIWI-101647]

Responsibility: Martin Klarmann
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in:
- Business Administration
  - Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
  - Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
  - Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<td>Market Research (S. 516)</td>
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<tr>
<td>T-WIWI-103139</td>
<td>Marketing Analytics (S. 517)</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the rst decimal.

Conditions
In order to attend Marketing Analytics [2572170], students are required to have passed the course Market Research [2571150].

Qualification Objectives
Students
- possess advanced knowledge of relevant market research contents
- know many different qualitative and quantitative methods for measuring customer behavior, preparation of strategic decisions, making causal deductions, usage of social media data and sales forecasting
- possess the statistical skills required for working in marketing research

Content
This module provides in-depth knowledge of relevant quantitative and qualitative methods used in market research.
Students can attend the following courses:
- The course “Market Research” provides contents of practical relevance for measuring customer attitudes and customer behavior. The participants learn using statistical methods for strategic decision-making in marketing. Students who are interested in writing their master thesis at the Marketing & Sales Research Group are required to take this course.
- The course “Marketing Analytics” is based on „Market Research“ and teaches advanced statistical methods for analyzing relevant marketing and market research questions.

Recommendations
None

Remarks
Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Strategic Decision Making and Organization  [M-WIWI-101509]

Responsibility: Hagen Lindstädt  
Organisation: KIT-Fakultät für Wirtschaftswissenschaften  
Curricular Anchorage: Compulsory Elective  
Contained in: Business Administration
  - Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
  - Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

ECTS  Recurrence  Duration  Level  Version
9  Jedes Semester  1 Semester  4  2

Wahlpflichtangebot  
Non-Compulsory Block; You must choose 9 credits.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-WIWI-102803</td>
<td>Modeling Strategic Decision Making (S. 546)</td>
<td>4,5</td>
<td>Hagen Lindstädt</td>
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<tr>
<td>T-WIWI-102740</td>
<td>Public Management (S. 647)</td>
<td>4,5</td>
<td>Berthold Wigger</td>
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<tr>
<td>T-WIWI-102883</td>
<td>Pricing (S. 624)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
</tr>
</tbody>
</table>

Learning Control / Examinations
The module will not be offered any more from winterterm 2016/2017. Students who are already assigned on the module can still finish it until summer term 2017 (only for repeater).

Conditions
None

Qualification Objectives
See German version.

Recommendations
None

Remarks
The course “Organization Theory” will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Real Estate Economics and Sustainability [M-WIWI-101508]

Responsibility: David Lorenz
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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Compulsory

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<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-102838</td>
<td>Real Estate Economics and Sustainability Part 1: Basics and Valuation (S. 655)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102839</td>
<td>Real Estate Economics and Sustainability Part 2: Reporting and Rating (S. 657)</td>
<td>4,5</td>
<td>David Lorenz</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place.

Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

The overall grade of the module is the average of the grades of each course weighted by the credits and truncated after the first decimal.

It is possible to include the grade of a seminar paper, dealing with a topic from the area of Real Estate Economics and Sustainability, into the final grade of the module (according to Section 4(2), 3 of the examination regulation). The seminar has a weight of 20 percent.

Conditions
None

Qualification Objectives

The student
- possesses an overview of key interrelationships within the real estate industry concerning macro- and microeconomic questions as well as the interaction of the industry’s key players;
- is aware of the basics concerning the sustainable development debate and knows about the possible contribution of buildings and the real estate industry to a more sustainable development;
- knows the basics, key methods and tools of property valuation and is able to apply them;
- is aware of the key influencing factors of a building’s market value and is able to factor in sustainability considerations into market value estimates;
- possess an overview of important other methods and processes – besides property valuation – which are applied within the real estate industry to assess property related risks (e.g. property ratings) and to communicate property performance towards third parties (e.g. sustainability assessment of buildings and sustainability reporting of companies).
The implementation of sustainable development principles within the real estate industry requires taking into account sustainability considerations within real estate related procedures and decision making processes. Within this context, property valuation and valuation professionals play an important role.

Property valuations are carried out in almost any phase of the building life cycle and support, for example, financing as well as buy and sell decisions.

Valuation methods and procedures, however, have to be adjusted to changing market participants' preferences and their willingness to pay. For this reason, the issue of “valuation and sustainability” is of particular topicality and relevance.

Within the real estate industry professionals are sought which combine micro- and macroeconomic knowledge and real estate specific expertise with knowledge and skills regarding the sustainability of buildings and building stocks.

The real estate industry offers attractive working and career opportunities. This teaching module / course therefore offers insights into key methods applied within the real estate industry (particularly valuation) and places them into the context of sustainable development. The focus of the module / course, however, is not only on theoretical content but also on the provisioning of linkages to real estate practice; this will be realized, amongst other issues, by practical tutorials which are offered in addition to the course lectures.

Recommendations
A combination with courses in the area of
- Finance
- Insurance
- Civil engineering and architecture
is recommended.

Particularly recommended is the successful completion of the following Bachelor-Modules:
- Real Estate Management I and II
- Design, Construction and Assessment of Green Buildings I and II

Remarks
See German version.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Data Science: Advanced CRM  [M-WIWI-101470]

Responsibility: Andreas Geyer-Schulz

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

<table>
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<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
<th>Level</th>
<th>Version</th>
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<td>Jedes Semester</td>
<td>1 Semester</td>
<td>Deutsch</td>
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<td>2</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-102847</td>
<td>Recommender Systems (S. 659)</td>
<td>4,5</td>
<td>Andreas Geyer-Schulz</td>
</tr>
<tr>
<td>T-WIWI-102848</td>
<td>Personalization and Services (S. 584)</td>
<td>4,5</td>
<td>Andreas Sonnenbichler</td>
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<tr>
<td>T-WIWI-102642</td>
<td>Social Network Analysis in CRM (S. 740)</td>
<td>4,5</td>
<td>Andreas Geyer-Schulz</td>
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<tr>
<td>T-WIWI-102762</td>
<td>Business Dynamics (S. 278)</td>
<td>4,5</td>
<td>Andreas Geyer-Schulz</td>
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<tr>
<td>T-WIWI-105778</td>
<td>Service Analytics A (S. 726)</td>
<td>4,5</td>
<td>Sebastian Blanc, Hanzjörg Fromm, Thomas Setzer</td>
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<tr>
<td>T-WIWI-103549</td>
<td>Intelligent CRM Architectures (S. 466)</td>
<td>4,5</td>
<td>Andreas Geyer-Schulz</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives

The student

- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services,
- models, analyzes and optimizes the structure and dynamics of complex business applications,
- develops and realizes personalized services, especially in the field of recommendation services,
- analyzes social networks and knows their application field in CRM,
- works in teams.

Content

Building on the basics of CRM from the Bachelor’s degree program, the module “Data Science: Advanced CRM” is focusing on the use of information technology and its related economic issues in the CRM environment. The course “Intelligent CRM Architectures” deals with the design of modern intelligent systems. The focus is on the software architecture and design patterns that are relevant to learning systems. It also covers important aspects of machine learning that complete the picture of an intelligent system. Examples of presented systems are “Taste Map”-architectures, “Counting Services”, as well as architectures of “Business Games”. The impact of management decisions in complex systems are considered in the course “Business dynamics”. The understanding, modeling and simulation of complex systems allows the analysis, the goal-oriented design and the optimization of markets, business processes and regulations throughout the company. Specific
problems of intelligent systems are covered in the courses “Personalization and Services”, “Recommender Systems”, “Service Analytics” and “Social Network Analysis in CRM”. The content includes procedures and methods to create user-oriented services. The measurement and monitoring of service systems, the design of personalized offers, and the generation of recommendations based on the collected data of products and customers are discussed. The importance of user modeling and recognition, data security and privacy are addressed as well.

**Recommendations**
None

**Remarks**
The course Social Network Analysis in CRM [2540518] is currently not offered.
The courses Recommendersystems and Personalization and Services will take place in an alternating way from summer term 14. Details on the cycle and on the exams can be found on http://www.em.uni-karlsruhe.de/studies/.
The module has been renamed to “Data Science: Advanced CRM” in winter term 2016/2017.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Intelligent Risk and Investment Advisory  [M-WIWI-103247]

Responsibility: Maxim Ulrich
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

ECTS 9

Recurrence Jedes Semester

Duration 1 Semester

Language Englisch

Version 1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-102878</td>
<td>Computational Risk and Asset Management (S. 303)</td>
<td>4.5</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>T-WIWI-106494</td>
<td>Bayesian Risk Analytics and Machine Learning (S. 265)</td>
<td>4.5</td>
<td>Maxim Ulrich</td>
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<tr>
<td>T-WIWI-106193</td>
<td>Engineering FinTech Solutions (S. 363)</td>
<td>4.5</td>
<td>Maxim Ulrich</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
Students obtain a practical and yet research oriented introduction into the field of quantitative and computational risk and investment management. Students learn how to use concepts from computer science, statistics, OR and economics to build intelligent risk and investment systems. Based on personal preferences, students can specialize within the module on either more practical programming and statistical learning points or more on the economic and mathematical insights and intuition.

After successful completion of the module, students know the industry intuition as well as state-of-the-art academic ‘financial engineering’ methods necessary to successfully contribute to sustainable and value oriented innovations in the field of intelligent risk and investment advisory.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
Module: Computational Finance [M-WIWI-101512]

Responsibility: Maxim Ulrich

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in:
- Business Administration
- Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
- Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
- Additional Examinations

<table>
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<th>Level</th>
<th>Version</th>
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<td>1 Semester</td>
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Compulsory

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<tr>
<td>T-WIWI-102878</td>
<td>Computational Risk and Asset Management (S. 303)</td>
<td>4,5</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>T-WIWI-103110</td>
<td>Programming Internship: Solving Computational Risk and Asset Management Problems (S. 637)</td>
<td>4,5</td>
<td>Maxim Ulrich</td>
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</tbody>
</table>

Learning Control / Examinations

This module has been canceled.

Successful completion of this module requires the successful completion of the lecture Computational Risk and Asset Management and the programming seminar: Solving Computational Risk and Asset Management Problems.

Conditions

None

Qualification Objectives

The objective of this module is to become familiar with empirical and numerical algorithms necessary for quantitative asset and risk management.

The students will learn how to empirically estimate the return characteristics of assets (expected return, volatility, and cross-correlations) using simulated and real-world data and apply them to the strategic portfolio allocation concept of Markowitz.

Also they are capable to understand the intuition and algorithm behind empirical methods and obtain an understanding and working knowledge of important numerical concepts.

Content

Markowitz portfolio optimization (empirical and numerical implementation)

Generating random numbers

Techniques for Monte Carlo Simulations

Time-Series methods (ARMA, predictions, impulse response functions, Wold decomposition, VAR, Granger causality, unit roots, cointegration)

Maximum-Likelihood and Kalman Filtering

CAPM, Fama/French and Fama/MacBeth regressions to estimate risk premia (i.e. expected returns on investment)

numerical root finding

numerical optimization

numerical integration of ode’s, pde’s, and sde’s

analytical solution to simple ode’s and sde’s

Recommendations

This module is self contained and does not have any pre-requisites. Knowledge of finance is helpful but not a must. All necessary financial, statistical and numerical concepts are introduced during the lecture. The programming seminar focuses on implementing and applying most of the tools to real-world problems. Lecture and programming seminar must be completed in the same semester.
Remarks
The courses of the module are held in English.
The module will not be offered any more in its old form (Computational Risk and Asset Management [2530371] with 9 credits) from winter term 2015/16. Students who are already assigned on the module can still finish it until winter term 2015/16 (repeaters only).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Information Engineering  [M-WIWI-101411]

Responsibility: Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

Compulsory

<table>
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<th>Course</th>
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<th>Level</th>
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<tr>
<td>T-WIWI-102638</td>
<td>Principles of Information Engineering and Management (S. 627)</td>
<td>5</td>
<td>Jedes Semester</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose between 4 and 4,5 credits.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
</tr>
</thead>
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<tr>
<td>T-WIWI-102640</td>
<td>Market Engineering: Information in Institutions (S. 514)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102706</td>
<td>Special Topics in Information Engineering &amp; Management (S. 746)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
</tr>
<tr>
<td>T-WIWI-102794</td>
<td>eEnergy: Markets, Services, Systems (S. 342)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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</table>

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course Principles of Information Engineering and Management [2540450] is compulsory and must be examined.

Qualification Objectives

The student

- understands and analyzes the central role of information as an economic good, a production factor, and a competitive factor,
- identifies, evaluates, prices, and markets information goods,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

Content

In the lecture Principles of Information Engineering and Management, a clear distinction of information as a production, competitive, and economic good is introduced. The central role of information is explained through the concept of the “information lifecycle”. The single phases from existence/generation through allocation and evaluation until the
distribution and usage of information are analyzed from the business administration perspective and the microeconomic perspective.

In a second course the student can deepen his knowledge on the one hand on the design and operation of markets and on the other hand on the impact of digital goods in network industries regarding the pricing policies, business strategies and regulation issues. If choosen, the course Special Topics in Information Engineering & Management additionally provides an opportunity of practical research in the aforementioned range of subjects.

**Recommendations**
None

**Remarks**
All practical Seminars offered at the IM can be chosen for *Special Topics in Information Engineering & Management*. Please update yourself on www.iism.kit.edu/im/lehre.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Service Economics and Management  [M-WIWI-102754]

Responsibility: Gerhard Satzger, Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

<table>
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<th>Recurrence</th>
<th>Duration</th>
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<th>Level</th>
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<td>4</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Responsibility</th>
</tr>
</thead>
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<tr>
<td>T-WIWI-102881</td>
<td>Business and IT Service Management (S. 276)</td>
<td>4,5</td>
<td>Gerhard Satzger</td>
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<tr>
<td>T-WIWI-102640</td>
<td>Market Engineering: Information in Institutions (S. 514)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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<tr>
<td>T-WIWI-106201</td>
<td>Digital Transformation of Organizations (S. 336)</td>
<td>4,5</td>
<td>Alexander Mädche</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students

- understand the scientific basics of the management of digital services and corresponding systems
- gain a comprehensive insight in the importance and the most important features of information systems as an central component of the digitalization of business processes, products and services
- know the most relevant concepts and theories to shape the digital transformation process of service systems successfully
- understand the OR methods in the sector of service management and apply them adequately
- are able to use large amounts of available data systematically for the planning, operation and improvement of complex service offers and to design and control information systems
- are able to develop market-oriented coordination mechanisms and apply service systems.

Content
This module provides the foundation for the management of digital services and corresponding systems. The courses in this module cover the major concepts for a successful management of service systems and their digital transformation. Current examples from the research and practice enhance the relevance of the discussed topics.
**Recommendations**
None

**Remarks**
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Innovation Management  [M-WIWI-101507]

Responsibility: Marion Weissenberger-Eibl
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
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Compulsory

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<th>Responsibility</th>
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<tr>
<td>T-WIWI-102893</td>
<td>Innovation Management: Concepts, Strategies and Methods (S. 456)</td>
<td>3</td>
<td>Marion Weissenberger-Eibl</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose between 1 und 2 courses.

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<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-102853</td>
<td>Roadmapping (S. 670)</td>
<td>3</td>
<td>Daniel Jeffrey Koch</td>
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<tr>
<td>T-WIWI-102858</td>
<td>Technology Assessment (S. 783)</td>
<td>3</td>
<td>Daniel Jeffrey Koch</td>
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<tr>
<td>T-WIWI-102854</td>
<td>Technologies for Innovation Management (S. 782)</td>
<td>3</td>
<td>Daniel Jeffrey Koch</td>
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<tr>
<td>T-WIWI-102852</td>
<td>Case Studies Seminar: Innovation Management (S. 288)</td>
<td>3</td>
<td>Marion Weissenberger-Eibl</td>
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<tr>
<td>T-WIWI-102873</td>
<td>Current Issues in Innovation Management (S. 322)</td>
<td>3</td>
<td>Marion Weissenberger-Eibl</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<td>T-WIWI-102864</td>
<td>Entrepreneurship (S. 367)</td>
<td>3</td>
<td>Orestis Terzidis</td>
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<td>T-WIWI-102866</td>
<td>Design Thinking (S. 332)</td>
<td>3</td>
<td>Orestis Terzidis</td>
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<td>T-WIWI-102833</td>
<td>Entrepreneurial Leadership &amp; Innovation Management (S. 366)</td>
<td>3</td>
<td>Carsten Linz, Orestis Terzidis</td>
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</tbody>
</table>

Learning Control / Examinations
See German version.

Conditions
The lecture “Innovation Management: Concepts, Strategies and Methods” and one of the seminars of the chair for Innovation and Technology Management are compulsory. The third course can be chosen from the courses of the module.

Qualification Objectives
Students develop a comprehensive understanding of the innovation process and its conditionality. There is an additional focus on the concepts and processes which are of particular relevance with regard to shaping the entire process. Various strategies and methods are then taught based on this.
After completing the module, students should have developed a systemic understanding of the innovation process and be
able to shape this by developing and applying suitable methods.

**Content**
The Innovation Management: Concepts, Strategies and Methods lecture course teaches concepts, strategies and methods which help students to form a systemic understanding of the innovation process and how to shape it. Building on this holistic understanding, the seminar courses then go into the subjects in greater depth and address specific processes and methods which are central to innovation management.

**Recommendations**
None

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Service Innovation, Design & Engineering  [M-WIWI-102806]

Responsibility: Alexander Mädche, Gerhard Satzger

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

<table>
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<th>ECTS</th>
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<th>Level</th>
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<td>T-WIWI-105773</td>
<td>Digital Service Design (S. 335)</td>
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<td>T-WIWI-102639</td>
<td>Business Models in the Internet: Planning and Implementation (S. 281)</td>
<td>4.5</td>
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<td>T-WIWI-102799</td>
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<tr>
<td>T-WIWI-105774</td>
<td>Practical Seminar: Digital Service Design (S. 617)</td>
<td>4.5</td>
<td>Norbert Koppenhagen, Alexander Mädche</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
Dependencies between courses:
The course Practical Seminar Service Innovation cannot be applied in combination with the course Practical Seminar Digital Service Design.

Qualification Objectives
Students

- know about the challenges, concepts, methods and tools of service innovation management and are able to use them successfully.
- have a profound comprehension of the development and design of innovative services and are able to apply suitable methods and tools on concrete and specific issues.
- are able to embed the concepts of innovation management, development and design of services into organisations
- are aware of the strategic importance of services, are able to present value creation in the context of services systems and to strategically exploit the possibilities of their digital transformation
- elaborate concrete and problem-solving solutions for practical tasks in teams.
Content
This module is designed to constitute the basis for the development of successful ICT supported innovations thus including the methods and tools for innovation management, for the design and the development of digital services and the implementation of new business models. Current examples from science and practice enhance the relevance of the topics addressed.

Recommendations
Attending the course Practical Seminar Service Innovation [2595477] is recommended in combination with the course Service Innovation [2595468].
Attending the course Practical Seminar Digital Service Design [new] is recommended in combination with the course Digital Service Design [new].

Remarks
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
# Module: Insurance Management II  [M-WIWI-101449]

**Responsibility:** Ute Werner  
**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Business Administration  
  - Compulsory Elective Modules / Compulsory Modules 1 / Business Administration  
  - Compulsory Elective Modules / Compulsory Modules 2 / Business Administration  
  - Additional Examinations

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<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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<td>Insurance Production (S. 460)</td>
<td>4,5</td>
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<td>T-WIWI-102637</td>
<td>Current Issues in the Insurance Industry (S. 323)</td>
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<td>Jedes Semester</td>
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<td>T-WIWI-102636</td>
<td>Insurance Risk Management (S. 461)</td>
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<td>T-WIWI-102649</td>
<td>Risk Communication (S. 667)</td>
<td>4,5</td>
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<td>T-WIWI-102797</td>
<td>P&amp;C Insurance Simulation Game (S. 579)</td>
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<td>T-WIWI-102603</td>
<td>Principles of Insurance Management (S. 629)</td>
<td>4,5</td>
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<td>T-WIWI-102841</td>
<td>Modelling, Measuring and Managing of Extreme Risks (S. 547)</td>
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**Wahlpflichtangebot**  
Non-Compulsory Block; You must choose 9 credits.

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**Learning Control / Examinations**  
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.  
The assessment procedures are described for each course of the module separately.  
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**  
It is only possible to choose this module in combination with the module Insurance Management I. The module is passed only after the final partial exam of Insurance Management I has been passed.

**Modeled Conditions**  
The following conditions must be met:
- The module [M-WIWI-101469] Insurance Management I must have been started.

**Qualification Objectives**  
See German version.

**Content**  
See German version.

**Recommendations**  
The courses chosen from the modules Insurance Management I or Insurance Management II are supposed to complement each other. Advice and information is available from the person responsible for the examination process at the Insurance Department of FBV.
Remarks
Please note:

- T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017.
- T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on;
- T-WIWI-102603 Principles of Insurance Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102636 Insurance Risk Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102649 Risk Communication will be offered latest until winter term 2017/2018 (beginners only);
- T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Energy Economics and Technology [M-WIWI-101452]

Responsibility: Wolf Fichtner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration

Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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Wahlpflichtangebot

Non-Compulsory Block; You must choose at least 9 credits.

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<th>Responsibility</th>
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<td>Energy and Environment (S. 353)</td>
<td>4,5</td>
<td>Ute Karl</td>
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<td>T-WIWI-102633</td>
<td>Strategical Aspects of Energy Economy (S. 761)</td>
<td>3,5</td>
<td>Armin Ardone</td>
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<td>T-WIWI-102694</td>
<td>Technological Change in Energy Economics (S. 780)</td>
<td>3</td>
<td>Martin Wietschel</td>
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<td>T-WIWI-102695</td>
<td>Heat Economy (S. 432)</td>
<td>3</td>
<td>Wolf Fichtner</td>
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<tr>
<td>T-WIWI-102830</td>
<td>Energy Systems Analysis (S. 359)</td>
<td>3,5</td>
<td>Patrick Jochem, Russell McKenna</td>
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<tr>
<td>T-WIWI-102793</td>
<td>Efficient Energy Systems and Electric Mobility (S. 344)</td>
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Learning Control / Examinations

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. Additional courses might be accredited upon request.

Conditions

None

Qualification Objectives

The student

- gains detailed knowledge about present and future energy supply technologies (focus on final energy carriers electricity and heat),
- knows the techno-economic characteristics of plants for energy provision, for energy transport as well as for energy distribution and demand,
- is able to assess the environmental impact of these technologies.

Content

Strategical Aspects of Energy Economy: Long-term planning methods, generation technologies
Technological Change in Energy Economics: Future energy technologies, learning curves, energy demand
Heat Economy: district heating, heating technologies, reduction of heat demand, statutory provisions
Energy Systems Analysis: Interdependencies in energy economics, energy systems modelling approaches in energy economics
Energy and Environment: emission factors, emission reduction measures, environmental impact
Efficient Energy Systems and Electric Mobility: concepts and current trends in energy efficiency, Overview of and economical, ecological and social impacts through electric mobility

Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Electronic Markets [M-WIWI-101409]

Responsibility: Andreas Geyer-Schulz

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Business Administration

Contained in: Compulsory Elective Modules / Compulsory Modules 1 / Business Administration

Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

Identifiers | Course | ECTS | Language | Level | Version |
---|---|---|---|---|---|
T-WIWI-102821 | Markets and Organizations: Principles (S. 520) | 4,5 | Deutsch | 4 | 2 |
T-WIWI-102640 | Market Engineering: Information in Institutions (S. 514) | 4,5 | Christof Weinhardt |
T-WIWI-102713 | Telecommunication and Internet Economics (S. 784) | 4,5 | Kay Mitsch |
T-WIWI-102762 | Business Dynamics (S. 278) | 4,5 | Andreas Geyer-Schulz |
T-WIWI-102886 | Business Administration in Information Engineering and Management (S. 274) | 5 | Andreas Geyer-Schulz |
T-WIWI-105946 | Price Management (S. 621) | 4,5 | Andreas Geyer-Schulz, Paul Glenn |

Wahlpflichtangebot

Non-Compulsory Block; You must choose at least 9 credits.

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

None

Qualification Objectives

The student

- knows coordination and motivation methods and analyzes them regarding their efficiency,
- classifies markets and describes the roles of the participants in a formal way,
- knows the conditions for market failure and knows and develops countermeasures,
- knows institutions and market mechanisms, their fundamental theories and empirical research results,
- knows the design criteria of market mechanisms and a systematical approach for creating new markets,
- models, analyzes and optimizes the structure and dynamics of complex business applications.

Content

What are the conditions that make electronic markets develop and how can one analyse and optimize such markets?

In this module, the selection of the type of organization as an optimization of transaction costs is treated. Afterwards, the efficiency of electronic markets (price, information and allocation efficiency) as well as reasons for market failure are described. Finally, motivational issues like bounded rationality and information asymmetries (private information and moral hazard), as well as the development of incentive schemes, are presented. Regarding the market design, especially
the interdependencies of market organization, market mechanisms, institutions and products are described and theoretical foundations are lectured.

Electronic markets are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such markets can be modelled. Simulations of complex systems allow the analysis and optimization of markets, business processes, policies, and organizations.

Topics include:

- classification, analysis, and design of markets
- simulation of markets
- auction methods and auction theory
- automated negotiations
- nonlinear pricing
- continuous double auctions
- market-maker, regulation, control

Recommendations
None

Remarks
The course Electronic Markets: Principles is not offered at the moment.
The course Price Management is offered for the first time in summer term 2016.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Service Analytics  [M-WIWI-101506]

Responsibility: Hansjörg Fromm, Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

<table>
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<th>Language</th>
<th>Level</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>ECTS</th>
<th>Responsibility</th>
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<td>Sebastian Blanc, Hansjörg Fromm, Thomas Setzer</td>
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<tr>
<td>T-WIWI-105779</td>
<td>Service Analytics B - Enterprise Data Reduction and Prediction (S. 728)</td>
<td>4,5</td>
<td>Sebastian Blanc, Thomas Setzer</td>
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<tr>
<td>T-WIWI-102822</td>
<td>Industrial Services (S. 444)</td>
<td>4,5</td>
<td>Hansjörg Fromm</td>
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<td>T-WIWI-105777</td>
<td>Business Intelligence Systems (S. 280)</td>
<td>4,5</td>
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<td>Special Topics in Information Engineering &amp; Management (S. 746)</td>
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<td>T-WIWI-102899</td>
<td>Modeling and Analyzing Consumer Behavior with R (S. 541)</td>
<td>4,5</td>
<td>Verena Dorner, Christof Weinhardt</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students
- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context
- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

Content
The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or...
transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.

It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

**Recommendations**
The courses Service Analytics A [2595501] or Service Analytics B [2540498] should be applied.

**Remarks**
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

From the summer term 2016 the following courses should not be taken in the module Service Analytics:

- Special Topics in Information Engineering & Management [2540498]
- Modeling and Analyzing Consumer Behaviour with R [2540470].

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Quantitative Valuation  [M-WIWI-103123]

Responsibility: Maxim Ulrich

Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective

Contained in:
- Business Administration
- Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
- Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
- Additional Examinations

<table>
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<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Course</th>
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<th>Responsibility</th>
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<td>Computational Risk and Asset Management (S. 303)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-106191</td>
<td>Bayesian Methods for Financial Economics (S. 264)</td>
<td>4,5</td>
<td>Maxim Ulrich</td>
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Learning Control / Examinations
This module has been cancelled.

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students apply statistical methods to estimate expected returns, risk and risk densities of different asset classes. Students apply methods such as Maximum Likelihood and Expectation Maximization to estimate linear and nonlinear return forecasting models. Students learn how to program and implement the necessary methods to pursue their own research. Moreover, students obtain a hands-on introduction to the calculus and estimation of both discrete-time and continuous-time pricing models. The empirical estimation relies on Bayesian MCMC methods and is applied to estimate stochastic volatility, crash risks (jumps) and their respective risk premiums.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
## Module: Finance 2 [M-WIWI-101483]

**Responsibility:** Martin Ruckes, Marliese Uhrig-Homburg

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Business Administration

### ECTS
- **Recurrence:** Jedes Semester
- **Duration:** 1 Semester
- **Level:** 4
- **Version:** 2

### Wahlpflichtangebot

Non-Compulsory Block; You must choose 9 credits.

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<tbody>
<tr>
<td>T-WIWI-102644</td>
<td>Fixed Income Securities (S. 396)</td>
<td>4.5</td>
<td>Marliese Uhrig-Homburg</td>
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<td>T-WIWI-102622</td>
<td>Corporate Financial Policy (S. 319)</td>
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<td>Credit Risk (S. 321)</td>
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<td>Asset Pricing (S. 249)</td>
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<td>T-WIWI-102621</td>
<td>Valuation (S. 810)</td>
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<td>T-WIWI-102643</td>
<td>Derivatives (S. 330)</td>
<td>4.5</td>
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<td>T-WIWI-102646</td>
<td>International Finance (S. 470)</td>
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<td>T-WIWI-102626</td>
<td>Business Strategies of Banks (S. 285)</td>
<td>3</td>
<td>Wolfgang Müller</td>
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<td>Exchanges (S. 377)</td>
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<td>Jörg Franke</td>
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<td>Financial Intermediation (S. 395)</td>
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<td>eFinance: Information Engineering and Management for Securities Trading (S. 345)</td>
<td>4.5</td>
<td>Christof Weinhardt</td>
</tr>
<tr>
<td>T-WIWI-102900</td>
<td>Financial Analysis (S. 393)</td>
<td>4.5</td>
<td>Torsten Luedecke</td>
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</table>

### Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Conditions

It is only possible to choose this module in combination with the module Finance 1. The module is passed only after the final partial exam of Finance 1 is additionally passed.

### Modeled Conditions

The following conditions must be met:
- The module [M-WIWI-101482] Finance 1 must have been started.

### Qualification Objectives

The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

### Content

The module Finance 2 is based on the module Finance 1. The courses of this module equip the students with advanced...
skills in economics and methodology in the field of modern finance on a broad basis.

Remarks
The courses eFinance: Information Engineering and Management for Securities Trading [2540454] and Financial Analysis [2530205] can be chosen from summer term 2015 on.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Sales Management  [M-WIWI-101487]

Responsibility: Martin Klarmann
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

Compulsory

<table>
<thead>
<tr>
<th>Identifier</th>
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<th>Duration</th>
<th>Level</th>
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<tr>
<td>T-WIWI-102890</td>
<td>Sales Management and Retailing (S. 676)</td>
<td>3</td>
<td>Jedes Wintersemester</td>
<td>1 Semester</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

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<tr>
<td>T-WIWI-106137</td>
<td>Country Manager Simulation (S. 320)</td>
<td>1,5</td>
<td>Sven Feurer</td>
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<tr>
<td>T-WIWI-102891</td>
<td>Price Negotiation and Sales Presentations (S. 623)</td>
<td>1,5</td>
<td>Martin Klarmann, Marc Schröder</td>
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<tr>
<td>T-WIWI-102834</td>
<td>Case Studies in Sales and Pricing (S. 287)</td>
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<td>Martin Klarmann</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<tbody>
<tr>
<td>T-WIWI-102883</td>
<td>Pricing (S. 624)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
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<tr>
<td>T-WIWI-102811</td>
<td>Market Research (S. 516)</td>
<td>4,5</td>
<td>Martin Klarmann</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course.

Conditions
The course “Sales Management and Retailing” is compulsory.

Qualification Objectives
Students
- have an advanced knowledge about sales management (design and structure of sales systems, relationship with sales partners and important customers)
- have a fundamental understanding of price management (in particular consumer behavior of pricing, pricing strategy, price determination)
- are able to handle particularities and challenges in sales management
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- are able to implement their extensive sales and pricing knowledge in a practical context
• have the theoretical knowledge to write a master thesis in Marketing
• have the theoretical knowledge to work in/together with the sales department

Content
The aim of the module is to deepen the sales management knowledge of the students. Theoretical approaches often have a combined view on marketing and sales, whereas in practical surroundings the sales department is completely separated from the marketing tasks. Given this fact, we concentrate on pure sales management topics and address different facets of the sales management.

Students can choose between the following courses:

• “Sales Management and Retailing”
• “Pricing”
• “Market Research” - this course has to be completed successfully by students interested in seminar or master thesis positions at the Marketing and Sales Research Group
• “Case Studies in Pricing”
• “Sales Strategy and Control”
• “Country Manager Simulation”

Remarks
For further information please contact the Marketing and Sales Research Group (marketing.iism.kit.edu).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Insurance Management I  [M-WIWI-101469]

Responsibility: Ute Werner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Business Administration

Contained in: Business Administration

<table>
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<tr>
<th>Identifier</th>
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<td>T-WIWI-102603</td>
<td>Principles of Insurance Management (S. 629)</td>
<td>4,5</td>
<td>Jedes Semester</td>
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<td>T-WIWI-102601</td>
<td>Insurance Marketing (S. 459)</td>
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<td>T-WIWI-102648</td>
<td>Insurance Production (S. 460)</td>
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<td>T-WIWI-102637</td>
<td>Current Issues in the Insurance Industry (S. 323)</td>
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<td>T-WIWI-102636</td>
<td>Insurance Risk Management (S. 461)</td>
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<td>T-WIWI-102797</td>
<td>P&amp;C Insurance Simulation Game (S. 579)</td>
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<td>T-WIWI-102649</td>
<td>Risk Communication (S. 667)</td>
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<tr>
<td>T-WIWI-102841</td>
<td>Modelling, Measuring and Managing of Extreme Risks (S. 547)</td>
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Non-Compulsory Block; You must choose 9 credits.

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
See German version.

Content
See German version.

Remarks
Please note:
- T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017.
- T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on;
- T-WIWI-102603 Principles of Insurance Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102636 Insurance Risk Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102649 Risk Communication will be offered latest until winter term 2017/2018 (beginners only);
- T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).
Workload
See German version.
# Module: Entrepreneurship (EnTechnon) [M-WIWI-101488]

**Responsibility:** Orestis Terzidis  
**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Business Administration  
**Compulsory Elective Modules / Compulsory Modules 1 / Business Administration**  
**Compulsory Elective Modules / Compulsory Modules 2 / Business Administration**  
**Additional Examinations**

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<td>2 Semester</td>
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## Compulsory

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<tr>
<td>T-WIWI-102864</td>
<td>Entrepreneurship (S. 367)</td>
<td>3</td>
<td>Orestis Terzidis</td>
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### Wahlpflichtangebot
Non-Compulsory Block; You must choose between 1 und 2 courses.

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<tbody>
<tr>
<td>T-WIWI-102865</td>
<td>Business Planning (S. 282)</td>
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<tr>
<td>T-WIWI-102866</td>
<td>Design Thinking (S. 332)</td>
<td>3</td>
<td>Orestis Terzidis</td>
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<tr>
<td>T-WIWI-102833</td>
<td>Entrepreneurial Leadership &amp; Innovation Management (S. 366)</td>
<td>3</td>
<td>Carsten Linz, Orestis Terzidis</td>
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<tr>
<td>T-WIWI-102894</td>
<td>Entrepreneurship Research (S. 368)</td>
<td>3</td>
<td>Orestis Terzidis</td>
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### Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

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<th>Responsibility</th>
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<tbody>
<tr>
<td>T-WIWI-102612</td>
<td>Managing New Technologies (S. 510)</td>
<td>5</td>
<td>Thomas Reiß</td>
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<tr>
<td>T-WIWI-102893</td>
<td>Innovation Management: Concepts, Strategies and Methods (S. 456)</td>
<td>3</td>
<td>Marion Weissenberger-Eibl</td>
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<tr>
<td>T-WIWI-102639</td>
<td>Business Models in the Internet: Planning and Implementation (S. 281)</td>
<td>4,5</td>
<td>Timm Teubner</td>
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<tr>
<td>T-WIWI-102851</td>
<td>Developing Business Models for the Semantic Web (S. 333)</td>
<td>3</td>
<td>Rudi Studer</td>
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<tr>
<td>T-WIWI-102852</td>
<td>Case Studies Seminar: Innovation Management (S. 288)</td>
<td>3</td>
<td>Marion Weissenberger-Eibl</td>
</tr>
<tr>
<td>T-WIWI-102853</td>
<td>Roadmapping (S. 670)</td>
<td>3</td>
<td>Daniel Jeffrey Koch</td>
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</table>

## Learning Control / Examinations
See German version.

### Conditions
None

### Qualification Objectives
See German version.

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Industrial Engineering and Management (M.Sc.)  
Date 05/17/2017  
87
Recommendations
None

Remarks
The course T-WIWI-102832 - Business Plan Workshop is not available anymore.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Service Design Thinking  [M-WIWI-101503]

Responsibility: Gerhard Satzger, Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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Compulsory

Identifier Course ECTS Responsibility

T-WIWI-102849 Team Work in the Area of Service Oriented Architectures (S. 778) 9 Gerhard Satzger, Christof Weinhardt

Learning Control / Examinations
The assessment is carried out as a general exam (according to Section 4(2), 3 of the examination regulation). The overall grade of the module is the grade of the examination (according to Section 4(2), 3 of the examination regulation).

Conditions
None

Qualification Objectives

- Deep knowledge of the innovation method “Design Thinking”, as introduced and promoted by Stanford University
- Development of new, creative solutions through extensive observation of oneself and one’s environment, in particular with regard to the relevant service users
- Know how to use prototyping and experimentation to visualize one’s ideas, to test and iteratively develop them, and to converge on a solution
- Communicate, work and present in an interdisciplinary and international project setting

Content

- Paper Bike: Learning about the basic method elements by building a paper bike that has to fulfill a given set of challenges.
- Design Space Exploration: Exploring the problem space through customer and user observation.
- Critical Function Prototype: Identification of critical features from the customer’s perspective that can contribute to the solution of the overarching problem. Building and testing prototypes that integrate these functionalities.
- Dark Horse Prototype: Inverting earlier assumptions and experiences, which leads to the inclusion of new features and solutions.
- Funky Prototype: Integration of the individually tested and successful functions to a complete solution, which is further tested and developed.
- Functional Prototype: Further selection and convergence of existing ideas. Building a higher resolution prototype that can be tested by customers.
- Final Prototype: Preparing and presenting the final solution to the customer.

Recommendations
This course is held in English – proficiency in writing and communication is required.
Remarks
Due to the project nature of the course, the number of participants is limited. For further information see the course description.
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Services Marketing  [M-WIWI-101649]

Responsibility: Ju-Young Kim
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<tr>
<td>T-WIWI-103140</td>
<td>Services Marketing (S. 732)</td>
<td>3</td>
<td>Ju-Young Kim</td>
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<tr>
<td>T-WIWI-103141</td>
<td>Online Marketing (S. 565)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
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<tr>
<td>T-WIWI-102902</td>
<td>Marketing Communication (S. 518)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
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<tr>
<td>T-WIWI-102883</td>
<td>Pricing (S. 624)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
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<tr>
<td>T-WIWI-102834</td>
<td>Case Studies in Sales and Pricing (S. 287)</td>
<td>1,5</td>
<td>Martin Klarmann</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the rst decimal.

Conditions
None

Qualification Objectives
Students
- gain knowledge about basic content and strategies of services marketing
- know about current topics (research and practice) in online marketing and learn how the transparency of the internet provides new opportunities to measure the success of marketing instruments
- get to know marketing communications objectives and strategies
- have a fundamental understanding of price management (in particular consumer behavior of pricing, pricing strategy, price determination)
- are able to implement their extensive sales and pricing knowledge in a practical context
- are able to implement their extensive marketing knowledge in a practical context
- have the knowledge to write a master thesis in Services Marketing

Content
understanding of services marketing. Besides the classical offline services, the module also focuses on online services. The course “Services Marketing” starts with an overview of basic content and strategies in services marketing.
Within the course “Online Marketing” students learn about current topics (research and practice) in online marketing and learn how the transparency of the internet provides new opportunities to measure the success of marketing instruments. In “Marketingkommunikation” students learn about marketing communication objectives and strategies.
The course “Pricing” builds a fundamental understanding of price management.
In the course “Case Studies in Sales and Pricing” students work with case studies helping them to understand the bridge between theoretical and practical knowledge.

**Recommendations**
None

**Remarks**
new module starting winter term 2015/2016
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

**Workload**
See German version.
Module: Designing Interactive Systems  [M-WIWI-103200]

Responsibility: Alexander Mädche
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration
       Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
       Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
       Additional Examinations

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<th>Version</th>
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Compulsory

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<tbody>
<tr>
<td>T-WIWI-106342</td>
<td>Interactive Systems (S. 468)</td>
<td>4,5</td>
<td>Alexander Mädche, Silvia Schacht</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose at most 4,5 credits.

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<td>Digital Service Design (S. 335)</td>
<td>4,5</td>
<td>Alexander Mädche</td>
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<tr>
<td>T-WIWI-105774</td>
<td>Practical Seminar: Digital Service Design (S. 617)</td>
<td>4,5</td>
<td>Norbert Koppenhagen, Alexander Mädche</td>
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</table>

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

Conditions
The course “Interactive Systems” is compulsory and must be examined.

Qualification Objectives
The student

- has a comprehensive understanding of conceptual and theoretical foundations of interactive systems
- knows design processes for interactive systems
- is aware of the most important techniques and tools for designing interactive systems and knows how to apply them to real-world problems
- is able to apply design principles for the design of most important classes of interactive systems,
- creates new solutions of interactive systems teams

Content
Advanced information and communication technologies make interactive systems ever-present in the users’ private and business life. They are an integral part of smartphones, devices in the smart home, mobility vehicles as well as at the working place in production and administration (e.g. in the form of dashboards).

With the continuous growing capabilities of computers, the design of the interaction between human and computer becomes even more important. This module focuses on design processes and principles for interactive systems. The contents of the module abstract from the technical implementation details and focus on foundational concepts, theories,
practices and methods for the design of interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.
Each lecture in the module is accompanied with a capstone project that is carried out with an industry partner.

Remarks

Workload
The total workload for this module is approximately 270 hours.
Module: Market Engineering  [M-WIWI-101446]

Responsibility: Christof Weinhardt

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration

Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

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<tr>
<td>T-WIWI-102640</td>
<td>Market Engineering: Information in Institutions (S. 514)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose 4,5 credits.

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<td>Auction Theory (S. 250)</td>
<td>4,5</td>
<td>Karl-Martin Ehrhart</td>
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<td>T-WIWI-102600</td>
<td>eFinance: Information Engineering and Management for Securities Trading (S. 345)</td>
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<td>Christof Weinhardt</td>
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<td>Experimental Economics (S. 381)</td>
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<td>Timm Teubner, Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102794</td>
<td>eEnergy: Markets, Services, Systems (S. 342)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
</tr>
<tr>
<td>T-WIWI-103131</td>
<td>Regulatory Management and Grid Management - Economic Efficiency of Network Operation (S. 663)</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course Market Engineering: Information in Institutions [2540460] is compulsory and must be examined.

Qualification Objectives

The students

- know the design criterias of market mechanisms and the systematic approach to create new markets,
- understand the basics of the mechanism design and auction theory,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

Content

This module explains the dependencies between the design von markets and their success. Markets are complex interaction
of different institution and participants in a market behave strategically according to the market rules. The development and the design of markets or market mechanisms has a strong influence on the behavior of the participants. A systematic approach and a thorough analysis of existing markets is inevitable to design, create and operate a market place successfully. The approaches for a systematic analysis are explained in the mandatory course Market Engineering [2540460] by discussing theories about mechanism design and institutional economics. The student can deepen his knowledge about markets in a second course.

**Recommendations**
None

**Remarks**
The course “Computational Economics” [2590458] will not be offered any more in this module from winter term 2015/2016 on. The examination will be offered latest until summer term 2016 (repeaters only).

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Data Science: Data-Driven User Modeling  [M-WIWI-103118]

Responsibility: Christof Weinhardt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

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<thead>
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<th>Recurrence</th>
<th>Duration</th>
<th>Version</th>
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<td>Jedes Semester</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

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<th>ECTS</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>T-WIWI-102899</td>
<td>Modeling and Analyzing Consumer Behavior with R (S. 541)</td>
<td>4,5</td>
<td>Verena Dorner, Christof Weinhardt</td>
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<td>T-WIWI-102614</td>
<td>Experimental Economics (S. 381)</td>
<td>4,5</td>
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<td>T-WIWI-106214</td>
<td>Practical Seminar: Crowd Analytics (S. 615)</td>
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Learning Control / Examinations
The assessment is carried out as partial exams of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

Conditions
None

Qualification Objectives
Students of this module
- learn methods for planning empirical studies, in particular laboratory experiments,
- acquire theoretical knowledge and practical skills in analysing empirical data,
- familiarize with different ways of modelling user behaviour, are able to critically discuss, and to evaluate them

Content
Understanding and supporting user interactions with applications better plays an increasingly large role in the design of business applications. This applies both to interfaces for customers and to internal information systems. The data that is generated during user interactions can be channelled straight into business processes, for instance by analysing and decomposing purchase decisions, and by feeding this data into product design processes.

The Crowd Analytics section considers the analysis of data from online platforms, particularly of those following crowd- or peer-to-peer based business models. This includes platforms like Airbnb, Kickstarter and Amazon Mechanical Turk. Theoretical models of user (decision) behaviour help analyzing the empirically observed user behaviour in a systematic fashion. Testing these models and their predictions in controlled experiments (primarily in the lab) in turn helps refine theory and to generate practically relevant design recommendations. Analyses are carried out using advanced analytic methods.

Students learn fundamental theoretical models for user behaviour in systems and apply them to cases. Students are also taught methods and skills for conceptualizing and planning empirical studies and for analyzing the resulting data.
Recommendations
Basic knowledge of Information Management, Operations Research, Descriptive Statistics, and Inferential Statistics is assumed.

Remarks
The course „Crowd Analytics” can be chosen from winter term 2016 on.
Module: Marketing Management [M-WIWI-101490]

Responsibility: Martin Klarmann

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

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<th>Recurrence</th>
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<td>Market Research (S. 516)</td>
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<td>Open Innovation - Concepts, Methods and Best Practices (S. 566)</td>
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<td>Product and Innovation Management (S. 632)</td>
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<td>T-WIWI-102618</td>
<td>Strategic and Innovative Decision Making in Marketing (S. 757)</td>
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<td>T-WIWI-102619</td>
<td>Behavioral Approaches in Marketing (S. 266)</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

Only one of the following courses can be counted towards the final grade of the module:
- Marketing Strategy Business Game
- Business Plan Workshop
- Open Innovation – Concepts, Methods and Best Practices
- Strategic Brand Management

Exception: In summer term 2016 exceptionally two of the courses can be chosen or, in case one course has already been chosen previously, a second course can be chosen.

Qualification Objectives

Students
- have an advanced knowledge about central marketing contents
- have a fundamental understanding of the marketing instruments
- know and understand several strategic concepts and how to implement them
- are able to implement their extensive marketing knowledge in a practical context
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the Marketing department
Content
The aim of this module is to deepen central marketing contents in different areas. Therefore the students can choose between the following marketing courses:

- “Product and Innovation Marketing”
- “Market Research” – this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing
- “Strategic and Behavioral Marketing”
- “Marketing Strategy Business Game”
- “Strategic Brand Management”
- “Open Innovation”

Recommendations
None

Remarks
The course “Open Innovation – Concepts, Methods and Best Practices” [2571199] has been added summer 2015.
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Digital Service Systems in Industry  [M-WIWI-102808]

Responsibility: Wolf Fichtner, Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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<th>Level</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Responsibility</th>
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<td>Basics of Liberalised Energy Markets (S. 261)</td>
<td>3</td>
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<td>T-WIWI-102872</td>
<td>Challenges in Supply Chain Management (S. 291)</td>
<td>4,5</td>
<td>Robert Blackburn</td>
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<td>T-WIWI-102822</td>
<td>Industrial Services (S. 444)</td>
<td>4,5</td>
<td>Hansjörg Fromm</td>
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<tr>
<td>T-WIWI-106200</td>
<td>Modeling and OR-Software: Advanced Topics (S. 543)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-106201</td>
<td>Digital Transformation of Organizations (S. 336)</td>
<td>4,5</td>
<td>Alexander Mädche</td>
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<td>T-WIWI-106563</td>
<td>Practical Seminar Digital Service Systems (S. 613)</td>
<td>4,5</td>
<td>Wolf Fichtner, Alexander Mädche, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt</td>
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</table>

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
This module can only be assigned as an elective module.

Qualification Objectives
Students

- understand the basics of the management of digital services applied on an industrial context
- gain an industry-specific insight into the importance and most relevant characteristics of information systems as key components of the digitalization of business processes, products and services
- are able to transfer and apply the models and methods introduced on practical scenarios and simulations.
- understand the control and optimization methods in the sector of service management and are able to apply them properly.

Content
This module aims at deepening the fundamental knowledge of digital service management in the industrial context. Various mechanisms and methods to shape and control connected digital service systems in different industries are discussed and demonstrated with real life application cases.

Recommendations
None
Remarks
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Business & Service Engineering  [M-WIWI-101410]

Responsibility:  
Christof Weinhardt

Organisation:  
KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage:  
Compulsory Elective

Contained in:  
Business Administration  
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration  
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration  
Additional Examinations

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Wahlpflichtangebot
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<td>T-WIWI-102639</td>
<td>Business Models in the Internet: Planning and Implementation (S. 281)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102706</td>
<td>Special Topics in Information Engineering &amp; Management (S. 746)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102847</td>
<td>Recommender Systems (S. 659)</td>
<td>4,5</td>
<td>Andreas Geyer-Schulz</td>
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<tr>
<td>T-WIWI-102848</td>
<td>Personalization and Services (S. 584)</td>
<td>4,5</td>
<td>Andreas Sonnenbichler</td>
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<tr>
<td>T-WIWI-102641</td>
<td>Service Innovation (S. 729)</td>
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<td>Gerhard Satzger</td>
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<tr>
<td>T-WIWI-102799</td>
<td>Practical Seminar Service Innovation (S. 614)</td>
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<td>Gerhard Satzger</td>
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<td>T-WIWI-106201</td>
<td>Digital Transformation of Organizations (S. 336)</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The student should

- learn to develop and implement new markets with regards to the technological progresses of information and communication technology and the increasing economic networking
- learn to restructure and develop new business processes in markets under those conditions
- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services.
- improve his statistics skills and apply them to appropriate cases
- learn to elaborate solutions in a team

Content
This module addresses the challenges of creating new kinds of products, processes, services, and markets from a service perspective in the context of new developed information and communication technologies and the globalization process. The module describes service competition as a business strategy in the long term that leads to the design of business processes, business models, forms of organization, markets, and competition. This will be shown by actual examples from personalized services, recommender services and social networks.
**Recommendations**
None

**Remarks**
All practical Seminars offered at the IM can be chosen for *Special Topics in Information Engineering & Management*. Please update yourself on www.iism.kit.edu/im/lehre.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Cross-functional Management Accounting [M-WIWI-101510]

Responsibility: Marcus Wouters

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration

Compulsory Elective Modules / Compulsory Modules 2 / Business Administration

Additional Examinations

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<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
<th>Version</th>
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Compulsory

Identifier Course ECTS Responsibility

T-WIWI-102885 Advanced Management Accounting (S. 240) 4,5 Marcus Wouters

Ergänzungsangebot

Non-Compulsory Block; You must choose 4,5 credits.

<table>
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<td>Pricing (S. 624)</td>
<td>4,5</td>
<td>Ju-Young Kim</td>
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<td>T-WIWI-102812</td>
<td>Product and Innovation Management (S. 632)</td>
<td>3</td>
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<td>Marketing Strategy Business Game (S. 519)</td>
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<td>Martin Klarmann</td>
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<td>T-WIWI-102621</td>
<td>Valuation (S. 810)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<td>T-WIWI-102803</td>
<td>Modeling Strategic Decision Making (S. 546)</td>
<td>4,5</td>
<td>Hagen Lindstädt</td>
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<td>T-WIWI-105781</td>
<td>Incentives in Organizations (S. 440)</td>
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<td>Petra Nieken</td>
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Learning Control / Examinations

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The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course “Advanced Management Accounting” is compulsory.

The additional courses can only be chosen after the compulsory course has been completed successfully.

Qualification Objectives

Students will be able to apply advanced management accounting methods to managerial decision-making problems in marketing, finance, organization and strategy.

Recommendations

None

Workload

The total workload for this module is approximately 270 hours. For further information see German version.
Module: Financial Technology for Risk and Asset Management  [M-WIWI-103121]

Responsibility: Maxim Ulrich
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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<th>Duration</th>
<th>Language</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<td>T-WIWI-106195</td>
<td>Machine Learning in Finance (S. 500)</td>
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<tr>
<td>T-WIWI-106193</td>
<td>Engineering FinTech Solutions (S. 363)</td>
<td>4,5</td>
<td>Maxim Ulrich</td>
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Learning Control / Examinations
The module has been cancelled.
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students will be able to connect innovative financial research with modern information technology to build a prototype that solves some daunting tasks for professional end-users in the field of modern asset and risk management based on the knowledge they obtained in either ‘Computational Risk and Asset Management’ or ‘Machine Learning in Finance’.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
Module: Service Management [M-WIWI-101448]

Responsibility: Gerhard Satzger, Christof Weinhardt

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Business Administration

Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

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Compulsory

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<td>T-WIWI-102881</td>
<td>Business and IT Service Management (S. 276)</td>
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<td>Gerhard Satzger</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose 4,5 credits.

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<td>Service Innovation (S. 729)</td>
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<td>T-WIWI-105778</td>
<td>Service Analytics A (S. 726)</td>
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<td>T-WIWI-102822</td>
<td>Industrial Services (S. 444)</td>
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<td>Hansjörg Fromm</td>
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<tr>
<td>T-WIWI-102899</td>
<td>Modeling and Analyzing Consumer Behavior with R</td>
<td>4,5</td>
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<td>(S. 541)</td>
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<td>T-WIWI-106201</td>
<td>Digital Transformation of Organizations (S. 336)</td>
<td>4,5</td>
<td>Alexander Mädche</td>
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Learning Control / Examinations

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The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course Business and IT Service Management [2590484] is compulsory and must be examined.

Qualification Objectives

The students

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- systematically use vast amounts of available data for planning, operation, personalization and improvement of complex service offerings, and
- understand and analyze innovation processes in corporations.

Content

The module service management addresses the basics of developing and managing IT-based services. The lectures contained in this module teach the basics of developing and managing IT-based services and the application of OR methods in the field of service management. Moreover, students learn to systematically analyze vast amounts of data...
for planning, operation and improvement for complex service offerings. These tools enhance operational and strategic decision support and help to analyze and understand the overall innovation processes in corporations. Current examples from research and industry demonstrate the relevance of the topics discussed in this module.

**Recommendations**
None

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Quantitative Risk Management  [M-WIWI-103122]

Responsibility: Maxim Ulrich
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Business Administration

<table>
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<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
<th>Version</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-106191</td>
<td>Bayesian Methods for Financial Economics (S. 264)</td>
<td>4,5</td>
<td>Maxim Ulrich</td>
</tr>
<tr>
<td>T-WIWI-106195</td>
<td>Machine Learning in Finance (S. 500)</td>
<td>4,5</td>
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Learning Control / Examinations
This module has been cancelled.
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students are able to apply Bayesian MCMC methods to estimate financial models. Moreover, students are able to apply machine learning algorithms to solve current finance problems.

Content
See respective lecture

Recommendations
None

Remarks
Further remarks see respective lecture.

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
Module: Disruptive FinTech Innovations  [M-WIWI-103261]

Responsibility: Maxim Ulrich

Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective

Contained in: Business Administration
Compulsory Elective Modules / Compulsory Modules 1 / Business Administration
Compulsory Elective Modules / Compulsory Modules 2 / Business Administration
Additional Examinations

<table>
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<tr>
<td>T-WIWI-106193</td>
<td>Engineering FinTech Solutions (S. 363)</td>
<td>4.5</td>
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<tr>
<td>T-WIWI-106496</td>
<td>Computational FinTech with Python and C++ (S. 302)</td>
<td>1.5</td>
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<tr>
<td>T-WIWI-106495</td>
<td>Automated Financial Advisory (S. 251)</td>
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<td>Maxim Ulrich</td>
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Learning Control / Examinations
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Conditions
None.

Qualification Objectives
Students with a strong technological background and/or a strong interest for software development and investments will learn how to build a prototype that automates essential steps for a fully automated investment and risk management process. Students also learn to organize themselves efficiently in teams of several developers in order to complete a prototype in a limited amount of time. Moreover, students deepen their understanding of finance and technology and learn how to combine both in an effective way. Students will hence be well prepared to become leaders and pioneers for upcoming FinTech innovations (and beyond) to help society to better invest for the future and to better protect from adverse risks.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.
Module: Microeconomic Theory [M-WIWI-101500]

Responsibility: Clemens Puppe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchor: Compulsory Elective

Contained in: Economics

Compulsory Elective Modules / Compulsory Modules 1 / Economics

Additional Examinations

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Wahlpflichtangebot

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<tr>
<td>T-WIWI-102609</td>
<td>Advanced Topics in Economic Theory (S. 243)</td>
<td>4,5</td>
<td>Kay Mitsusch</td>
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<tr>
<td>T-WIWI-102861</td>
<td>Advanced Game Theory (S. 236)</td>
<td>4,5</td>
<td>Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß</td>
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<tr>
<td>T-WIWI-102859</td>
<td>Social Choice Theory (S. 739)</td>
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<td>Clemens Puppe</td>
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<td>T-WIWI-102613</td>
<td>Auction Theory (S. 250)</td>
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<td>Karl-Martin Ehrhart</td>
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<tr>
<td>T-WIWI-105781</td>
<td>Incentives in Organizations (S. 440)</td>
<td>4,5</td>
<td>Petra Nieken</td>
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Learning Control / Examinations

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The overall grade of the the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students

- are able to model practical microeconomic problems mathematically and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs.

An example of a positive question is: which regulation policy results in which firm decisions under imperfect competition?
An example of a normative question is: which voting rule has appealing properties?

Content
The student should gain an understanding of advanced topics in economic theory, game theory and welfare economics. Core topics are, among others, strategic interactions in markets, cooperative and non-cooperative bargaining (Advanced Game Theory), allocation under asymmetric information and general equilibrium over time (Advanced Topics in Economic Theory), voting and the aggregation of preferences and judgements (Social Choice Theory).

Remarks
The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Innovation Economics  [M-WIWI-101514]

Responsibility:  Ingrid Ott

Organisation:  KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage:  Compulsory Elective

Contained in:  Economics
Compulsory Elective Modules / Compulsory Modules 1 / Economics
Compulsory Elective Modules / Compulsory Modules 2 / Economics
Additional Examinations

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Wahlpflichtangebot
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<tr>
<td>T-WIWI-102840</td>
<td>Innovation theory and -Policy (S. 457)</td>
<td>4,5</td>
<td>Ingrid Ott</td>
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<tr>
<td>T-WIWI-102812</td>
<td>Product and Innovation Management (S. 632)</td>
<td>3</td>
<td>Martin Klarmann</td>
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<tr>
<td>T-WIWI-102789</td>
<td>Seminar in Economic Policy (S. 697)</td>
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<td>Ingrid Ott</td>
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<tr>
<td>T-WIWI-102906</td>
<td>Methods in Economic Dynamics (S. 532)</td>
<td>1,5</td>
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Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students shall be given the ability to

- understand the important role of innovation for economic growth and welfare
- understand the relevance of alternative incentive mechanisms for the emergence and dissemination of innovations
- know basic terms of product and innovation concepts
- know fundamental concepts of innovation management
- work with fundamental theoretical innovation models and to implement them in appropriate computer algebra systems
- query appropriate data sources and to analyse and visualise them using statistical methods

Content
The module provides students with knowledge about implications of technological and organizational changes. Addressed economic issues are incentives for developing innovations, diffusion processes, and associated effects. In this context the module analyses appropriate policies in the presence of market failures to take corrective action on the market process and thus to increase the dynamic efficiency of economies.

Furthermore, the module offers the possibility to learn about different aspects of theoretical modelling of innovation-based growth as a part of the seminar and the methods-workshop. This includes the implementation of formal models in computer algebra systems as well as recording, processing and econometric analysis of related data from relational databases (concerning for example patents or trademarks). Moreover, methods of network theory are applied.
Finally, the module emphasises the business perspective: Issues of all stages of innovation processes will be discussed, from innovation strategies up to the market commercialisation.

**Recommendations**
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012] and Economics II [2600014]. Further, it is assumed that students have interest in using quantitative-mathematical methods.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
**Module: Innovation and growth [M-WIWI-101478]**

**Responsibility:** Ingrid Ott

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Economics

**Additional Examinations**

<table>
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**Wahlpflichtangebot**

Non-Compulsory Block; You must choose between 9 and 10 credits.

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<td>Innovation theory and -Policy (S. 457)</td>
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<td>Ingrid Ott</td>
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<td>T-WIWI-102785</td>
<td>Theory of Endogenous Growth (S. 791)</td>
<td>4.5</td>
<td>Ingrid Ott</td>
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**Learning Control / Examinations**

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The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

None

**Qualification Objectives**

Students shall be given the ability to

- know the basic techniques for analyzing static and dynamic optimization models that are applied in the context of micro- and macroeconomic theories
- understand the important role of innovation to the overall economic growth and welfare
- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

**Content**

The module includes courses that deal with issues of innovation and growth in the context of micro-and macroeconomic theories. The dynamic analysis makes it possible to analyze the consequences of individual decisions over time, and sheds light on the tension between static and dynamic efficiency in particular. In this context is also analyzed, which policy is appropriate to carry out corrective interventions in the market and thus increase welfare in the presence of market failure.

**Recommendations**

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

**Workload**

Total expenditure of time for 9 credits: 270 hours
Attendance time per lecture: 3x14h

Preparation and wrap-up time per lecture: 3x14h

Rest: Exam Preparation

The exact distribution is subject to the credits of the courses of the module.
Module: Economic Theory and its Application in Finance  [M-WIWI-101502]

Responsibility: Kay Mitusch
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Economics

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Ergänzungsangebot
Non-Compulsory Block; You must choose 1 courses.

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<th>Responsibility</th>
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<td>T-WIWI-102622</td>
<td>Corporate Financial Policy (S. 319)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<tr>
<td>T-WIWI-102623</td>
<td>Financial Intermediation (S. 395)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<td>T-WIWI-102647</td>
<td>Asset Pricing (S. 249)</td>
<td>4,5</td>
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Wahlpflichtangebot
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<td>Advanced Topics in Economic Theory (S. 243)</td>
<td>4,5</td>
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<td>T-WIWI-102861</td>
<td>Advanced Game Theory (S. 236)</td>
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Learning Control / Examinations
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Conditions
One of the courses T-WIWI-102861 “Advanced Game Theory” and T-WIWI-102609 “Advanced Topics in Economic Theory” is compulsory.

Qualification Objectives
The students

- have learnt the methods of formal economic modeling, particularly of General Equilibrium Theory and contract theory
- will be able to apply these methods to the topics in Finance, specifically the areas of financial markets and institutions and corporate finance
- have gained many useful insights into the relationship between firms and investors and the functioning of financial markets
Content
The mandatory course “Advanced Topics in Economic Theory” is devoted in equal parts to General Equilibrium Theory and to contract theory. The course “Asset Pricing” will apply techniques of General Equilibrium Theory to valuation of financial assets. The courses “Corporate Financial Policy” and “Finanzintermediation” will apply the techniques of contract theory to issues of corporate finance and financial institutions.

Remarks
The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available. The course restarts in summer term 2018.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Collective Decision Making  [M-WIWI-101504]

Responsibility: Clemens Puppe
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Economics
Compulsory Elective Modules / Compulsory Modules 1 / Economics
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Additional Examinations

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***Wahlpflichtangebot***
Non-Compulsory Block; You must choose between 9 and 9.5 credits.

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<tr>
<td>T-WIWI-102617</td>
<td>Mathematical Theory of Democracy (S. 529)</td>
<td>4,5</td>
<td>Andranik Melik-Tangian</td>
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<td>Social Choice Theory (S. 739)</td>
<td>4,5</td>
<td>Clemens Puppe</td>
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<td>T-WIWI-102740</td>
<td>Public Management (S. 647)</td>
<td>4,5</td>
<td>Berthold Wigger</td>
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Learning Control / Examinations
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The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students
- are able to model practical problems of the public sector and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs,
- are familiar with the functioning and design of democratic elections and can analyze them with respect to their individual incentives.

Content
The focus of the module is on mechanisms of public decisions making, including voting and the aggregation of preferences and judgements.

Remarks
The lecture “Mathematical Theory of Democracy” will not be offered from winter term 2017/2018. The last examination takes place in summer term 2017 (only for repeaters).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
**Module: Macroeconomic Theory [M-WIWI-101462]**

**Responsibility:** Marten Hillebrand

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:**
- Economics
- Compulsory Elective Modules / Compulsory Modules 1 / Economics
- Compulsory Elective Modules / Compulsory Modules 2 / Economics
- Additional Examinations

**ECTS**

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**Wahlpflichtangebot**

Non-Compulsory Block; You must choose between 9 and 10 credits.

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<td>T-WIWI-102785</td>
<td>Theory of Endogenous Growth (S. 791)</td>
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<td>Ingrid Ott</td>
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<tr>
<td>T-WIWI-102825</td>
<td>Theory of Economic Growth (S. 790)</td>
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<td>T-WIWI-102824</td>
<td>Theory of Business Cycles (S. 789)</td>
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**Learning Control / Examinations**

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The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

None

**Qualification Objectives**

See German version.

**Content**

See German version

**Remarks**

The module will not be offered any more from summer term 2016.

**Workload**

The total workload for this module is approximately 270 hours. For further information see German version.
Module: Growth and Agglomeration  [M-WIWI-101496]

Responsibility: Ingrid Ott

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Economics

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<tr>
<td>T-WIWI-103107</td>
<td>Spatial Economics (S. 743)</td>
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Learning Control / Examinations
The assessment is carried out as partial written exams (see the lectures descriptions).
The overall grade for the module is the average of the grades for each course weighted by the credits.

Conditions
None

Qualification Objectives
The student
- gains deepened knowledge of micro-based general equilibrium models
- understands how based on individual optimizing decisions aggregate phenomena like economic growth or agglomer-
ation (cities / metropolises) result
- is able to understand and evaluate the contribution of these phenomena to the development of economic trends
- can derive policy recommendations based on theory

Content
The module includes the contents of the lectures Endogenous Growth Theory [2561503], Spatial Economics [2561260] and International Economic Policy [2560254]. While the first two lectures have a more formal-analytic focus, the third lecture approaches fundamental ideas and problems from the field of international economic policy from a more verbal perspective.
The common underlying principle of all three lectures in this module is that, based on different theoretical models, economic policy recommendations are derived.

Recommendations
Attendance of the course Introduction Economic Policy [2560280] is recommended.
Successful completion of the courses Economics I: Microeconomics and Economics II: Macroeconomics is required.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Environmental Economics [M-WIWI-101468]

Responsibility: Kay Mitusch

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Economics

Compulsory Elective Modules / Compulsory Modules 1 / Economics

Compulsory Elective Modules / Compulsory Modules 2 / Economics

Additional Examinations

<table>
<thead>
<tr>
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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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<td>4</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

<table>
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<tr>
<td>T-WIWI-102615</td>
<td>Environmental Economics and Sustainability (S. 372)</td>
<td>5</td>
<td>Rainer Walz</td>
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<tr>
<td>T-WIWI-102616</td>
<td>Environmental and Ressource Policy (S. 369)</td>
<td>4</td>
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<td>T-WIWI-102650</td>
<td>Energy and Environment (S. 353)</td>
<td>4,5</td>
<td>Ute Karl</td>
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<tr>
<td>T-WIWI-100007</td>
<td>Transport Economics (S. 802)</td>
<td>4,5</td>
<td>Kay Mitusch, Eckhard Szimba</td>
</tr>
<tr>
<td>T-INFO-101348</td>
<td>Environmental Law (S. 373)</td>
<td>3</td>
<td>Matthias Bäcker</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The students
- understand the treatment of non-market resources as well as future resource shortages
- are able to model markets of energy and environmental goods
- are able to assess the results of government intervention
- know legal basics and are able to evaluate conflicts with regard to legal situation

Content
Environmental degradation and increasing resource use are global challenges, which have to be tackled on a worldwide level. The module addresses these challenges from the perspective of economics, and imparts the fundamental knowledge of environmental and sustainability economics, and environmental and resource policy to the students. Additional courses address environmental law, environmental pressure, and applications to the transport sector.

Recommendations
Knowledge in the area of microeconomics and of the content of the course *Economics I: Microeconomics* [2600012], respectively, is required.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Transport infrastructure policy and regional development [M-WIWI-101485]

Responsibility: Kay Mitusch
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Economics
Compulsory Elective Modules / Compulsory Modules 1 / Economics
Compulsory Elective Modules / Compulsory Modules 2 / Economics
Additional Examinations

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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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**Compulsory**

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<th>Identifier</th>
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<th>ECTS</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>T-WIWI-100007</td>
<td>Transport Economics (S. 802)</td>
<td>4,5</td>
<td>Kay Mitusch, Eckhard Szimba</td>
</tr>
<tr>
<td>T-WIWI-103107</td>
<td>Spatial Economics (S. 743)</td>
<td>4,5</td>
<td>Ingrid Ott</td>
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**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**
None

**Qualification Objectives**
The students
- understand the economic issues related to transport and regional development with a main focus on economic policy issues generated by the relationship of transport and regional development with the public sector
- are able to compare different considerations of politics, regulation and the private sector and to analyse and assess the respective decision problems both qualitatively and by applying appropriate methods from economic theory
- are prepared for careers in the public sector, particularly for public companies, politics, regulatory agencies, related consultancies, major construction companies or infrastructure project corporations

**Content**
The development infrastructure (e.g. transport, energy, telecommunications) has always been one of the most relevant factors for economic development and particularly influences the development of the regional economy. From the repertoire of state actions, investments into transport infrastructure are often regarded the most important measure to foster regional economic growth. Besides the direct effects of transport policy on passenger and freight transport, a variety of individual economic activities is significantly dependent on the available or potential transport options. Decisions on the planning, financing and realization of major infrastructure projects require a solid and far-reaching consideration of direct and indirect growth effects with the occurring costs.

Through its combination of lectures the module reflects the complex interdependencies between infrastructure policy, transport industry and regional policy and provides its participants with a comprehensive understanding of the functionalities of one of the most important sectors of the economy and its relevance for economic policy.

**Remarks**
The courses Assessment of Public Policies and Projects I (winter term) and Assessment of Public Policies and Projects II
(summer term) will no longer be part of this module. Student who have already had exams in this courses can integrate these exams in this module.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Network Economics [M-WIWI-101406]

Responsibility: Kay Mitusch
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Economics

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<tr>
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<th>Level</th>
<th>Version</th>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<th>Identifier</th>
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<th>Responsibility</th>
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<tr>
<td>T-WIWI-100005</td>
<td>Competition in Networks (S. 299)</td>
<td>4.5</td>
<td>Kay Mitusch</td>
</tr>
<tr>
<td>T-WIWI-100007</td>
<td>Transport Economics (S. 802)</td>
<td>4.5</td>
<td>Kay Mitusch, Eckhard Szimba</td>
</tr>
<tr>
<td>T-WIWI-102609</td>
<td>Advanced Topics in Economic Theory (S. 243)</td>
<td>4.5</td>
<td>Kay Mitusch</td>
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<tr>
<td>T-WIWI-102712</td>
<td>Regulation Theory and Practice (S. 662)</td>
<td>4.5</td>
<td>Kay Mitusch</td>
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<tr>
<td>T-WIWI-102713</td>
<td>Telecommunication and Internet Economics (S. 784)</td>
<td>4.5</td>
<td>Kay Mitusch</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.
The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The students
- have acquired the basic knowledge for a future job in a network company or in a regulatory agency, ministry etc.
- recognize the specific characterizations of network sectors, know fundamental methods for an economic analysis of network sectors and recognize the interfaces for an interdisciplinary cooperation of economists, engineers and lawyers
- understand the interactions between infrastructures, control systems, and the users of networks, especially concerning their implications on investments, price setting and competitive behavior, and they can model or simulate exemplary applications
- can assess the necessity of regulation of natural monopolies and identify regulatory measures that are important for networks.

Content
The module is concerned with network or infrastructure industries in the economy, e.g. telecommunication, traffic and energy sectors. These sectors are characterized by close interdependencies of operators and users of infrastructure as well as on states. States intervene in various forms, by the public and regulation authorities, due to the importance of network industries and due to limited abilities of markets to work properly in these industries. The students are supposed to develop a broad knowledge of these sectors and of the political options available.
Recommendations
Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required.

Remarks
The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
### Module: Applied Strategic Decisions [M-WIWI-101453]

**Responsibility:** Johannes Philipp Reiß  
**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Economics
- Compulsory Elective Modules / Compulsory Modules 1 / Economics  
- Compulsory Elective Modules / Compulsory Modules 2 / Economics  
- Additional Examinations

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<th>Language</th>
<th>Level</th>
<th>Version</th>
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**Ergänzungsangebot**  
Non-Compulsory Block; You must choose between 1 und 2 courses and at least 4,5 credits.

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<th>Responsibility</th>
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<tr>
<td>T-WIWI-102613</td>
<td>Auction Theory (S. 250)</td>
<td>4,5</td>
<td>Karl-Martin Ehrhart</td>
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<tr>
<td>T-WIWI-102614</td>
<td>Experimental Economics (S. 381)</td>
<td>4,5</td>
<td>Timm Teubner, Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102622</td>
<td>Corporate Financial Policy (S. 319)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<tr>
<td>T-WIWI-102623</td>
<td>Financial Intermediation (S. 395)</td>
<td>4,5</td>
<td>Martin Ruckes</td>
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<tr>
<td>T-WIWI-102640</td>
<td>Market Engineering: Information in Institutions (S. 514)</td>
<td>4,5</td>
<td>Christof Weinhardt</td>
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<tr>
<td>T-WIWI-102862</td>
<td>Predictive Mechanism and Market Design (S. 620)</td>
<td>4,5</td>
<td>Johannes Philipp Reiß</td>
</tr>
<tr>
<td>T-WIWI-105781</td>
<td>Incentives in Organizations (S. 440)</td>
<td>4,5</td>
<td>Petra Nieken</td>
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**Wahlpflichtangebot**  
Non-Compulsory Block; You must choose 1 courses.

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**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

The course Advanced Game Theory is obligatory. Exception: The course Introduction to Game Theory [2520525] was completed.

**Qualification Objectives**

Students

- can model and analyze complex situations of strategic interaction using advanced game theoretic concepts;
- are provided with essential and advanced game theoretic solution concepts on a rigorous level and can apply them to understand real-life problems;
- learn about the experimental method, ranging from designing an economic experiment to data analysis.
Content
The module provides solid skills in game theory and offers a broad range of game theoretic applications. To improve the understanding of theoretical concepts, it pays attention to empirical evidence as well.

Recommendations
Basic knowledge in game theory is assumed.

Remarks
The course Predictive Mechanism and Market Design is not offered each year.
The course “Decision Theory” [2520365] will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Experimental Economics [M-WIWI-101505]

Responsibility: Johannes Philipp Reiß

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Economics Compulsory Elective Modules / Compulsory Modules 1 / Economics Compulsory Elective Modules / Compulsory Modules 2 / Economics Additional Examinations

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Course</th>
<th>ECTS</th>
<th>Language</th>
<th>Level</th>
<th>Version</th>
</tr>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 2 courses.

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
Students
- are acquainted with the methods of Experimental Economics along with its strengths and weaknesses;
- understand how theory-guided research in Experimental Economics interacts with the development of theory;
- are provided with foundations in data analysis;
- design an economic experiment and analyze its outcome.

Content
The module Experimental Economics offers an introduction into the methods and topics of Experimental Economics. It also fosters and extends knowledge in theory-guided experimental economics and its interaction with theory development. Throughout the module, readings of selected papers are required.

Recommendations
Basic knowledge in mathematics, statistics, and game theory is assumed.

Remarks
- The course Advanced Game Theory is not offered before Winter 2014/15.
- The course Predictive Mechanism and Market Design is not offered each year.
**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Advanced Topics in Public Finance [M-WIWI-101511]

Responsibility: Berthold Wigger

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Economics Compulsory Elective Modules / Compulsory Modules 1 / Economics Compulsory Elective Modules / Compulsory Modules 2 / Economics Additional Examinations

<table>
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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
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Compulsory

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<th>ECTS</th>
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<tr>
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<td>Public Management (S. 647)</td>
<td>4,5</td>
<td>Berthold Wigger</td>
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Ergänzungsangebot

Non-Compulsory Block; You must choose between 4,5 and 5 credits.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<td>4,5</td>
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<tr>
<td>T-WIWI-102790</td>
<td>Specific Aspects in Taxation (S. 752)</td>
<td>4,5</td>
<td>Armin Bader, Berthold Wigger</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course “Public Management” is compulsory and must be examined.

Qualification Objectives

The student

- understands the theory and politics of taxation
- has knowledge in the area of public debt.
- understands efficiency problems of public organizations.
- is able to work on fiscal problems.

Content

As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs. In the course of the lectures within this module the students achieve knowledge in the areas of public revenues, national and international law of taxation and theory of public sector organizations.
**Recommendations**  
Basic knowledge in the area of public finance and public management is required.

**Remarks**  
Students who successfully passed the exam in „Public Management“ before the introduction of the module “Advanced Topics in Public Finance” in winter term 2014/15 are allowed to take both courses “Public Revenues” and “Specific Aspects in Taxation”.  
The module will be offered from winter term 2014/15.

**Workload**  
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Economic Policy II [M-WIWI-101481]

Responsibility: Jan Kowalski
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Economics

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<th>Level</th>
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<td>4</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<tr>
<td>T-WIWI-102896</td>
<td>Economic Integration in Europe (S. 341)</td>
<td>4.5</td>
<td>Jan Kowalski</td>
</tr>
<tr>
<td>T-WIWI-102840</td>
<td>Innovationtheory and -Policy (S. 457)</td>
<td>4.5</td>
<td>Ingrid Ott</td>
</tr>
<tr>
<td>T-WIWI-102897</td>
<td>International Economic Policy (S. 469)</td>
<td>4.5</td>
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Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Workload
The total workload for this module is approximately 270 hours. For further information see German version
Module: Agglomeration and Innovation [M-WIWI-101497]

Responsibility: Ingrid Ott

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Economics

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<td>T-WIWI-103107</td>
<td>Spatial Economics (S. 743)</td>
<td>4,5</td>
<td>Ingrid Ott</td>
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<tr>
<td>T-WIWI-102840</td>
<td>Innovationtheory and -Policy (S. 457)</td>
<td>4,5</td>
<td>Ingrid Ott</td>
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<tr>
<td>T-WIWI-102609</td>
<td>Advanced Topics in Economic Theory (S. 243)</td>
<td>4,5</td>
<td>Kay Mitusch</td>
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Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must add up to at least 9.

The overall grade for the module is the average of the grades for each course weighted by the credits.

Conditions
None

Qualification Objectives
The student
- applies quantitative methods in the context of economic models
- learns advanced micro- and macroeconomic theories
- is able to derive policy recommendations based on theory
- can identify the importance of alternative incentive mechanisms for the development and spread of innovations
- begins to understand the connections between market form and the development of innovations
- analyzes the determinants of the spatial distribution of economic activity
- understands how processes of concentration result from the interplay of agglomeration and dispersion forces

Content
The module comprises theories of incentives for the development of innovations as well as theories of wage-based labor mobility, which leads to spatial concentration processes. The microfounded optimality decisions of the actors are in each case transformed into macroeconomic results. In the context of the theory of innovations the diffusion of technological knowledge and the resulting effect on growth due to technological progress is discussed and economic-policy implications are derived. Spatial economics adds to the picture of economic activity by introducing a spatial point of view.

Recommendations
Successful completion of the courses Economics I: Microeconomics and Economics II: Macroeconomics is required.

Remarks
The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Informatics [M-WIWI-101472]

Responsibility: Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Informatics

Additional Examinations

<table>
<thead>
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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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Wahlpflichtangebot

Non-Compulsory Block; You must choose between 9 and 10 credits.

<table>
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<th>Identifier</th>
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<th>Responsibility</th>
</tr>
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<tbody>
<tr>
<td>T-WIWI-102759</td>
<td>Requirements Analysis and Requirements Management (S. 666)</td>
<td>4</td>
<td>Ralf Kneuper</td>
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<tr>
<td>T-WIWI-102651</td>
<td>Applied Informatics II - IT Systems for eCommerce (S. 248)</td>
<td>5</td>
<td>York Sure-Vetter</td>
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<tr>
<td>T-WIWI-102680</td>
<td>Computational Economics (S. 300)</td>
<td>5</td>
<td>Pradyumn Kumar Shukla</td>
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<td>T-WIWI-102661</td>
<td>Database Systems and XML (S. 328)</td>
<td>5</td>
<td>Andreas Oberweis</td>
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<tr>
<td>T-WIWI-102663</td>
<td>Document Management and Groupware Systems (S. 339)</td>
<td>4</td>
<td>Stefan Klink</td>
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<tr>
<td>T-WIWI-102668</td>
<td>Enterprise Architecture Management (S. 365)</td>
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<td>T-WIWI-106423</td>
<td>Information Service Engineering (S. 449)</td>
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<td>Knowledge Discovery (S. 481)</td>
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<td>Management of IT-Projects (S. 508)</td>
<td>5</td>
<td>Roland Schätzle</td>
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<td>T-WIWI-106340</td>
<td>Machine Learning 1 - Basic Methods (S. 497)</td>
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<td>T-WIWI-106341</td>
<td>Machine Learning 2 – Advanced Methods (S. 498)</td>
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<td>T-WIWI-102697</td>
<td>Business Process Modelling (S. 283)</td>
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<td>T-WIWI-102679</td>
<td>Nature-Inspired Optimisation Methods (S. 555)</td>
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<td>T-WIWI-102874</td>
<td>Semantic Web Technologies (S. 681)</td>
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<td>T-WIWI-105801</td>
<td>Service Oriented Computing (S. 731)</td>
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<td>Software Quality Management (S. 741)</td>
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<td>T-WIWI-102676</td>
<td>Special Topics of Enterprise Information Systems (S. 748)</td>
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<td>T-WIWI-102657</td>
<td>Special Topics of Efficient Algorithms (S. 747)</td>
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<tr>
<td>T-WIWI-102678</td>
<td>Special Topics of Software- and Systemsengineering (S. 750)</td>
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<td>Special Topics of Knowledge Management (S. 749)</td>
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<td>Strategic Management of Information Technology (S. 759)</td>
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<td>T-WIWI-103112</td>
<td>Web Science (S. 833)</td>
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<td>T-WIWI-102662</td>
<td>Workflow-Management (S. 844)</td>
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<td>T-WIWI-103523</td>
<td>Advanced Lab Informatics (S. 237)</td>
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<td>Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner</td>
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</table>
**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.
The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
Please note the following information about the module component exams of Prof. Dr. H. Schmeck:

**Conditions**
It is only allowed to choose one lab.

**Qualification Objectives**
The student
- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

**Content**
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

**Remarks**
The course “Document Management and Groupware Systems” expires after summer term 2017. Last examination date is winter term 2017/2018 (only for repeaters).

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Mathematical Programming  [M-WIWI-101473]

Responsibility: Oliver Stein
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Operations Research
Compulsory Elective Modules / Compulsory Modules 1 / Operations Research
Compulsory Elective Modules / Compulsory Modules 2 / Operations Research
Additional Examinations

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
</tr>
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<td>1 Semester</td>
<td>4</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

<table>
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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<tr>
<td>T-WIWI-102719</td>
<td>Mixed Integer Programming I (S. 535)</td>
<td>4,5</td>
<td>Oliver Stein</td>
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<tr>
<td>T-WIWI-102733</td>
<td>Mixed Integer Programming I and II (S. 536)</td>
<td>9</td>
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<tr>
<td>T-WIWI-102856</td>
<td>Convex Analysis (S. 316)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102855</td>
<td>Parametric Optimization (S. 581)</td>
<td>4,5</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

<table>
<thead>
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<th>Identifier</th>
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<td>T-WIWI-106548</td>
<td>Advanced Stochastic Optimization (S. 242)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
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<td>T-WIWI-102720</td>
<td>Mixed Integer Programming II (S. 537)</td>
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<td>T-WIWI-102726</td>
<td>Global optimization I (S. 420)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102727</td>
<td>Global optimization II (S. 422)</td>
<td>4,5</td>
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<td>T-WIWI-103638</td>
<td>Global optimization I and II (S. 421)</td>
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<td>Oliver Stein</td>
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<tr>
<td>T-WIWI-102723</td>
<td>Graph Theory and Advanced Location Models (S. 428)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-106549</td>
<td>Large-scale Optimization (S. 484)</td>
<td>4,5</td>
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<td>Nonlinear Optimization I (S. 557)</td>
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<td>T-WIWI-102725</td>
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<tr>
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<td>Operations Research in Supply Chain Management (S. 572)</td>
<td>4,5</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses “Mixed Integer Programming I”, “Parametric Optimization” and “Convex Analysis” has to be taken. Students who choose the module in the field “compulsory elective modules” may select any two courses of the module. Exemption for the summer term 2017:
In the summer term 2017, the two OR master modules “Mathematical Optimization” and “Operations Research in Supply Chain Management” can be taken without compulsory courses. This corresponds to the already existing regulation when taking OR modules in the elective area. The derogation does not apply to the winter term 2017/18.

Qualification Objectives
The student
- names and describes basic notions for advanced optimization methods, in particular from continuous and mixed integer programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Content
The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous and mixed integer decision variables.

Remarks
The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu). For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
**Module: Stochastic Modelling and Optimization [M-WIWI-101454]**

**Responsibility:** Karl-Heinz Waldmann

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Operations Research

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
</tr>
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<td>1 Semester</td>
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**Wahlpflichtangebot**

Non-Compulsory Block; You must choose between 9 and 10 credits.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-WIWI-106546</td>
<td>Introduction to Stochastic Optimization (S. 476)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
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<tr>
<td>T-WIWI-102628</td>
<td>Optimization in a Random Environment (S. 576)</td>
<td>4,5</td>
<td>Karl-Heinz Waldmann</td>
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<tr>
<td>T-WIWI-102730</td>
<td>OR-Oriented Modeling and Analysis of Real Problems (Project) (S. 578)</td>
<td>4,5</td>
<td>Karl-Heinz Waldmann</td>
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<tr>
<td>T-WIWI-102728</td>
<td>Quality Control I (S. 650)</td>
<td>4,5</td>
<td>Karl-Heinz Waldmann</td>
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<tr>
<td>T-WIWI-102729</td>
<td>Quality Control II (S. 651)</td>
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<tr>
<td>T-WIWI-102627</td>
<td>Simulation I (S. 734)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102703</td>
<td>Simulation II (S. 735)</td>
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<tr>
<td>T-WIWI-102710</td>
<td>Markov Decision Models I (S. 521)</td>
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<tr>
<td>T-WIWI-102711</td>
<td>Markov Decision Models II (S. 522)</td>
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**Learning Control / Examinations**

The module is not offered from summer term 2017.

The assessment is carried out as partial written exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

None

**Qualification Objectives**

The student possesses detailed knowledge in modelling, analyzing and optimizing stochastic systems in economy and engineering.

**Content**

Markov Decision Models II: Queueing Systems, Stochastic Decision Processes
Simulation I: Generation of random numbers, Monte Carlo integration, Discrete event simulation, Discrete and continuous random variables, Statistical analysis of simulated data.
Simulation II: Variance reduction techniques, Simulation of stochastic processes, Case studies.
Quality Control I: Statistical Process Control, Acceptance Sampling, Design of experiments
Quality Control II: Reliability of complex systems with and without repair, Maintenance
OR-oriented modeling and analysis of real problems: project-based modelling and analysis

**Remarks**

The examination
- T-WIWI-102627 Simulation I will be offered latest until winter term 2016/2017 (for beginners).
- T-WIWI-102703 Simulation II will be offered latest until summer term 2017 (for beginners).
- T-WIWI-102710 Markov Decision Models I will be offered latest until summer term 2017 (for beginners).
- T-WIWI-102711 Markov Decision Models II will be offered latest until winter term 2016/2017 (for beginners).

The planned lectures and courses for the next two years are announced online (http://www.ior.kit.edu/).

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.

Responsibility: Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in:
- Compulsory Elective Modules / Compulsory Modules 1 / Operations Research
- Compulsory Elective Modules / Compulsory Modules 2 / Operations Research
- Additional Examinations

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
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<td>Jedes Semester</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose between 9 and 11,5 credits.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<tbody>
<tr>
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<td>Challenges in Supply Chain Management (S. 291)</td>
<td>4,5</td>
<td>Robert Blackburn</td>
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<tr>
<td>T-WIWI-102718</td>
<td>Discrete-Event Simulation in Production and Logistics (S. 338)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102723</td>
<td>Graph Theory and Advanced Location Models (S. 428)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102715</td>
<td>Operations Research in Supply Chain Management (S. 572)</td>
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<td>Stefan Nickel</td>
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<td>T-WIWI-102884</td>
<td>Operations Research in Health Care Management (S. 571)</td>
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<tr>
<td>T-WIWI-102716</td>
<td>Practical Seminar: Health Care Management (with Case Studies) (S. 618)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102704</td>
<td>Facility Location and Strategic Supply Chain Management (S. 385)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102860</td>
<td>Supply Chain Management in the Process Industry (S. 770)</td>
<td>4,5</td>
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<td>T-WIWI-102714</td>
<td>Tactical and Operational Supply Chain Management (S. 775)</td>
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<tr>
<td>T-WIWI-106200</td>
<td>Modeling and OR-Software: Advanced Topics (S. 543)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course Challenges in Supply Chain Management can only be assigned if this module is assigned as an elective module.

Qualification Objectives
The student
- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of SCM and their respective optimization problems,
is acquainted with classical location problem models (in planes, in networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
• is familiar with general procedures and characteristics of Health Care Management and the possibilities for adapting mathematical models for non-profit organizations,
• is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

Content
Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.

This module considers several areas of SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of Supply Chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of supply chain management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Supply Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Health Care Management addresses specific Supply Chain Management problems in the health sector. Important applications arise in scheduling and internal logistics of hospitals.

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research [WI1OR] is assumed.

Remarks
Some lectures and courses are offered irregularly.
The planned lectures and courses for the next three years are announced online.
The module will not be offered any more from summer term 2016. Students who are already assigned on the module can still finish it until summer term 2017 (repeaters only).

Workload
Total effort for 9 credits: ca. 270 hours

• Presence time: 84 hours
• Preparation/Wrap-up: 112 hours
• Examination and examination preparation: 74 hours
# Module: Stochastic Optimization  [M-WIWI-103289]

**Responsibility:** Steffen Rebennack  
**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Operations Research  

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
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</tr>
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<tr>
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<td>Jedes Semester</td>
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## Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<th>Course</th>
<th>ECTS</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>T-WIWI-106546</td>
<td>Introduction to Stochastic Optimization (S. 476)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
</tr>
<tr>
<td>T-WIWI-106548</td>
<td>Advanced Stochastic Optimization (S. 242)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
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<tr>
<td>T-WIWI-106549</td>
<td>Large-scale Optimization (S. 484)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
</tr>
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</table>

## Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

<table>
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<tr>
<th>Identifier</th>
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<tr>
<td>T-WIWI-102723</td>
<td>Graph Theory and Advanced Location Models (S. 428)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
</tr>
<tr>
<td>T-WIWI-102719</td>
<td>Mixed Integer Programming I (S. 535)</td>
<td>4,5</td>
<td>Oliver Stein</td>
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<tr>
<td>T-WIWI-102720</td>
<td>Mixed Integer Programming II (S. 537)</td>
<td>4,5</td>
<td>Oliver Stein</td>
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<tr>
<td>T-WIWI-103124</td>
<td>Multivariate Statistical Methods (S. 550)</td>
<td>4,5</td>
<td>Oliver Grothe</td>
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<tr>
<td>T-WIWI-102715</td>
<td>Operations Research in Supply Chain Management (S. 572)</td>
<td>4,5</td>
<td>Stefan Nickel, Steffen Rebennack</td>
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<tr>
<td>T-WIWI-106552</td>
<td>Simulation of Stochastic Systems (S. 737)</td>
<td>4,5</td>
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</table>

## Learning Control / Examinations
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.  

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.  

## Conditions
At least one of the courses “Advanced Stochastic Optimization” and “Large-scale Optimization” has to be taken. Students who choose the module in the field “compulsory elective modules” may select any two courses of the module.

## Qualification Objectives
The student
- names and describes basic notions for advanced stochastic optimization methods, in particular, ways to algorithmically exploit the special model structures,  
- knows the indispensable methods and models for quantitative analysis of stochastic optimization problems,
- models and classifies stochastic optimization problems and chooses the appropriate solution methods to solve also challenging stochastic optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Recommendations
It is recommended to listen to the lecture “Introduction to Stochastic Optimization” before the lecture “Advanced Stochastic Optimization” is visited.
Module: Service Operations  [M-WIWI-102805]

Responsibility: Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Research

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Course</th>
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<tr>
<td>T-WIWI-102715</td>
<td>Operations Research in Supply Chain Management (S. 572)</td>
<td>4,5</td>
<td>Jedes Semester</td>
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<td>Deutsch</td>
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<td>Operations Research in Health Care Management (S. 571)</td>
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<td>T-WIWI-102716</td>
<td>Practical Seminar: Health Care Management (with Case Studies) (S. 618)</td>
<td>4,5</td>
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Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102884</td>
<td>Operations Research in Health Care Management (S. 571)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102716</td>
<td>Practical Seminar: Health Care Management (with Case Studies) (S. 618)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<tbody>
<tr>
<td>T-WIWI-102718</td>
<td>Discrete-Event Simulation in Production and Logistics (S. 338)</td>
<td>4,5</td>
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<td>T-WIWI-102860</td>
<td>Supply Chain Management in the Process Industry (S. 770)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102872</td>
<td>Challenges in Supply Chain Management (S. 291)</td>
<td>4,5</td>
<td>Robert Blackburn</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the three courses Operations Research in Supply Chain Management, Operations Research in Health Care Management or Practical seminar: Health Care Management has to be assigned. Students who choose the module in the field “compulsory elective modules” may select any two courses of the module. The course Challenges in Supply Chain Management can only be assigned, if this module is assigned as an elective module.

Qualification Objectives

Students
- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
• are introduced into various application scenarios of analytics in the service context
• are able to distinguish different analytics methods and apply them in context
• learn how to apply analytics software in the service context
• are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

Content
The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role. It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

Recommendations
The course Practical Seminar Health Care should be combined with the course OR in Health Care Management.

Remarks
This module is part of the KSRI teaching profile “Digital Service Systems”. Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
### Module: Operations Research in Supply Chain Management  [M-WIWI-102832]

**Responsibility:** Stefan Nickel  
**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:**  
- Operations Research  
  - Compulsory Elective Modules / Compulsory Modules 1 / Operations Research  
  - Compulsory Elective Modules / Compulsory Modules 2 / Operations Research  
  - Additional Examinations

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#### Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<tbody>
<tr>
<td>T-WIWI-102723</td>
<td>Graph Theory and Advanced Location Models (S. 428)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-106200</td>
<td>Modeling and OR-Software: Advanced Topics (S. 543)</td>
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<td>Stefan Nickel</td>
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<tr>
<td>T-WIWI-102715</td>
<td>Operations Research in Supply Chain Management (S. 572)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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#### Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

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<td>T-WIWI-102718</td>
<td>Discrete-Event Simulation in Production and Logistics (S. 338)</td>
<td>4,5</td>
<td>Stefan Nickel</td>
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<td>T-WIWI-106548</td>
<td>Advanced Stochastic Optimization (S. 242)</td>
<td>4,5</td>
<td>Steffen Rebennack</td>
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<tr>
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<td>Mixed Integer Programming I (S. 535)</td>
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<td>Oliver Stein</td>
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<td>Mixed Integer Programming II (S. 537)</td>
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<td>Oliver Stein</td>
</tr>
<tr>
<td>T-WIWI-106549</td>
<td>Large-scale Optimization (S. 484)</td>
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<td>Steffen Rebennack</td>
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<tr>
<td>T-WIWI-102704</td>
<td>Facility Location and Strategic Supply Chain Management (S. 385)</td>
<td>4,5</td>
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<tr>
<td>T-WIWI-102714</td>
<td>Tactical and Operational Supply Chain Management (S. 775)</td>
<td>4,5</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses “Operations Research in Supply Chain Management”, “Graph Theory and Advanced Location Models”, “Modeling and OR-Software: Advanced Topics” and “Special Topics of Stochastic Optimization (elective)” has to be taken. Students who choose the module in the field “compulsory elective modules” may select any two courses of the module. Exemption for the summer term 2017:
In the summer term 2017, the two OR master modules “Mathematical Optimization” and “Operations Research in Supply Chain Management” can be taken without compulsory courses. This corresponds to the already existing regulation when taking OR modules in the elective area. The derogation does not apply to the winter term 2017/18.

Modeled Conditions
The following conditions must be met:
- The module [M-WIWI-101415] Operations Research in Supply Chain Management and Health Care Management must not have been started.

Qualification Objectives
The student
- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of SCM and their respective optimization problems,
- is acquainted with classical location problem models (in planes, in networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

Content
Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands. This module considers several areas of SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of Supply Chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of supply chain management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Suppy Chain Mangement, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research [WI1OR] is assumed.

Remarks
Some lectures and courses are offered irregularly. The planned lectures and courses for the next three years are announced online.

Workload
Total effort for 9 credits: ca. 270 hours
- Presence time: 84 hours
- Preparation/Wrap-up: 112 hours
- Examination and examination preparation: 74 hours
Module: Transportation Modelling and Traffic Management [M-BGU-101065]

Responsibility: Peter Vortisch

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

<table>
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<tr>
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<td>Deutsch/Englisch</td>
<td>4</td>
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Pflichtleistung

Non-Compulsory Block; You must choose between 2 and 3 courses and between 6 and 9 credits.

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<th>Identifier</th>
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<tbody>
<tr>
<td>T-BGU-101797</td>
<td>Methods and Models in Transportation Planning (S. 531)</td>
<td>3</td>
<td>Peter Vortisch</td>
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<tr>
<td>T-BGU-101798</td>
<td>Traffic Engineering (S. 798)</td>
<td>3</td>
<td>Peter Vortisch</td>
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<tr>
<td>T-BGU-101799</td>
<td>Traffic Management and Transport Telematics (S. 801)</td>
<td>3</td>
<td>Peter Vortisch</td>
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<tr>
<td>T-BGU-101800</td>
<td>Traffic Flow Simulation (S. 799)</td>
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Wahlpflicht

Non-Compulsory Block; You must choose at most 1 courses and between 0 and 3 credits.

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<tr>
<td>T-BGU-100010</td>
<td>Transportation Data Analysis (S. 804)</td>
<td>3</td>
<td>Martin Kagerbauer</td>
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<tr>
<td>T-BGU-106611</td>
<td>Freight Transport (S. 399)</td>
<td>3</td>
<td>Bastian Chlond</td>
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<tr>
<td>T-BGU-106301</td>
<td>Long-distance and Air Traffic (S. 496)</td>
<td>3</td>
<td>Bastian Chlond</td>
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<tr>
<td>T-BGU-101005</td>
<td>Tendering, Planning and Financing in Public Transport (S. 787)</td>
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<tr>
<td>T-BGU-100014</td>
<td>Seminar in Transportation (S. 718)</td>
<td>3</td>
<td>Bastian Chlond, Peter Vortisch</td>
</tr>
<tr>
<td>T-WIWI-103174</td>
<td>Seminar Mobility Services (Master) (S. 719)</td>
<td>3</td>
<td>Gerhard Satzger, Carola Stryja</td>
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<tr>
<td>T-BGU-103425</td>
<td>Mobility Services and new Forms of Mobility (S. 539)</td>
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<tr>
<td>T-BGU-103426</td>
<td>Strategic Transport Planning (S. 760)</td>
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<td>Volker Waßmuth</td>
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<tr>
<td>T-BGU-106608</td>
<td>Information Management for public Mobility Services (S. 447)</td>
<td>3</td>
<td>Peter Vortisch</td>
</tr>
</tbody>
</table>

Conditions

None

Qualification Objectives

See German version.

Recommendations

None
Module: Material Flow in Logistic Systems  [M-MACH-101277]

Responsibility: Kai Furmans
Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

<table>
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Materialfluss in Logistiksystemen
Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-102151</td>
<td>Material Flow in Logistic Systems (S. 525)</td>
<td>6</td>
<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105174</td>
<td>Warehousing and Distribution Systems (S. 826)</td>
<td>4</td>
<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105175</td>
<td>Airport Logistics (S. 244)</td>
<td>4</td>
<td>André Richter</td>
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<td>T-MACH-105165</td>
<td>Automotive Logistics (S. 260)</td>
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<td>T-WIWI-103091</td>
<td>Production and Logistics Controlling (S. 633)</td>
<td>3</td>
<td>Helmut Wlcek</td>
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Learning Control / Examinations
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Conditions
The course Material Flow in Logistic Systems [2117051] is compulsory and must be examined.

Qualification Objectives
The student
- acquires comprehensive and well-founded knowledge on the main topics of logistics, an overview of different logistic questions in practice and knows the functionality of material handling systems,
- is able to illustrate logistic systems with adequate accuracy by using simple models,
- is able to realize coherences within logistic systems,
- is able to evaluate logistic systems by using the learnt methods.

Content
The module Material Flow in Logistic Systems provides comprehensive and well-founded basics for the main topics of logistics. Within the lectures, the interaction between several components of logistic systems will be shown. The module focuses on technical characteristics of material handling systems as well as on methods for illustrating and evaluating logistics systems. To gain a deeper understanding, the course is accompanied by exercises and case studies.

Remarks
If the course 2117051 “Materialfluss in Logistiksystemen” had been taken already, one of the modules [WW4INGMB26], [WW4INGMB27] and [WW4INGMB28] can be chosen.

Workload
Regular attendance: 270 hours (9 credits). Lectures with 120 hours 4 credits. Lectures with 180 hours 6 credits.

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
**Module: Automotive Engineering**  [M-MACH-101266]

**Responsibility:** Frank Gauterin

**Organisation:** KIT-Fakultät für Maschinenbau

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Engineering Sciences

<table>
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**Fahrzeugtechnik**

Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-100092</td>
<td>Automotive Engineering I (S. 255)</td>
<td>6</td>
<td>Frank Gauterin, Hans-Joachim Unrau</td>
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<tr>
<td>T-MACH-102117</td>
<td>Automotive Engineering II (S. 259)</td>
<td>3</td>
<td>Frank Gauterin, Hans-Joachim Unrau</td>
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<tr>
<td>T-MACH-102156</td>
<td>Project Workshop: Automotive Engineering (S. 644)</td>
<td>4.5</td>
<td>Michael Frey, Frank Gauterin, Martin Gießler</td>
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<tr>
<td>T-MACH-102116</td>
<td>Fundamentals for Design of Motor-Vehicle Bodies I (S. 401)</td>
<td>1.5</td>
<td>Horst Dietmar Bardehle</td>
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<tr>
<td>T-MACH-102119</td>
<td>Fundamentals for Design of Motor-Vehicle Bodies II (S. 403)</td>
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<td>Horst Dietmar Bardehle</td>
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<td>T-MACH-102093</td>
<td>Fluid Power Systems (S. 397)</td>
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<tr>
<td>T-MACH-102150</td>
<td>BUS-Controls (S. 273)</td>
<td>3</td>
<td>Marcus Geimer, Felix Weber</td>
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<tr>
<td>T-MACH-102203</td>
<td>Automotive Engineering I (S. 257)</td>
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<td>Frank Gauterin, Martin Gießler</td>
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</table>

**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Qualification Objectives**

The student
- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

**Content**

See course descriptions.

**Recommendations**


**Workload**

See German version.
Module: Environmental Management [M-BGU-103308]

Responsibility: Stephan Fuchs
Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

<table>
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<tr>
<td>T-BGU-106682</td>
<td>Environmental Management (S. 374)</td>
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<td>Stephan Fuchs</td>
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</table>

Wahlpflicht

Non-Compulsory Block; You must choose 1 courses and 0 credits.

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<tr>
<td>T-BGU-106668</td>
<td>Field Training Water Quality (S. 391)</td>
<td>0</td>
<td>Stephan Fuchs, Stephan Hilgert</td>
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<tr>
<td>T-BGU-106681</td>
<td>Modeling Mass Fluxes in River Basins (S. 544)</td>
<td>0</td>
<td>Stephan Fuchs</td>
</tr>
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</table>

Conditions
None

Modeled Conditions
The following conditions must be met:
- The module [M-BGU-101000] Environmental Management must not have been started.

Qualification Objectives
The students develop system thinking and gain applicable knowledge and tools in regard to engineering methods.

Recommendations
None
Module: Virtual Engineering B [M-MACH-101281]

Responsibility: Jivka Ovtcharova
Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

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<tr>
<td>T-MACH-102124</td>
<td>Virtual Engineering II (S. 822)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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**Virtual Engineering B**
Non-Compulsory Block; You must choose at least 3 credits.

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<tr>
<td>T-MACH-102125</td>
<td>Computer Integrated Planning of New Products (S. 305)</td>
<td>4</td>
<td>Roland Kläger</td>
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<tr>
<td>T-MACH-102149</td>
<td>Virtual Reality Practical Course (S. 824)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-102181</td>
<td>PLM for Product Development in Mechatronics (S. 598)</td>
<td>4</td>
<td>Martin Eigner</td>
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<tr>
<td>T-MACH-102209</td>
<td>Information Engineering (S. 446)</td>
<td>3</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-102153</td>
<td>PLM-CAD Workshop (S. 599)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-102185</td>
<td>CATIA CAD Training Course (S. 289)</td>
<td>2</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-102187</td>
<td>CAD-NX Training Course (S. 286)</td>
<td>2</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-105937</td>
<td>Information management in production (S. 448)</td>
<td>4</td>
<td>Oliver Riedel</td>
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<tr>
<td>T-MACH-106740</td>
<td>Virtual Engineering Lab (S. 823)</td>
<td>4</td>
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<td>T-MACH-106741</td>
<td>Virtual training factory 4.X (S. 825)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-106743</td>
<td>IoT platform for engineering (S. 477)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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</table>

**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**
The course Virtual Engineering II [2122378] is compulsory module and must be examined.

**Qualification Objectives**
The students should:
- have basic knowledge about industrial practice of Information Technology in the field of product development,
- have basic knowledge about innovative visualization techniques like Virtual Reality and feasible application of Virtual Mock-Ups (VMU) for validating product properties.
- Is able to estimate potentials and risks of current Virtual Reality Systems in product development.
• understands demands and relevance of interconnected IT-systems and respective methods for product development

**Content**
The module Virtual Engineering B communicates basics of Virtual Reality applications and their fields of application for validating product properties and for supporting product development processes.
Optional courses of this module complete the content with practical application of VR techniques in product development (Virtual Reality Exercise) and current product development processes.

**Recommendations**
We recommend to attend/visit the courses *Engineering I* [2121352] before *Virtual Engineering II* [2122378]

**Workload**
Workload at 9 graduate credits / credit points: ca. 270 hours.

- regular attendance: 100 hours
- Preparation and reworking: 50 hours
- Exam and exam revision/preparation: 120 hours

Detailed apportionment results from credit points of the courses of the module
### Module: Track Guided Transport Systems / Engineering  [M-BGU-101112]

- **Responsibility:** Eberhard Hohnecker
- **Organisation:** KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
- **Curricular Anchorage:** Compulsory Elective

#### Contained in:
- Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
- Additional Examinations

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#### Compulsory

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<tr>
<td>T-BGU-100052</td>
<td>Track Guided Transport Systems - Technical Design and Components (S. 796)</td>
<td>6</td>
<td>Eberhard Hohnecker</td>
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#### Wahlpflicht

Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 4,5 credits.

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<tr>
<td>T-BGU-101848</td>
<td>Infrastructure Dimensioning and Running Dynamics Based Railway Alignment (S. 453)</td>
<td>3</td>
<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-101849</td>
<td>Infrastructure Equipment of Railway Tracks (S. 454)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<td>T-BGU-101851</td>
<td>Construction and Maintenance of Guided Track Infrastructure (S. 310)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<td>T-MACH-102121</td>
<td>Electrical Railway Traction Systems (S. 347)</td>
<td>3</td>
<td>Peter Gratzfeld</td>
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<tr>
<td>T-BGU-101825</td>
<td>Environmental Aspects of Guided Transport Systems (S. 370)</td>
<td>3</td>
<td>Eberhard Hohnecker</td>
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<td>T-BGU-101794</td>
<td>Economic Efficiency of Guided Transport Systems (S. 340)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<td>T-BGU-101793</td>
<td>Law Aspects of Guided Transport Systems (S. 488)</td>
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<td>T-BGU-101858</td>
<td>Homework &quot;Track Guided Transport Systems / Engineering&quot; (S. 439)</td>
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<td>Eberhard Hohnecker</td>
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</table>

#### Learning Control / Examinations

See German version.

#### Conditions

See German version.

#### Qualification Objectives

See German version.

#### Recommendations

See German version.

#### Workload

The total workload for this module is approximately 270 hours. For further information see German version.
Module: Combustion Engines I [M-MACH-101275]

Responsibility: Thomas Koch, Heiko Kubach

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

<table>
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Compulsory

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<td>T-MACH-102194</td>
<td>Combustion Engines I (S. 296)</td>
<td>5</td>
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<tr>
<td>T-MACH-105564</td>
<td>Energy Conversion and Increased Efficiency in Internal Combustion Engines (S. 356)</td>
<td>4</td>
<td>Thomas Koch, Heiko Kubach</td>
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</tbody>
</table>

Learning Control / Examinations
The module examination contains of two oral examinations. The module score results from the two scores weighted according to the ECTS.

Conditions
None

Qualification Objectives
The student can name and explain the working principle of combustion engines. He is able to analyse and evaluate the combustion process. He is able to evaluate influences of gas exchange, mixture formation, fuels and exhaust gas aftertreatment on the combustion performance. He can solve basic research problems in the field of engine development. The student can name all important influences on the combustion process. He can analyse and evaluate the engine process considering efficiency, emissions and potential.

Content
Introduction, History, Concepts
Working Principle and Thermodynamics
Characteristic Parameters
Air Path
Fuel Path
Energy Conversion
Fuels
Emissions
Exhaust Gas Aftertreatment
Reaction kinetics
Gas exchange
Ignition
Flow field of gasoline engines
Working process
Pressure trace analysis
Thermodynamic analysis of the high pressure process
Exergy analysis and waste heat recuperation
Aspects of sustainability
Module: Process Engineering in Construction [M-BGU-101110]

Responsibility: Shervin Haghsheno

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Additional Examinations

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Compulsory

Identifier | Course | ECTS | Responsibility |
---|---|---|---|
T-BGU-101844 | Process Engineering (S. 631) | 3 | Harald Schneider |

Wahlpflicht

Non-Compulsory Block; You must choose between 2 und 3 courses and between 6 and 7,5 credits.

Identifier | Course | ECTS | Responsibility |
---|---|---|---|
T-BGU-101845 | Construction Equipment (S. 311) | 3 | Sascha Gentes |
T-BGU-101832 | Operation Methods for Foundation and Marine Construction (S. 569) | 1,5 | Harald Schneider |
T-BGU-101801 | Operation Methods for Earthmoving (S. 568) | 1,5 | Heinrich Schlick |
T-BGU-101846 | Tunnel Construction and Blasting Engineering (S. 806) | 3 | Shervin Haghsheno |
T-BGU-101847 | Project Studies (S. 643) | 3 | Sascha Gentes |
T-BGU-101850 | Disassembly Process Engineering (S. 337) | 3 | Sascha Gentes |

Conditions

The course Verfahrenstechnik [6241704] is compulsory and must be examined.

Qualification Objectives

Students understand different processes and the related construction equipment, its technology, capabilities and constraints. Students can define process solutions consisting of machinery and devices. They can evaluate existing processes through knowledge about process performance and operating conditions, and they can identify potential for improvement.

Content

Within the frame of this module, various construction and conditioning processes will be presented as well as performance calculations conducted. Students learn about the construction machinery and devices of these processes. Transmission, generation, conversion and controlling of power are explained with the help of various practical examples. Moreover, the module includes possibilities for an on-site familiarization.

Recommendations

None

Remarks

None
Module: Manufacturing Technology [M-MACH-101276]

Responsibility: Volker Schulze
Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  Additional Examinations

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Compulsory

Identifier Course ECTS Responsibility
T-MACH-102105 Manufacturing Technology (S. 512) 9 Volker Schulze, Frederik Zanger

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 SPO of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the wbk. The term paper may not be convalidated in the seminar module.

Conditions
None

Qualification Objectives
The students

- can name different manufacturing processes, can describe their specific characteristics and are capable to depict the general function of manufacturing processes and are able to assign manufacturing processes to the specific main groups.
- are enabled to identify correlations between different processes and to select a process depending on possible applications.
- are capable to describe the theoretical basics for the manufacturing processes they got to know within the scope of the course and are able to compare the processes.
- are able to correlate based on their knowledge in materials science the processing parameters with the resulting material properties by taking into account the microstructural effects.
- are qualified to evaluate different processes on a material scientific basis.

Content
Within this engineering sciences-oriented module the students will get to learn principle aspects of manufacturing technology. Further information can be found at the description of the lecture “Manufacturing Technology”.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: **Water Chemistry and Water Technology I**  [M-CIWVT-101121]  

**Responsibility:** Harald Horn  
**Organisation:** KIT-Fakultät für Chemieingenieurwesen und Verfahrenstechnik  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences  
  - Additional Examinations

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**Compulsory**

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<td>Harald Horn</td>
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<tr>
<td>T-CIWVT-103351</td>
<td>Laboratory Work Water Chemistry (S. 483)</td>
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<td>Gudrun Abbt-Braun, Harald Horn</td>
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**Conditions**

none

**Qualification Objectives**

The student

- has knowledge of types and sum of the water constituents and their interaction with each other and with the water molecules,
- knows and understands the basics of water chemistry and the most important methods for the treatment of different types of raw water.

**Content**

This module gives the basis to understand the most important methods of raw water treatment. Therefore types and sum of water constituents and their interaction with each other and with water molecules are introduced. The effects of the different treatment and purification methods are shown.
Module: Specialization in Production Engineering  [M-MACH-101284]

Responsibility: Volker Schulze
Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Identification

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Vertiefung der Produktionstechnik
Non-Compulsory Block; You must choose at least 9 credits.

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<th>Course</th>
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<tr>
<td>T-MACH-102107</td>
<td>Quality Management (S. 652)</td>
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<td>Gisela Lanza</td>
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<tr>
<td>T-MACH-105166</td>
<td>Materials and Processes for Body Lightweight Construction in the Automotive Industry (S. 526)</td>
<td>4</td>
<td>Stefan Kienzle, Dieter Steegmüller</td>
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<td>T-MACH-105177</td>
<td>Metal Forming (S. 530)</td>
<td>3</td>
<td>Florian Herlan</td>
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<td>Control Technology (S. 314)</td>
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<td>Christoph Gönnheimer</td>
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<td>T-MACH-102148</td>
<td>Gear Cutting Technology (S. 418)</td>
<td>4</td>
<td>Markus Klaiber</td>
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<tr>
<td>T-MACH-102189</td>
<td>Production Technology and Management in Automotive Industry (S. 635)</td>
<td>4</td>
<td>Volker Michael Stauch</td>
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<tr>
<td>T-MACH-105188</td>
<td>Integrative Strategies in Production and Development of High Performance Cars (S. 464)</td>
<td>4</td>
<td>Karl-Hubert Schlichtenmayer, Frederik Zanger</td>
</tr>
<tr>
<td>T-MACH-105277</td>
<td>Safe mechatronic systems (S. 671)</td>
<td>4</td>
<td>Markus Golder</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the wbk. The term paper may not be convalidated in the seminar module.
Module: Machine Tools and Industrial Handling  [M-MACH-101286]

Responsibility:  Jürgen Fleischer
Organisation:  KIT-Fakultät für Maschinenbau
Curricular Anchorage:  Compulsory Elective
Contained in:  Engineering Sciences
              Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
              Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
              Additional Examinations

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Compulsory

Identifier Course ECTS Responsibility
T-MACH-102158 Machine Tools and Industrial Handling (S. 501) 9 Jürgen Fleischer

Learning Control / Examinations
The assessment is carried out as an oral exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date.

Conditions
None

Qualification Objectives
The students

- are capable to explain the use and application of machine tools and handling devices as well as differentiate their characteristics and structure.
- are able to name and describe the essential components (frame, main spindles, feed axis, peripheral equipment, control) of machine tools.
- Are capable to distinguish and select and describe the essential components regarding structure, characteristics advantages and disadvantages.
- are enabled to dimension the main components of machine tools.
- are able to name and describe the control principles of machine tools.
- are capable to name examples of machine tools and industrial handling as well as to deduce compare the essential components. Additionally they can allocate manufacturing processes.
- are enabled to identify drawbacks as well as derive and asses measures for improvements.
- are qualified to apply methods for selection and evaluation of machine tools.
- are experienced to deduce the particular failure characteristics of a ball screw.

Content
The module overviews the assembly, dimensioning and application of machine tools and industrial handling. A consolidated and practice oriented knowledge is imparted about the choice, dimensioning and assessment of production machines. At first, the major components of machine tools are explained systematically. At this, the characteristics of dimensioning of machine tools are described in detail. Finally, the application of machine tools is demonstrated by means of example machines of the manufacturing processes turning, milling, grinding, massive forming, sheet metal forming and toothing.
Module: Design, Construction, Operation and Maintenance of Highways [M-BGU-100998]

Responsibility: Ralf Roos
Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Curricular Anchorage: Compulsory Elective

Contained in:
- Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  - Additional Examinations

<table>
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Compulsory

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<tr>
<td>T-BGU-106613</td>
<td>Design Basics in Highway Engineering (S. 331)</td>
<td>3</td>
<td>Ralf Roos</td>
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<tr>
<td>T-BGU-106300</td>
<td>Infrastructure Management (S. 455)</td>
<td>6</td>
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Conditions
The selection of this module excludes the selection of the module “Highway Engineering” (WI4INGBGU2).

Modeled Conditions
The following conditions must be met:
- The module [M-BGU-100999] Highway Engineering must not have been started.

Qualification Objectives
See German version.

Recommendations
None

Remarks
None

Workload
See German version.
**Module: Extracurricular Module in Engineering [M-WIWI-101404]**

**Responsibility:** Prüfungsausschuss der KIT-Fakultät für Wirtschaftswissenschaften

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Engineering Sciences

**ECTS**

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**Wahlpflichtangebot**

Non-Compulsory Block; You must choose between 9 and 12 credits.

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<td>PH APL-ING-TL01 (S. 586)</td>
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<td>T-WIWI-106292</td>
<td>PH APL-ING-TL02 (S. 587)</td>
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<td>PH APL-ING-TL03 (S. 588)</td>
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<td>T-WIWI-106294</td>
<td>PH APL-ING-TL04 ub (S. 589)</td>
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**Learning Control / Examinations**

The assessment of the module is determined by the respective module coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points (max. 12 credits) and at least 6 hours per week (max. 8 hours per week). The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

The formation of the overall grade of the module will be determined by the respective module coordinator.

**Conditions**

See German version.

**Qualification Objectives**

See German version.
Module: High-Voltage Technology  [M-ETIT-101163]

Responsibility: Bernd Hoferer, Thomas Leibfried

Organisation: KIT-Fakultät für Elektrotechnik und Informationstechnik

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Compulsory

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<tr>
<td>T-ETIT-101913</td>
<td>High-Voltage Technology I (S. 434)</td>
<td>4,5</td>
<td>Rainer Badent</td>
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<tr>
<td>T-ETIT-101914</td>
<td>High-Voltage Technology II (S. 435)</td>
<td>4,5</td>
<td>Rainer Badent</td>
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</table>

Qualification Objectives

The student

- has wide knowledge of electrical power engineering,
- is capable to analyse and develop electrical power engineering systems.

Content

The module deals with wide knowledge about the electrical power engineering. This ranges from the electric power equipment networks in terms of function, structure and interpretation on the calculation of electrical power networks to special areas such as the FACTS elements or power transformers.
Module: Combustion Engines II [M-MACH-101303]

Responsibility: Heiko Kubach

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Additional Examinations

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<td>T-MACH-104609</td>
<td>Combustion Engines II (S. 297)</td>
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Non-Compulsory Block; You must choose at least 4 credits.

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<tr>
<td>T-MACH-105044</td>
<td>Fundamentals of Catalytic Exhaust Gas Aftertreatment (S. 411)</td>
<td>4</td>
<td>Egbert Lox</td>
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<tr>
<td>T-MACH-105173</td>
<td>Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines (S. 245)</td>
<td>4</td>
<td>Marcus Gohl</td>
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<td>T-MACH-105184</td>
<td>Fuels and Lubricants for Combustion Engines (S. 400)</td>
<td>4</td>
<td>Bernhard Kehrwald</td>
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<td>T-MACH-105167</td>
<td>Analysis Tools for Combustion Diagnostics (S. 246)</td>
<td>4</td>
<td>Uwe Wagner</td>
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<td>T-MACH-102197</td>
<td>Gas Engines (S. 415)</td>
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<td>T-MACH-102199</td>
<td>Model Based Application Methods (S. 540)</td>
<td>4</td>
<td>Frank Kirschbaum</td>
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<tr>
<td>T-MACH-105169</td>
<td>Engine Measurement Techniques (S. 362)</td>
<td>4</td>
<td>Sören Bernhardt</td>
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</table>

Learning Control / Examinations

The assessment consists of an oral exam (60 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

Conditions

None

Modeled Conditions

The following conditions must be met:

- The module [M-MACH-101275] Combustion Engines I must have been started.

Qualification Objectives

See courses.
Module: Optoelectronics and Optical Communication [M-MACH-101295]

Responsibility: Jan Gerrit Korvink

Organisation: Institut für Mikrostrukturtechnik

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  - Additional Examinations

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Optoelektronik und Optische Kommunikationstechnik
Non-Compulsory Block; You must choose at least 9 credits.

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<th>Course</th>
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<th>Responsibility</th>
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<tr>
<td>T-MACH-102166</td>
<td>Fabrication Processes in Microsystem Technology (S. 384)</td>
<td>3</td>
<td>Klaus Bade</td>
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<tr>
<td>T-MACH-102152</td>
<td>Novel Actuators and Sensors (S. 563)</td>
<td>4</td>
<td>Manfred Kohl, Martin Sommer</td>
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<tr>
<td>T-ETIT-101938</td>
<td>Communication Systems and Protocols (S. 298)</td>
<td>5</td>
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<tr>
<td>T-ETIT-100741</td>
<td>Laser Physics (S. 487)</td>
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<td>T-ETIT-100740</td>
<td>Quantum Functional Devices and Semiconductor Technology (S. 654)</td>
<td>3</td>
<td>Christian Koos</td>
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<td>T-ETIT-101945</td>
<td>Optical Waveguides and Fibers (S. 575)</td>
<td>4</td>
<td>Christian Koos</td>
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<tr>
<td>T-ETIT-100639</td>
<td>Optical Transmitters and Receivers (S. 574)</td>
<td>4</td>
<td>Wolfgang Freude</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
- Student has basic knowledge of optical communication systems and related device and fabrication technologies.
- He/she can apply this knowledge to specific problems.

Content
This module covers practical and theoretical aspects in the areas of optical communications and optoelectronics. System aspects of communication networks are complemented by fundamental principles and device technologies of optoelectronics as well as and microsystem fabrication technologies.

Remarks
If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber.
Module: Project in Public Transportation  [M-BGU-101113]

Responsibility: Eberhard Hohnecker

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Additional Examinations

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Compulsory

Identifier Course ECTS Responsibility

T-BGU-100066 Traffic Infrastructure (S. 800) 6 Eberhard Hohnecker

Wahlpflicht

Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 4,5 credits.

Identifer Course ECTS Responsibility

T-BGU-101825 Environmental Aspects of Guided Transport Systems (S. 370) 3 Eberhard Hohnecker
T-BGU-101794 Economic Efficiency of Guided Transport Systems (S. 340) 1,5 Eberhard Hohnecker
T-BGU-101824 Operation Systems and Track Guided Infrastructure Capacity (S. 570) 3 Eberhard Hohnecker
T-BGU-101795 Management in Public Transport (S. 507) 3 Eberhard Hohnecker
T-BGU-101793 Law Aspects of Guided Transport Systems (S. 488) 1,5 Eberhard Hohnecker
T-BGU-101856 Homework “Project in Public Transportation” (S. 437) 3 Eberhard Hohnecker

Learning Control / Examinations

See German version.

Conditions

See German version.

Qualification Objectives

See German version.

Recommendations

See German version.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.
Module: Microfabrication [M-MACH-101291]

Responsibility: Jan Gerrit Korvink

Organisation: Institut für Mikrostrukturtechnik

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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**Mikrofertigung**

Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-102164</td>
<td>Practical Training in Basics of Microsystem Technology (S. 619)</td>
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<tr>
<td>T-MACH-102166</td>
<td>Fabrication Processes in Microsystem Technology (S. 384)</td>
<td>3</td>
<td>Klaus Bade</td>
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<td>T-MACH-102168</td>
<td>Replication Technologies in Micro System Technology (S. 664)</td>
<td>3</td>
<td>Matthias Worgull</td>
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<td>T-MACH-100530</td>
<td>Physics for Engineers (S. 595)</td>
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<td>Peter Gumbsch, Alexander Nesterov-Müller</td>
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<td>T-MACH-102169</td>
<td>Chemical, Physical and Material Scientific Aspects of Polymers in Microsystem Technologies (S. 294)</td>
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<td>T-MACH-105186</td>
<td>Fundamentals of X-Ray Optics I (S. 413)</td>
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<td>T-MACH-102167</td>
<td>Nanotribology and -Mechanics (S. 553)</td>
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<td>Martin Dienwiebel, Hendrik Hölscher</td>
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<tr>
<td>T-MACH-102191</td>
<td>Polymers in MEMS B: Physics, Microstructuring and Applications (S. 604)</td>
<td>3</td>
<td>Matthias Worgull</td>
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<tr>
<td>T-MACH-102192</td>
<td>Polymers in MEMS A: Chemistry, Synthesis and Applications (S. 602)</td>
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<td>T-MACH-102200</td>
<td>Polymers in MEMS C: Biopolymers and Bioplastics (S. 606)</td>
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<td>Practical Course Polymers in MEMS (S. 611)</td>
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**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

None

**Qualification Objectives**

The student

- gains advanced knowledge concerning fabrication techniques in micrometer scale
- acquires knowledge in up-to-date developing research
• can detect and use causal relation in microfabrication process chains.

Content
This engineering module allows the student to gain advanced knowledge in the area of microfabrication. Different manufacturing methods are described and analyzed in an advanced manner. Necessary interdisciplinary knowledge from physics, chemistry, materials science and also up-to-date developments (nano and x-ray optics) in micro fabrication is offered.

Remarks
Starting summer term 2015, the course “Practical course Polymers in MEMS” [2142856] can be chosen in the module. If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber.
Module: Energy and Process Technology I [M-MACH-101296]

Responsibility: Heiner Wirbser
Organisation: Institut für Technische Thermodynamik
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Compulsory

Identifier Course ECTS Responsibility

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module, whose sum of credits must meet the requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
In this module students achieve a basic understanding of the technical properties of energy conversion processes and machines.

Content
Energy and Process Technology I:
1. thermodynamic basics and cycle processes (ITT)
2. basics of piston engines (IFKM)
3. basics of turbomachines (FSM)
4. basics of thermal turbomachines (ITS)

Remarks
All lectures and exams are held in German only.
## Module: Introduction to Logistics [M-MACH-101263]

**Responsibility:** Kai Furmans  
**Organisation:** KIT-Fakultät für Maschinenbau  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Engineering Sciences  
**Additional Examinations**

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### Wahlblock
Non-Compulsory Block; You must choose 1 course.

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<td>Information Systems and Supply Chain Management (S. 451)</td>
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<td>Christoph Kilger</td>
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<tr>
<td>T-MACH-102178</td>
<td>Elements of Technical Logistics and Project (S. 349)</td>
<td>6</td>
<td>Martin Mittwollen, Jan Oellerich</td>
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<tr>
<td>T-MACH-105149</td>
<td>Industrial Application of Technological Logistics Instancing Crane Systems (S. 443)</td>
<td>4</td>
<td>Markus Golder</td>
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<tr>
<td>T-MACH-105151</td>
<td>Energy Efficient Intralogistic Systems (S. 357)</td>
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<td>Meike Braun, Frank Schönung</td>
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<tr>
<td>T-MACH-105165</td>
<td>Automotive Logistics (S. 260)</td>
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<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105175</td>
<td>Airport Logistics (S. 244)</td>
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<td>André Richter</td>
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<td>T-MACH-105187</td>
<td>IT-Fundamentals of Logistics (S. 479)</td>
<td>4</td>
<td>Frank Thomas</td>
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<tr>
<td>T-MACH-105174</td>
<td>Warehousing and Distribution Systems (S. 826)</td>
<td>4</td>
<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105171</td>
<td>Safety Engineering (S. 674)</td>
<td>4</td>
<td>Hans-Peter Kany</td>
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<td>T-WIWI-103091</td>
<td>Production and Logistics Controlling (S. 633)</td>
<td>3</td>
<td>Helmut Wlcek</td>
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<tr>
<td>T-MACH-102159</td>
<td>Elements and Systems of Technical Logistics (S. 348)</td>
<td>4</td>
<td>Martin Mittwollen, Jan Oellerich</td>
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<tr>
<td>T-MACH-105200</td>
<td>Safe structures for machines in material handling (S. 673)</td>
<td>4</td>
<td>Markus Golder</td>
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<tr>
<td>T-MACH-105277</td>
<td>Safe mechatronic systems (S. 671)</td>
<td>4</td>
<td>Markus Golder</td>
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<td>T-MACH-106599</td>
<td>Wildcard - Introduction to Logistics (S. 836)</td>
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### Pflichtblock
Non-Compulsory Block; You must choose 1 course.

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<tr>
<td>T-MACH-102151</td>
<td>Material Flow in Logistic Systems (S. 525)</td>
<td>6</td>
<td>Kai Furmans</td>
</tr>
<tr>
<td>T-MACH-102163</td>
<td>Basics of Technical Logistics (S. 263)</td>
<td>6</td>
<td>Martin Mittwollen, Jan Oellerich</td>
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</table>
Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

Conditions
It is obligatory to choose one of the following courses:
- Material Flow in Logistic Systems
- Basics of technical logistics

Qualification Objectives
The student
- acquires an overview of different logistic questions in practice,
- is able to model logistic systems with adequate accuracy by using simple models,
- is able to handle analytical methods for a performance evaluation of logistic systems,
- is able to identify cause and effects within logistic systems.

Content
The module Introduction to Logistics provides well-founded knowledge in main questions of logistics. In this module, focuses on the acquisition of theoretical basics linked with exemplary practice questions are laid. To gain a deeper understanding, the course is accompanied by exercises and further improved by case studies.
Module: Virtual Engineering A  [M-MACH-101283]

Responsibility: Jivka Ovtcharova

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Additional Examinations

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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<tbody>
<tr>
<td>9</td>
<td>Jedes Semester</td>
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Compulsory

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<tbody>
<tr>
<td>T-MACH-102123</td>
<td>Virtual Engineering I (S. 821)</td>
<td>6</td>
<td>Jivka Ovtcharova</td>
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</table>

Virtual Engineering A

Non-Compulsory Block; You must choose at least 3 credits.

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<tbody>
<tr>
<td>T-MACH-102125</td>
<td>Computer Integrated Planning of New Products (S. 305)</td>
<td>4</td>
<td>Roland Kläger</td>
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<tr>
<td>T-MACH-102149</td>
<td>Virtual Reality Practical Course (S. 824)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
</tr>
<tr>
<td>T-MACH-102153</td>
<td>PLM-CAD Workshop (S. 599)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-102181</td>
<td>PLM for Product Development in Mechatronics (S. 598)</td>
<td>4</td>
<td>Martin Eigner</td>
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<tr>
<td>T-MACH-102209</td>
<td>Information Engineering (S. 446)</td>
<td>3</td>
<td>Jivka Ovtcharova</td>
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<tr>
<td>T-MACH-105937</td>
<td>Information management in production (S. 448)</td>
<td>4</td>
<td>Oliver Riedel</td>
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<tr>
<td>T-MACH-106740</td>
<td>Virtual Engineering Lab (S. 823)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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<td>T-MACH-106741</td>
<td>Virtual training factory 4.X (S. 825)</td>
<td>4</td>
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<tr>
<td>T-MACH-106743</td>
<td>IoT platform for engineering (S. 477)</td>
<td>4</td>
<td>Jivka Ovtcharova</td>
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Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course Virtual Engineering I [2121352] is compulsory modules and must be examined.

Qualification Objectives

The students should:

- have basic knowledge about the industrial application of Information Technology in product development,
- have understanding about current and future application of information systems in product development processes in the context of Product Lifecycle Management and Virtual Engineering,
- be able to operate current CAx- and PLM-systems in the product development process
- understands demands and relevance of interconnected IT-systems and respective methods for product development
Content
The Module Virtual Engineering A gives an overview about product development processes, beginning with requirement engineering, verification of manufacturing feasibility and virtual operation in the scope of Digital Factory. The guest-lectures contained in this module complete the content of the lecture with introducing current product development processes focusing.

Workload
Workload at 9 graduate credits / credit points: ca. 270 hours.

- regular attendance: 100 hours
- Preparation and reworking: 50 hours
- Exam and exam revision/preparation: 120 hours

Detailed apportionment results from credit points of the courses of the module
Module: Project Management in Construction  [M-BGU-101888]

Responsibility: Shervin Haghsheno

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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<th>Duration</th>
<th>Language</th>
<th>Version</th>
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<tr>
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Compulsory

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<tbody>
<tr>
<td>T-BGU-103432</td>
<td>Project Management in Construction and Real Estate Industry I (S. 640)</td>
<td>3</td>
<td>Shervin Haghsheno</td>
</tr>
<tr>
<td>T-BGU-103431</td>
<td>Turnkey Construction II - Trades and Technology (S. 808)</td>
<td>3</td>
<td>Shervin Haghsheno</td>
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</table>

Wahlpflicht

Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 4,5 credits.

<table>
<thead>
<tr>
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<th>Course</th>
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<th>Responsibility</th>
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<tr>
<td>T-BGU-103427</td>
<td>Site Management (S. 738)</td>
<td>1,5</td>
<td>Shervin Haghsheno</td>
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<tr>
<td>T-BGU-103430</td>
<td>Turnkey Construction I - Processes and Methods (S. 807)</td>
<td>1,5</td>
<td>Shervin Haghsheno</td>
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<td>T-BGU-103428</td>
<td>Supplementary Claim Management (S. 767)</td>
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<tr>
<td>T-BGU-103429</td>
<td>Building Laws (S. 272)</td>
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<tr>
<td>T-BGU-103433</td>
<td>Project Management in Construction and Real Estate Industry II (S. 641)</td>
<td>3</td>
<td>Shervin Haghsheno</td>
</tr>
</tbody>
</table>

Conditions

The courses Projektmanagement in der Bau- und Immobilienwirtschaft I and Schlüsselfertiges Bauen II are compulsory and must be examined.

Recommendations

None

Remarks

None
Module: Specific Topics in Materials Science  [M-MACH-101268]

Responsibility: Michael Hoffmann
Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Spezielle Werkstoffkunde
Non-Compulsory Block; You must choose at least 9 credits.

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<tbody>
<tr>
<td>T-MACH-102141</td>
<td>Constitution and Properties of Wearresistant Materials (S. 308)</td>
<td>4</td>
<td>Sven Ulrich</td>
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<tr>
<td>T-MACH-100287</td>
<td>Introduction to Ceramics (S. 473)</td>
<td>6</td>
<td>Michael Hoffmann</td>
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<td>T-MACH-102099</td>
<td>Experimental Lab Class in Welding Technology, in Groups (S. 383)</td>
<td>4</td>
<td>Jürgen Hoffmeister</td>
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<tr>
<td>T-MACH-102111</td>
<td>Principles of Ceramic and Powder Metallurgy Processing (S. 625)</td>
<td>4</td>
<td>Rainer Oberacker</td>
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<tr>
<td>T-MACH-102154</td>
<td>Laboratory Laser Materials Processing (S. 482)</td>
<td>4</td>
<td>Johannes Schneider</td>
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<td>T-MACH-102102</td>
<td>Physical Basics of Laser Technology (S. 593)</td>
<td>5</td>
<td>Johannes Schneider</td>
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<td>T-MACH-102137</td>
<td>Polymer Engineering I (S. 600)</td>
<td>4</td>
<td>Peter Elsner</td>
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<tr>
<td>T-MACH-102138</td>
<td>Polymerengineering II (S. 601)</td>
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<td>T-MACH-102103</td>
<td>Superhard Thin Film Materials (S. 765)</td>
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<td>T-MACH-100531</td>
<td>Systematic Materials Selection (S. 774)</td>
<td>5</td>
<td>Stefan Dietrich</td>
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<td>T-MACH-102139</td>
<td>Failure of Structural Materials: Fatigue and Creep (S. 389)</td>
<td>4</td>
<td>Patrick Gruber, Peter Gumbsch, Oliver Kraft</td>
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<tr>
<td>T-MACH-102140</td>
<td>Failure of Structural Materials: Deformation and Fracture (S. 387)</td>
<td>4</td>
<td>Peter Gumbsch, Oliver Kraft, Daniel Weygand</td>
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<td>T-MACH-102157</td>
<td>High Performance Powder Metallurgy Materials (S. 433)</td>
<td>4</td>
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<tr>
<td>T-MACH-102179</td>
<td>Structural Ceramics (S. 764)</td>
<td>4</td>
<td>Michael Hoffmann</td>
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<tr>
<td>T-MACH-102182</td>
<td>Ceramic Processing Technology (S. 290)</td>
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<td>Joachim Binder</td>
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<tr>
<td>T-MACH-102170</td>
<td>Structural and Phase Analysis (S. 763)</td>
<td>4</td>
<td>Susanne Wagner</td>
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<tr>
<td>T-MACH-105150</td>
<td>Constitution and Properties of Protective Coatings (S. 306)</td>
<td>4</td>
<td>Sven Ulrich</td>
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<tr>
<td>T-MACH-105170</td>
<td>Welding Technology (S. 834)</td>
<td>4</td>
<td>Majid Farajian</td>
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<td>T-MACH-105164</td>
<td>Laser in Automotive Engineering (S. 485)</td>
<td>4</td>
<td>Johannes Schneider</td>
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<tr>
<td>T-MACH-105157</td>
<td>Foundry Technology (S. 398)</td>
<td>4</td>
<td>Christian Wilhelm</td>
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<tr>
<td>T-MACH-105178</td>
<td>Practical Course Technical Ceramics (S. 612)</td>
<td>1</td>
<td>Rainer Oberacker</td>
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</table>
Learning Control / Examinations
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The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students acquire special basic knowledge in selected areas of materials science and engineering and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Content
See courses.
Module: Vehicle Development  [M-MACH-101265]

**Responsibility:** Frank Gauterin  
**Organisation:** KIT-Fakultät für Maschinenbau  
**Curricular Anchorage:** Compulsory Elective

**Contained in:** Engineering Sciences  
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

**Additional Examinations**  
**ECTS** 9  
**Recurrence** Jedes Semester  
**Duration** 1 Semester  
**Level** 4  
**Version** 1

Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-105156</td>
<td>Vehicle Mechatronics I (S. 815)</td>
<td>3</td>
<td>Dieter Ammon</td>
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<tr>
<td>T-MACH-105160</td>
<td>Fundamentals in the Development of Commercial Vehicles I (S. 405)</td>
<td>1,5</td>
<td>Jörg Zürn</td>
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<tr>
<td>T-MACH-105161</td>
<td>Fundamentals in the Development of Commercial Vehicles II (S. 407)</td>
<td>1,5</td>
<td>Jörg Zürn</td>
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<tr>
<td>T-MACH-102207</td>
<td>Tires and Wheel Development for Passenger Cars (S. 793)</td>
<td>3</td>
<td>Günter Leister</td>
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<tr>
<td>T-MACH-105162</td>
<td>Fundamentals of Automobile Development I (S. 409)</td>
<td>1,5</td>
<td>Rolf Frech</td>
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<tr>
<td>T-MACH-105163</td>
<td>Fundamentals of Automobile Development II (S. 410)</td>
<td>1,5</td>
<td>Rolf Frech</td>
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<tr>
<td>T-MACH-102156</td>
<td>Project Workshop: Automotive Engineering (S. 644)</td>
<td>4,5</td>
<td>Michael Frey, Frank Gauterin,</td>
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<td>Martin Gießler</td>
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<tr>
<td>T-MACH-105172</td>
<td>Simulation of Coupled Systems (S. 736)</td>
<td>3</td>
<td>Marcus Geimer</td>
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**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

None

**Qualification Objectives**

The student

- knows and understands the procedures in automobile development,
- knows and understands the technical specifications at the development procedures,
- is aware of notable boundaries like legislation.

**Content**

See courses.

**Recommendations**


**Workload**

See German version.
## Module: Fundamentals of Transportation [M-BGU-101064]

**Responsibility:** Peter Vortisch  
**Organisation:** KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften  
**Curricular Anchorage:** Compulsory Elective  
**Contents in:** Engineering Sciences  
**Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences**  
**Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences**  
**Additional Examinations**

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**Pflichtleistung**  
Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 6 credits.

<table>
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<tbody>
<tr>
<td>T-BGU-106609</td>
<td>Characteristics of Transportation Systems (S. 293)</td>
<td>3</td>
<td>Peter Vortisch</td>
</tr>
<tr>
<td>T-BGU-106610</td>
<td>Transportation Systems (S. 805)</td>
<td>3</td>
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**Wahlpflicht**  
Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 6 credits.

<table>
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<td>T-BGU-106611</td>
<td>Freight Transport (S. 399)</td>
<td>3</td>
<td>Bastian Chlond</td>
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<tr>
<td>T-BGU-106301</td>
<td>Long-distance and Air Traffic (S. 496)</td>
<td>3</td>
<td>Bastian Chlond</td>
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<tr>
<td>T-BGU-101005</td>
<td>Tendering, Planning and Financing in Public Trans-</td>
<td>3</td>
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<td>port (S. 787)</td>
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<tr>
<td>T-BGU-100014</td>
<td>Seminar in Transportation (S. 718)</td>
<td>3</td>
<td>Bastian Chlond, Peter Vortisch</td>
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<tr>
<td>T-WIWI-103174</td>
<td>Seminar Mobility Services (Master) (S. 719)</td>
<td>3</td>
<td>Gerhard Satzger, Carola Stryja</td>
</tr>
<tr>
<td>T-BGU-103425</td>
<td>Mobility Services and new Forms of Mobility (S. 539)</td>
<td>3</td>
<td>Martin Kagerbaier</td>
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<tr>
<td>T-BGU-103426</td>
<td>Strategic Transport Planning (S. 760)</td>
<td>3</td>
<td>Volker Waßmuth</td>
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<tr>
<td>T-BGU-106608</td>
<td>Information Management for public Mobility Services (S. 447)</td>
<td>3</td>
<td>Peter Vortisch</td>
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</tbody>
</table>

**Conditions**  
None

**Qualification Objectives**  
See German version.

**Recommendations**  
None
Module: Natural Hazards and Risk Management 1 [M-WIWI-101642]

Responsibility: Michael Kunz
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose between 9 and 12 credits.

<table>
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<td>T-PHYS-103118</td>
<td>Engineering Geophysics for external students (S. 364)</td>
<td>4</td>
<td>Friedemann Wenzel</td>
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<tr>
<td>T-BGU-101859</td>
<td>Morphodynamics (S. 549)</td>
<td>3</td>
<td>Franz Nestmann</td>
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<tr>
<td>T-BGU-101676</td>
<td>Environmental Communication (S. 371)</td>
<td>4</td>
<td>Charlotte Kämpf</td>
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<tr>
<td>T-BGU-106620</td>
<td>Examination Prerequisite Environmental Communication (S. 376)</td>
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<td>Charlotte Kämpf</td>
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<tr>
<td>T-BGU-101805</td>
<td>Water Resource Management and Engineering Hydrology (S. 831)</td>
<td>3</td>
<td>Jürgen Ihringer</td>
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<tr>
<td>T-BGU-102997</td>
<td>River and Floodplain Ecology (S. 669)</td>
<td>3</td>
<td>Florian Wittmann</td>
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</table>

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
See German version

Content
See German version

Remarks
Students, who successfully completed both modules “Understanding and Prediction of Disasters” I and II (alternatively: one of the modules in Bachelor and Master) can get a certificate of the module coordinator (CEDIM). This certificate lists the successful completed courses within the two modules.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
**Module: Natural Hazards and Risk Management 2 [M-WIWI-101644]**

**Responsibility:** Michael Kunz

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Engineering Sciences

- Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
- Additional Examinations

<table>
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<th>Version</th>
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**Wahlpflichtangebot**
Non-Compulsory Block; You must choose between 9 and 12 credits.

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<tbody>
<tr>
<td>T-PHYS-103118</td>
<td>Engineering Geophysics for external students (S. 364)</td>
<td>4</td>
<td>Friedemann Wenzel</td>
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<tr>
<td>T-BGU-101859</td>
<td>Morphodynamics (S. 549)</td>
<td>3</td>
<td>Franz Nestmann</td>
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<tr>
<td>T-BGU-106620</td>
<td>Examination Prerequisite Environmental Communication (S. 376)</td>
<td>0</td>
<td>Charlotte Kämpf</td>
</tr>
<tr>
<td>T-BGU-101676</td>
<td>Environmental Communication (S. 371)</td>
<td>4</td>
<td>Charlotte Kämpf</td>
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<tr>
<td>T-BGU-101805</td>
<td>Water Resource Management and Engineering Hydrology (S. 831)</td>
<td>3</td>
<td>Jürgen Ihringer</td>
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<tr>
<td>T-BGU-102997</td>
<td>River and Floodplain Ecology (S. 669)</td>
<td>3</td>
<td>Florian Wittmann</td>
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</table>

**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**
None

**Qualification Objectives**
See German version

**Content**
See German version

**Recommendations**
See German version

**Remarks**
Students, who successfully completed both modules “Understanding and Prediction of Disasters” I and II (alternatively: one of the modules in Bachelor and Master) can get a certificate of the module coordinator (CEDIM). This certificate lists the successful completed courses within the two modules.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Specialization in Food Process Engineering  [M-CIWVT-101119]

Responsibility: Volker Gaukel
Organization: KIT-Fakultät für Chemieingenieurwesen und Verfahrenstechnik
Curricular Anchorage: Compulsory Elective

Contained in:
- Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
- Additional Examinations

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Compulsory

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<tr>
<td>T-CIWVT-101875</td>
<td>Specialization in Food Process Engineering (S. 751)</td>
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</table>

Conditions
The module “Principles of Food Process Engineering” must be passed.

Qualification Objectives
See German version.

Content
See courses.
Module: Generation and transmission of renewable power  [M-ETIT-101164]

Responsibility:  Bernd Hoferer, Thomas Leibfried

Organisation:  KIT-Fakultät für Elektrotechnik und Informationstechnik

Curricular Anchorage:  Compulsory Elective

Contained in:  Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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<tr>
<td>T-ETIT-100830</td>
<td>Power Network (S. 609)</td>
<td>6</td>
<td>Thomas Leibfried</td>
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<tr>
<td>T-ETIT-101941</td>
<td>Power Transmission and Power Network Control (S. 610)</td>
<td>5</td>
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<tr>
<td>T-ETIT-100724</td>
<td>Photovoltaics (S. 592)</td>
<td>3</td>
<td>N.N.</td>
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<tr>
<td>T-ETIT-101915</td>
<td>High-Voltage Test Technique (S. 436)</td>
<td>4</td>
<td>Rainer Badent</td>
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</table>

Conditions
None

Qualification Objectives
The student
- has wide knowledge of electrical power engineering,
- is capable to analyse and develop electrical power engineering systems.

Content
The module deals with wide knowledge about the electrical power engineering. This ranges from the electric power equipment networks in terms of function, structure and interpretation on the calculation of electrical power networks to special areas such as the FACTS elements or power transformers.

Remarks
The course 23381 Windpower will not be offered any more from winter term 2014/15 on. The examination will be offered latest until sommer term 2015 (repeaters only).
Module: Nanotechnology [M-MACH-101294]

Responsibility: Jan Gerrit Korvink
Organisation: Institut für Mikrostrukturtechnik
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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**Nanotechnologie**

Non-Compulsory Block; You must choose at least 9 credits.

<table>
<thead>
<tr>
<th>Identifier Course ECTS Responsibility</th>
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<tbody>
<tr>
<td>T-MACH-102080 Nanotechnology with Clusterbeams (S. 552) 3 Jürgen Gspann</td>
</tr>
<tr>
<td>T-MACH-102167 Nanotribology and -Mechanics (S. 553) 3 Martin Dienwiebel, Hendrik Hölscher</td>
</tr>
<tr>
<td>T-MACH-102164 Practical Training in Basics of Microsystem Technology (S. 619) 3 Arndt Last</td>
</tr>
<tr>
<td>T-MACH-102152 Novel Actuators and Sensors (S. 563) 4 Manfred Kohl, Martin Sommer</td>
</tr>
<tr>
<td>T-MACH-102172 Bionics for Engineers and Natural Scientists (S. 271) 3 Hendrik Hölscher</td>
</tr>
<tr>
<td>T-MACH-105180 Nanotechnology for Engineers and Natural Scientists (S. 551) 4 Martin Dienwiebel, Hendrik Hölscher, Stefan Walheim</td>
</tr>
<tr>
<td>T-ETIT-100740 Quantum Functional Devices and Semiconductor Technology (S. 654) 3 Christian Koos</td>
</tr>
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</table>

**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Qualification Objectives**
The student

- has detailed knowledge in the field of nanotechnology
- is able to evaluate the specific characteristics of nanosystems.

**Content**
The module deals with the most important principles and fundamentals of modern nanotechnology. The compulsory module “Nanotechnology with scanning probe methods” introduces the basics of nanotechnology and nanoanalytics. The specific phenomena and properties found in nanoscale systems are the main topic of the module.

**Remarks**
If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber.
Module: Public Transportation Operations  [M-BGU-101111]

Responsibility: Eberhard Hohnecker

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Engineering Sciences

Contained in:
- Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
- Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
- Additional Examinations

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Compulsory

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<tr>
<td>T-BGU-100060</td>
<td>Track Guided Transport Systems - Operational Logistics &amp; Management (S. 795)</td>
<td>6</td>
<td>Eberhard Hohnecker</td>
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Wahlpflicht

Non-Compulsory Block; You must choose between 1 and 2 courses and between 3 and 4,5 credits.

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<tr>
<td>T-BGU-101825</td>
<td>Environmental Aspects of Guided Transport Systems (S. 370)</td>
<td>3</td>
<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-101794</td>
<td>Economic Efficiency of Guided Transport Systems (S. 340)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-101793</td>
<td>Law Aspects of Guided Transport Systems (S. 488)</td>
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<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-106611</td>
<td>Freight Transport (S. 399)</td>
<td>3</td>
<td>Bastian Chlond</td>
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<tr>
<td>T-BGU-101849</td>
<td>Infrastructure Equipment of Railway Tracks (S. 454)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-101851</td>
<td>Construction and Maintenance of Guided Track Infrastructure (S. 310)</td>
<td>1,5</td>
<td>Eberhard Hohnecker</td>
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<tr>
<td>T-BGU-101857</td>
<td>Homework &quot;Public Transportation Operations&quot; (S. 438)</td>
<td>3</td>
<td>Eberhard Hohnecker</td>
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</table>

Learning Control / Examinations

The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

The exams are offered each semester. The re-examinations are offered upon prior agreement with the interested participants and not later than the next regular examination date.

Conditions

See German version.

Qualification Objectives

See German version.

Recommendations

See German version.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.
Module: Integrated Production Planning  [M-MACH-101272]

Responsibility: Gisela Lanza

Organisation: Werkstoffkunde

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

<table>
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<td>9</td>
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Compulsory

Identifier Course ECTS Responsibility
T-MACH-102106 Integrated Production Planning (S. 462) 9 Gisela Lanza

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1-3 SPO of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the wbk. The term paper may not be convalidated in the seminar module.

Conditions
none

Qualification Objectives

The students
- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

Content
Within this engineering sciences-oriented module the students will get to learn principle aspects of organization and planning of production systems. Further information can be found at the description of the lecture “Integrated Production Planning”.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Principles of Food Process Engineering  [M-CIWVT-101120]

Responsibility: Volker Gaukel
Organisation: KIT-Fakultät für Chemieingenieurwesen und Verfahrenstechnik
Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Compulsory

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<td>Principles of Food Process Engineering (S. 626)</td>
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<td>Volker Gaukel</td>
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Conditions
none

Qualification Objectives
See German version.
Module: Microsystem Technology [M-MACH-101287]

Responsibility: Jan Gerrit Korvink
Organisation: Institut für Mikrostrukturtechnik
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
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Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-105182</td>
<td>Introduction to Microsystem Technology I (S. 474)</td>
<td>3</td>
<td>Andreas Guber, Jan Gerrit Korvink</td>
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<tr>
<td>T-MACH-105183</td>
<td>Introduction to Microsystem Technology II (S. 475)</td>
<td>3</td>
<td>Andreas Guber</td>
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<tr>
<td>T-MACH-100530</td>
<td>Physics for Engineers (S. 595)</td>
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<td>Peter Gumbsch, Alexander Nesterov-Müller</td>
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<tr>
<td>T-MACH-100967</td>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II (S. 268)</td>
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<tr>
<td>T-MACH-100968</td>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III (S. 270)</td>
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<td>T-MACH-101910</td>
<td>Microactuators (S. 533)</td>
<td>3</td>
<td>Manfred Kohl</td>
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<tr>
<td>T-MACH-102080</td>
<td>Nanotechnology with Clusterbeams (S. 552)</td>
<td>3</td>
<td>Jürgen Gspann</td>
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<tr>
<td>T-MACH-102152</td>
<td>Novel Actuators and Sensors (S. 563)</td>
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<td>Manfred Kohl, Martin Sommer</td>
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<tr>
<td>T-MACH-102164</td>
<td>Practical Training in Basics of Microsystem Technology (S. 619)</td>
<td>3</td>
<td>Arndt Last</td>
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<tr>
<td>T-MACH-102165</td>
<td>Selected Topics on Optics and Microoptics for Mechanical Engineers (S. 680)</td>
<td>3</td>
<td>Timo Mappes</td>
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<td>Bionics for Engineers and Natural Scientists (S. 271)</td>
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<td>Hendrik Hölscher</td>
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<tr>
<td>T-ETIT-101907</td>
<td>Optoelectronic Components (S. 577)</td>
<td>4</td>
<td>Wolfgang Freude</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course Introduction to Microsystem Technology I is compulsory.

Qualification Objectives
- construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

Content
The module offers courses in microsystem technology. Knowledge is imparted in various fields like basics in construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.
Remarks
If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber.
# Module: Water Chemistry and Water Technology II [M-CIWVT-101122]

**Responsibility:** Harald Horn  

**Organisation:** KIT-Fakultät für Chemieingenieurwesen und Verfahrenstechnik  

**Curricular Anchorage:** Compulsory Elective  

**Contained in:**  
- Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences  
  - Additional Examinations

## Compulsory

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<td>Water Chemistry and Water Technology II (S. 830)</td>
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**Conditions**  
The Module “Water Chemistry and Water Technology I” must be passed.

**Qualification Objectives**  
The student

- has knowledge of types and sum of the water constituents and their interaction with each other and with the water molecules,
- knows and understands the basics of water chemistry and the most important methods for the treatment of different types of raw water,
- knows about the different types of water treatment and water purification methods to convert, reduce or concentrate water constituents,

**Content**  
The effects of the different treatment and purification methods are shown and it is explained how they can convert, reduce or concentrate water constituents.
**Module: Sensor Technology I [M-ETIT-101158]**

**Responsibility:** Wolfgang Menesklou  
**Organisation:** KIT-Fakultät für Elektrotechnik und Informationstechnik  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Engineering Sciences  
- Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
- Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences  
- Additional Examinations

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<td>T-ETIT-101911</td>
<td>Sensors (S. 724)</td>
<td>3 Wolfgang Menesklou</td>
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**Wahlpflicht**  
Non-Compulsory Block; You must choose 6 credits.

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<td>Sensors and Actuators Laboratory (S. 725)</td>
<td>6 Wolfgang Menesklou</td>
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<tr>
<td>T-ETIT-100709</td>
<td>Sensor Systems (S. 723)</td>
<td>3 Wolfgang Menesklou</td>
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<tr>
<td>T-ETIT-100707</td>
<td>Seminar Sensors (S. 720)</td>
<td>3 Wolfgang Menesklou</td>
</tr>
<tr>
<td>T-MACH-101910</td>
<td>Microactuators (S. 533)</td>
<td>3 Manfred Kohl</td>
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</table>

**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**
The course *Sensor Technology* [23231] is obligatory and has to be attended. The elected courses must not be credited in the module *Sensorik II* [WI4INGETIT5] or other modules.

Before *Experimental Laboratories in Sensors and Actuators* [23232] the course *Sensor Technology* [23231] has to be completed successfully.

**Recommendations**
Knowledge of electrical engineering is assumed. Therefore it is recommended to attend the courses *Electrical Engineering II* [23224] beforehand.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
## Module: BioMEMS  [M-MACH-101290]

**Responsibility:** Jan Gerrit Korvink  
**Organisation:** Institut für Mikrostrukturtechnik  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences  
  - Additional Examinations

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<th>Recurrence</th>
<th>Duration</th>
<th>Level</th>
<th>Version</th>
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### BioMEMS
Non-Compulsory Block; You must choose at least 9 credits.

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<td>T-MACH-102164</td>
<td>Practical Training in Basics of Microsystem Technology (S. 619)</td>
<td>3</td>
<td>Arndt Last</td>
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<td>T-MACH-102165</td>
<td>Selected Topics on Optics and Microoptics for Mechanical Engineers (S. 680)</td>
<td>3</td>
<td>Timo Mappes</td>
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<tr>
<td>T-MACH-100966</td>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I (S. 267)</td>
<td>3</td>
<td>Andreas Guber</td>
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<tr>
<td>T-MACH-100967</td>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II (S. 268)</td>
<td>3</td>
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<tr>
<td>T-MACH-100968</td>
<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III (S. 270)</td>
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<td>Microactuators (S. 533)</td>
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<td>Manfred Kohl</td>
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<tr>
<td>T-MACH-102168</td>
<td>Replication Technologies in Micro System Technology (S. 664)</td>
<td>3</td>
<td>Matthias Worgull</td>
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<tr>
<td>T-MACH-102172</td>
<td>Bionics for Engineers and Natural Scientists (S. 271)</td>
<td>3</td>
<td>Hendrik Hölscher</td>
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<td>T-MACH-102176</td>
<td>Current Topics on BioMEMS (S. 324)</td>
<td>3</td>
<td>Andreas Guber</td>
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**Learning Control / Examinations**
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**
None

**Qualification Objectives**
The student
- has basic as well as extensive knowledge about different fields of applications of BioMEMS
- understands continuative aspects of the related subjects optics and microoptics, micro actuators, replications techniques and bionics

**Content**
Operations through small orifices, a pill which will take pictures on its way through your body or lab results right at the point of care - the need for easier and faster ways to help people is an important factor in research. The module
BioMEMS (Bio(medical)-Micro-Electro-Mechanical-Systems) describes the application of microtechnology in the field of Life-Science, medical applications and Biotechnology and will teach you the necessary skills to understand and develop biological and medical devices.

The BioMEMS lectures will cover the fields of minimal invasive surgery, lab-on-chip systems, NOTES-Technology (Natural Orifice Transluminal Endoscopic Surgery), as well as endoscopic surgery and stent technology. Additionally to the BioMEMS lectures you can specialize in various related fields like fabrication, actuation, optics and bionics. The course Replication processes will teach you some cost efficient and fast ways to produce parts for medical or biological devices. In the course Microactuation it is discussed how to receive movements in micrometer scale in a microsystem, this could be e.g. to drive micro pumps or micro valves. The necessary tools for optical measurement and methods of analysis to gain high resolution pictures are also part of this module. To deepen your knowledge and to get a hands-on experience this module contains a one week lab course. In the lecture bionics you can see how biological effects can be transferred into technical products.

Remarks
If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber
Module: Water Supply and Sanitation [M-BGU-101001]

Responsibility: Stephan Fuchs

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  Additional Examinations

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Wahlpflicht
Non-Compulsory Block; You must choose between 2 und 3 courses and between 10 and 12 credits.

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<tr>
<td>T-BGU-106601</td>
<td>Wastewater and Storm Water Treatment (S. 828)</td>
<td>6</td>
<td>Stephan Fuchs, Erhard Hoffmann</td>
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<td>T-BGU-106667</td>
<td>Report Urban Water Infrastructure and Management (S. 665)</td>
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<td>T-BGU-106600</td>
<td>Urban Water Infrastructure and Management (S. 809)</td>
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<tr>
<td>T-BGU-101788</td>
<td>Water Supply and Sanitation (S. 832)</td>
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Conditions
None

Recommendations
None
Module: Environmental Management  [M-BGU-101000]

Responsibility: Stephan Fuchs, Erhard Hoffmann

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Compulsory

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<tr>
<td>T-BGU-103647</td>
<td>Applied Ecology and Water Quality (S. 247)</td>
<td>3</td>
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<td>T-BGU-103648</td>
<td>Mass Fluxes in River Basins (S. 523)</td>
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Wahlpflicht

Non-Compulsory Block; You must choose 1 courses and 3 credits.

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<td>Field Training Water Quality (S. 392)</td>
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<tr>
<td>T-BGU-103649</td>
<td>Modeling Mass Fluxes in River Basins (S. 545)</td>
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Learning Control / Examinations

The module is not offered anymore from summer term 2017.

Conditions

none

Modeled Conditions

The following conditions must be met:

- The module [M-BGU-103308] Environmental Management must not have been started.

Qualification Objectives

The students develop system thinking and gain applicable knowledge and tools in regard to engineering methods.
Module: Highway Engineering  [M-BGU-100999]

Responsibility:  Ralf Roos
Organisation:  KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften
Curricular Anchorage:  Compulsory Elective
Contained in:  Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
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Additional Examinations

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Compulsory

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<tr>
<td>T-BGU-106300</td>
<td>Infrastructure Management (S. 455)</td>
<td>6</td>
<td>Ralf Roos</td>
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<tr>
<td>T-BGU-101860</td>
<td>Special Topics in Highway Engineering and Environmental Impact Assessment (S. 745)</td>
<td>3</td>
<td>Ralf Roos</td>
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</table>

Conditions
The selection of this module excludes the selection of the module “Design, Construction, Operation and Maintenance of Highways” (WI4INGBGU1).

Modeled Conditions
The following conditions must be met:
- The module [M-BGU-100998] Design, Construction, Operation and Maintenance of Highways must not have been started.

Qualification Objectives
See German version.

Recommendations
None

Remarks
None

Workload
See German version.
Module: Microoptics  [M-MACH-101292]

Responsibility: Jan Gerrit Korvink

Organisation: Institut für Mikrostrukturtechnik

Curricular Anchorage: Compulsory Elective

Contained in:
- Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  - Additional Examinations

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Mikrooptik
Non-Compulsory Block; You must choose at least 9 credits.

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<td>T-MACH-101910</td>
<td>Microactuators (S. 533)</td>
<td>3</td>
<td>Manfred Kohl</td>
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</table>
| T-MACH-102164  | Practical Training in Basics of Microsystem Techno-
|                | lgy (S. 619)                                    | 3    | Arndt Last     |
| T-MACH-102165  | Selected Topics on Optics and Microoptics for Me-
|                | chanical Engineers (S. 680)                     | 3    | Timo Mappes    |
| T-MACH-105176  | Microoptics and Lithography (S. 534)             | 3    | Timo Mappes    |
| T-MACH-102174  | Fundamentals of X-Ray Optics II (S. 414)        | 3    | Arndt Last     |
| T-MACH-105186  | Fundamentals of X-Ray Optics I (S. 413)         | 3    | Arndt Last     |
| T-ETIT-100741  | Laser Physics (S. 487)                          | 4    | Christian Koos |
| T-ETIT-101945  | Optical Waveguides and Fibers (S. 575)           | 4    | Christian Koos |

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
- basic knowledge for the applications of microoptical systems
- understanding fabrication processes of microoptical elements & systems
- analyzing strengths and weaknesses of lithography processes
- knowledge on the basics of optical sources and detectors and their use in technical systems
- fundamental knowledge on different lasers and their design
- knowledge on X-ray imaging methods

Content
Optical imaging, measuring and sensor systems are a base for modern natural sciences. In particular life sciences and telecommunications have an intrinsic need for the application of optical technologies. Numerous fields of physics and engineering, e.g. astronomy and material sciences, require optical techniques. Micro optical systems are introduced in medical diagnostics and biological sensing as well as in products of the daily life.
In this module, an introduction to the basics of optics is provided; optical effects are presented with respect to their technical use. Optical elements and instruments are presented. Fabrication processes of micro optical systems and elements, in particular lithography, are discussed. In addition X-ray optics and X-ray imaging systems are presented as well as elements of optical telecommunication. A closer look on the physics behind lasers, being one of the most important technical light sources, is provided. As high end technology and clean room equipment is present in all the lectures of this module, the students will have a hands-on training with several experiments in micro optics.

Remarks
If you have any questions concerning the module, please contact Prof. Dr. Andreas E. Guber.
Module: Logistics in Value Chain Networks [M-MACH-101280]

Responsibility: Kai Furmans
Organization: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  Additional Examinations

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Logistik in Wertschöpfungsnetzwerken

Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-102089</td>
<td>Logistics - Organisation, Design and Control of Logistic Systems (S. 494)</td>
<td>6</td>
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<tr>
<td>T-MACH-102128</td>
<td>Information Systems and Supply Chain Management (S. 451)</td>
<td>4</td>
<td>Christoph Kilger</td>
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<td>T-MACH-105165</td>
<td>Automotive Logistics (S. 260)</td>
<td>4</td>
<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105175</td>
<td>Airport Logistics (S. 244)</td>
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<td>André Richter</td>
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<tr>
<td>T-MACH-105181</td>
<td>Supply Chain Management (S. 768)</td>
<td>6</td>
<td>Knut Alicke</td>
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<tr>
<td>T-MACH-105174</td>
<td>Warehousing and Distribution Systems (S. 826)</td>
<td>4</td>
<td>Kai Furmans</td>
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<tr>
<td>T-WIWI-103091</td>
<td>Production and Logistics Controlling (S. 633)</td>
<td>3</td>
<td>Helmut Wlcek</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

Conditions
One of the lectures
- Logistics – Organisation, Design and Control of Logistic Systems [2118078]
- Supply Chain Management [2117062]

is compulsory and must be examined. Also the course Material flow in logistic systems is mandatory. In case of combining this module with Global Production and Logistics [WW4INGMB31] the course Material flow in logistic systems is not compulsory.

Qualification Objectives
The student
- is able to plan logistic systems and evaluate their performance,
- can use approaches of Supply Chain Management within the operational practice,
- identifies, analyses and evaluates risks within logistic systems.

Content
The module Logistics in value chain networks provides basics for the main topics of logistics. Within the lecture basic
methods for planning and running logistic systems are introduced. Furthermore special issues like supply chain management and risks in logistic systems are focused. To gain a deeper understanding, the course is accompanied by exercises.

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Global Production and Logistics [M-MACH-101282]

Responsibility: Volker Schulze
Organisation: Werkstoffkunde
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences

<table>
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Globale Produktion und Logistik

Non-Compulsory Block; You must choose at least 9 credits.

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<td>Global Production and Logistics - Part 1: Global Production (S. 423)</td>
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<td>Gisela Lanza</td>
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<tr>
<td>T-MACH-105159</td>
<td>Global Production and Logistics - Part 2: Global Logistics (S. 425)</td>
<td>4</td>
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<td>Automotive Logistics (S. 260)</td>
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<td>T-MACH-102107</td>
<td>Quality Management (S. 652)</td>
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<tr>
<td>T-MACH-102128</td>
<td>Information Systems and Supply Chain Management (S. 451)</td>
<td>4</td>
<td>Christoph Kilger</td>
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<tr>
<td>T-MACH-102189</td>
<td>Production Technology and Management in Automotive Industry (S. 635)</td>
<td>4</td>
<td>Volker Michael Stauch</td>
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<td>T-MACH-105188</td>
<td>Integrative Strategies in Production and Development of High Performance Cars (S. 464)</td>
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<td>Karl-Hubert Schlichtenmayer, Frederik Zanger</td>
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<tr>
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<td>Production and Logistics Controlling (S. 633)</td>
<td>3</td>
<td>Helmut Wlcek</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) 1-3 SPO of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL or the wbk. The term paper may not be convalidated in the seminar module.

Conditions
The courses Global Production and Logistics - Part 1: Global Production and Global Production and Logistics - Part 2: Global Logistics are compulsory.

Qualification Objectives
The students

- are able to analyze the main topics of global production and logistics.
- can explain the main topics about planning and operations of global supply chains and are able to use simple models for planning.
- are capable to name the main topics about planning of global production networks.

Content
The module Global Production and Logistics provides comprehensive and well-founded basics for the main topics of global
production and logistics. The lectures aim to show opportunities and market conditions for global enterprises. Part 1 focuses on economic backgrounds, opportunities and risks of global production. Part 2 focuses on the structure of international logistics, their modeling, design and analysis. The threats in international logistics are discussed in case studies.
## Module: Technical Logistics [M-MACH-101279]

**Responsibility:** Kai Furmans  
**Organisation:** KIT-Fakultät für Maschinenbau  
**Curricular Anchorage:** Compulsory Elective

**Contained in:**  
- Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences  
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences  
  - Additional Examinations

### ECTS Recurrence Duration Version
9 Jedes Semester 2 Semester 1

#### Technische Logistik
Non-Compulsory Block; You must choose at least 9 credits.

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<td>Warehousing and Distribution Systems (S. 826)</td>
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<tr>
<td>T-MACH-105171</td>
<td>Safety Engineering (S. 674)</td>
<td>4</td>
<td>Hans-Peter Kany</td>
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<tr>
<td>T-MACH-105149</td>
<td>Industrial Application of Technological Logistics Instanting Crane Systems (S. 443)</td>
<td>4</td>
<td>Markus Golder</td>
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<tr>
<td>T-MACH-105151</td>
<td>Energy Efficient Intralogistic Systems (S. 357)</td>
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<td>Meike Braun, Frank Schönung</td>
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<tr>
<td>T-MACH-102163</td>
<td>Basics of Technical Logistics (S. 263)</td>
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<td>Martin Mittwollen, Jan Oellerich</td>
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<tr>
<td>T-MACH-102159</td>
<td>Elements and Systems of Technical Logistics (S. 348)</td>
<td>4</td>
<td>Martin Mittwollen, Jan Oellerich</td>
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<tr>
<td>T-MACH-102160</td>
<td>Selected Applications of Technical Logistics (S. 678)</td>
<td>4</td>
<td>Vladimir Madzharov, Martin Mittwollen</td>
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<tr>
<td>T-MACH-102161</td>
<td>Selected Applications of Technical Logistics and Project (S. 679)</td>
<td>6</td>
<td>Vladimir Madzharov, Martin Mittwollen</td>
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<td>T-MACH-102178</td>
<td>Elements of Technical Logistics and Project (S. 349)</td>
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<td>IT-Fundamentals of Logistics (S. 479)</td>
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<td>Frank Thomas</td>
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<td>Safe structures for machines in material handling (S. 673)</td>
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<td>T-MACH-105277</td>
<td>Safe mechatronic systems (S. 671)</td>
<td>4</td>
<td>Markus Golder</td>
</tr>
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</table>

### Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

### Conditions
The lecture basics of technical logistics has to be chosen. If the lecture Basics of technical logistics has been succesfully examinated in another module, the lecture elements and systems of technical logistics can be choosen instead. If both lectures are examinated successfully, one can chose selected applications of technical logistics or selected applications of technical logistics and project instead.

### Qualification Objectives
The student
• acquires well-founded knowledge on the main topics of technical logistics
• gets an overview of different applications of technical logistics in practice,
• acquires expertise and understanding about functionality of material handling systems.

Content
The module *Technical Logistics* provides in-depth basics on the main topics of technical logistics. The module focuses on technical characteristics of material handling technology. To gain a deeper understanding, the course is accompanied by exercises.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
**Module: Material Flow in Networked Logistic Systems** [M-MACH-101278]

- **Responsibility:** Kai Furmans
- **Organisation:** KIT-Fakultät für Maschinenbau
- **Curricular Anchorage:** Compulsory Elective
- **Contained in:** Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  - Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  - Additional Examinations

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<th>Duration</th>
<th>Version</th>
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### Compulsory

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<tr>
<td>T-MACH-105189</td>
<td>Mathematical Models and Methods for Production Systems (S. 528)</td>
<td>6</td>
<td>Kai Furmans</td>
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### Non-Compulsory Block

Non-Compulsory Block; You must choose at least 3 credits.

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<tr>
<td>T-MACH-105174</td>
<td>Warehousing and Distribution Systems (S. 826)</td>
<td>4</td>
<td>Kai Furmans</td>
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<tr>
<td>T-MACH-105175</td>
<td>Airport Logistics (S. 244)</td>
<td>4</td>
<td>André Richter</td>
</tr>
<tr>
<td>T-MACH-105165</td>
<td>Automotive Logistics (S. 260)</td>
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<td>Kai Furmans</td>
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<tr>
<td>T-WIWI-103091</td>
<td>Production and Logistics Controlling (S. 633)</td>
<td>3</td>
<td>Helmut Wlcek</td>
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### Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

### Conditions

- The course Analytical Models for Material Flow [2117060] is compulsory and must be examined.

### Modeled Conditions

The following conditions must be met:
- The course [T-MACH-102151] Material Flow in Logistic Systems must have been started.

### Qualification Objectives

The student
- acquires in-depth knowledge on the main topics of logistics, gets an overview of different logistic questions in practice,
- is able to evaluate logistic systems by using the learnt methods,
- is able to analyze and explain the phenomena of industrial material and value streams.

### Content

The module Material Flow in networked Logistic Systems provides in-depth basics for the main topics of logistics and...
industrial material and value streams. The obligatory lecture focuses on queuing methods to model production systems. To gain a deeper understanding, the course is accompanied by exercises.

**Workload**
Regular attendance: 270 hours (9 credits). Lectures with 180 hours attendance 6 credits. Lectures with 120 hours 4 credits.
Module: Mobile Machines [M-MACH-101267]

Responsibility: Marcus Geimer

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

<table>
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Mobile Arbeitsmaschinen

Non-Compulsory Block; You must choose at least 9 credits.

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<tbody>
<tr>
<td>T-MACH-102093</td>
<td>Fluid Power Systems (S. 397)</td>
<td>5</td>
<td>Marcus Geimer, Stefan Haug, Martin Scherer</td>
</tr>
<tr>
<td>T-MACH-105172</td>
<td>Simulation of Coupled Systems (S. 736)</td>
<td>3</td>
<td>Marcus Geimer</td>
</tr>
<tr>
<td>T-MACH-102150</td>
<td>BUS-Controls (S. 273)</td>
<td>3</td>
<td>Marcus Geimer, Felix Weber</td>
</tr>
<tr>
<td>T-MACH-105168</td>
<td>Mobile Machines (S. 538)</td>
<td>9</td>
<td>Marcus Geimer</td>
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<tr>
<td>T-MACH-105160</td>
<td>Fundamentals in the Development of Commercial Vehicles I (S. 405)</td>
<td>1,5</td>
<td>Jörg Zürn</td>
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<tr>
<td>T-MACH-105161</td>
<td>Fundamentals in the Development of Commercial Vehicles II (S. 407)</td>
<td>1,5</td>
<td>Jörg Zürn</td>
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</table>

Learning Control / Examinations

The assessment is carried out as a general oral exam (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

The overall grade of the module is the grade of the oral examination.

The assessment may be carried out as partial oral exams (according to Section 4(2), 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. In this case the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

The assessment procedures are described for each course of the module separately.

Conditions

None

Qualification Objectives

The student

- knows and understands the basic structure of the machines
- masters the basic skills to develop the selected machines

Content

In the module of Mobile Machines [WI4INGMB15] the students will learn the structure of the machines and deepen the knowledge of the subject for developing the machines. After conclusion the module the student will know the latest developments in mobile machines and is able to evaluate the concepts and the trends of developments. The module is practically orientated and supported by industry partners.
**Recommendations**
Knowledge of Fluid Power Systems are helpful, otherwise it is recommended to take the course *Fluid Power Systems* [2114093].

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Automated Manufacturing Systems [M-MACH-101298]

Responsibility: Jürgen Fleischer
Organization: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

<table>
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Compulsory

Identifier Course ECTS Responsibility
T-MACH-102162 Automated Manufacturing Systems (S. 252) 9 Jürgen Fleischer

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 SPO of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the wbk. The term paper may not be convalidated in the seminar module.

Qualification Objectives
The students
- are able to analyze implemented automated manufacturing systems and describe their components.
- are capable to assess the implemented examples of implemented automated manufacturing systems and apply them to new problems.
- are able to name automation tasks in manufacturing plants and name the components which are necessary for the implementation of each automation task.
- are capable with respect to a given task to plan the configuration of an automated manufacturing system and to determine the necessary components to its realization.
- are able to design and select components for a given use case of the categories: “Handling Technology”, “Industrial Robotics”, “Sensory” and “Controls”.
- are capable to compare different concepts for multi-machine systems and select a suitable concept for a given use case.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Sensor Technology II [M-ETIT-101159]

Responsibility: Wolfgang Menesklou

Organisation: KIT-Fakultät für Elektrotechnik und Informationstechnik

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

<table>
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<th>Duration</th>
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Wahlpflicht
Non-Compulsory Block; You must choose at least 9 credits.

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<tbody>
<tr>
<td>T-ETIT-100706</td>
<td>Sensors and Actuators Laboratory (S. 725)</td>
<td>6</td>
<td>Wolfgang Menesklou</td>
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<tr>
<td>T-ETIT-100709</td>
<td>Sensor Systems (S. 723)</td>
<td>3</td>
<td>Wolfgang Menesklou</td>
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<tr>
<td>T-ETIT-100707</td>
<td>Seminar Sensors (S. 720)</td>
<td>3</td>
<td>Wolfgang Menesklou</td>
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<tr>
<td>T-MACH-101910</td>
<td>Microactuators (S. 533)</td>
<td>3</td>
<td>Manfred Kohl</td>
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</table>

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
It is only possible to choose this module in combination with the module Sensor Technology I [WI4INGETIT3]. The module is passed only after the final partial exam of Sensor Technology I is additionally passed.

Modeled Conditions
The following conditions must be met:
- The module [M-ETIT-101158] Sensor Technology I must have been started.

Qualification Objectives
The student
- acquires fundamental principles in materials science and device technology of sensors.
- applies materials and sensors from the viewpoint of an application or development engineer.

Content
The operating principles of the most important sensors are taught. The student will learn to use the acquired knowledge for key issues relating to select and use sensors. Sensor module I gives an overview of the basic sensor principles. Sensor module II goes into specific topics of sensors and actuators further.

Recommendations
Knowledge of electrical engineering is assumed. Therefore it is recommended to attend the courses Electrical Engineering II [23224] beforehand.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Control Engineering II [M-ETIT-101157]

Responsibility: Sören Hohmann

Organisation: KIT-Fakultät für Elektrotechnik und Informationstechnik

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
  Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
  Additional Examinations

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<tr>
<td>T-ETIT-100981</td>
<td>Automation of Discrete Event and Hybrid Systems (S. 254)</td>
<td>3</td>
<td>4</td>
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<td>Sören Hohmann</td>
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<tr>
<td>T-ETIT-100666</td>
<td>Control of Linear Multivariable Systems (S. 313)</td>
<td>6</td>
<td>4</td>
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<td>Sören Hohmann</td>
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</table>
Module: Handling Characteristics of Motor Vehicles  [M-MACH-101264]

Responsibility: Frank Gauterin

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences

Additional Examinations

<table>
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<th>Level</th>
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Fahrzeugeigenschaften
Non-Compulsory Block; You must choose at least 9 credits.

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<tr>
<td>T-MACH-105152</td>
<td>Handling Characteristics of Motor Vehicles I (S. 429)</td>
<td>3</td>
<td>Hans-Joachim Unrau</td>
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<tr>
<td>T-MACH-105153</td>
<td>Handling Characteristics of Motor Vehicles II (S. 431)</td>
<td>3</td>
<td>Hans-Joachim Unrau</td>
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<tr>
<td>T-MACH-105154</td>
<td>Vehicle Comfort and Acoustics I (S. 811)</td>
<td>3</td>
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<tr>
<td>T-MACH-105155</td>
<td>Vehicle Comfort and Acoustics II (S. 813)</td>
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<tr>
<td>T-MACH-105156</td>
<td>Vehicle Mechatronics I (S. 815)</td>
<td>3</td>
<td>Dieter Ammon</td>
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<tr>
<td>T-MACH-102156</td>
<td>Project Workshop: Automotive Engineering (S. 644)</td>
<td>4,5</td>
<td>Michael Frey, Frank Gauterin, Martin Gießler</td>
</tr>
<tr>
<td>T-MACH-102177</td>
<td>Global Vehicle Evaluation within Virtual Road Test (S. 427)</td>
<td>3</td>
<td>Bernhard Schick</td>
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<tr>
<td>T-MACH-102206</td>
<td>Vehicle Ride Comfort &amp; Acoustics I (S. 817)</td>
<td>4</td>
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<td>T-MACH-102205</td>
<td>Vehicle Ride Comfort &amp; Acoustics II (S. 819)</td>
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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Qualification Objectives
The student
- knows and understands the characteristics of vehicles, owing to the construction and design tokens,
- knows and understands especially the factors being relevant for comfort and acoustics
- is capable of fundamentally evaluating and rating handling characteristics.

Content
See courses.

Recommendations

Workload
See German Version.
Module: Safety, Computing and Law in Highway Engineering  [M-BGU-101066]

Responsibility: Ralf Roos

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

ECTS 9  Recurrence Jedes Wintersemester  Duration 2 Semester  Language Deutsch  Level 4  Version 2

Compulsory

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<tr>
<td>T-BGU-101804</td>
<td>IT-Based Road Design (S. 478)</td>
<td>3</td>
<td>Matthias Zimmermann</td>
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<tr>
<td>T-BGU-101674</td>
<td>Safety Management in Highway Engineering (S. 675)</td>
<td>3</td>
<td>Matthias Zimmermann</td>
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<tr>
<td>T-BGU-106615</td>
<td>Laws concerning Traffic and Roads (S. 490)</td>
<td>3</td>
<td>Dietmar Hönig</td>
</tr>
</tbody>
</table>

Conditions
The examination “Design Basics in Highway Engineering” has to be passed. This can be taken either in the module “Design, Construction, Operation and Maintenance of Highways” (WI4INGBGU1) or can be approved from a previous study (e.g. Civil Engineering BSc at KIT).

Qualification Objectives
See German version.

Recommendations
None

Remarks
None
Module: Energy and Process Technology II  [M-MACH-101297]

Responsibility: Heiner Wirbser
Organisation: Institut für Technische Thermodynamik
Curricular Anchorage: Compulsory Elective
Contained in: Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

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Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module, whose sum of credits must meet the requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
In this modul students achieve the ability to evaluate solitary and interconnected energy systems with respect to societal and economical aspects

Content
Energy and Process Technology 2:
1. basics in combustion and pollutant formation (ITT)
2. technical realisation and application of piston engines (IFKM) fluid flow engines (FSM) and thermal turbomachines (ITS)
3. technical aspects of energy supply systems and networks (ITS)

Remarks
All lectures and exams are hold in German only.
Module: Lean Management in Construction [M-BGU-101884]

Responsibility: Shervin Haghsheno

Organisation: KIT-Fakultät für Bauingenieur-, Geo- und Umweltwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Engineering Sciences

Compulsory Elective Modules / Compulsory Modules 1 / Engineering Sciences
Compulsory Elective Modules / Compulsory Modules 2 / Engineering Sciences
Additional Examinations

<table>
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### Compulsory

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<tr>
<td>T-BGU-100148</td>
<td>Lean Construction (S. 491)</td>
<td>4,5</td>
<td>Shervin Haghsheno</td>
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<tr>
<td>T-BGU-101007</td>
<td>project paper Lean Construction (S. 642)</td>
<td>1,5</td>
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### Wahlpflicht

Non-Compulsory Block; You must choose between 1 und 2 courses and between 3 and 4,5 credits.

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<tr>
<td>T-BGU-103430</td>
<td>Turnkey Construction I - Processes and Methods (S. 807)</td>
<td>1,5</td>
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<td>T-BGU-103431</td>
<td>Turnkey Construction II - Trades and Technology (S. 808)</td>
<td>3</td>
<td>Shervin Haghsheno</td>
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<tr>
<td>T-BGU-103427</td>
<td>Site Management (S. 738)</td>
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<td>T-BGU-103429</td>
<td>Building Laws (S. 272)</td>
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<td>T-BGU-103432</td>
<td>Project Management in Construction and Real Estate Industry I (S. 640)</td>
<td>3</td>
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<tr>
<td>T-BGU-103433</td>
<td>Project Management in Construction and Real Estate Industry II (S. 641)</td>
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### Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

The exam must be repeated at the latest 2 semesters after the first try. The exam will be based on the content of the latest lecture.

The exam of of the course Lean Construction consists of a preparatory and oral assessment. The preparatory assessment is a group work and consists of an assignment with presentation. The preparatory assessment is precondition to attend the oral examination (30 min) of the course Lean Construction. The grade of the exam Lean Construction is defined by weighted average of grades for oral examination (75 %) and preparatory assignment (25 %).

Examination of courses Projektmanagement in der Bau- und Immobilienwirtschaft I, Projektmanagement in der Bau- und Immobilienwirtschaft II, and Baurecht are carried out written. Combinations of courses Schlüsselfertiges Bauen I, Schlüsselfertiges Bauen II, Bauleitung, and Nachtragsmanagement are examined orally.

### Conditions

The course Lean Construction is compulsory and must be examined.
**Recommendations**
It is recommend to take the module Fundamentals of construction [WI3INGBGU3] from the Bachelor’s degree program.

**Remarks**
None

**Workload**
The total workload for this module is approximately 270 hours. For further information see German version.
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### SQ-Seminar

Non-Compulsory Block; You must choose between 3 and 4 credits.

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Learning Control / Examinations
The modul examination consists of two seminars and of at least one key qualification (KQ) course (according to §4 (3), 3 of the examination regulation). A detailed description of every singled assessment is given in the specific course characerization.
The final mark for the module is the average of the marks for each of the two seminars weighted by the credits and truncated after the first decimal. Grades of the KQ courses are not included.

Conditions
The course specific preconditions must be observed.

- **Seminars**: Two seminars out of the course list, that have at least 3 CP each and are offered by a representative of the Department of Economics and Management or of the Center for applied legal studies (Department of Informatics), have to be chosen.
- Alternatively one of the two seminars can be absolved at a engineering department or at the Department of Mathematics. The seminar has to be offered by a representative of the respective department as well. The assessment has to meet the demands of the Department of Economics and Management (active participation, term paper with a workload of at least 80 h, presentation). This alternative seminar requires an official approval and can be applied at the examination office of the Department of Economics and Management. Seminars at the institutes wbk and IFL do not require these approval.
- **Key Qualification (KQ)-course(s)**: One or more courses with at least 3 CP in total of additional key qualifications have to be chosen among the courses [HoC, ZAK, Sprachenzentrum].

Qualification Objectives
- The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Content
Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.
Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailed description o these qualifications is given in the section “Key Qualifications” of the module handbook.
Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Electives in Informatics [M-WIWI-101630]

Responsibility: Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Compulsory Elective Modules / Compulsory Modules 1 / Informatics

Compulsory Elective Modules / Compulsory Modules 2 / Informatics

Additional Examinations

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<th>Level</th>
<th>Version</th>
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Wahlpflichtangebot

Non-Compulsory Block; You must choose between 9 and 10 credits.

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<td>Thomas Wolf</td>
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<td>Knowledge Discovery (S. 481)</td>
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Learning Control / Examinations
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The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
The student
- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Remarks
The course “Document Management and Groupware Systems” expires after summer term 2017. Last examination date is winter term 2017/2018 (only for repeaters).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
### Wahlpflichtangebot

Non-Compulsory Block; You must choose between 9 and 10 credits.

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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Learning Control / Examinations
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The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Remarks
The course “Document Management and Groupware Systems” expires after summer term 2017. Last examination date is winter term 2017/2018 (only for repeaters).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Module: Analytics and Statistics [M-WIWI-101637]

Responsibility: Oliver Grothe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Compulsory Elective Modules / Compulsory Modules 1 / Statistics
Compulsory Elective Modules / Compulsory Modules 2 / Statistics
Additional Examinations

ECTS 9
Language Deutsch
Version 1

Compulsory

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Ergänzungsangebot
Non-Compulsory Block; You must choose between 4,5 and 5 credits.

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Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course "Advanced Statistics" is compulsory.

Qualification Objectives
A Student
- Deepens the knowledge of descriptive and inferential statistics.
- Deals with simulation methods.
- Learns basic and advanced methods of statistical analysis of multivariate and high-dimensional data.

Content
- Deriving estimates and testing hypotheses
- Stochastic processes
- Multivariate statistics, copulas
- Dependence measures
- Dimension reduction
- High-dimensional methods
- Prediction

Remarks
The planned lectures and courses for the next three years are announced online.

**Workload**
The total workload for this module is approximately 270 hours.
Module: Econometrics and Statistics I [M-WIWI-101638]

Responsibility: Melanie Schienle
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Compulsory Elective Modules / Compulsory Modules 1 / Statistics
Compulsory Elective Modules / Compulsory Modules 2 / Statistics
Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 2 courses.

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<td>T-WIWI-103065</td>
<td>Statistical Modeling of generalized regression models (S. 754)</td>
<td>4,5</td>
<td>Wolf-Dieter Heller</td>
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Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
Starting winter term 2017/18, the course "Advanced Statistics" [2520020] is compulsory and must be examined.

Qualification Objectives
The student shows an in depth understanding of advanced Econometric techniques suitable for different types of data. He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

Content
The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the-art data analysis.

Remarks

Workload
The total workload for this module is approximately 270 hours.
**Module: Econometrics and Statistics II**

**Responsibility:** Melanie Schienle

**Organisation:** KIT-Fakultät für Wirtschaftswissenschaften

**Curricular Anchorage:** Compulsory Elective

**Contained in:**
- Compulsory Elective Modules / Compulsory Modules 1 / Statistics
- Compulsory Elective Modules / Compulsory Modules 2 / Statistics
- Additional Examinations

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### Wahlpflichtangebot

Non-Compulsory Block; You must choose between 9 and 10 credits.

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<tr>
<td>T-WIWI-103066</td>
<td>Data Mining and Applications (S. 325)</td>
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<tr>
<td>T-WIWI-103064</td>
<td>Financial Econometrics (S. 394)</td>
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<td>T-WIWI-103124</td>
<td>Multivariate Statistical Methods (S. 550)</td>
<td>4,5</td>
<td>Oliver Grothe</td>
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<tr>
<td>T-WIWI-103126</td>
<td>Non- and Semiparametrics (S. 556)</td>
<td>4,5</td>
<td>Melanie Schienle</td>
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<tr>
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<td>Panel Data (S. 580)</td>
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<td>Portfolio and Asset Liability Management (S. 608)</td>
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<td>T-WIWI-103129</td>
<td>Stochastic Calculus and Finance (S. 755)</td>
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<td>Mher Safarian</td>
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### Learning Control / Examinations

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

### Conditions

This module can only be passed if the module “Econometrics and Statistics I” has been finished successfully before.

### Modeled Conditions

The following conditions must be met:

- The module [M-WIWI-101638] Econometrics and Statistics I must have been started.

### Qualification Objectives

The student shows an in depth understanding of advanced Econometric techniques suitable for different types of data. He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

### Content

This module builds on prerequisites acquired in Module “Econometrics and Statistics I”. The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the art data analysis.

### Workload

The total workload for this module is approximately 270 hours.
## Module: Commercial Law [M-INFO-101191]

**Responsibility:** Thomas Dreier  
**Organisation:** KIT-Fakultät für Informatik  
**Curricular Anchorage:** Compulsory Elective  
**Contained in:** Compulsory Elective Modules / Compulsory Modules 2 / Law

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### Compulsory

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<td>Exercises in Civil Law (S. 378)</td>
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Module: Governance, Risk & Compliance  [M-INFO-101242]

Responsibility: Thomas Dreier
Organisation: KIT-Fakultät für Informatik
Curricular Anchorage: Compulsory Elective
Contained in: Compulsory Elective Modules / Compulsory Modules 2 / Law

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Governance, Risk & Compliance
Non-Compulsory Block; You must choose at least 1 courses and at least 9 credits.

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<td>T-INFO-101303</td>
<td>Data Protection Law (S. 327)</td>
<td>3</td>
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<td>T-INFO-101308</td>
<td>Copyright (S. 317)</td>
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<td>T-INFO-101315</td>
<td>Tax Law I (S. 776)</td>
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<td>Law of Contracts (S. 489)</td>
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<td>T-INFO-101288</td>
<td>Corporate Compliance (S. 318)</td>
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<td>T-INFO-101997</td>
<td>Seminar: Legal Studies I (S. 721)</td>
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<td>Thomas Dreier</td>
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Module: Public Business Law [M-INFO-101217]

Responsibility: Matthias Bäcker
Organisation: KIT-Fakultät für Informatik
Curricular Anchorage: Compulsory Elective
Contained in: Compulsory Elective Modules / Compulsory Modules 2 / Law

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**Öffentliches Wirtschaftsrecht**
Non-Compulsory Block; You must choose at least 1 courses and at least 9 credits.

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<td>T-INFO-101311</td>
<td>Public Media Law (S. 648)</td>
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<td>T-INFO-101312</td>
<td>European and International Law (S. 375)</td>
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<td>T-INFO-101348</td>
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**Learning Control / Examinations**
see course description.
Module: Private Business Law [M-INFO-101216]

**Responsibility:** Thomas Dreier

**Organisation:** KIT-Fakultät für Informatik

**Curricular Anchorage:** Compulsory Elective

**Contained in:** Compulsory Elective Modules / Compulsory Modules 2 / Law

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**Recht der Wirtschaftsunternehmen**

Non-Compulsory Block; You must choose at least 1 courses and at least 9 credits.

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<td>T-INFO-101329</td>
<td>Employment Law I (S. 351)</td>
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<td>T-INFO-101330</td>
<td>Employment Law II (S. 352)</td>
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<td>Tax Law II (S. 777)</td>
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<td>Tax Law I (S. 776)</td>
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<td>Thomas Dreier</td>
</tr>
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</table>

**Conditions**

None

**Qualification Objectives**

The student

- has gained in-depth knowledge of German company law, commercial law and civil law;
- is able to analyze, evaluate and solve complex legal and economic relations and problems;
- is well grounded in individual labour law, collective labour law and commercial constitutional law, evaluates and critically assesses clauses in labour contracts;
- recognizes the significance of the parties to collective labour agreements within the economic system and has differentiated knowledge of labour disputes law and the law governing the supply of temporary workers and of social law;
- possesses detailed knowledge of national earnings and corporate tax law and is able to deal with provisions of tax law in a scientific manner and assesses the effect of these provisions on corporate decision-making.

**Content**

The module provides the student with knowledge in special matters in business law, like employment law, tax law and business law, which are essential for managerial decisions.

Responsibility: Thomas Dreier
Organisation: KIT-Fakultät für Informatik
Curricular Anchorage: Compulsory Elective
Contained in: Compulsory Elective Modules / Compulsory Modules 2 / Law

<table>
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Recht des Geistigen Eigentums
Non-Compulsory Block; You must choose at least 1 courses and at least 9 credits.

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<td>Computer Contract Law (S. 304)</td>
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<td>Trademark and Unfair Competition Law (S. 797)</td>
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<td>Yvonne Matz</td>
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Conditions
None
Module: Sociology  [M-GEISTSOZ-101169]

Responsibility: Gerd Nollmann

Organisation: KIT-Fakultät für Geistes- und Sozialwissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Compulsory Elective Modules / Compulsory Modules 2 / Sociology

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Compulsory

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<td>Theoretical Sociology (S. 788)</td>
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<td>Projectseminar (S. 646)</td>
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Conditions
None

Qualification Objectives
The student

- Gains theoretical and methodical knowledge of social processes and structures.
- Is able to apply his/her gained knowledge practically.
- Is able to present his/her work results in a precise and clear way.

Content
The module sociology offers students the possibility to get to know problems touching social phenomenons and to answer these theoretically as well as empirically. For example: Who does earn how much in his job and why? How do subcultures emerge? Why are boys’ grades in school always worse than those of girls? Do divorces have negative influences on the development of children? How does mass consumption influence the individual? Is there a world society emerging?

In addition the module contains courses on sociological methods that are essential to answer the above questions scientifically.
Module: Strategic Corporate Management and Organization [M-WIWI-101450]

Responsibility: Hagen Lindstädt
Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Additional Examinations

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Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

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<tr>
<td>T-WIWI-102630</td>
<td>Managing Organizations (S. 511)</td>
<td>3.5</td>
<td>Hagen Lindstädt</td>
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<tr>
<td>T-WIWI-102803</td>
<td>Modeling Strategic Decision Making (S. 546)</td>
<td>4.5</td>
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<td>T-WIWI-102629</td>
<td>Management and Strategy (S. 506)</td>
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<tr>
<td>T-WIWI-102871</td>
<td>Problem Solving, Communication and Leadership (S. 630)</td>
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</table>

Learning Control / Examinations
The module will not be offered any more from summer term 2015. Students who are already assigned on the module can still finish it until summer term 2016.
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
See German version.

Content
The module emphasizes the following aspects: The students learn models and frameworks which are used in strategic management and managing organizations. In addition, the module provides knowledge about management concepts and their practical application.
The module addresses three focal points: First, the students will learn models, frameworks and theoretical findings of the economic organization theory. Further, questions of a value-based concern leadership are discussed. Finally, the limitations of the basic models of economic decision theory are identified and advanced concepts are developed.

Recommendations
None

Remarks
The course “Organization Theory” will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).
The credits for the courses “Managing Organizations” and “Management and Strategy” have been changed from 4 to 3,5 from summer term 2015 on.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
Part V

Module component exams

Course: Wildcard Key Competences Seminar 2 [T-WIWI-104681]

Responsibility:
Contained in: [M-WIWI-101808] Seminar Module

ECTS  Version
2      1
Course: Advanced Game Theory [T-WIWI-102861]

Responsibility: Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß

Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-101502] Economic Theory and its Application in Finance

ECTS: 4,5
Language: englisch
Recurrence: Jedes Wintersemester
Version: 1

Events

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<tr>
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<th>Event-No.</th>
<th>Events</th>
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<td>WS 16/17</td>
<td>2521533</td>
<td>Advanced Game Theory</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Johannes Brumm, Karl-Martin Ehrhart, Nora Szech</td>
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<tr>
<td>WS 16/17</td>
<td>2521534</td>
<td>Übung (U)</td>
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<td>Nora Szech</td>
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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
Basic knowledge of mathematics and statistics is assumed.

Event excerpt: Advanced Game Theory (WS 16/17)

Aim
The student
- deepens and broadens his/her basic knowledge of Game Theory,
- develops a rigorous understanding of newer concepts in Game Theory,
- develops the capability to independently model and analyze complex systems of strategic decision-making, and to develop appropriate solutions.

Content
This course offers an advanced and rigorous treatment of game theory.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
**Course:** Advanced Lab Informatics [T-WIWI-103523]

**Responsibility:** Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner

**Contained in:** [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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<td>2512200</td>
<td>2512200 Praktikum (P)</td>
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<td>Murat Citak, Andreas Fritsch, Andreas Oberweis, Andreas Schoknecht, Meike Ullrich</td>
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<td>WS 16/17</td>
<td>2512100</td>
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<td>Praktikum (P)</td>
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<td>WS 16/17</td>
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<td>Smart Services and the IoT</td>
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<td>Maribel Acosta Deibe, Andreas Harth, Tobias Christof Käfer, Rudi Studer, York Sure-Vetter</td>
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<td>SS 2017</td>
<td>2512101</td>
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<td>Andreas Drescher, Andreas Oberweis, Frederic Toussaint</td>
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</table>

**Industrial Engineering and Management (M.Sc.)**

*Date 05/17/2017*
Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Conditions
None

Remarks
The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at https://portal.wiwi.kit.edu.

V Event excerpt: Smart Services and the IoT (WS 16/17)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

V Event excerpt: Applications of Semantic MediaWiki (WS 16/17)

Content
Topics of interest include, but are not limited to:

- Analysis of Medical Processes
- Correlation analysis of medical data
- Visualization of data in SMW
- Sentiment analysis of Twitter data
- Upload Interface for SMW
- Process Matching of process data

V Event excerpt: (SS 2017)

Aim
Die Studierenden können Kenntnisse aus der Vorlesung Maschinelles Lernen auf einem ausgewählten Gebiet der aktuellen Forschung im Bereich Robotik oder kognitive Automobile praktisch anwenden.
Die Studierenden beherrschen die Analyse und Lösung entsprechender Problemstellungen im Team.
Die Studierenden können ihre Konzepte und Ergebnisse evaluieren, dokumentieren und präsentieren.

Content
Umsetzung einzelner, durch die Studenten ausgewählter Verfahren des Maschinellen Lernens an einer konkreten Aufgabenstellung entweder aus dem Bereich Robotik oder kognitive Automobile.

Die einzelnen Projekte erfordern die Analyse der gestellten Aufgabe, Auswahl geeigneter Lernverfahren, Spezifikation und Implementierung und Evaluierung eines Lösungsansatzes. Schließlich ist die gewählte Lösung zu dokumentieren und in einem Kurzvortrag vorzustellen.

Workload
Der Arbeitsaufwand von 4 SWS setzt sich zusammen aus Präsenzzeit am Versuchsort zur praktischen Umsetzung der gewählten Lösung, sowie der Zeit für Literaturrecherchen und Planung/Spezifikation der geplanten Lösung. Zusätzlich
wird ein kurzer Bericht und eine Präsentation der durchgeführten Arbeit erstellt.

**Event excerpt: (SS 2017)**

**Content**
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

**Literature**
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning

**Event excerpt: (WS 16/17)**

**Workload**
Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media
**Course: Advanced Management Accounting [T-WIWI-102885]**

**Responsibility:** Marcus Wouters

**Contained in:** [M-WIWI-101510] Cross-functional Management Accounting

**ECTS:** 4.5

**Language:** deutsch

**Recurrence:** Jedes Wintersemester

**Version:** 1

### Events

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<td>Advanced Management Accounting</td>
<td>Vorlesung (V)</td>
<td>3</td>
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#### Learning Control / Examinations

The assessment consists of an oral exam (20 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**

None.

**Recommendations**

The course requires significant prior knowledge of Management Accounting, similar to the content of the courses MA 1 and 2, although completion of these particular courses is not a formal requirement.

**Remarks**

This course is held in English.
The course is compulsory and must be examined.

---

**Event excerpt: Advanced Management Accounting (WS 16/17)**

**Aim**

Students will be able to consider advanced management accounting methods in an interdisciplinary way and to apply these to managerial decision-making problems in operations and innovation. They will also be able to identify relevant research results on such methods.

**Content**

The course addresses several topics where management accounting is strongly related to marketing, finance, or organization and strategy, such as customer value propositions, financial performance measures, managing new product development, and technology investment decisions.

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.
Course: Advanced Statistics [T-WIWI-103123]

Responsibility: Oliver Grothe
Contained in: [M-WIWI-101637] Analytics and Statistics

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Learning Control / Examinations

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4). The exam is offered every semester. Re-examinations are offered only for repeaters.

Conditions
None

Remarks
New course starting winter term 2015/2016
Course: Advanced Stochastic Optimization [T-WIWI-106548]

Responsibility: Steffen Rebennack

Contained in:
- [M-WIWI-101473] Mathematical Programming
- [M-WIWI-103289] Stochastic Optimization

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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.
### Course: Advanced Topics in Economic Theory [T-WIWI-102609]

**Responsibility:** Kay Mitusch  
**Contained in:**  
- [M-WIWI-101500] Microeconomic Theory  
- [M-WIWI-101502] Economic Theory and its Application in Finance  
- [M-WIWI-101406] Network Economics  
- [M-WIWI-101497] Agglomeration and Innovation

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**Learning Control / Examinations**  
The course T-WIWI-102609 - Advanced Topics in Economic Theory is currently not available. The course restarts in summer term 2018.  
The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the beginning of the recess period or at the beginning of the following semester.  

**Conditions**  
None

**Recommendations**  
This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.
**Course: Airport Logistics [T-MACH-105175]**

**Responsibility:** André Richter

**Contained in:**
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101280] Logistics in Value Chain Networks

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</table>

**Learning Control / Examinations**
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

**Conditions**
one

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**Event excerpt: Airport logistics (WS 16/17)**

**Aim**
Students are able to:

- Describe material handling and informations technology activities on airports,
- Evaluate processes and systems on airports as the law stands, and
- Choose appropriate processes and material handling systems for airports.

**Content**
Introduction
airport installations
luggage transport
passenger transport
security on the airport
legal bases of the air traffic
freight on the airport

**Workload**
regular attendance: 21 hours
self-study: 99 hours

**Literature**
Course: Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines [T-MACH-105173]

Responsibility: Marcus Gohl
Contained in: [M-MACH-101303] Combustion Engines II

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<td>2</td>
<td>Marcus Gohl</td>
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Learning Control / Examinations
Letter of attendance or oral exam (25 minutes, no auxillary means)

Conditions
none

Event excerpt: Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines (SS 2017)

Aim
The students can point out the challenges concerning the current emission standards in engine development. They can name and explain the basic principles of measurement techniques and methods to analyse exhaust gas components and components of engine oil. Hence, the students have the ability to choose the right methods for a given problem and to interpret the results.

Content
The students get involved in the application of different measurement techniques in the field of exhaust gas and lubricating oil analysis. The functional principles of the systems as well as the application areas of the latter are discussed. In addition to a general overview of standard applications, current specific development and research activities are introduced.

Workload
regular attendance: 24 hrs
self study: 96 hrs

Literature
The lecture documents are distributed during the courses.
**Course: Analysis Tools for Combustion Diagnostics [T-MACH-105167]**

**Responsibility:** Uwe Wagner

**Contained in:** [M-MACH-101303] Combustion Engines II

<table>
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<td>Analysis tools for combustion diagnostics</td>
<td>Vorlesung (V)</td>
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<td>Jürgen Pfeil</td>
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</table>

**Learning Control / Examinations**

oral examination, Duration: 25 min., no auxiliary means

**Conditions**

none

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**Event excerpt: Analysis tools for combustion diagnostics (SS 2017)**

**Aim**

The students can name and explain state-of-the-art methods to analyse the process in combustion as well as special measuring techniques such as optical and laser analysis. They are able to thermodynamically model, analyse and evaluate the engine process.

**Content**

energy balance at the engine
energy conversion in the combustion chamber
thermodynamics of the combustion process

flow velocities

flame propagation

special measurement techniques

**Workload**

regular attendance: 24 hours
self-study: 96 hours

**Literature**

Lecture notes available in the lectures
**Course: Applied Ecology and Water Quality [T-BGU-103647]**

**Responsibility:** Stephan Fuchs  
**Contained in:** [M-BGU-101000] Environmental Management

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<td>SS 2017</td>
<td>6223814</td>
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<td>Stephan Fuchs, Stephan Hilgert</td>
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### Conditions

none
Course: Applied Informatics II - IT Systems for eCommerce [T-WIWI-102651]

Responsibility: York Sure-Vetter

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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<td>2511033</td>
<td>Applied Informatics II: IT Systems for e-Commerce</td>
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<td>Agnes Koschmider</td>
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<td>SS 2017</td>
<td>2511032</td>
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<td>Vorlesung (V)</td>
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<td>Agnes Koschmider</td>
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Learning Control / Examinations
The assessment consists of a written exam (120 min) according to Section 4(2), 1 of the examination regulation. The successful completion of the compulsory exercises is prerequisite for the admission to the written exam. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
Knowledge of content of the modules Foundations in Informatics [IW1INF1] and Algorithms I [IW2INF2] is expected.


Aim
The student learns about concepts and technologies for designing big, distributed application architectures. Students apply industryrelevant technology to solve application-oriented problems in lab classes.

Content
The course Applied Informatics II [2511032] covers various facets of electronic commerce which have to be supported by adequate and efficient distributed information systems. Key topics are middleware technologies and distributed application architectures. Document description and exchange (incl. XML), Java EE, Web technologies, and Web services are additional topics.

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
Tba in the lecture.
Course: Asset Pricing [T-WIWI-102647]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg

Contained in:
- [M-WIWI-101480] Finance 3
- [M-WIWI-101482] Finance 1
- [M-WIWI-101483] Finance 2
- [M-WIWI-101502] Economic Theory and its Application in Finance

ECTS 4,5
Language deutsch
Recurrence Jedes Sommersemester
Version 1

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<td>SS 2017</td>
<td>2530556</td>
<td>Übung (U)</td>
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<td>SS 2017</td>
<td>2530555</td>
<td>Asset Pricing</td>
<td>Vorlesung (V)</td>
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<td>Martin Ruckes, Marliese Uhrig-Homburg</td>
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</table>

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
We strongly recommend knowledge of the basic topics in investments (bachelor course), which will be necessary to be able to follow the course.

Event excerpt: Asset Pricing (SS 2017)

Aim
Students are familiar with advanced concepts in asset pricing (in particular the stochastic discount factor model). They are able to apply their acquired skills to solve empirical questions related to securities.

Content
This lecture deals with the valuation of risky cash flows. A stochastic discount model and a central equation will be introduced, which form the basis of nearly every valuation model in finance. That includes the valuation of stocks, bonds and derivatives. The first part of the lecture will present the theory, the second part covers empirical questions related to this approach.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Basic literature

Elective literature
Course: Auction Theory [T-WIWI-102613]

Responsibility: Karl-Martin Ehrhart
Contained in:
- [M-WIWI-101500] Microeconomic Theory
- [M-WIWI-101453] Applied Strategic Decisions

ECTS: 4.5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

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</table>

Learning Control / Examinations
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins. The exam is offered each semester.

Conditions
None

Event excerpt: (WS 16/17)

Aim
The student
- learns the game-theoretic modeling and analysis of auctions,
- learns about various auction formats and their specific characteristics,
- understands the challenge for participating in auctions as bidder,
- understands the challenge of designing auctions as auctioneer,
- gains insight into practice by case studies,
- participates in and analyzes demonstration experiments.

Content
This course deals with the analysis and modeling of auction which are based on game theory. This also includes aspects of applying and designing auctions as well as experiences with auctions. Main topics are:

- Single- and multi-unit auctions
- Selling and procurement auctions
- Electronic auctions (e.g. eBay, C2C, B2B)
- Multi-attributive auctions.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
- Ehrhart, K.-M. und S. Seifert: Auktionstheorie, Skript zur Vorlesung, KIT, 2011
- Ausubel, L.M. und P. Cramton: Demand Reduction and Inefficiency in Multi-Unit Auctions, University of Maryland, 1999
**Course: Automated Financial Advisory [T-WIWI-106495]**

**Responsibility:** Maxim Ulrich  
**Contained in:** [M-WIWI-103261] Disruptive FinTech Innovations

**Events**

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<td>Automated Financial Advisory (Master)</td>
<td>Seminar (S)</td>
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<td>Maxim Ulrich</td>
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</table>

**Learning Control / Examinations**
The grade consists of a written thesis and an oral presentation.

**Conditions**
There are two conditions for taking this course:

1. This course is only open for registered students of the module “Disruptive FinTech Innovations”.
2. Registered students do also attend in the same semester the lecture “Engineering FinTech Solutions” and the programming internship “Computational FinTech with Python and C++”.

**Modeled Conditions**
The following conditions must be met:

1. The course [T-WIWI-106193] Engineering FinTech Solutions must have been started.
2. The course [T-WIWI-106496] Computational FinTech with Python and C++ must have been started.

**Event excerpt: Automated Financial Advisory (Master) (SS 2017)**

**Aim**
In this seminar students work on issues related to the automatization of risk and investment management applications.

**Content**
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

**Workload**
The total workload for this course is approximately 90 hours.

**Literature**
Literature will be distributed during the first lecture.
### Course: Automated Manufacturing Systems [T-MACH-102162]

**Responsibility:** Jürgen Fleischer  
**Contained in:** [M-MACH-101298] Automated Manufacturing Systems

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<td>2150904</td>
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<td>Vorlesung (VÜ) / Übung 6</td>
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#### Learning Control / Examinations

The assessment is carried out as an oral exam. The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

#### Conditions

none

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### Event excerpt: Automated Manufacturing Systems (SS 2017)

#### Aim

The students...

- are able to analyze implemented automated manufacturing systems and describe their components.
- are capable to assess the implemented examples of implemented automated manufacturing systems and apply them to new problems.
- are able to name automation tasks in manufacturing plants and name the components which are necessary for the implementation of each automation task.
- are capable with respect to a given task to plan the configuration of an automated manufacturing system and to determine the necessary components to its realization.
- are able to design and select components for a given use case of the categories: “Handling Technology”, “Industrial Robotics”, “Sensory” and “Controls”.
- are capable to compare different concepts for multi-machine systems and select a suitable concept for a given use case.

#### Content

The lecture provides an overview of the structure and functioning of automated manufacturing systems. In the introduction chapter the basic elements for the realization of automated manufacturing systems are given. This includes:

- Drive and control technology
- Handling technology for handling work pieces and tools
- Industrial Robotics
- Quality assurance in automated manufacturing
- automatic machines, cells, centers and systems for manufacturing and assembly
- structures of multi-machine systems
- planning of automated manufacturing systems

In the second part of the lecture, the basics are illustrated using implemented manufacturing processes for the production of automotive components (chassis and drive technology). The analysis of automated manufacturing systems for manufacturing of defined components is also included.

In the field of vehicle power train both, the automated manufacturing process for the production of the conventional internal-combustion engine and the automated manufacturing process for the production of the prospective electric power train (electric motor and battery) are considered. In the field of car body, the focus is on the analysis of the process...
chain for the automated manufacturing of conventional sheet metal body parts, as well as for automated manufacturing of body components made out of fiber-reinforced plastics. Within tutorials, the contents from the lecture are advanced and applied to specific problems and tasks.

**Workload**

- regular attendance: 63 hours
- self-study: 177 hours

**Literature**

Lecture Notes
Course: Automation of Discrete Event and Hybrid Systems [T-ETIT-100981]

Responsibility: Sören Hohmann

Contained in: [M-ETIT-101157] Control Engineering II

ECTS

<table>
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<th>Recurrence</th>
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</thead>
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Conditions

none
Course: Automotive Engineering I [T-MACH-100092]

Responsibility: Frank Gauterin, Hans-Joachim Unrau

Contained in: [M-MACH-101266] Automotive Engineering

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<td>Automotive Engineering I</td>
<td>Vorlesung (V)</td>
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<td>Frank Gauterin, Hans-Joachim Unrau</td>
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Learning Control / Examinations
Written examination

Duration: 120 minutes

Auxiliary means: none

Modeled Conditions
The following conditions must be met:
- The course [T-MACH-102203] Automotive Engineering I must not have been started.

Event excerpt: Automotive Engineering I (WS 16/17)

Aim
The students know the movements and the forces at the vehicle and are familiar with active and passive security. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to judge and to develop the complex system “vehicle”.

Content
1. History and future of the automobile
2. Driving mechanics: driving resistances and driving performances, mechanics of the longitudinal and transverse forces, passive safety
3. Engines: combustion engine, alternative drives (e.g. electric motor, fuel cell)
4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)
5. Power transmission and distribution: drive shafts, cardon joints, differentials

Workload
regular attendance: 45 hours
self-study: 195 hours
Literature


**Course: Automotive Engineering I [T-MACH-102203]**

**Responsibility:** Frank Gauterin, Martin Gießler  
**Contained in:** [M-MACH-101266] Automotive Engineering

**ECTS** 6  
**Language** englisch  
**Recurrence** Jedes Wintersemester  
**Version** 1

### Events

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### Learning Control / Examinations

Written examination

Duration: 120 minutes

Auxiliary means: none

**Modeled Conditions**
The following conditions must be met:

- The course [T-MACH-100092] Automotive Engineering I must not have been started.

**Event excerpt: Automotive Engineering I (WS 16/17)**

**Aim**
The students know the movements and the forces at the vehicle and are familiar with active and passive security. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to judge and to develop the complex system “vehicle”.

**Content**
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performances, mechanics of the longitudinal and transverse forces, passive safety

3. Engines: combustion engine, alternative drives (e.g. electric motor, fuel cell)

4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)

5. Power transmission and distribution: drive shafts, cardon joints, differentials

**Workload**
regular attendance: 45 hours  
self-study: 195 hours
Literature


Course: Automotive Engineering II [T-MACH-102117]

Responsibility: Frank Gauterin, Hans-Joachim Unrau

Contained in: [M-MACH-101266] Automotive Engineering

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<td>Automotive Engineering II</td>
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<td>Hans-Joachim Unrau</td>
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</table>

Learning Control / Examinations

Written Examination

Duration: 90 minutes

Auxiliary means: none

Conditions

none

Event excerpt: Automotive Engineering II (SS 2017)

Aim

The students have an overview of the modules, which are necessary for the road holding of a motor vehicle and the power transmission between vehicle bodywork and roadway. They have knowledge of different wheel suspensions, the tyres, the steering elements and the brakes. They know different execution forms, the function and the influence on the driving or brake behavior. They are able to develop the appropriate components correctly. They are ready to analyze, to judge and to optimize the complex relationship of the different components under consideration of boundary conditions.

Content

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, retarder, comparison of the designs

Workload

regular attendance: 22,5 hours
self-study: 97,5 hours

Literature


3. Gnadler, R.: Script to the lecture ‘Automotive Engineering II’
**Course: Automotive Logistics [T-MACH-105165]**

**Responsibility:** Kai Furmans

**Contained in:**
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101280] Logistics in Value Chain Networks
- [M-MACH-101282] Global Production and Logistics

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</table>

### Learning Control / Examinations

The assessment consists of a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

### Conditions

none

---

**Event excerpt: Automotive Logistics (SS 2017)**

**Aim**

Students are able to:

- Describe essential logistic questions, in a complex production network. As an example the automobile industry is used.
- Choose and apply solution possibilities for logistic problems in this area.

**Content**

- Logistic questions within the automobile industry
- Basic model of automobile production and distribution
- Relation with the suppliers
- Disposition and physical execution
- Vehicle production in the interaction of shell, paint shop and assembly
- Sequence planning
- Assembly supply
- Vehicle distribution and linkage with selling processes
- Physical execution, planning and control

**Workload**

- regular attendance: 21 hours
- self-study: 99 hours

**Literature**

None.
Course: Basics of Liberalised Energy Markets [T-WIWI-102690]

Responsibility: Wolf Fichtner

[M-WIWI-102808] Digital Service Systems in Industry

ECTS 3
Language englisch
Recurrence Jedes Wintersemester
Version 1

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<td>Wolf Fichtner</td>
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Learning Control / Examinations
The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
See German version.

Recommendations
None


Aim
The student has detailed knowledge concerning the new challenges of liberalised energy markets. He has the ability to:

- Understand the new economic reality of liberalised energy markets
- Obtain a deeper understanding of the different submarkets of the power market
- Identify problems of the liberalised energy markets

Content
1. The European liberalisation process
   1.1 The concept of a competitive market
   1.2 The regulated market
   1.3 Deregulation in Europe
2. Pricing and investments in a liberalised power market
   2.1 Merit order
   2.2 Prices and investments
   2.3 Market flaws and market failure
   2.4 Regulation in liberalised markets
   2.5 Additional regulation mechanisms
3. The power market and the corresponding submarkets
   3.1 List of submarkets
   3.2 Types of submarkets
   3.3 Market rules
4. Risk management
   4.1 Uncertainties in a liberalised market
   4.2 Investment decisions under uncertainty
   4.3 Estimating future electricity prices
   4.4 Portfolio management
5. Market power
   5.1 Defining market power
   5.2 Indicators of market power
   5.3 Reducing market power
6. Market structures in the value chain of the power sector
Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature
Elective literature:
Course: Basics of Technical Logistics [T-MACH-102163]

Responsibility: Martin Mittwollen, Jan Oellerich

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS: 6
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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<td>Basics of Technical Logistics</td>
<td>Vorlesung / Übung 4 (VÜ)</td>
<td>4 Martin Mittwollen, Jan Oellerich</td>
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Learning Control / Examinations
The assessment consists of a written exam (90 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Conditions
none

Event excerpt: Basics of Technical Logistics (WS 16/17)

Aim
Students are able to:
- Describe processes and machines of technical logistics,
- Model the fundamental structures and the impacts of material handling machines with mathematical models,
- Refer to industrially used machines
- Model real machines applying knowledge from lessons and calculate their dimensions.

Content
- effect model of conveyor machines
- elements for the change of position and orientation
- conveyor processes
- identification systems
- drives
- mechanical behaviour of conveyors
- structure and function of conveyor machines
- elements of intralogistics
- sample applications and calculations in addition to the lectures inside practical lectures

Workload
presence: 48h
rework: 132h

Literature
Recommendations during lessons
Course: Bayesian Methods for Financial Economics  [T-WIWI-106191]

Responsibility:  Maxim Ulrich
Contained in:  [M-WIWI-103123] Quantitative Valuation  
                [M-WIWI-103122] Quantitative Risk Management

<table>
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<td>Jedes Sommersemester</td>
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Learning Control / Examinations
The course has been cancelled.
The grade is based on an exam. The exam covers all the material that is taught in the current semester. The exam takes place in the last week of the lecture-free period. Students who fail the exam are allowed to retake it in the following semester (last week of the respective lecture-free period).

Conditions
None

Recommendations
None
Learning Control / Examinations
The grade consists of an exam and seven problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

Conditions
None.

Recommendations
It is recommend that students have studied the material of „Computational Risk and Asset Management“.

Remarks
Course: Behavioral Approaches in Marketing [T-WIWI-102619]

Responsibility: Bruno Neibecker

Contained in: [M-WIWI-101489] Strategy, Communication, and Data Analysis

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**Events**

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**Learning Control / Examinations**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The examination will be offered latest until winter term 2016/2017 (repeaters only).

**Conditions**

None

**Recommendations**

None

**Event excerpt: Behavioral Approaches in Marketing (WS 16/17)**

**Aim**

Students have learned the following outcomes and competences:

- To specify the key terms in marketing and communication management
- To identify and define theoretical constructs in marketing communication, based on behavioral theory
- To indentify the main research trends
- To analyze and interpret high level academic articles
- To learn interactive skills to work in teams and to follow a goal-oriented approach
- To gain understanding of methodological research to develop concrete plans for marketing decision-making

**Content**

This course gives an introduction to consumer behavior and the influence of cognitive and emotional information processing on consumer decision making. The contribution of advertising response models is considered and faced with social and environmental aspects (e.g. cross-cultural influences) on consumer behavior, mass communication and internet advertising. In addition, a scientific case study on the effectiveness of TV-commercials is discussed. Central issues of the course: Case Studies in brand management and advertising response. Psychological factors (research design and test marketing / arousal / effectiveness of TV-commercials as case studies). Emotions in marketing. Information processing and retention in memory (schema theory / visual information processing/grounded theory). Complex advertising response models (attitude towards the ad / attitude towards the brand / persuasion / context effects in learning / decision making / Means-end-theory and strategic advertising). Social processes (culture / subculture / cross cultural influence / product design). Neuromarketing.

**Workload**

The total workload for this course is approximately 140.0 hours. For further information see German version.

**Literature**

(Literature is in English and German, see German description)
Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I [T-MACH-100966]

Responsibility: Andreas Guber

Contained in: [M-MACH-101290] BioMEMS

ECTS 3 Language deutsch Recurrence Jedes Wintersemester Version 1

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<td>Vorlesung (V)</td>
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</table>

Learning Control / Examinations

oral exam

Event excerpt: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I (WS 16/17)

Aim
The lecture will first address relevant microtechnical manufacturing methods. Then, selected biomedical applications will be presented, as the increasing use of microstructures and microsystems in Life-Sciences and in medicine leads to improved medico-technical products, instruments, and operation and analysis systems.

Content
Introduction into various microtechnical manufacturing methods: LIGA, Micro milling, Silicon Micromachining, Laser Microstructuring, μEDM, Metal-Etching, Biomaterials, Sterilisation.
Examples of use in the life science sector: basic micro fluidic structures: micro channels, micro filters, micromixers, micropumps, microvalves, Micro and nanotiter plates, Microanalysis systems (μTAS), Lab-on-chip applications.

Workload
Literature: 20 h
Lessons: 21 h
Preparation and Review: 50 h
Exam preparation: 30 h

Literature
Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005
M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011
**Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II [T-MACH-100967]**

**Responsibility:** Andreas Guber

**Contained in:**
- [M-MACH-101287] Microsystem Technology
- [M-MACH-101290] BioMEMS

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<td>BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</td>
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<td>Andreas Guber</td>
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</table>

**Learning Control / Examinations**

oral exam

**Conditions**

none

**Event excerpt: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II (SS 2017)**

**Aim**

The lecture will first shortly address some relevant microtechnical manufacturing methods. Then, selected biomedical applications will be presented, as the increasing use of microstructures and microsystems in Life-Sciences und in medicine leads to improved medico-technical products, instruments, and operation and analysis systems.

**Content**

Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:
- LabCD, Protein Crystallisation
- Microarrays
- Tissue Engineering
- Cell Chip Systems
- Drug Delivery Systems
- Micro reaction technology
- Microfluidic Cells for FTIR-Spectroscopy
- Microsystem Technology for Anesthesia, Intensive Care and Infusion
- Analysis Systems of Person’s Breath
- Neurobionics and Neuroprosthesis
- Nano Surgery

**Workload**

- Literature: 20 h
- Lessions: 21 h
- Preparation and Review: 50 h
- Exam preparation: 30 h

**Literature**

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II; Springer-Verlag, 1994
Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III [T-MACH-100968]

Responsibility: Andreas Guber

Contained in: [M-MACH-101287] Microsystem Technology
[M-MACH-101290] BioMEMS

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Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III (SS 2017)

Aim
The lecture will first shortly address some relevant microtechnical manufacturing methods. Then, selected biomedical applications will be presented, as the increasing use of microstructures and microsystems in Life-Sciences und in medicine leads to improved medico-technical products, instruments, and operation and analysis systems.

Content
Examples of use in minimally invasive therapy
Minimally invasive surgery (MIS)
Endoscopic neurosurgery
Interventional cardiology
NOTES
OP-robots and Endosystems
License of Medical Products and Quality Management

Workload
Literature: 20 h
Lessons: 21 h
Preparation and Review: 50 h
Exam preparation: 30 h

Literature
Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005
Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II; Springer-Verlag, 1994
M. Madou
Fundamentals of Microfabrication
Course: Bionics for Engineers and Natural Scientists [T-MACH-102172]

Responsibility: Hendrik Hölscher

Contained in:
- [M-MACH-101294] Nanotechnology
- [M-MACH-101287] Microsystem Technology
- [M-MACH-101290] BioMEMS

ECTS: 3
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>Christian Greiner, Hendrik Hölscher, Stefan Walheim</td>
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Learning Control / Examinations
written or oral exam

Conditions
none

Event excerpt: Bionics for Engineers and Natural Scientists (SS 2017)

Aim
The students should be able analyze, judge, plan and develop biomimetic strategies and products.

Content
Bionics focuses on the design of technical products following the example of nature. For this purpose we have to learn from nature and to understand its basic design rules. Therefore, the lecture focuses on the analysis of the fascinating effects used by many plants and animals. Possible implementations into technical products are discussed in the end.

Workload
lectures 30 h
self study 30 h
preparation for examination 30 h

Literature
Course: Building Laws [T-BGU-103429]

Responsibility: Shervin Haghsheno

Contained in: [M-BGU-101888] Project Management in Construction
[M-BGU-101884] Lean Management in Construction

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>6241803</td>
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<td>Vorlesung (V)</td>
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<td>Rainer Kohlhammer, Helmut Johannes Miernik</td>
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Conditions
None

Recommendations
None

Remarks
None
**Course: BUS-Controls [T-MACH-102150]**

**Responsibility:** Marcus Geimer, Felix Weber

**Contained in:**
- [M-MACH-101266] Automotive Engineering
- [M-MACH-101267] Mobile Machines

<table>
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**Events**

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</table>

**Learning Control / Examinations**

The assessment consists of an oral exam taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**
none

**Event excerpt: BUS-Controls (SS 2017)**

**Aim**
The students will get an overview of the theoretic and practical functioning of different bus systems.

After the practical oriented lessons the students will be able to visualize the communication structure of different applications, design basic systems and evaluate the complexity of programming of the complete system.

**Content**
- Knowledge of the basics of data communication in networks
- Overview of the operating mode of current field buses
- Explicit observation of the operating mode and application areas of CAN buses
- Practical programming of an example application (hardware is provided)

**Workload**
- regular attendance: 21 hours
- self-study: 92 hours

**Literature**

**Elective literature:**
### Course: Business Administration in Information Engineering and Management [T-WIWI-102886]

**Responsibility:** Andreas Geyer-Schulz  
**Contained in:** [M-WIWI-101409] Electronic Markets

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<td>Andreas Geyer-Schulz, Andreas Sonnenbichler</td>
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**Learning Control / Examinations**
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively.  
The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from excersise work will be added.

**Conditions**  
None

**Recommendations**  
Basic knowledge from Operations Research (linear programming) and from decision theory are expected.

### Event excerpt: Business Administration in Information Engineering and Management (SS 2017)

**Aim**  
The student is able to

- transfer models from Business Administration to situations in business whose basic conditions are changed due to the implementation of information and communication technology,
- apply methods from Business Administration (Decision theory, game theory, operations research, etc.) to questions of Information Engineering and Management,
- analyze the potential to automize the decision making process in businesses by data bases,
- describe the process to extract relevant data for decision making from operational accounting systems.

**Content**  
In this lecture, classical Business Administration is applied to businesses in an information- and communicatationotechnological environment. The process to extract relevant data for decision making from operational accounting systems receives special attention. In order to do so, topics such as activity-based costing and transaction costs models are addressed. The automization of the decision making process in businesses by data bases is another focus of the module. To solve such issues within a company, relevant methods such as decision theory and game theory are lectured. Finally, complex business relevant questions in a dynamically changing environment are adressed by presenting models and methods from system dynamics.

**Workload**  
The total workload for this course is approximately 150 hours (5 credits):

**Time of attendance**
- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 40h 00m
- Preparation of the examination: 31h 00m

Sum: 150h 00m

Literature

Course: Business and IT Service Management [T-WIWI-102881]

Responsibility: Gerhard Satzger

Contained in: [M-WIWI-102754] Service Economics and Management
[M-WIWI-101448] Service Management

ECTS: 4,5
Language: englisch
Recurrence: Jedes Wintersemester
Version: 1

Events

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Learning Control / Examinations
The assessment of this course is a written examination (60 min.) (following §4(2), 1 SPOs) and by submitting written papers as part of the exercise (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Recommendations
None

Event excerpt: Business and IT Service Management (WS 16/17)

Aim
Students understand the importance of “servitization” for organizations, the challenges for the management of service-oriented enterprises and the interdependence of business and IT services.
Students learn standard concepts and methods of service-oriented management and are able to apply them in practical case studies.
Students get familiar with current research and tools and are able to critically evaluate them.
Students practice to communicate in English and to work on solutions in teams.

Content
The rapid development of information and communication technology transforms many enterprises towards service-oriented structures: with new digital services, new business models and process structures within larger service networks. Thus, strategic and operative management of service-oriented enterprises increasingly gains importance. In this course, we want to systematically acquire relevant know-how and apply this to real word examples. Particular focus will be on the interdependence of business, IT and legal aspects.
The course will be taught in English. It should provide ample opportunity for active participation of students. The course will integrate presentations of experts from business practice as well as a comprehensive case study (“en bloc” for 1 day) in which students will actively work on the strategic service-oriented shift of an enterprise.

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature
Maister, David H., Managing The Professional Service Firm, 1997
Teboul, J., Service is Front Stage: Positioning services for value advantage, 2006
Grönroos, Service Management and Marketing, 2007
Course: Business data strategy [T-WIWI-106187]

Responsibility: Christof Weinhardt

Contained in: [M-WIWI-103117] Data Science: Data-Driven Information Systems

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<td>Christof Weinhardt</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

Remarks
Limited number of participants.

Event excerpt: (WS 16/17)

Aim
The student

- understands the fundamental issues in operative and strategic business controlling and management
- models analytic models and performance indicators to support these issues
- understands the usage of performance indicators for a variety of controlling and management issues and is able to define models for generating the relevant performance indicators under considerations of data availability
- understands the strategic role of integrating, transforming, and analyzing large and complex enterprise data in modern business information systems

Content
In modern business information systems, profitable usage of large amounts of data plays an increasingly important role. Systematic and goal-oriented data usage for decision support, including data collection and integration, requires a strategic approach based on the company’s business model and related business issues.

Improved data collection of business process data (e.g., sensor data generated in production processes) enables building business information systems for supporting controlling and management even for sophisticated issues. Due to the complexity of business processes and IT system architectures, this requires integrated modeling of business models, information management and IT systems.

Based on case studies, this lecture equips students with core skills to understand fundamental strategies for integrating analytic models and operative controlling mechanisms while ensuring the technical feasibility of the resulting information systems.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
Course: Business Dynamics [T-WIWI-102762]

Responsibility: Andreas Geyer-Schulz

Contained in: [M-WIWI-101470] Data Science: Advanced CRM
[M-WIWI-101409] Electronic Markets

ECTS 4,5  Language  Recurrence  Version
4,5  deutsch  Jedes Wintersemester  1

Term  Event-No.  Events  Type  SWS  Lecturers
WS 16/17  2540531  Business Dynamics  Vorlesung (V)  2  Andreas Geyer-Schulz, Paul Glenn
WS 16/17  2540532  Exercise Business Dynamics  Übung (U)  1  Andreas Geyer-Schulz, Paul Glenn

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively.
The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from excersise work will be added.

Conditions
None

Recommendations
None

Event excerpt: Business Dynamics (WS 16/17)

Aim
Students

- acquire the system thinking worldview for economics
- utilize different methods and tools to map the structure of complex economic systems
- are able to relate dynamic effects to these structures
- learn how to simulate systems within the computer for testing purposes
- use simulation results to improve models
- can independently as well as in teams model, analyze, and optimize business processes and applications
- know how to offer business dynamics as a consulting service and work together with client teams

Content
Corporate growth, the diffusion of new technologies, business processes, project management, product development, service quality management – all these are examples for application areas of business dynamics. They all are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such systems can be modelled. Simulations of complex systems allow the analysis, the goal centered design, as well as the optimization of markets, business processes, policies, and organizations.

Workload
The total workload for this course is approximately 135 hours (4.5 credits):
Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m
Self-study

- Preparation and wrap-up of the lecture: $15 \times 180\text{min} = 45\text{h}\ 00\text{m}$
- Preparing the exercises: $25\text{h}\ 00\text{m}$
- Preparation of the examination: $31\text{h}\ 00\text{m}$

**Sum: 135h 00m**

**Literature**

Course: Business Intelligence Systems [T-WIWI-105777]

Responsibility: Alexander Mädche

Contained in: [M-WIWI-103117] Data Science: Data-Driven Information Systems
[M-WIWI-101506] Service Analytics

ECTS: 4.5

Version: 1

Events

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Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and the Business Intelligence System challenge (40%). The exam and the Business Intelligence System challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Business Intelligence System challenge.

Conditions
None

Recommendations
Basic knowledge on database systems is helpful. We recommend attending the lecture Management of Information Systems.
Course: Business Models in the Internet: Planning and Implementation [T-WIWI-102639]

Responsibility: Timm Teubner

Contained in: [M-WIWI-101489] Strategy, Communication, and Data Analysis
[M-WIWI-102806] Service Innovation, Design & Engineering
[M-WIWI-101488] Entrepreneurship (EnTechnon)
[M-WIWI-101410] Business & Service Engineering

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Learning Control / Examinations

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations) and by submitting written essays as part of the exercise (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015). 50% of the final grade is based on the written exam and 50% is based on assignments from the exercises. Successful completion of the exercises is a prerequisite for admission to the written exam. The points obtained in the exercises only apply to the first and second exam of the semester in which they were obtained.

Conditions

None

Recommendations

None

Event excerpt: Internet Business Models (SS 2017)

Aim

The student

- is able to list the most important features of web application lifecycles,
- analyses, designs and implements web applications,
- evaluates and argues internet business models with special requirements and features,
- is able to estimate the practicability of business models.

Content

The emergence of internet economy has resulted in an accelerated evolution of commerce models in eBusiness. Early adopters have experimented with a variety of new business models, technologies and application designs. At the same time, there has been a growing demand for new standards to facilitate the exchange of information, catalogue content and transactions between buyers and sellers. But the true understanding of how to bring buyers and sellers together is still widely missing, leading to multiple cases of costly missed investments. This course focuses on the design and implementation of successful business models for eBusiness applications for the World Wide Web (WWW), imparting the basic knowledge for building successful eBusiness applications. We consider not only technical foundations of eBusiness applications but also economical aspects. In small groups, students develop and implement an eBusiness model that is eventually discussed with a representative from the venture capitalist industry.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Will be announced within the course.
Course: Business Planning [T-WIWI-102865]

Responsibility: Orestis Terzidis
Contained in: [M-WIWI-101488] Entrepreneurship (EnTechnon)

<table>
<thead>
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<td>Michael Bauman, Florian Wohlfeil</td>
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Learning Control / Examinations

Conditions
None

Recommendations
None

**Event excerpt: (WS 16/17)**

**Aim**
Students will learn methods on how to turn patents as well as business ideas into a solid business model and furthermore to develop them into a concrete Business Plan.

**Literature**
Osterwalter, Alexander, Pigneur, Yves (2010): Business Model Generation

**Event excerpt: (SS 2017)**

**Aim**
Students will learn methods on how to turn patents as well as business ideas into a solid business model and furthermore to develop them into a concrete Business Plan.

**Literature**
Osterwalter, Alexander, Pigneur, Yves (2010): Business Model Generation
Course: Business Process Modelling [T-WIWI-102697]

Responsibility: Andreas Oberweis

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

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</table>
| WS 16/17  | 2511211   |                      | Übung (U) | 1   | Andreas Drescher,
                                                          Andreas Oberweis |

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

Event excerpt: Business Process Modelling (WS 16/17)

Aim
Students
- describe goals of business process modeling and apply different modeling languages,
- choose the appropriate modeling language according to a given context,
- use suitable tools for modeling business processes,
- apply methods for analysing and assessing process models to evaluate specific quality characteristics of the process model.

Content
The proper modeling of relevant aspects of business processes is essential for an efficient and effective design and implementation of processes. This lecture presents different classes of modeling languages and discusses the respective advantages and disadvantages of using actual application scenarios. For that simulative and analytical methods for process analysis are introduced. In the accompanying exercise the use of process modeling tools is practiced.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

Further Literature will be given in the lecture.
Course: Business Strategies of Banks [T-WIWI-102626]

Responsibility: Wolfgang Müller

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

<table>
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</table>

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Event excerpt: Business Strategies of Banks (WS 16/17)

Aim
Students are are in a position to discuss the principles of commercial banking. They are familiar with fundamental concepts of bank management and are able to apply them.

Content
The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank’s success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management’s perspective.

The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank’s corporate policy.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Elective literature:
- A script is disseminated chapter by chapter during the course of the lecture.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2000, Bankbetriebslehre, 6th edition, Springer
**Course: CAD-NX Training Course [T-MACH-102187]**

**Responsibility:** Jivka Ovtcharova  
**Contained in:** [M-MACH-101281] Virtual Engineering B

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**Learning Control / Examinations**  
Practical examination, duration: 60 min., auxiliary means: script

**Conditions**  
none

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**Event excerpt: CAD-NX training course (SS 2017)**

**Aim**

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry  
- carry out FE-studies and kinematic simulations using the integrated CAE tools  
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

**Content**

The participant will learn the following knowledge:

- Overview of the functional range  
- Introduction to the work environment of NX  
- Basics of 3D-CAD modelling  
- Feature-based modelling  
- Freeform modelling  
- Generation of technical drawings  
- Assembly modelling  
- Finite element method (FEM) and multi-body simulation (MBS) with NX

**Workload**

Regular attendance: 35 hours,  
Self-study: 12 hours

**Literature**

Practical course skript
Course: Case Studies in Sales and Pricing [T-WIWI-102834]

Responsibility: Martin Klarmann

Contained in: [M-WIWI-101487] Sales Management
[M-WIWI-101649] Services Marketing

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Events

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<td>2572182</td>
<td></td>
<td>Block (B)</td>
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<td>Assistenten, Martin Klarmann</td>
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</table>

Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

Event excerpt: (WS 16/17)

Aim
Students
- are able to work on a case study in the field of sales and pricing on their own
- are able to apply quantitative calculations on a case study in the field of sales and pricing
- are able to collect information and data beyond the case study description and make use of them for solving their tasks
- are able to apply theories from related lectures to a practical example
- are able to present their results in a a structured and concise manner
- are able to organize their teamwork and collaborate in teams

Content
Students work in groups on case studies from the field of sales and pricing. The case studies contain quantitative calculations in the context of sales and pricing as well as tasks which are to be solved by logical reasoning. When solving the case studies, theoretical sales and pricing content is applied to practical problems. Finally, the results are presented by the group and discussed.

Workload
Total work load for 1.5 ECTS: ca. 45 hours
**Course: Case Studies Seminar: Innovation Management [T-WIWI-102852]**

**Responsibility:** Marion Weissenberger-Eibl

**Contained in:**
- [M-WIWI-101507] Innovation Management
- [M-WIWI-101488] Entrepreneurship (EnTechnon)

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<tr>
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<td>2545019</td>
<td>Case studies seminar: Innovation management</td>
<td>Seminar (S)</td>
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</table>

**Learning Control / Examinations**

**Conditions**
None

**Recommendations**
Prior attendance of the course Innovation Management [2545015] is recommended.

**Event excerpt: Case studies seminar: Innovation management (WS 16/17)**

**Aim**
The students
- look critically into current research topics in the field of Innovation Management
- do literature search based on a given topic, identify relevant literature and evaluate this literature,
- give presentations in a scientific context in front of an auditorium to present the results of the research,
- train their presentation skills,
- present results of the research in a seminar thesis as a scientific publication.

**Content**
The objective of the seminar is to master selected concepts and methods of innovation management and then to apply these practically. Working in groups, the students apply the described concepts and methods of innovation management to a case study from the automotive industry to answer specific questions. Accordingly, the block seminar involves a switch from input to the application of this input. At the end, the results of the group work are presented in the form of a seminar paper and discussed by the whole course.

A short introduction to presentation techniques is planned to help students prepare the seminar papers.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.
Course: CATIA CAD Training Course [T-MACH-102185]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-101281] Virtual Engineering B

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<td>WS 16/17</td>
<td>2123358</td>
<td>CATIA CAD training course</td>
<td>Praktikum (P)</td>
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<td>Mitarbeiter, Jivka Ovtcharova</td>
</tr>
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</table>

Learning Control / Examinations
Practical examination, duration: 60 min., auxiliary means: script

Conditions
none

Event excerpt: CATIA CAD training course (WS 16/17)

Aim
Students are able to:

- create their own 3D geometric models in the CAD system CATIA and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of CATIA to automate the creation of geometry and thus to ensure the reusability of the models.

Content
The participant will learn the following knowledge:

- Basics of CATIA such as user interface, handling etc.
- Production and processing of different model types
- Production of basic geometries and parts
- Generation of detailed drawings
- Integration of partial solutions in modules
- Working with constrains
- Strength analysis with FEM
- Kinematic simulation with DMU
- Dealing with CATIA Knowledgeware

Workload
Regular attendance: 35 hours,
self-study: 12 hours

Literature
practical course skript
**Course: Ceramic Processing Technology [T-MACH-102182]**

**Responsibility:** Joachim Binder

**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

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<td>SS 2017</td>
<td>2126730</td>
<td>Ceramics Processing</td>
<td>Vorlesung (V)</td>
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<td>Joachim Binder</td>
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</table>

**Learning Control / Examinations**

The assessment consists of an oral exam (approx. 20 min) taking place at the agreed date.

Auxiliary means: none

The re-examination is offered upon agreement.

**Conditions**

none

**Event excerpt: Ceramics Processing (SS 2017)**

**Aim**

The students are able to name the major ceramic process technologies and explain their specifics in detail. Additionally, they are capable of illustrating the correlations between the individual processes and their importance for the production of engineering ceramics. The students are able to relate processing effects to material properties. Furthermore, the students can apply the basics to concrete tasks. They are able to comprehend and assess information in professional articles.

**Content**

The course imparts technological basics for processing of engineering ceramics. The course is arranged in the following units:

- Synthesis methods
- Powder conditioning and mixing methods
- Forming of ceramics
- Sintering
- Finishing processes
- Ceramic films and multi-layer systems
- Effects of processing on properties

**Workload**

regular attendance: 21 hours
self-study: 99 hours

**Literature**

### Course: Challenges in Supply Chain Management [T-WIWI-102872]

**Responsibility:** Robert Blackburn  
**Contained in:**  
[M-WIWI-102808] Digital Service Systems in Industry  
[M-WIWI-102805] Service Operations

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<td>2550494</td>
<td>Challenges in Supply Chain Management</td>
<td>Vorlesung (V)</td>
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<td>Robert Blackburn, Jan Buchmann</td>
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</table>

#### Learning Control / Examinations

The assessment consists of a written paper and an oral exam (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

#### Conditions

None

#### Recommendations

Basic knowledge as conveyed in the module “Introduction to Operations Research [WI1OR]” is assumed.

#### Remarks

Please notice that this course can be attended only in the elective part of the course program.  
The number of participants is restricted due to the execution of joint projects with BASF teams and the resulting examination effort. Due to these capacity restrictions, registration before course start is required. For further information see the webpage of the course.  
The course is offered irregularly. The planned lectures and courses for the next three years are announced online.

### Event excerpt: Challenges in Supply Chain Management (SS 2017)

#### Aim

The student
- analyzes and evaluates current developments and approaches in the design and planning of supply chain strategies, especially with respect to future challenges in this area,
- explains and utilizes theoretical concepts and methods for the design and strategy of supply chains,
- classifies and accounts for trend-setting theories in the SCM context such as Behavioral Supply Chain Management or Supply Chain Analytics.

#### Content

The course consists of case studies of BASF which cover future challenges of supply chain management. Thus, the course aims at a case-study based presentation, critical evaluation and exemplary discussion of recent questions in supply chain management. The focus lies on future challenges and trends, also with regard to their applicability in practical cases (especially in the chemical industry).  
The main part of the course is working on a project together with BASF in Ludwigshafen. The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the project topic.  
This course will include working on cutting edge supply chain topics like Industry 4.0 / “Internet of Everything in production”, supply chain analytics, risk management, procurement and production in SCM. The team essays / project
reports will be linked to industry-related challenges as well as to upcoming theoretical concepts. The topics of the seminar will be announced at the beginning of the term in a preliminary meeting.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**
To be defined depending on the topic.
Course: Characteristics of Transportation Systems [T-BGU-106609]

Responsibility: Peter Vortisch
Contained in: [M-BGU-101064] Fundamentals of Transportation

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Conditions
None

Recommendations
None

Remarks
None
### Course: Chemical, Physical and Material Scientific Aspects of Polymers in Microsystem Technologies [T-MACH-102169]

- **Responsibility:** Matthias Worgull
- **Contained in:** [M-MACH-101291] Microfabrication

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<th>Recurrence</th>
<th>Version</th>
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### Learning Control / Examinations
The assessment will consist of an oral exam (30 min) (following §4 (2), 2 of the examination regulation).

**Conditions**
none
**Course: Civil Law for Advanced [T-INFO-101994]**

**Responsibility:** Thomas Dreier  
**Contained in:** [M-INFO-101216] Private Business Law

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**Event excerpt: Civil Law for Advanced (SS 2017)**

**Aim**


**Content**

Die Vorlesung befasst sich vertiefen mit einzelnen Problemfeldern aus den Bereichen des Gesellschaftsrechts, des Handelsrechts und des Rechts der Vertraglichen und gesetzlichen Schuldverhältnisse. Es werden rechtliche und wirtschaftliche Zusammenhänge anhand konkreter Beispiele eingehend und praxisnah besprochen.

**Workload**

Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt 90 h, davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

**Literature**

Course: Combustion Engines I [T-MACH-102194]

Responsibility: Thomas Koch, Heiko Kubach

Contained in: [M-MACH-101275] Combustion Engines I

ECTS: 5  
Language: deutsch  
Recurrence: Jedes Wintersemester  
Version: 1

Events

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<td></td>
<td></td>
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<td>/ Übung 4</td>
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Learning Control / Examinations
oral examination, Duration: 25 min., no auxiliary means

Conditions
none

Event excerpt: Combustion Engines I (WS 16/17)

Aim
The student can name and explain the working principle of combustion engines. He is able to analyse and evaluate the combustion process. He is able to evaluate influences of gas exchange, mixture formation, fuels and exhaust gas aftertreatment on the combustion performance. He can solve basic research problems in the field of engine development.

Content
Introduction, History, Concepts
Working Principle and Thermodynamics
Characteristic Parameters
Air Path
Fuel Path
Energy Conversion
Fuels
Emissions
Exhaust Gas Aftertreatment

Workload
regular attendance: 32 hours
self-study: 88 hours
Course: Combustion Engines II [T-MACH-104609]

Responsibility: Rainer Koch, Heiko Kubach

Contained in: [M-MACH-101303] Combustion Engines II

ECTS 5  Language  deutsch  Recurrence Jedes Sommersemester  Version 1

Events

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<td>2134151</td>
<td>Combustion Engines II</td>
<td>Vorlesung / Übung 3</td>
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</table>

Learning Control / Examinations
oral examination, duration: 25 minutes, no auxiliary means

Conditions
none

Recommendations
Fundamentals of Combustion Engines I helpful

V Event excerpt: Combustion Engines II (SS 2017)

Aim
The students deepen and complement their knowledgement from the lecture combustion engines A. they can name and explain construction elements, development tools and latest development trends. They are be able to analyse and evaluate powertrain concepts which are subject of the lecture.

Content
Emissions
Fuels
Drive Train Dynamics
Engine Parts
Boosting
Alternative Powertrain Concepts

Special Engine Concepts

Power Transmission

Workload
regular attendance: 31,5 hours
self-study: 90 hours
Course: Communication Systems and Protocols [T-ETIT-101938]

Responsibility: Jürgen Becker

Contained in: [M-MACH-101295] Optoelectronics and Optical Communication

ECTS: 5  Recurrence: Jedes Sommersemester  Version: 1

Conditions: none
## Course: Competition in Networks [T-WIWI-100005]

**Responsibility:** Kay Mitusch  
**Contained in:** [M-WIWI-101406] Network Economics

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<td>Cornelia Gremm, Kay Mitusch</td>
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<td>WS 16/17</td>
<td>2561204</td>
<td>Competition in Networks</td>
<td>Vorlesung (V)</td>
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<td>Kay Mitusch</td>
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</table>

### Learning Control / Examinations

Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

### Recommendations

Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required.

### Event excerpt: Competition in Networks (WS 16/17)

#### Aim

**Bachelor**

The Students

- will use their basic knowledge of microeconomic in a problem-oriented way and learn to apply theoretical instruments to practical issues.
- will have a vivid idea of economics characteristics and basic questions of network industries as telecom, utilities and transport sectors
- understand the special characteristics of network industries regarding the cost situation and competitive conditions

**Master**

The Students

- will know the basic understanding of network industries concerning competition, competitive distortion, state intervention, pricing and financing
- will know the special characteristics of network industries like telecom, utilities, IT and transport sectors
- will be able to apply and adjust abstract concepts and formal methods to these fields

#### Content

Anknüpfend an die Mikroökonomie im Grundstudium (VWL 1) wird zunächst das “partialökonomische Modell” dargestellt, welches der adäquate Analyserahmen für die Industriöökonomik und viele wirtschaftspolitische Anwendungen ist. Sodann wird der für die Netzwerkökonomie zentrale Begriff der Kostensubadditivität (bzw. natürliches Monopol) dargestellt und in seinen Implikationen diskutiert. Weitere Themen: vertikale Beziehungen in Netzsektoren, Verkehrsmodellierung, Preise in Stromnetzen und Prinzipien der Infrastrukturfinanzierung nach Ramsey und Shapley.

#### Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

#### Literature

Will be announced in the lecture.
Course: Computational Economics [T-WIWI-102680]

Responsibility: Pradyumn Kumar Shukla

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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<td>WS 16/17</td>
<td>2590458</td>
<td>Computational Economics</td>
<td>Vorlesung (V)</td>
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<td>Pradyumn Kumar Shukla</td>
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Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

Conditions
None

Remarks
The credits have been changed to 5 starting summer term 2016.

Event excerpt: Computational Economics (WS 16/17)

Aim
The student

- understands the methods of Computational Economics and applies them on practical issues,
- evaluates agent models considering bounded rational behaviour and learning algorithms,
- analyses agent models based on mathematical basics,
- knows the benefits and disadvantages of the different models and how to use them,
- examines and argues the results of a simulation with adequate statistical methods,
- is able to support the chosen solutions with arguments and can explain them.

Content
Examining complex economic problems with classic analytical methods usually requires making numerous simplifying assumptions, for example that agents behave rationally or homogeneously. Recently, widespread availability of computing power gave rise to a new field in economic research that allows the modeling of heterogeneity and forms of bounded rationality: Computational Economics. Within this new discipline, computer based simulation models are used for analyzing complex economic systems. In short, an artificial world is created which captures all relevant aspects of the problem under consideration. Given all exogenous and endogenous factors, the modelled economy evolves over time and different scenarios can be analyzed. Thus, the model can serve as a virtual testbed for hypothesis verification and falsification.

Literature

Elective literature:

Course: Computational FinTech with Python and C++ [T-WIWI-106496]

Responsibility:

Contained in: [M-WIWI-103261] Disruptive FinTech Innovations

ECTS: 1.5
Recurrence: Jedes Sommersemester
Version: 1

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<td></td>
<td>Praktikum (P)</td>
<td>2</td>
<td>Maxim Ulrich</td>
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Learning Control / Examinations
The grade is based on a larger or several smaller programming exercises.

Conditions
There are two conditions for taking this course:

1. This course is only open for registered students of the module “Disruptive FinTech Innovations”.
2. Registered students do also attend in the same semester the lecture “Engineering FinTech Solutions” and the seminar “Automated Financial Advisory”.

Modeled Conditions
The following conditions must be met:

1. The course [T-WIWI-106193] Engineering FinTech Solutions must have been started.
2. The course [T-WIWI-106495] Automated Financial Advisory must have been started.

Event excerpt: (SS 2017)

Aim
Implementation of different programming specific concepts and skills.

Content
At the beginning of the semester, each student receives a personalized set of programming tasks.

Workload
Roughly 45 hours.
### Course: Computational Risk and Asset Management [T-WIWI-102878]

**Responsibility:** Maxim Ulrich  
**Contained in:**  
- [M-WIWI-103120] Financial Economics  
- [M-WIWI-103247] Intelligent Risk and Investment Advisory  
- [M-WIWI-101512] Computational Finance  
- [M-WIWI-103123] Quantitative Valuation  

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<th>Recurrence</th>
<th>Version</th>
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### Events

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<td>2530360</td>
<td>Computational Risk and Asset Management</td>
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<td>Elmar Jakobs</td>
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### Learning Control / Examinations

The grade consists of an exam and seven problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

### Conditions

None.

### Recommendations

None.
Course: Computer Contract Law [T-INFO-102036]

Responsibility: Thomas Dreier
Contained in: [M-INFO-101215] Intellectual Property Law

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Event excerpt: Law of Contracts (SS 2017)

Aim

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

Literature
Wird in der Vorlesung bekannt gegeben.
Course: Computer Integrated Planning of New Products [T-MACH-102125]

Responsibility: Roland Kläger

Contained in: [M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

ECTS 4  Recurrence Jedes Semester  Version 1

Learning Control / Examinations
Oral examination

Conditions none
Course: Constitution and Properties of Protective Coatings [T-MACH-105150]

Responsibility: Sven Ulrich

Contained in: [M-MACH-101268] Specific Topics in Materials Science

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Learning Control / Examinations
oral examination (30 min)

no tools or reference materials

Conditions
none

Event excerpt: Constitution and Properties of Protective Coatings (WS 16/17)

Aim
Transfer of the basic knowledge of surface engineering, of the relations between constitution, properties and performance, of the manifold methods of modification, coating and characterization of surfaces.

Content
introduction and overview

concepts of surface modification

coating concepts

coating materials

methods of surface modification

coating methods

characterization methods

state of the art of industrial coating of tools and components

new developments of coating technology
Workload
regular attendance: 22 hours
self-study: 98 hours

Literature

Copies with figures and tables will be distributed
**Course: Constitution and Properties of Wearresistant Materials [T-MACH-102141]**

**Responsibility:** Sven Ulrich  
**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

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**Learning Control / Examinations**

oral examination (30 min)

no tools or reference materials

**Conditions**

none

**Event excerpt: Constitution and Properties of Wear resistant materials (SS 2017)**

**Aim**

Basic understanding of constitution of wear-resistant materials, of the relations between constitution, properties and performance, of principles of increasing of hardness and toughness of materials as well as of the characteristics of the various groups of wear-resistant materials.

**Content**

introduction

materials and wear

unalloyed and alloyed tool steels

high speed steels

stellites and hard alloys

hard materials

hard metals

ceramic tool materials

superhard materials
new developments

**Workload**
regular attendance: 22 hours
self-study: 98 hours

**Literature**


Schneider, J.: Schneidkeramik, Verlag moderne Industrie, Landsberg am Lech, 1995

Copies with figures and tables will be distributed
**Course: Construction and Maintenance of Guided Track Infrastructure [T-BGU-101851]**

**Responsibility:** Eberhard Hohnecker

**Contained in:**
- [M-BGU-101111] Public Transportation Operations

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<td>6234809</td>
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**Conditions**

None

**Recommendations**

None

**Remarks**

None

**Event excerpt: Construction and Maintenance of Tracke Infrastructure (SS 2017)**

**Literature**

Fiedler: Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf
Course: Construction Equipment [T-BGU-101845]

Responsibility: Sascha Gentes

Contained in: [M-BGU-101110] Process Engineering in Construction

ECTS: 3  Recurrence: Jedes Wintersemester  Version: 1

Events

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Conditions
None

Recommendations
None

Remarks
None
Course: Consumer Behavior [T-WIWI-106569]

Responsibility: Sven Feurer

Contained in: [M-WIWI-101489] Strategy, Communication, and Data Analysis

ECTS 3  Recurrence Einmalig  Version 1

Learning Control / Examinations
Please note: This course is offered only once in winter term 2017/18.
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). Since the course is only offered in winter term 2017/18, students are required to take the exam in winter term 2017/18 at the first exam date offered. Exclusively for students who need to retake the exam, a re-examination will be offered in the following semester if required.

Conditions
None.

Remarks
For further information, please contact the research group Marketing and Sales (http://marketing.iism.kit.edu/).
## Course: Control of Linear Multivariable Systems [T-ETIT-100666]

**Responsibility:** Sören Hohmann  
**Contained in:** [M-ETIT-101157] Control Engineering II

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**Conditions**

none
**Course: Control Technology [T-MACH-105185]**

**Responsibility:** Christoph Gönnheimer

**Contained in:** [M-MACH-101284] Specialization in Production Engineering

<table>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<td>Christoph Gönnheimer</td>
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</table>

### Learning Control / Examinations

The assessment is carried out as an oral exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date. In case of a great number of participating students assessment is carried out as a written exam. Oral exams then are only carried out in the event of repetition.

### Conditions

none

---

**Event excerpt: Control Technology (SS 2017)**

**Aim**

The students...

- are able to name the electrical controls which occur in the industrial environment and explain their function.
- can explain fundamental methods of signal processing. This involves in particular several coding methods, error protection methods and analog to digital conversion.
- are able to choose and to dimension control components, including sensors and actors, for an industrial application, particularly in the field of plant engineering and machine tools. Thereby, they can consider both, technical and economical issues.
- can describe the approach for projecting and writing software programs for a programmable logic control named Simatic S7 from Siemens. Thereby they can name several programming languages of the IEC 1131.

**Content**

The lecture control technology gives an integral overview of available control components within the field of industrial production systems. The first part of the lecture deals with the fundamentals of signal processing and with control peripherals in the form of sensors and actors which are used in production systems for the detection and manipulation of process states. The second part handles with the function of electric control systems in the production environment. The main focus in this chapter is laid on programmable logic controls, computerized numerical controls and robot controls. Finally the course ends with the topic of cross-linking and decentralization with the help of bus systems.

The lecture is very practice-oriented and illustrated with numerous examples from different branches.

The following topics will be covered

- Signal processing
- Control peripherals
- Programmable logic controls
- Numerical controls
- Controls for industrial robots
- Process control systems
- Field bus
- Trends in the area of control technology
Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Lecture Notes
Course: Convex Analysis [T-WIWI-102856]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming

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<th>Recurrence</th>
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Events

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Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester. Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Conditions
None

Recommendations
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks
The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).
Course: Copyright [T-INFO-101308]

Responsibility: Thomas Dreier

Contained in: [M-INFO-101242] Governance, Risk & Compliance
[M-INFO-101215] Intellectual Property Law

<table>
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<th>ECTS</th>
<th>Language</th>
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<td>Copyright</td>
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<td>Thomas Dreier</td>
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Event excerpt: Copyright (WS 16/17)

Aim
Der/die Studierende hat vertiefte Kenntnisse auf dem Gebiet des Urheberrechts. Er/sie erkennt die Zusammenhänge zwischen den wirtschaftlichen Hintergründen, den rechtspolitischen Anliegen, den informations- und kommunikationstechnischen Rahmenbedingungen und dem rechtlichen Regelungsrahmen. Er/sie kennt die Regelungen des nationalen, europäischen und internationalen Urheberrechts und kann sie auf praktische Sachverhalte anwenden.

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt 90 h, davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

Literature
Schulze, Gernot: “Meine Rechte als Urheber”, Verlag C.H. Beck, aktuelle Auflage

Weiterführende Literatur
Ergänzende Literatur wird in den Vorlesungsfolien angegeben.
Course: Corporate Compliance [T-INFO-101288]

Responsibility: Thomas Dreier
Contained in: [M-INFO-101242] Governance, Risk & Compliance

ECTS Language Recurrence Version
3 deutsch Jedes Wintersemester 1

Events
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Event excerpt: Corporate Compliance (WS 16/17)

Aim
Der/die Studierende hat vertiefte Kenntnisse hinsichtlich der Thematik “Governance, Risk & Compliance” sowohl im Hinblick auf die regulatorischen als auch im Hinblick auf die betriebswirtschaftlichen Rahmenbedingungen sowie ein profundes Verständnis für die Notwendigkeit dieser Systeme. Er/sie kennt die nationalen, europäischen und internationalen Regulierungen und kann sie anwenden. Der/die Studierende ist in der Lage, praxisrelevante Sachverhalte selbstständig zu analysieren, zu bewerten und in den Kontext einzuordnen.

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden, davon 30 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 15 h für die Klausurvorbereitung.
**Course: Corporate Financial Policy [T-WIWI-102622]**

**Responsibility:** Martin Ruckes  
**Contained in:**  
[M-WIWI-101480] Finance 3  
[M-WIWI-101483] Finance 2  
[M-WIWI-101502] Economic Theory and its Application in Finance  

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**Learning Control / Examinations**

The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins. The exam is offered each semester.

**Conditions**

None

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**Event excerpt: (SS 2017)**

**Aim**

Students

- are in a position to explain the importance of informational frictions for the financing of firms,
- are able to evaluate financing contracts with respect to their incentive effects,
- are able to analyse financing contracts with respect to their information they provide to outsiders,
- are in a position to derive optimal financing contracts in prototypical situations,
- are able to discuss the financial determinants of corporate distribution policy.

**Content**

Students are told profound knowledge about appropriate financing of firms. The course is concerned with the theory of corporate financing:

- Financing contracts
- Financing capacity
- Issuance of securities
- Capital structure
- Payout policy

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

**Elective Literature**

Course: Country Manager Simulation [T-WIWI-106137]

Responsibility: Sven Feurer

Contained in: [M-WIWI-101489] Strategy, Communication, and Data Analysis
[M-WIWI-101487] Sales Management

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Learning Control / Examinations

Remarks
The course language is English. In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.

Please note that only one of the following courses can be chosen in the Sales Management Module: Country Manager Simulation, Case Studies in Sales and Pricing or Preisverhandlungen und Verkaufspräsentationen.

Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

Event excerpt: (WS 16/17)

Aim
Students...

- ... understand what makes marketing and sales special in an international context (role of culture, international buyer behavior, strategic market entry decisions, international marketing mix management)
- ... are able to analyze relevant country, customer and competitor information and derive a suitable market entry strategy
- ... understand important concepts of international sales and are able to apply these in the realm of the simulation
- ... are capable of re-evaluating and adapting their strategy on the basis of changes in the market environment
- ... are able to critically evaluate the success of the chosen strategy and present the results in front of the class

Content
Understanding Culture
Understanding International Buyer Behavior
Market Entry Decisions
International Marketing and Sales Management (adaptation vs. differentiation)

Workload
Total workload for 1.5 ECTS: ca. 45 hours
Course: Credit Risk [T-WIWI-102645]

Responsibility: Marliese Uhrig-Homburg

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

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Learning Control / Examinations

The assessment consists of a written exam following §4, Abs. 2, 1.

Conditions

None

Recommendations

See German version.

Event excerpt: Credit Risk (WS 16/17)

Aim

The objective of this course is to become familiar with the credit markets and the credit risk indicators like ratings, default probabilities and credit spreads. The students learn about the components of credit risk (e.g. default time and default rate) and quantify these in different theoretical models to price credit derivatives.

Content

The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature


Elective literature:

Course: Current Issues in Innovation Management [T-WIWI-102873]

Responsibility: Marion Weissenberger-Eibl

Contained in: [M-WIWI-101507] Innovation Management

<table>
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<th>Recurrence</th>
<th>Version</th>
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Learning Control / Examinations
Non exam assessment (following §4(2) 3 of the examination regulation).

Conditions
None

Recommendations
None

Remarks
See German version.
Course: Current Issues in the Insurance Industry [T-WIWI-102637]

Responsibility: Wolf-Rüdiger Heilmann
Contained in: [M-WIWI-101449] Insurance Management II
[M-WIWI-101469] Insurance Management I

<table>
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Learning Control / Examinations
The exam is offered latest in summer term 2016.
The assessment consists of a written exam (according to Section 4 (2), 1 of the examination regulation).
The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
For the understanding of this course knowledge of Private and Social Insurance [2530050] is required.

Remarks
Block course. For organizational reasons, please register with the secretay of the chair: thomas.mueller3@kit.edu.
Course: Current Topics on BioMEMS [T-MACH-102176]

Responsibility: Andreas Guber
Contained in: [M-MACH-101290] BioMEMS

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Learning Control / Examinations
active participation and own presentation

Event excerpt: Actual topics of BioMEMS (SS 2017)

Aim
Knowledge in the actual activities in bio-medical and biological technologies under the view of micro technology. The student gets an overview on actual examples of new applications in BioMEMS. After successfull participation of this seminar the student is able to prepare a new topic in BioMEMS and to present it to an audience.

Workload
Active participation on the seminary and preparation of an own presentation of a topic in BioMEMS.
Lecture time: 21 h
Preparation: 40 h
Preparation of own preparation: 60 h
Course: Data Mining and Applications [T-WIWI-103066]

Responsibility: Rheza Nakhaeizadeh

Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

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Learning Control / Examinations

- Oral examination 70%
- Conduction of a small empirical study 30%

Conditions

None

Event excerpt: (SS 2017)

Aim

After completing of the course the students:

- know the definition of Data Mining
- are familiar with the CRISP-DM
- are Familiar with at least six important Data Mining Tasks
- can recognize whether a given problem can be formulated as a data mining problem
- are familiar with the most important Data Mining Algorithms like Decision Tree, K-Means, Artificial Neural Networks, Association Rules, Regression Analysis
- are familiar with evaluation of DM-algorithms
- will be able to use a DM-Tool

Content

Part one: Data Mining
Why Data Mining?

- What is Data Mining?
- History of Data Mining
- Conferences and Journals on Data Mining
- Potential Applications
- Data Mining Process:
  - Business Understanding
  - Data Understanding
  - Data Preparation
  - Modeling
  - Evaluation
  - Deployment
  - Interdisciplinary aspects of Data Mining
  - Data Mining tasks
  - Data Mining Algorithms (Decision Trees, Association Rules,
Regression, Clustering, Neural Networks)
Fuzzy Mining
OLAP and Data Warehouse
Data Mining Tools
Trends in Data Mining

Part two: Examples of application of Data Mining

- Success parameters of Data Mining Projects
- Application in industry
- Application in Commerce

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature

- Jiawei Han, Micheline Kamber, Data Mining : Concepts and Techniques, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
- David J. Hand, Heikki Mannila and Padhraic Smyth, Principles of Data Mining , MIT Press, Fall 2000
Course: Data Protection Law [T-INFO-101303]

Responsibility: Nikolaus Marsch

Contained in: [M-INFO-101242] Governance, Risk & Compliance
[M-INFO-101217] Public Business Law

ECTS: 3
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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Event excerpt: (WS 16/17)

Aim

Content
Auf der Grundlage der verfassungs- und unionsrechtlichen Hintergründe wird primär das Bundesdatenschutzgesetz behandelt. Hier werden die Regelungsgrundsätze (wie Verbotsprinzip, Erforderlichkeit und Zweckbindung), die personenbezogenen Daten als Regelungsobjekt, die Rechte der Betroffenen sowie die Zulässigkeit der verschiedenen Datenbearbeitungsvorgänge dargelegt. Auch organisatorische Vorschriften, insb. der Datenschutzbeauftragte, werden angesprochen. Zudem befasst sich die Vorlesung mit den bereichsspezifischen Regelungen zum Telekommunikationsdatenschutz sowie zum Datenschutz bei Telemediendiensten.

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden (3.0 Credits).

- Präsenzzzeit: Besuch der Vorlesung 15 x 90 min = 22 h 30 min
- Vor-/Nachbereitung der Vorlesung 15 x 120 min = 30 h 00 min
- Skript 2 x wiederholen & 2 x 10 h = 20 h 00 min
- Prüfung vorbereiten = 17 h 30 min
- Summe 90 h 00 min

Literature
Wird in der Veranstaltung bekannt gegeben.

Weiterführende Literatur
Wird in der Veranstaltung bekannt gegeben.
**Course: Database Systems and XML [T-WIWI-102661]**

**Responsibility:** Andreas Oberweis  
**Contained in:**  
[M-WIWI-101472] Informatics  
[M-WIWI-101630] Electives in Informatics  
[M-WIWI-101628] Emphasis in Informatics

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**Learning Control / Examinations**  
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.  
**Conditions**  
None

**Event excerpt: Database Systems and XML (WS 16/17)**

**Aim**  
Students

- know the basics of XML and generate XML documents,
- are able to use XML database systems and to formulate queries to XML documents,
- know to assess the use of XML in operational practice in different application contexts.

**Content**  
Databases are a proven technology for managing large amounts of data. The oldest database model, the hierarchical model, was replaced by different models such as the relational or the object-oriented data model. The hierarchical model became particularly more important with the emergence of the extensible Markup Language XML. XML is a data format for structured, semi-structured, and unstructured data. In order to store XML documents consistently and reliably, databases or extensions of existing data base systems are required. Among other things, this lecture covers the data model of XML, concepts of XML query languages, aspects of storage of XML documents, and XML-oriented database systems.

**Workload**  
Lecture 30h  
Exercise 15h  
Preparation of lecture 30h  
Preparation of exercises 30h  
Exam preparation 44h  
Exam 1h

Total: 150h

**Literature**
Further literature will be given individually.
Course: Derivatives [T-WIWI-102643]

Responsibility: Marliese Uhrig-Homburg

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101482] Finance 1
[M-WIWI-101483] Finance 2

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Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Event excerpt: Derivatives (SS 2017)

Aim
The objective of the Derivatives lecture is to become familiar with financial markets, especially derivatives markets. Traded securities and frequently used trading strategies will be introduced. Furthermore the pricing of derivatives will be derived and their use in risk management will be discussed.

Content
The lecture deals with the application areas and valuation of financial derivatives. After an overview of the most important derivatives and their relevance, forwards and futures are analysed. Then, an introduction to the Option Pricing Theory follows. The main emphasis is on option valuation in discrete and continuous time models. Finally, construction and usage of derivatives are discussed, e.g. in the context of risk management.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Elective literature:
Course: Design Basics in Highway Engineering [T-BGU-106613]

Responsibility: Ralf Roos

ECTS 3
Recurrence Jedes Sommersemester
Version 1

Events

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<th>Term</th>
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Conditions
None

Recommendations
None

Remarks
None
Course: Design Thinking [T-WIWI-102866]

Responsibility: Orestis Terzidis

Contained in: [M-WIWI-101507] Innovation Management
[M-WIWI-101488] Entrepreneurship (EnTechnon)

ECTS 3
Language deutsch
Recurrence Jedes Semester
Version 1

Events

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<td>Design Thinking (Track 1)</td>
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Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
The seminar content will be published on the website of the institute.

Event excerpt: Design Thinking (Track 1) (WS 16/17)

Aim
Methods and tools of the Design Thinking approach will be learned and - more than that - actively practiced. This includes leaving class and work on hands on solutions.

Content
See German version.

Workload
Time of attendance: 30 hours
Studying at home: 30 hours
Exam preparation: 30 hours

Literature
See German version.
Course: Developing Business Models for the Semantic Web [T-WIWI-102851]

Responsibility: Rudi Studer

Contained in: [M-WIWI-101488] Entrepreneurship (EnTechnon)

<table>
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<td>Felix Leif Keppmann, Maria Maleshkova, Rudi Studer, York Sure-Vetter</td>
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</table>

Learning Control / Examinations

Conditions
None

Recommendations
As a recommendation to attending the seminar, basic knowledge about semantic technologies and concepts should be available. This may be acquired by attending one of the following lectures – Wissensmanagement, Semantic Web Technologies 1, Semantic Web Technologies 2 or by studying related literature. Furthermore the topic entrepreneurship should be of interest.

Event excerpt: Developing IT-based Business Models (WS 16/17)

Aim
The Student

- analyzes and develops in small teams a business model from an idea to a complete business plan or
- treats a special topic from the area of Semantic Web in businesses and entrepreneurship.
- learns about basic concepts and problem areas and considers these while building the business plan for a particular business idea.
- understands and considers the viewpoints of different stakeholders in the area of entrepreneurship and their influences on an own business idea.

Content
Semantic technologies such as RDF, SPARQL, OWL, and RIF are still standardised only in their first versions. Still, the multitude of integrated technologies provides the basis for development of new applications and creates, with the help of the initial standardisations, a foundation for attracting investors. The potential and future developments in the field are exemplified by the growing popularity and importance of data, being published as Linked Data, as well as by the increase in applications developed outside the scope of research. The seminar “Developing Business Models for the Semantic Web” aims to explore these opportunities for new business models and business ventures.

The seminar takes place on a weekly basis and consists of two main parts. The first part is a series of presentations, held by external experts who share their experience in the area of entrepreneurship. The aim is to engage a wide variety of presenters, including applicants to programs for supporting young business ventures, startup founders, and people in leadership positions in established companies. Further guest lecturers include experts in the field of business and startup development, tax and enterprise law, as well as entrepreneurs, who have sold their startups or had to give up their ideas. The second part consists of the contributions of seminar participants. They are required to develop a business model, starting with the initial idea and building it up to a complete business plan. This development process is accompanied by feedback sessions, pitches, mid-term presentations and a final presentation. The student presentations alternate with
Presentations given by external experts. Furthermore, besides on the development of a business plan, student can work on a specific topic such as “Analysing Existing Business Models on the Web” or “Using Open Source in Startups”. The seminar pass can be obtained by submitting a completed seminar thesis (i.e. the business plan or the specific topic) and by regularly attending the seminar presentations.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.
**Course: Digital Service Design**  [T-WIWI-105773]

**Responsibility:**  Alexander Mädche

**Contained in:**  
- [M-WIWI-102806] Service Innovation, Design & Engineering
- [M-WIWI-103200] Designing Interactive Systems

**ECTS**  4.5

**Recurrence**  Jedes Wintersemester

**Version**  1

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### Events

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**Learning Control / Examinations**

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation. Students receive one aggregated grade consisting of a written exam (60%) and the Digital Service Design challenge (40%). The exam and the Digital Service Design challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Digital Service Design challenge.

**Conditions**

None

**Recommendations**

None

**Remarks**

The course is held in English.

---

**Event excerpt: (WS 16/17)**

**Aim**

The students

- get a deeper understanding of design in general and specifically understand what digital service design comprises
- can conceptualize and operationalize usability, user experience, service experience, and customer experience
- understand the underlying mechanisms for a successful interplay between individuals, teams, and the organization within the entire digital service lifecycle
- learn the most important digital service design practices & tools
- apply digital service design practices & tools in a real-world scenario

**Content**

- Definition and key concepts of digital service design and related terms
- Introduction to the business and design perspective of a service design project
- The digital service design process from strategy through planning and prototyping to launching the digital service.
- Practice-oriented capstone project focusing on the design of a real-world digital service
**Course: Digital Transformation of Organizations [T-WIWI-106201]**

**Responsibility:** Alexander Mädche

**Contained in:**
- [M-WIWI-102754] Service Economics and Management
- [M-WIWI-102808] Digital Service Systems in Industry
- [M-WIWI-101410] Business & Service Engineering
- [M-WIWI-101448] Service Management

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### Learning Control / Examinations

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

Students receive one aggregated grade consisting of a written exam (60%) and case study deliverable (40%). The exam and the case study need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the case study.

### Conditions
None

### Remarks
The course will be held in English.

---

**Event excerpt: (SS 2017)**

### Aim
The students will:
- Get an overview on basic concepts and definitions of information systems and understand key characteristics of IS as a foundation for digitization of business processes, products and services
- Understand important characteristics of software products on which IS are built on
- Learn important concepts and theories in order to successfully execute a digital transformation process

### Content
Definition and key concepts of Information Systems
- Introduction of different types of application systems (organizational process & information-centric systems, customer-centric systems, supplier-centric systems and people-centric systems) and their characteristics
- The digital transformation process: The pre-implementation, implementation and post-implementation phase covering facets such as business/IT alignment, packaged software selection, IS implementation projects, as well as adoption & use of IS
- Practice-oriented case study focusing on real-world IS scenarios
Course: Disassembly Process Engineering [T-BGU-101850]

Responsibility: Sascha Gentes

Contained in: [M-BGU-101110] Process Engineering in Construction

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

Events

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Conditions
None

Recommendations
None

Remarks
None
Course: Discrete-Event Simulation in Production and Logistics [T-WIWI-102718]

Responsibility: Stefan Nickel

[M-WIWI-102805] Service Operations

<table>
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<th>Recurrence</th>
<th>Version</th>
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<td>2550488</td>
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<td>Vorlesung (V)</td>
<td>3</td>
<td>Sven Spieckermann</td>
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</table>

Learning Control / Examinations

The assessment consists of a written paper and an oral exam (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

Conditions

None

Recommendations

Basic knowledge as conveyed in the module Introduction to Operations Research [WI1OR] is assumed.

Remarks

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is planned to be held every summer term.

The planned lectures and courses for the next three years are announced online.

Event excerpt: (SS 2017)

Aim

The student

- knows basic concepts of discrete event simulation models,
- applies computer-based simulation systems,
- structures and implements simulation studies according to specific process models,
- has in-depth knowledge for logistics issues and discovers the importance of statistical methods in modeling and evaluation of simulation models,
- explains coupled systems of simulation and meta-heuristics, and characterizes simulation programs.

Content

Simulation of production and logistics systems is an interdisciplinary subject connecting expert knowledge from production management and operations research with mathematics/statistics as well as computer science and software engineering.

With completion of this course, students know statistical foundations of discrete simulation, are able to classify and apply related software applications, and know the relation between simulation and optimization as well as a number of application examples. Furthermore, students are enabled to structure simulation studies and are aware of specific project scheduling issues.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.
Course: Document Management and Groupware Systems [T-WIWI-102663]

Responsibility: Stefan Klink

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

<table>
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<tr>
<td>2511212</td>
<td>Document Management and Groupware Systems</td>
<td>Vorlesung (V)</td>
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<td>Stefan Klink</td>
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</table>

Learning Control / Examinations
The course expires after summer term 2017. Last examination date is winter term 2017/2018 (only for repeaters).
The assessment consists of an 1h written exam in the first week after lecture period according to Section 4(2), 1 of the examination regulation.

Conditions
None


Aim
Students master the basics of integration and structure of document management systems (DMS) and know the complete DMS process - from document capture of the archiving until retrieval. Students know how to realize operative workflows. They know which activities are needed to carry out the conceptual design and installation of DMS and they are able to apply a DMS as an archive system, workflow system and retrieval system. Furthermore, they know groupware systems exemplarily and can use them for collaborative tasks.

Content
The lecture gives basics of document management and groupware systems. It covers different system categories, their interaction and their use areas and illustrates this with concrete examples. These include document management in the strict sense, scanning, Document Imaging (acquisition and visualization of scanned documents), indexing, electronic archiving, retrieval of relevant documents, workflow, groupware, and office communications.

Workload
Workload: 120h overall,
Lecture 30h
Review and preparation of lectures 60h
Exam preparation 29h
Exam 1h

Literature

Further literature is given in each lecture individually.

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Economic Efficiency of Guided Transport Systems [T-BGU-101794]

Responsibility: Eberhard Hohnecker

Contained in:
- [M-BGU-101113] Project in Public Transportation
- [M-BGU-101111] Public Transportation Operations

ECTS: 1.5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

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<td>Economic Efficiency of Guided Transport Systems</td>
<td>Vorlesung (V)</td>
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<td>Eberhard Hohnecker, Mitarbeiter/innen</td>
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</table>

Conditions
None

Recommendations
None

Remarks
None


Aim
Die Studierenden können die wesentlichen verkehrswirtschaftlichen Aspekte des Schienenverkehrs beschreiben, strukturieren und an konkreten ökonomischen Fallbeispielen anwenden.

Content
- Basics of Business Management
- Cost-Performance Calculation
- Investment and Financing
- Basics of National Economy
- Market Forms
- Financial Science
- Cost Theorie
- Basics of Transport Industry
- Traffic Demand and Offer
- Transport Policy

Workload
45 Stunden

Literature
Aberle: Transportwirtschaft, Oldenbourg-Verlag
Kunz: Eisenbahnrecht, Nomos, Baden-Baden
Course: Economic Integration in Europe [T-WIWI-102896]

Responsibility: Jan Kowalski
Contained in: [M-WIWI-101481] Economic Policy II

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Learning Control / Examinations
See German version

Conditions
None
**Course: eEnergy: Markets, Services, Systems [T-WIWI-102794]**

**Responsibility:** Christof Weinhardt

**Contained in:**
- [M-WIWI-101411] Information Engineering

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**Events**

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<td>David Dauer, Johannes Gärttner</td>
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<td>SS 2017</td>
<td>2540464</td>
<td>eEnergy: Markets, Services, Systems</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>David Dauer, Johannes Gärttner, Clemens van Dinther, Christof Weinhardt</td>
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</table>

**Learning Control / Examinations**

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

**Conditions**

None

**Recommendations**

None

**Remarks**

The lecture has also been added in the IIP Module Basics of Liberalised Energy Markets.


**Aim**

The student

- understands the tasks and basic structure of the energy economy, in particular concerning electricity markets,
- understands the change in the energy economy and the necessity for the development of a Smart Grid,
- knows the market mechanisms in the energy market and their role in coordination and allocation of electric energy,
- is able to describe the relation between OTC, spot and balancing energy markets,
- knows the regulation specifications for energy markets and can reflect them critically,
- is able to model smart grid mechanisms and to evaluate them by simulation based methods.

**Content**

Scope of the lecture eEnergy: Markets, Services, Systems is economics and information management in energy markets. Integration of the growing number of renewable energy sources imposes new challenges on energy markets and the power system. To improve coordination between supply and demand it is necessary to interlink centralized and decentralized generators as well as consumers by means of ICT. Current electricity networks are extended by intelligent IT components thus incorporating the “Smart Grid”. Existing market structures for electricity have to be adjusted for a successful implementation of demand side management and integration of an increasing number of renewable energy producers as well as electric vehicles. Apart from regulatory and economic concepts, methods for modeling and analysis of energy markets are introduced and explained during the course.
The lecture is structured as follows:

1. **Electricity Markets**
   - Market Models, EEX (spot and futures market), OTC Trading, Market Coupling
2. **Regulation**
   - Charges and Incentives, Network Congestion (Management)
3. **Demand Side Management**
   - Smart Meters, Tariffs, Price Elasticity, Storage Systems, Electric Mobility
4. **Modeling and Analysis of Energy Markets**

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

Course: Efficient Energy Systems and Electric Mobility [T-WIWI-102793]

Responsibility: Patrick Jochem, Russell McKenna

Contained in: [M-WIWI-101452] Energy Economics and Technology

<table>
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<td>SS 2017</td>
<td>2581006</td>
<td>Efficient Energy Systems and Electric Mobility</td>
<td>Vorlesung (V)</td>
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<td>Patrick Jochem, Russell McKenna</td>
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</table>

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Event excerpt: Efficient Energy Systems and Electric Mobility (SS 2017)

Aim
- Understand the concept of energy efficiency as applied to specific systems
- Obtain an overview of the current trends in energy efficiency
- Be able to determine and evaluate alternative methods of energy efficiency improvement
- Overview of technical and economical stylized facts on electric mobility
- Judging economical, ecological and social impacts through electric mobility

Content
This lecture series combines two of the most central topics in the field of energy economics at present, namely energy efficiency and electric mobility. The objective of the lecture is to provide an introduction and overview to these two subject areas, including theoretical as well as practical aspects, such as the technologies, political framework conditions and broader implications of these for national and international energy systems.

The energy efficiency part of the lecture provides an introduction to the concept of energy efficiency, the means of affecting it and the relevant framework conditions. Further insights into economy-wide measurements of energy efficiency, and associated difficulties, are given with recourse to several practical examples. The problems associated with market failures in this area are also highlighted, including the Rebound Effect. Finally and by way of an outlook, perspectives for energy efficiency in diverse economic sectors are examined.

The electric mobility part of the lecture examines all relevant issues associated with an increased penetration of electric vehicles including their technology, their impact on the electricity system (power plants and grid), their environmental impact as well as their optimal integration in the future private electricity demand (i.e. smart grids and V2G). Besides technical aspects the user acceptance and behavioral aspects are also discussed.

Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature
Will be announced in the lecture.
Course: eFinance: Information Engineering and Management for Securities Trading [T-WIWI-102600]

Responsibility: Christof Weinhardt

Contained in:
- [M-WIWI-101480] Finance 3
- [M-WIWI-101483] Finance 2

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<td>Benedikt Notheisen, Christof Weinhardt</td>
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<td>WS 16/17</td>
<td>2540454</td>
<td>eFinance: Information Engineering and Management for Securities Trading</td>
<td>Vorlesung (V)</td>
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<td>Christof Weinhardt</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations) and by submitting written essays as part of the exercise (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015). 70% of the final grade is based on the written exam and 30% is based on assignments from the exercises. The points obtained in the exercises only apply to the first and second exam of the semester in which they were obtained.

Conditions
None

Recommendations
None

Event excerpt: eFinance: Information Engineering and Management for Securities Trading (WS 16/17)

Aim
The students
- are able to understand the theoretical and practical aspects of securities trading,
- are able to handle the relevant electronic tools for the evaluation of financial data,
- are able to identify the incentives of the traders for participation in different market plattforms,
- are able to analyse capital marketplaces concerning their efficiency, weaknesses and technical configuration,
- are able to apply theoretical methods of econometrics,
- are able to understand, criticize and present articles with a finance-scientific background,
- learn to elaborate solutions in a team.

Content
The theoretical part of the course examines the New Institutions Economics which provides a theoretically found explanation for the existence of markets and intermediaries. Building upon the foundations of the market micro structure, several key parameters and factors of electronic trading are examined. These insights gained along a structured securities trading process are complemented and verified by the analysis of prototypical trading systems developed at the institute as well as selected trading systems used by leading exchanges in the world. In the more practical-oriented second part of the lecture, speakers from practice will give talks about financial trading systems and link the theoretical findings to real-world systems and applications.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017

Elective literature:
Course: Electrical Railway Traction Systems [T-MACH-102121]

Responsibility: Peter Gratzfeld


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<td>SS 2017</td>
<td>2114346</td>
<td>Electric Rail Vehicles</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Peter Gratzfeld</td>
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</table>

Learning Control / Examinations

The assessment will consist of an oral exam (20 min) according to §4 (2), 2 of the examination regulation.
The exam is offered each semester. The re-examination is offered upon prior agreement with the interested participants and not later than the next regular examination date.

Conditions

none

Event excerpt: Electric Rail Vehicles (SS 2017)

Aim

The students know the history of electric traction in railway transportation from the very beginning to modern vehicles with three-phase traction drives.
They know the basics of railway transportation, vehicle dynamics and wheel-rail-contact and can deduct the requirements for electric rail vehicles out of it.
They understand purpose, design and functionality of electric traction drives.
They learn about the different systems of traction power supply with its advantages and disadvantages.
They are informed about actual concepts and new developments in the field of electric railway vehicles.

Content

History of electric traction with railway vehicles, economic impact
Vehicle dynamics: running resistance, tractive effort diagram, running cycles
Wheel-rail-contact
Electric drives: traction motors, power conversion, drives for vehicles at dc and ac lines, dieselelectric vehicles, multi system vehicles, axle drives, transmission of tractive effort to the rails
Traction power supply: networks, substations, inductive power supply, energy management
Modern vehicle concepts for mass transit and main line

Workload

Regular attendance: 21 hours
Self-study: 21 hours
Exam and preparation: 78 hours

Literature

A bibliography is available for download (Ilias-platform).
Course: Elements and Systems of Technical Logistics [T-MACH-102159]

Responsibility: Martin Mittwollen, Jan Oellerich

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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<td>WS 16/17</td>
<td>2117096</td>
<td>Elements and systems of Technical Logistics</td>
<td>Vorlesung / Übung (VU)</td>
<td>3</td>
<td>Vladimir Madzharov, Martin Mittwollen</td>
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</tbody>
</table>

Learning Control / Examinations
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Conditions
none

Recommendations
previous / parallel visit of LV 21177095 “Basics of Technical Logistics”

Event excerpt: Elements and systems of Technical Logistics (WS 16/17)

Aim
Students are able to:

- Describe elements and systems of technical logistics,
- Model and calculate structures and functions of special conveying machines,
- Describe interdependence of material flow systems and technique quantitatively and qualitatively
- Equip material flow systems with appropriate machines.

Content

- material flow systems and their (conveying) technical components
- mechanical behaviour of conveyors;
- structure and function of conveyor machines; elements of intralogistics (belt conveyor, racks, automatic guided vehicles, fan-in, bifurcation, and etc.)
- sample applications and calculations in addition to the lectures inside practical lectures

Workload
presence: 36h
rework: 84h

Literature
recommendations during lectures
Course: Elements of Technical Logistics and Project [T-MACH-102178]

Responsibility: Martin Mittwollen, Jan Oellerich

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS 6
Language deutsch
Recurrence Jedes Wintersemester
Version 1

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<td>2117097</td>
<td>Elements and systems of Technical Logistics plus project</td>
<td>Vorlesung (VU) / Übung 4</td>
<td>4</td>
<td>Vladimir Madzharov, Martin Mittwollen</td>
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Learning Control / Examinations
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Conditions none

Recommendations
Knowledge out of Basics of Technical Logistics preconditioned

Event excerpt: Elements and systems of Technical Logistics plus project (WS 16/17)

Aim
Students are able to:

- Describe elements and systems of technical logistics,
- Model and calculate structures and functions of special conveying machines,
- Describe interdependence of material flow systems and technique quantitatively and qualitatively,
- Equip material flow systems with appropriate machines
- Judge about systems in place and justify it in front of subject related persons.

Content

- mechanical behaviour of conveyors;
- structure and function of conveyor machines;
- elements of intralogistics (belt conveyor, racks, automatic guided vehicles, fan-in, bifurcation, and etc.)
- sample applications and calculations in addition to the lectures inside practical lectures
- Self manufacturing of a project report to recesses the topic.

Workload
presence: 48h
rework: 132h

Literature
recommendations during lectures
Course: Emissions into the Environment [T-WIWI-102634]

Responsibility: Ute Karl
Contained in: [M-WIWI-101412] Industrial Production III
[M-WIWI-101471] Industrial Production II

ECTS: 3.5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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<td>2581962</td>
<td>Emissions into the Environment</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Ute Karl</td>
</tr>
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</table>

Recommendations
None

Event excerpt: Emissions into the Environment (WS 16/17)

Aim
The student should identify problems of industrial pollution control.
The student knows solutions to these problems and their ways of application.

Content
The course will provide an overview of sources of air pollution, waste and municipal waste; methods to monitor and to reduce/manage pollutant flows; regulatory framework on national and international level.

A Air pollution control
- Introduction and definitions
- Sources and pollutants
- Regulatory framework
- Emission monitoring
- Air pollution control measures

B Waste management and Recycling
- Introduction and regulatory framework
- Statistics and logistics
- Recycling and disposal
- Waste treatment

C Waste water treatment
- Municipal waste water treatment systems
- Sewage sludge disposal

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
Will be announced in the course.
**Course: Employment Law I [T-INFO-101329]**

**Responsibility:** Thomas Dreier  
**Contained in:** [M-INFO-101216] Private Business Law

<table>
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**Event excerpt: Employment Law I (WS 16/17)**

**Aim**  

**Content**  

**Workload**  
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.
**Course: Employment Law II [T-INFO-101330]**

**Responsibility:** Thomas Dreier  
**Contained in:** [M-INFO-101216] Private Business Law

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### Events

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**Event excerpt: Employment Law II (SS 2017)**

**Aim**  
Aufbauend auf den in Arbeitsrecht I erworbenen Kenntnissen sollen die Studenten einen vertieften Einblick in das Arbeitsrecht erhalten.

**Content**  
Aufbauend auf den in Arbeitsrecht I erworbenen Kenntnissen sollen die Studenten einen vertieften Einblick in das Arbeitsrecht erhalten.

**Workload**  
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

**Literature**  
Literaturempfehlung wird in der Vorlesung bekanntgegeben.
Course: Energy and Environment [T-WIWI-102650]

Responsibility: Ute Karl
Contained in: [M-WIWI-101452] Energy Economics and Technology
[M-WIWI-101468] Environmental Economics

ECTS 4,5 Language deutsch Recurrence Jedes Sommersemester Version 1

Events

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Event excerpt: Energy and Environment (SS 2017)

Aim
The student should identify environmental problems of energy from fossil fuels. The student can identify appropriate technologies for pollution control. The student knows methods for assessing environmental problems and their ways of application.

Content
The focus of the lecture is put on environmental impacts of fossil fuel conversion and related assessment methods. The list of topics is given below.

- Fundamentals of energy conversion
- Air pollutant formation from fossil fuel combustion
- Control of air pollutant emissions from fossil-fuelled power plants.
- Measures to improve conversion efficiency of fossil fuelled power plants.
- External effects of energy supply (Life Cycle Assessment of selected energy systems)
- Integrated Assessment models supporting the European Thematic Strategy on Air
- Cost-effectiveness analyses and cost-benefit analyses of air pollution control measures
- Monetary evaluation of external effects of energy supply (external costs)

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
**Course: Energy and Process Technology I [T-MACH-102211]**

**Responsibility:** Hans-Jörg Bauer, Corina Schwitzke, Amin Velji, Heiner Wirbser

**Contained in:** [M-MACH-101296] Energy and Process Technology I

**ECTS** 9  
**Language** deutsch  
**Recurrence** Jedes Wintersemester  
**Version** 1

### Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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<td>2157961</td>
<td>Energy and Process Technology I</td>
<td>Vorlesung / Übung 6 (VÜ)</td>
<td></td>
<td>Hans-Jörg Bauer, Mitarbeiter, Uwe Wagner, Heiner Wirbser</td>
</tr>
</tbody>
</table>

**Learning Control / Examinations**  
The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation).

**Conditions**  
none

---

**V Event excerpt: Energy and Process Technology I (WS 16/17)**

**Aim**  
The students are able to:

- describe and calculate the basic physical-technical processes  
- apply the mathematical and thermodynamical description  
- reflect on and explain the diagrams and schematics  
- comment on diagrams  
- explain the functionality of gas and steam turbines and their components  
- name the applications of thermal turbomachinery and their role in the field of electricity generation and propulsion technology

**Content**  
The last third of the lecture deals with the topic **Thermal Turbomachinery**. The basic principles, the functionality and the scope of application of gas and steam turbines for the generation of electrical power and propulsion technology are addressed.
**Course: Energy and Process Technology II [T-MACH-102212]**

**Responsibility:** Corina Schwitzke, Heiner Wirbser

**Contained in:** [M-MACH-101297] Energy and Process Technology II

<table>
<thead>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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**Events**

<table>
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<td>Energy and Process Technology II</td>
<td>Vorlesung / Übung 6</td>
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</table>

**Learning Control / Examinations**

The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation).

**Conditions**

none


**Aim**

The students are able to:

- discuss and evaluate energy resources and reserves and their utility
- review the use of energy carriers for electrical power generation
- explain the concepts and properties of power-heat cogeneration, renewable energy conversion and fuel cells and their fields of application
- comment on and compare centralized and decentralized supply concepts
- calculate the potentials, risks and economic feasibility of different strategies aiming at the protection of resources and the reduction of CO2 emissions
- name and judge on the options for solar energy utilization
- discuss the potential of geothermal energy and its utilization

**Content**

**Thermal Turbomaschinery** - In the first part of the lecture deals with energy systems. Questions regarding global energy resources and their use, especially for the generation and provision of electrical energy, are addressed. Common fossil and nuclear power plants for the centralized supply with electrical power as well as concepts of power-heat cogeneration for the decentralized electrical power supply by means of block-unit heat and power plants, etc. are discussed. Moreover, the characteristics and the potential of renewable energy conversion concepts, such as wind and hydro-power, photovoltaics, solar heat, geothermal energy and fuel cells are compare and evaluated. The focus is on the description of the potentials, the risks and the economic feasibility of the different strategies aimed to protect resources and reduce CO2 emissions.
Course: Energy Conversion and Increased Efficiency in Internal Combustion Engines [T-MACH-105564]

Responsibility: Thomas Koch, Heiko Kubach
Contained in: [M-MACH-101275] Combustion Engines I

ECTS 4 Language deutsch Recurrence Jedes Wintersemester Version 1

Events

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<thead>
<tr>
<th>Term</th>
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<td>Energy Conversion and Increased Efficiency in Internal Combustion Engines</td>
<td>Vorlesung (V)</td>
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<td>Thomas Koch</td>
</tr>
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</table>

Learning Control / Examinations
oral exam, 25 minutes, no auxiliary means

Conditions
none

Event excerpt: Energy Conversion and Increased Efficiency in Internal Combustion Engines (WS 16/17)

Aim
The students can name all important influences on the combustion process. They can analyse and evaluate the engine process considering efficiency, emissions and potential.

Content
1. Introduction
2. Thermodynamics of combustion engines
3. Fundamentals
4. gas exchange
5. Flow field
6. Wall heat losses
7. Combustion in gasoline engines
8. APR und DVA
9. Combustion in Diesel engines
10. Emissions
11. Waste heat recovery
12. Measures to increase efficiency

Workload
regular attendance: 24 hours, self-study: 96 hours
T Course: Energy Efficient Intralogistic Systems [T-MACH-105151]

Responsibility: Meike Braun, Frank Schönung

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

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<td>2117500</td>
<td>Energy efficient intralogistic systems</td>
<td>Vorlesung (V)</td>
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<td>Meike Braun, Frank Schönung</td>
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</tbody>
</table>

Learning Control / Examinations
Oral, 30 min. examination dates after the end of each lesson period.

Conditions
none

Recommendations
The content of course “Basics of Technical Logistics” should be known.

Remarks
Visit the IFL homepage of the course for the course dates and/or possible limitations of course participation.

V Event excerpt: Energy efficient intralogistic systems (WS 16/17)

Aim
Students are able to:
- Describe and choose basic measures to enhance energy efficiency.
- Specify these measures considering material handling processes like
  - steady conveyors,
  - unsteady conveyors,
  - as well as the necessary drives,
- Model based on this material handling systems and calculate and measure their energy efficiency and
- Choose resource efficient material handling systems.

Content
The main focuses of the course are:
- green supply chain
- processes in Intralogistic systems
- evaluation of energy consumption of conveyors
- modeling of conveying systems
- methods for energy savings
- approaches for energy efficiency increasing of continuous and discontinuous conveyors
- dimensioning energy efficient drives
- new approaches for resource efficient conveying systems.

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
None.
Course: Energy Policy [T-WIWI-102607]

Responsibility: Martin Wietschel


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<td>Energy Policy</td>
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<td>Martin Wietschel</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Event excerpt: Energy Policy (SS 2017)

Aim
See German version.

Content
The course deals with material and energy policy of policy makers and includes the effects of such policies on the economy as well as the involvement of industrial and other stakeholders in the policy design. At the beginning the neoclassical environment policy is discussed. Afterwards the Sustainable Development concept is presented and strategies how to translate the concept in policy decision follows. In the next part of the course an overview about the different environmental instruments classes, evaluation criteria for these instruments and examples of environmental instruments like taxes or certificates will be discussed. The final part deals with implementation strategies of material and energy policy.

Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature
Will be announced in the lecture.
Course: Energy Systems Analysis [T-WIWI-102830]

Responsibility: Valentin Bertsch
Contained in: [M-WIWI-101452] Energy Economics and Technology

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<td>Energy Systems Analysis</td>
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</table>

Learning Control / Examinations

The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
None

Recommendations
None

Remarks
Since 2011 the lecture is offered in winter term. Exams can still be taken in summer term.

Event excerpt: Energy Systems Analysis (WS 16/17)

Aim
The student
- has the ability to understand and critically reflect the methods of energy system analysis, the possibilities of its application in the energy industry and the limits and weaknesses of this approach
- can use select methods of the energy system analysis by her-/himself

Content
1. Overview and classification of energy systems modelling approaches
2. Usage of scenario techniques for energy systems analysis
3. Unit commitment of power plants
4. Interdependencies in energy economics
5. Scenario-based decision making in the energy sector
6. Visualisation and GIS techniques for decision support in the energy sector

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Weiterführende Literatur:
Course: Energy Trade and Risk Management [T-WIWI-102691]

Responsibility: Clemens Cremer, Wolf Fichtner, Dogan Keles


ECTS 4 Language deutsch Recurrence Jedes Sommersemester Version 1

<table>
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<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<td>Energy Trade and Risk Management</td>
<td>Vorlesung (V)</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
None

Recommendations
None

Event excerpt: Energy Trade and Risk Management (SS 2017)

Aim
The student
- has acquired a broad understanding of the different energy commodity markets (power, emissions, gas, oil, hard coal)
- knows the major products traded on the relevant energy commodity markets
- has a deep understanding of pricing mechanisms on these markets
- knows the major evaluation methods from financial mathematics being able to be used for evaluating energy commodity products
- knows the key risk evaluation methods of energy commodity trading (VaR, CVaR, ...).

Content
1. Introduction to Markets, Mechanisms, Interactions
2. Basics of Risk Management
3. Oil Markets
4. Gas Markets
5. Coal Markets
6. Emission Markets
7. Simulation Game
8. Power Markets
9. Risk Management in Utilities

Workload
The total workload for this course is approximately 120.0 hours. For further information see German version.

Literature
Elective literature:

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
www.riskglossary.com
Course: Engine Measurement Techniques [T-MACH-105169]

Responsibility: Sören Bernhardt
Contained in: [M-MACH-101303] Combustion Engines II

ECTS Language Recurrence Version
4 deutsch Jedes Sommersemester 1

Events

<table>
<thead>
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<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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<td>SS 2017</td>
<td>2134137</td>
<td>Engine measurement techniques</td>
<td>Vorlesung (V)</td>
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<td>Sören Bernhardt</td>
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</table>

Learning Control / Examinations
oral examination, Duration: 0.5 hours, no auxiliary means

Conditions
The course Combustion Engines A / Combustion Engines I has to be completed beforehand.

Modeled Conditions
The following conditions must be met:
- The course [T-MACH-102194] Combustion Engines I must have been passed.

V Event excerpt: Engine measurement techniques (SS 2017)

Aim
The students are able to explain the principles of modern measuring devices and are able to determine the right device for a certain measuring problem. They are able to analyse and evaluate the results.

Content
Students get to know state-of-the-art measurement techniques for combustion engines. In particular basic techniques for measuring engine operating parameters such as torque, speed, power and temperature.

Possible measurement errors and aberrations are discussed.

Furthermore techniques for measuring exhaust emissions, air/fuel ratio, fuel consumption as well as pressure indication for thermodynamic analysis are covered.

Workload
regular attendance: 21 hours
self-study: 100 hours

Literature
Lecture notes available in the lectures or in the ‘Studentenhaus’

1. Grohe, H.: Messen an Verbrennungsmotoren
2. Bosch: Handbuch Kraftfahrzeugtechnik
3. Veröffentlichungen von Firmen aus der Meßtechnik
4. Hoffmann, Handbuch der Meßtechnik
5. Klingenberg, Automobil-Meßtechnik, Band C
Course: Engineering FinTech Solutions [T-WIWI-106193]

Responsibility: Maxim Ulrich

Contained in:
- [M-WIWI-103247] Intelligent Risk and Investment Advisory
- [M-WIWI-103261] Disruptive FinTech Innovations

ECTS: 4,5
Recurrence: Jedes Sommersemester
Version: 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
</tr>
</thead>
<tbody>
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<td>Vorlesung (V)</td>
<td>Maxim Ulrich</td>
<td></td>
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</tr>
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</table>

Learning Control / Examinations
The grade consists of a written part and an oral exam. In the written part, students solve an academic problem from the field of risk and asset management. This part counts for 30% of the grade. An oral exam at the end of the semester accounts for 70% of the final grade and gives the student a chance to present and defend his solution.

Conditions
There are two conditions for taking this course:

1. This course is only open for registered students of the module “Intelligent Risk and Investment Advisory” and “Disruptive FinTech Solutions”.
2. Registered students have completed a Bachelor thesis with a grade of 1.3 or better on a topic that has had a significant exposure to IT- or software engineering content. Alternatively, students who completed at least one of the following lectures with a grade of 1.7 or better are also eligible to participate: Computational Risk and Asset Management, Bayesian Risk Analytics and Machine Learning.

Recommendations
None

Remarks
New course starting summer term 2017.

Event excerpt: (SS 2017)

Aim
Students develop modern IT-technologies to solve financial problems.

Content
This project-oriented lecture invites students to work independently and yet, under close monitoring of researchers and the professor of the C-RAM research group, on a sub-problem of a larger FinTech research question. Students will in a personalized manner be introduced to the necessary concepts, tools and methods that are necessary to solve the question at hand. Students obtain the opportunity to connect newest research insights with modern information technology to move a step closer towards their own development of a prototype. Depending on the topic, students work alone or in groups. An essential part of the guided research mentoring is that students take part in weekly meetings to discuss open issues, to present their progress and to learn from their fellow students.

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature
Literature will be distributed during the first lecture.
Course: Engineering Geophysics for external students [T-PHYS-103118]

Responsibility: Friedemann Wenzel

Contained in:
- [M-WIWI-101642] Natural Hazards and Risk Management 1
- [M-WIWI-101644] Natural Hazards and Risk Management 2

ECTS 4  Version 1
Course: Enterprise Architecture Management [T-WIWI-102668]

Responsibility: Thomas Wolf

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

ECTS: 5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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<td>WS 16/17</td>
<td>2511601</td>
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<td>Übung (Ü)</td>
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<td>Thomas Wolf</td>
</tr>
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</table>

Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Conditions
None

Event excerpt: Enterprise Architecture Management (WS 16/17)

Aim
Students understand the connection between enterprise strategy, business processes and business objects and IT architecture; they know methods to depict these connections and how they can be developed based on each other.

Content
The following topics will be covered: components of enterprise architecture, enterprise strategy including methods to develop strategies, business process (re)engineering, methods to implement changes within enterprises (management of change)

Literature
- Doppler, K., Lauterburg, Ch.: Change Management. Campus Verlag 1997
**Course: Entrepreneurial Leadership & Innovation Management [T-WIWI-102833]**

**Responsibility:** Carsten Linz, Orestis Terzidis

**Contained in:**
- [M-WIWI-101507] Innovation Management
- [M-WIWI-101488] Entrepreneurship (EnTechnon)

**ECTS** 3  
**Language** englisch  
**Recurrence** Jedes Wintersemester  
**Version** 1

### Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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<td>Entrepreneurial Leadership &amp; Innovation Management</td>
<td>Seminar (S)</td>
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</tr>
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</table>

### Learning Control / Examinations


**Conditions**

None

**Recommendations**

None

### Event excerpt: Entrepreneurial Leadership & Innovation Management (WS 16/17)

**Aim**
- Seize what determines entrepreneurial performance
- Identify entrepreneurial opportunities and evaluate them
- Develop and sharpen innovative business ideas
- Pitch a business idea in front of potential share-/stakeholders
- Lead new business growth by driving the enterprise evolution
- Effectively deal with critical challenges and overcome obstacles

**Content**

On campus the seminar combines foundational knowledge, real-world examples, and practical exercise/group work sessions.

**Workload**
- Time of attendance: 30 hours
- Studying at home: 30 hours
- Exam preparation: 30 hours
**Course: Entrepreneurship [T-WIWI-102864]**

**Responsibility:** Orestis Terzidis  
**Contained in:**  
- [M-WIWI-101507] Innovation Management  
- [M-WIWI-101488] Entrepreneurship (EnTechnon)

### Events

<table>
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<th>Term</th>
<th>Event-No.</th>
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</table>

### Learning Control / Examinations

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

### Conditions

None

### Recommendations

None

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### Event excerpt: Entrepreneurship Lecture (WS 16/17)

**Aim**  
Students are generally introduced to the topic of entrepreneurship. After successful completion of the lecture they should have an overview of the sub-areas of entrepreneurship and have to be able to understand basic concepts of entrepreneurship.

**Content**  
This lecture, as an obligatory part of the module “Entrepreneurship”, introduces basic concepts of entrepreneurship. It approaches the individual steps of dynamic corporate development. The focus here is the introduction to methods for generating innovative business ideas, the translation of patents into business concepts and general principles of financial planning.

Other topics are the design and use of service-oriented information systems for founders, technology management, business model generation and lean startup methods for the implementation of business ideas in the way of controlled experiments in the market.

In addition to the lectures the KIT Entrepreneurship Talks, where successful entrepreneurs share their experiences from the early stages of their companies, will be given. Dates and times will be announced in time on the EnTechnon website.

More details: [http://etm.entechnon.kit.edu/211.php](http://etm.entechnon.kit.edu/211.php)

**Workload**  
The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**  
Füglistaller, Urs, Müller, Christoph und Volery, Thierry (2008): Entrepreneurship  
Ries, Eric (2011): The Lean Startup  
Course: Entrepreneurship Research [T-WIWI-102894]

Responsibility: Orestis Terzidis

Contained in: [M-WIWI-101488] Entrepreneurship (EnTechnon)

<table>
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<table>
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<td>Mitarbeiter, Abilio Avila Albez, Jeanette Siegele</td>
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</table>

Learning Control / Examinations

The performance review is done via a so called other methods of performance review (term paper) (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)). The final grade is a result from both, the grade of the term paper and its presentation, as well as active participation during the seminar.

Conditions

None

Recommendations

None

Remarks

The topics will be prepared in groups. The presentation of the results is done during a a block period seminar at the end of the semester. Students have to be present all day long during the seminar.

Event excerpt: Entrepreneurship Research (SS 2017)

Aim

The students will work on a specific topic of Entrepreneurship Research. In their term paper, the chosen topic needs to be presented to scientific standards in written format on 15-20 pages. The results of the term paper will be presented during a block period seminar at the end of the semester (20 min presentation, 10 min discussion).

By writing the term paper, basic skills of autonomous scientific work, such as looking for literature, argumentation + discussion, citation and using qualitative, quantitative and simulative methods get trained. The term paper is therefore a preparation for the master thesis. For this reason the seminar is mainly for students that intend to write their master thesis at the Chair of Entrepreneurship and Technology Management.

Content

Content of the seminar is most recently discussed topics in the field of entrepreneurship. Topics and dates will be communicated online via the seminar portal.

Workload

The total workload for this course is approximately 90 hours. For further information see German version.

Literature

Will be announced during/prior to the seminar as this varies from topic to topic.
Course: Environmental and Ressource Policy [T-WIWI-102616]

Responsibility: Rainer Walz
Contained in: [M-WIWI-101468] Environmental Economics

<table>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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Events

<table>
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<th>Term</th>
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<td>2560548</td>
<td>Environmental and Ressource Policy</td>
<td>Vorlesung / Übung 2</td>
<td>2</td>
<td>Rainer Walz</td>
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</table>

Recommendations
It is recommended to already have knowledge in the area of industrial organization and economic policy. This knowledge may be acquired in the courses Introduction to Industrial Organization [2520371] and Economic Policy [2560280].

Event excerpt: Environmental and Ressource Policy (SS 2017)

Aim
See German version.

Content

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
Elective literature:
Michaelis, P.: Ökonomische Instrumente in der Umweltpolitik. Eine anwendungsorientierte Einführung, Heidelberg
OECD: Environmental Performance Review Germany, Paris
Course: Environmental Aspects of Guided Transport Systems [T-BGU-101825]

Responsibility: Eberhard Hohnecker

Contained in:
- [M-BGU-101113] Project in Public Transportation
- [M-BGU-101111] Public Transportation Operations

ECTS 3  Language deutsch  Recurrence Jedes Wintersemester  Version 1

Events

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<td>6234901</td>
<td>Environmental Aspects of Guided Transport Systems</td>
<td>Vorlesung (V)</td>
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<td>Eberhard Hohnecker</td>
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</table>

Conditions
None

Recommendations
None

Remarks
None


Aim
Die Studierenden können die wesentlichen umweltrelevanten Aspekte des Schienenverkehrs beschreiben, strukturieren und an konkreten Beispielen verdeutlichen.

Content
- Basics of Environmental Protection
- Human Medical Influences through Noise
- Basics and Systems of Active and Passive Noise Control
- Sound Calculation (Schall 03)
- Customer Focus

Literature
Aberle: Transportwirtschaft, Oldenbourg-Verlag
Kunz: Eisenbahnrecht, Nomos, Baden-Baden
Course: Environmental Communication [T-BGU-101676]

Responsibility: Charlotte Kämpf
Contained in: [M-WIWI-101642] Natural Hazards and Risk Management 1
[M-WIWI-101644] Natural Hazards and Risk Management 2

ECTS: 4
Recurrence: Jedes Wintersemester
Version: 2

Events

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<td>Charlotte Kämpf</td>
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<td>SS 2017</td>
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<td>Charlotte Kämpf</td>
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Learning Control / Examinations
Non exam assessment (following §4(2), 3 of the examination regulation).

Conditions
 Examination Prerequisite Environmental Communication must be passed.

Modeled Conditions
The following conditions must be met:
- The course [T-BGU-106620] Examination Prerequisite Environmental Communication must have been passed.

Recommendations
None

Remarks
None
Course: Environmental Economics and Sustainability [T-WIWI-102615]

Responsibility: Rainer Walz

Contained in: [M-WIWI-101468] Environmental Economics

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<td>Vorlesung / Übung 2</td>
<td>Rainer Walz</td>
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Learning Control / Examinations
See German version

Conditions
None

Recommendations
It is recommended to already have knowledge in the area of macro- and microeconomics. This knowledge may be acquired in the courses Economics I: Microeconomics [2600012] and Economics II: Macroeconomics [2600014].

Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
Course: Environmental Law [T-INFO-101348]

Responsibility: Matthias Bäcker
Contained in: [M-WIWI-101468] Environmental Economics
[M-INFO-101217] Public Business Law

ECTS: 3  Language: deutsch  Recurrence: Jedes Semester  Version: 1

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<td>24140</td>
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<td>Nikolaus Marsch</td>
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Event excerpt: (WS 16/17)

Aim
Das Umweltrecht ist eine vielseitige Materie, die Unternehmensführung vielseitig beeinflusst. Studenten sollen ein Gespür für die vielen Facetten des Umweltrechts und seiner Instrumente erhalten. Neben klassischen rechtlichen Instrumenten wie Genehmigung sollen sie daher auch ökonomisch geprägte Instrumente wie Informationsgewinnung und -verbreitung oder Handel mit Zertifikaten kennenlernen.


Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 120 Stunden (4.0 Credits).

Literature
Wird in der Veranstaltung bekannt gegeben.

Weiterführende Literatur
Wird in der Veranstaltung bekannt gegeben.
Course: Environmental Management [T-BGU-106682]

Responsibility: Stephan Fuchs

Contained in: [M-BGU-103308] Environmental Management

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<td>SS 2017</td>
<td>6223813</td>
<td>Seminar (S)</td>
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<td>Stephan Fuchs, Stephan Hilgert</td>
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<td>SS 2017</td>
<td>6223812</td>
<td>Vorlesung (V)</td>
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<td>Stephan Fuchs</td>
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Learning Control / Examinations
oral exam (ER/SPO § 4 par. 2 no. 2), appr. 30 min.

Conditions
none
Course: European and International Law [T-INFO-101312]

Responsibility: Matthias Bäcker
Contained in: [M-INFO-101217] Public Business Law

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Event excerpt: (SS 2017)

Aim

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

Literature
Literatur wird in der Vorlesung angegeben.

Weiterführende Literatur
Erweiterte Literaturangaben werden in der Vorlesung bekannt gegeben.
Course: Examination Prerequisite Environmental Communication [T-BGU-106620]

Responsibility: Charlotte Kämpf

Contained in:
- [M-WIWI-101642] Natural Hazards and Risk Management 1
- [M-WIWI-101644] Natural Hazards and Risk Management 2

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### Events

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### Conditions
None

### Recommendations
None

### Remarks
None
Course: Exchanges [T-WIWI-102625]

Responsibility: Jörg Franke

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

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</table>

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Event excerpt: Exchanges (SS 2017)

Aim
Students are in a position to discuss and evaluate current developments regarding the organisation of exchanges and securities trading.

Content
- Organisation of exchanges: Changing Zeitgeist - Corporates instead of cooparative structures
- Market models: order driven vs. market maker - Liquidity provision for less frequently traded securities
- Trading systems: The end of an era? - No more need for running traders?
- Clearing: Diversity instead of uniformity - Safety for all?
- Settlement: Increasing importance - Does efficient settlement assure the “value added” of exchanges in the long run?

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

Literature
Elective literature:
Educational material will be offered within the lecture.
Event excerpt: Commercial and Corporate Law (WS 16/17)

Aim

1. The student knows the peculiarities of trade transactions, the trade law representation and the merchant law. He/she has deepened his/her knowledge about the corporate forms, which the German company law provides for entrepreneurial activities. He/she is familiar with the law of person-centered companies (foundation, entry, dissolution, corporate governance). He/she knows the peculiarities of GmbH and GmbH & Co.KG as well as the AG.

Content

The lecture begins with an introduction to the merchant concepts of the Commercial Code. Then, the firm law, the commercial register law and the trade law representation are discussed. Afterwards, general provisions on trade transactions and special trade transactions are followed. In the company law, the basics of person-centered companies are explained. Afterwards, a concentration on the capital company law, which dominates the practice, is given.

Workload

The total work load for this learning unit amounts to around 90 hours, 22.5 hours of participation, 45 hours of pre- and post-preparation time and 22.5 hours of preparation for the examination.

\begin{tabular}{lll}
\hline
Aktivität & Arbeitsaufwand & \hline
Besuch der Vorlesung & 15 x 90min & 22h 30m \\
\hline
\end{tabular}

Literature

Klunzinger, Eugen

Weiterführende Literatur
Wird in der Vorlesung bekannt gegeben.

Event excerpt: Advanced Civil Law (SS 2017)

Aim
Der/die Studierende hat vertiefte Kenntnisse des allgemeinen und des besonderen Schuldrechts sowie des Sachenrechts. Er/sie kennt die gesetzlichen Grundregelungen von Leistungsort und Leistungszeit einschließlich der Modalitäten der Leistungsabwicklung sowie die gesetzliche Regelung des Rechts der Leistungsstörungen (Unmöglichkeit, Nichtleistung, verspätete Leistung, Schlechtleistung). Der/die Studierende ist vertraut mit den Grundzügen der gesetzlichen Vertragstypen und der Verschulden- wie auch der Gefährdungshaftung. Der/die Studierende kann aus dem Sachenrecht die unterschiedlichen Arten der Übereignung unterscheiden und hat einen Überblick über die dinglichen Sicherungsrechte

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden, davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

\begin{tabular}{l|c|r}
\hline
Aktivität & Arbeitsaufwand \\
\hline
Präsenzzeit & \begin{tabular}{c}
Besuch der Vorlesung & 15 x 90min & 22h 30m \\
Vor- / Nachbereitung der Vorlesung & 15 x 120min & 30h 00m \\
Skript 2x wiederholen & 2 x 10h & 20h 00m \\
Prüfung vorbereiten & & 17h 30m \\
\end{tabular} \\
\hline
Summe & 90h 00m \\
\hline
\end{tabular}
\caption{Arbeitsaufwand für die Lerneinheit "BGB für Fortgeschrittene"}

Literature
Wird in der Vorlesung bekannt gegeben.

Event excerpt: Exercises in Civil Law (SS 2017)

Aim
Der/die Studierende hat vertiefte Kenntnisse in der juristischen Falllösungstechnik (Anspruchsaufbau, Gutachtenstil, Subsumtion). Er/sie ist in der Lage, juristische Problemfälle der Praxis mit juristischen Mitteln methodisch sauber zu lösen.

Content
In 5 Übungsterminen wird der Stoff der Veranstaltungen “BGB für Fortgeschrittene” und “Handels- und Gesellschaftsrecht” wiederholt und die juristische Falllösungsmethode vertiefend eingeübt. Weiterhin werden im Rahmen der Übung 5
Klausuren geschrieben, die sich über den gesamten bisher im Privatrecht erlernten Stoff erstrecken. Weitere Termine sind für die Klausurrückgabe und die Besprechungen der einzelnen Klausuren reserviert.

**Workload**

Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden, davon 22,5 h Präsenz und 67,5 h Klausurvor- und nachbereitungszeit.

\[\begin{tabular}{|l|c|}
\hline
Aktivität & Arbeitsaufwand \\
\hline
\textit{Präsenzzeit} & \\
Besuch der Vorlesung (darin 5 Klausuren) & 15 x 90min & 22h 30m \\
\hline
Vor- / Nachbereitung der Vorlesung & 15 x 120min & 30h 00m \\
Skript 2x wiederholen & 2 x 10h & 20h 00m \\
Prüfung vorbereiten & 17h 30m \\
\hline
Summe & 90h 00m \\
\hline
\end{tabular}\]
**Course: Experimental Economics [T-WIWI-102614]**

**Responsibility:** Timm Teubner, Christof Weinhardt

**Contained in:**
- [M-WIWI-103118] Data Science: Data-Driven User Modeling
- [M-WIWI-101453] Applied Strategic Decisions
- [M-WIWI-101505] Experimental Economics

**ECTS** 4.5  
**Language** deutsch  
**Recurrence** Jedes Wintersemester  
**Version** 1

**Events**

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<th>Term</th>
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<td>Verena Dorner, Jella Pfeiffer, Timm Teubner</td>
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<tr>
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<td>Übung (U)</td>
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<td>Verena Dorner, Jella Pfeiffer, Timm Teubner</td>
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</table>

**Learning Control / Examinations**

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

**Conditions**

None

**Event excerpt: Experimental Economics (WS 16/17)**

**Aim**

The students should learn

- how to gain scientific experience and knowledge (philosophy of science),
- how Game Theory and Experimental Economics influenced each other in scientific research,
- about the methods as well as the strengths and weaknesses of Experimental Economics,
- some examples of experimental research, such as markets and auctions, coordination games, bargaining, decision making under risk,
- how to evaluate data.

**Content**

Experimental Economics have become a separate field in Economics. Nearly all fields of the economic discipline use economic experiments to verify theoretical results. Besides being used for empirical validation, this method is applied in political and strategic consulting. The lecture gives an introduction to experimental methods in economics and shows differences to experiments in natural sciences. Scientific studies are used to show exemplary applications.

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.
- Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.
Course: Experimental Lab Class in Welding Technology, in Groups [T-MACH-102099]

Responsibility: Jürgen Hoffmeister

Contained in: [M-MACH-101268] Specific Topics in Materials Science

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<td>Praktikum (P)</td>
<td>3</td>
<td>Stefan Dietrich,</td>
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<td></td>
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<td>Volker Schulze</td>
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</table>

Learning Control / Examinations
Certificate to be issued after evaluation of the lab class report

Conditions
Certificate of attendance for Welding technique

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105170] Welding Technology must have been passed.

Event excerpt: Welding Lab Course, in groups (WS 16/17)

Aim
The students are capable to name a survey of current welding processes and their suitability for joining different metals. The students can evaluate the advantages and disadvantages of the individual procedures. The students have weld with different welding processes.

Content
Gas welding of steels with different weld geometries

Gas welding of cast iron, nonferrous metals

Brazing of aluminum

Electric arc welding with different weld geometries

Gas welding according to the TIG, MIG and MAG procedures

Workload
regular attendance: 31,5 hours
preparation: 8,5 hours
lab report: 80 hours

Literature
distributed during the lab attendance
Course: Fabrication Processes in Microsystem Technology [T-MACH-102166]

Responsibility: Klaus Bade

Contained in: [M-MACH-101295] Optoelectronics and Optical Communication
[M-MACH-101291] Microfabrication

ECTS 3 Language deutsch Recurrence Jedes Semester Version 1

Events

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<td>Fabrication Processes in Microsystem Tech-</td>
<td>Vorlesung (V)</td>
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Learning Control / Examinations
Oral examination, 20 minutes

Conditions
none

Event excerpt: Fabrication Processes in Microsystem Technology (SS 2017)

Aim
The student
- collects advanced knowledge
- understands process conditions and process layout
- gains interdisciplinary knowledge (chemistry, manufacturing, physics)

Content
The lecture offers an advanced understanding of manufacturing processes in microsystem technology. Basic aspects of microtechnological processing will be introduced. With examples from semiconductor microfabrication and microsystem technology the base processing steps for conditioning and finishing, patterning, removal are imparted. Nano-patterning is covered is also included and the micro-nano interface is discussed. By the help of typical processing steps elementary mechanisms, process execution, and equipment are explained. Additionally quality control, process control and environmental topics are included

Workload
Präsenszeit: 24 Stunden
Vor- /Nachbereitung: 24 Stunden
Prüfung und Prüfungsvorbereitung: 30 Stunden

Literature
M. Madou
Fundamentals of Microfabrication
CRC Press, Boca Raton, 1997
W. Menz, J. Mohr, O. Paul
Mikrosystemtechnik für Ingenieure
Dritte Auflage, Wiley-VCH, Weinheim 2005
L.F. Thompson, C.G. Willson, A.J. Bowden
Introduction to Microlithography
Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

Responsibility: Stefan Nickel


ECTS Language Recurrence Version
4,5 deutsch Jedes Wintersemester 2

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
</tr>
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<tr>
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<td>2550487</td>
<td>Facility Location and Strategic Supply</td>
<td>Übung (Ü)</td>
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<td>Chain Management</td>
<td>Vorlesung (V)</td>
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<td>Stefan Nickel</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (120 min) according to Section 4 (2), 1 of the examination regulation. The exam takes place in every semester.
Prerequisite for admission to examination is the successful completion of the online assessments.

Conditions
Prerequisite for admission to examination is the successful completion of the online assessments.

Recommendations
None

Remarks
The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

Event excerpt: Facility Location and Strategic Supply Chain Management (WS 16/17)

Aim
The student

- knows and describes basic quantitative methods in location planning in the context of strategic Supply Chain Planning,
- applies several criteria for the evaluation of the locations of facilities in the context of classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models),
- implements the considered models in practical problems.

Content
Since the classical work “Theory of the Location of Industries” of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.
Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
Course: Failure of Structural Materials: Deformation and Fracture [T-MACH-102140]

Responsibility: Peter Gumbsch, Oliver Kraft, Daniel Weygand

Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS 4
Language deutsch
Recurrence Jedes Wintersemester
Version 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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<tr>
<td>WS 16/17</td>
<td>2181711</td>
<td>Failure of structural materials: deformation and fracture</td>
<td>Vorlesung / Übung 3 (VÜ)</td>
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<td>Peter Gumbsch, Daniel Weygand</td>
</tr>
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</table>

Learning Control / Examinations
oral exam

Conditions none

Event excerpt: Failure of structural materials: deformation and fracture (WS 16/17)

Aim
The student
- has the basic understanding of mechanical processes to explain the relationship between externally applied load and materials strength.
- can explain the foundation of linear elastic fracture mechanics and is able to determine if this concept can be applied to a failure by fracture.
- can describe the main empirical materials models for deformation and fracture and can apply them.
- has the physical understanding to describe and explain phenomena of failure.

Content
1. Introduction
2. linear elasticity
3. classification of stresses
4. Failure due to plasticity
   - tensile test
   - dislocations
   - hardening mechanisms
   - guidelines for dimensioning
5. composite materials
6. fracture mechanics
   - hypotheses for failure
   - linear elastic fracture mechanics
   - crack resistance
   - experimental measurement of fracture toughness
   - defect measurement
   - crack propagation
   - application of fracture mechanics
   - atomistics of fracture

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours
Literature

- *Bruchvorgänge in metallischen Werkstoffen*, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relatively simple but yet comprehensive overview of metallic materials
### Course: Failure of Structural Materials: Fatigue and Creep [T-MACH-102139]

**Responsibility:** Patric Gruber, Peter Gumbsch, Oliver Kraft  
**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

<table>
<thead>
<tr>
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<th>Language</th>
<th>Recurrence</th>
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#### Events

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</tbody>
</table>

#### Learning Control / Examinations

- **oral exam**

#### Conditions

- **none**

### Event excerpt: Failure of Structural Materials: Fatigue and Creep (WS 16/17)

#### Aim

The student

- has the basic understanding of mechanical processes to explain the relationships between externally applied load and materials strength.
- can describe the main empirical materials models for fatigue and creep and can apply them.
- has the physical understanding to describe and explain phenomena of failure.
- can use statistical approaches for reliability predictions.
- can use its acquired skills, to select and develop materials for specific applications.

#### Content

1 Fatigue  
1.1 Introduction  
1.2 Statistical Aspects  
1.3 Lifetime  
1.4 Fatigue Mechanisms  
1.5 Material Selection  
1.6 Thermomechanical Loading  
1.7 Notches and Shape Optimization  
1.8 Case Study: ICE-Desaster

2 Creep  
2.1 Introduction  
2.2 High Temperature Plasticity  
2.3 Phänomenological Description of Creep  
2.4 Creep Mechanisms  
2.5 Alloying Effects

#### Workload

- regular attendance: 22.5 hours  
- self-study: 97.5 hours

#### Literature

Industrial Engineering and Management (M.Sc.)  
Date 05/17/2017  

389
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relatively simple but yet comprehensive overview of metallic materials
- Fatigue of Materials, Subra Suresh (2nd Edition, Cambridge University Press); standard work on fatigue, all classes of materials, extensive, for beginners and advanced student
**Course: Field Training Water Quality [T-BGU-106668]**

**Responsibility:** Stephan Fuchs, Stephan Hilgert  
**Contained in:** [M-BGU-103308] Environmental Management

### Events

<table>
<thead>
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<th>Term</th>
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<td>Stephan Hilgert</td>
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**Learning Control / Examinations**  
attested learning control (SPO/ER § 4 par. 3), report on field training, appr. 8-15 pages

**Conditions**  
The “Teilleistung” Water Ecology (T-BGU-106602, seminar paper with presentation) has to be begun, i.e. at least the registration has to be made.

**Modeled Conditions**  
The following conditions must be met:

- The course [T-BGU-106682] *Environmental Management* must have been started.

**Recommendations**

none

**Remarks**

none
Course: Field Training Water Quality [T-BGU-101089]

Responsibility: Stephan Fuchs
Contained in: [M-BGU-101000] Environmental Management

ECTS 3  Version 1

Conditions
none
Course: Financial Analysis [T-WIWI-102900]

Responsibility: Torsten Luedecke

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

<table>
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<th>Recurrence</th>
<th>Version</th>
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<td>Torsten Luedecke</td>
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Learning Control / Examinations
See German version.

Conditions
None

Recommendations
Basic knowledge in corporate finance, accounting, and valuation is required.

V Event excerpt: (SS 2017)

Content
This course aims at providing students with the understanding of the purposes of alternative costing systems as well as the use of relevant information for decision making. The course will also examine techniques for the purpose of cost management and accounting for control.

Literature
Elective Literature

Course: Financial Econometrics [T-WIWI-103064]

Responsibility: Melanie Schienle

Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

<table>
<thead>
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<th>Recurrence</th>
<th>Version</th>
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<td>Jedes Wintersemester</td>
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Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

Remarks
The course is offered in summer term 2016, in winter term 2017/18 and afterwards every second term
Course: Financial Intermediation [T-WIWI-102623]

Responsibility: Martin Ruckes

Contained in:
- [M-WIWI-101480] Finance 3
- [M-WIWI-101483] Finance 2
- [M-WIWI-101502] Economic Theory and its Application in Finance
- [M-WIWI-101453] Applied Strategic Decisions

ECTS: 4.5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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<th>Type</th>
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<th>Lecturers</th>
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<td>Daniel Hoang, Martin Ruckes</td>
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<td>WS 16/17</td>
<td>2530232</td>
<td>Financial Intermediation</td>
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<td>Martin Ruckes</td>
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Learning Control / Examinations
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins. The exam is offered each semester.

Conditions
None

Recommendations
None

Event excerpt: Financial Intermediation (WS 16/17)

Aim
Students
- are in a position to describe the arguments for the existence of financial intermediaries,
- are able to discuss and analyze both static and dynamic aspects of contractual relationships between banks and borrowers,
- are able to discuss the macroeconomic role of the banking system,
- are in a position to explain the fundamental principles of the prudential regulation of banks and are able to recognize and evaluate the implications of specific regulations.

Content
- Arguments for the existence of financial intermediaries
- Bank loan analysis, relationship lending
- Stability of the financial system
- The macroeconomic role of financial intermediation
- Principles of the prudential regulation of banks

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:
**Course: Fixed Income Securities [T-WIWI-102644]**

**Responsibility:** Marliese Uhrig-Homburg  
**Contained in:** [M-WIWI-101480] Finance 3  
[M-WIWI-101483] Finance 2

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<td>Jedes Wintersemester</td>
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**Events**

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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**Learning Control / Examinations**
The assessment consists of a written exam following §4, Abs. 2, 1.

**Conditions**
None

**Recommendations**
See German version.

**Event excerpt: Fixed Income Securities (WS 16/17)**

**Aim**
The objective of this course is to become familiar with national and international bond markets. Therefore, we first have a look at financial instruments that are of particular importance. Thereafter, specific models and methods that allow the evaluation of interest rate derivatives are introduced and applied.

**Content**
The lecture deals with both German and international bond markets, which are an important source of funding for both the corporate and the public sector. After an overview of the most important bond markets, various definitions of return are discussed. Based on that, the concept of the yield curve is presented. The modelling of the dynamics of the term structure of interest rates provides the theoretical foundation for the valuation of interest rate derivatives, which is discussed in the last part of the lecture.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

**Elective literature:**
Course: Fluid Power Systems [T-MACH-102093]

Responsibility: Marcus Geimer, Stefan Haug, Martin Scherer

Contained in: [M-MACH-101266] Automotive Engineering
[M-MACH-101267] Mobile Machines

<table>
<thead>
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<th>ECTS</th>
<th>Language</th>
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<th>Version</th>
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Events

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<th>Event-No.</th>
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<th>Type</th>
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<th>Lecturers</th>
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<td>Fluid Technology</td>
<td>Vorlesung (V)</td>
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<td>Lars Brinkschulte, Marcus Geimer, Martin Scherer</td>
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Learning Control / Examinations

The assessment consists of a written exam (90 minutes) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
none

Event excerpt: Fluid Technology (WS 16/17)

Aim
The students will be able to

- know and understand physical principles of fluid power systems
- know the current components and their operating mode
- know the advantages and disadvantages of different components
- dimension the components for a given purpose
- calculate simple systems

Content
In the range of hydrostatics the following topics will be introduced:

- Hydraulic fluids
- Pumps and motors
- Valves
- Accessories
- Hydraulic circuits.

In the range of pneumatics the following topics will be introduced:

- Compressors
- Motors
- Valves
- Pneumatic circuits.

Workload
- regular attendance: 21 hours
- self-study: 92 hours

Literature
Scritum for the lecture Fluidtechnik
Institute of Vehicle System Technology
downloadable
Course: Foundry Technology [T-MACH-105157]

Responsibility: Christian Wilhelm

Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS: 4  Language: deutsch  Recurrence: Jedes Sommersemester  Version: 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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<th>Lecturers</th>
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</table>

Learning Control / Examinations

oral

duration: 20 - 30 minutes

no notes

Event excerpt: Foundry Technology (SS 2017)

Aim
The students know the specific moulding and casting techniques and are able to describe them in detail. The students know the application of moulding and casting techniques concerning castings and metals, their advantages and disadvantages in comparison, their application limits and are able to describe these in detail. The students know the applied metals and are able to describe advantages and disadvantages as well as the specific range of use. The students are able to describe detailed mould and core materials, technologies, their application focus and mould-affected casting defects. The students know the basics of casting process of any casting parts concerning the above mentioned criteria and are able to describe detailed.

Content
Moulding and casting processes
Solidifying of melts
Castability
Fe-Alloys
Non-Fe-Alloys
Moulding and additive materials
Core production
Sand reclamation
Feeding technology
Design in casting technology
Casting simulation
Foundry Processes

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Reference to literature, documentation and partial lecture notes given in lecture
**Course: Freight Transport [T-BGU-106611]**

**Responsibility:** Bastian Chlond

**Contained in:**
- [M-BGU-101065] Transportation Modelling and Traffic Management
- [M-BGU-101064] Fundamentals of Transportation
- [M-BGU-101111] Public Transportation Operations

<table>
<thead>
<tr>
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<th>Recurrence</th>
<th>Version</th>
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<tbody>
<tr>
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**Events**

<table>
<thead>
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**Conditions**

None

**Recommendations**

None

**Remarks**

None
Course: Fuels and Lubricants for Combustion Engines [T-MACH-105184]

Responsibility: Bernhard Kehrwald

Contained in: [M-MACH-101303] Combustion Engines II

<table>
<thead>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<tr>
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<td>Vorlesung (V)</td>
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**Learning Control / Examinations**
oral examination, Duration: ca. 25 min., no auxiliary means

**Conditions**
none

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Event excerpt: Fuels and Lubricants for Combustion Engines (WS 16/17)

**Aim**
The students can name and explain composition and meaning of fuels, lubricants and coolants as important components in the system of today's Otto and Diesel engines as well as definition and chemical composition of fuels and lubricants, the meaning of crude oil as basic primary product, production processes, major properties, standards and specifications, testing methods.

They can point out future worldwide trends in the field of conventional and alternative fuels regarding emission standards and energy conservation.

**Content**
Introduction and basics

- Fuels for Gasoline and Diesel engines

- Hydrogen

- Lubricants for Gasoline and Diesel engines

- Coolants for combustion engines

**Workload**
regular attendance: 24 hours
self-study: 96 hours

**Literature**
Lecturer notes
**Course: Fundamentals for Design of Motor-Vehicle Bodies I [T-MACH-102116]**

**Responsibility:** Horst Dietmar Bardehle  
**Contained in:** [M-MACH-101266] Automotive Engineering

<table>
<thead>
<tr>
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<td>Horst Dietmar Bardehle</td>
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**Learning Control / Examinations**

Oral group examination

Duration: 30 minutes

Auxiliary means: none

**Conditions**

none

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**Event excerpt: Fundamentals for Design of Motor-Vehicles Bodies I (WS 16/17)**

**Aim**

The students have an overview of the fundamental possibilities for design and manufacture of motor-vehicle bodies. They know the complete process, from the first idea, through the concept to the dimensioned drawings (e.g. with FE-methods). They have knowledge about the fundamentals and their correlations, to be able to analyze and to judge relating components as well as to develop them accordingly.

**Content**

1. History and design

2. Aerodynamics

3. Design methods (CAD/CAM, FEM)

4. Manufacturing methods of body parts

5. Fastening technology

6. Body in white / body production, body surface

**Workload**

regular attendance: 10.5 hours  
self-study: 49.5 hours
Literature
1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg
Course: Fundamentals for Design of Motor-Vehicle Bodies II [T-MACH-102119]

Responsibility: Horst Dietmar Bardehle
Contained in: [M-MACH-101266] Automotive Engineering

<table>
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<th>Recurrence</th>
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<td>SS 2017</td>
<td>2114840</td>
<td>Fundamentals for Design of Motor-Vehicles Bodies II</td>
<td>Vorlesung (V)</td>
<td>1</td>
<td>Horst Dietmar Bardehle</td>
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</table>

Learning Control / Examinations

Oral group examination

Duration: 30 minutes

Auxiliary means: none

Conditions
none

Event excerpt: Fundamentals for Design of Motor-Vehicles Bodies II (SS 2017)

Aim
The students know that, often the design of seemingly simple detail components can result in the solution of complex problems. They have knowledge in testing procedures of body properties. They have an overview of body parts such as bumpers, window lift mechanism and seats. They understand, as well as, parallel to the normal electrical system, about the electronic side of a motor vehicle. Based on this they are ready to analyze and to judge the relation of these single components. They are also able to contribute competently to complex development tasks by imparted knowledge in project management.

Content
1. Body properties/testing procedures

2. External body-parts

3. Interior trim

4. Compartment air conditioning

5. Electric and electronic features

6. Crash tests

7. Project management aspects, future prospects
**Workload**
regular attendance: 10.5 hours
self-study: 49.5 hours

**Literature**
1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg
Course: Fundamentals in the Development of Commercial Vehicles I [T-MACH-105160]

Responsibility: Jörg Zürn

Contained in: [M-MACH-101265] Vehicle Development
[M-MACH-101267] Mobile Machines

ECTS 1.5
Language deutsch
Recurrence Jedes Wintersemester
Version 1

Events

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<td>2113812</td>
<td>Fundamentals in the Development of Commercial Vehicles I</td>
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<td>Jörg Zürn</td>
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Learning Control / Examinations

Oral group examination

Duration: 30 minutes

Auxiliary means: none

Conditions none

Event excerpt: Fundamentals in the Development of Commercial Vehicles I (WS 16/17)

Aim

The students have proper knowledge about the process of commercial vehicle development starting from the concept and the underlying original idea to the real design. They know that the customer requirements, the technical realisability, the functionality and the economy are important drivers.

The students are able to develop parts and components. Furthermore they have knowledge about different cab concepts, the interior and the interior design process. Consequently they are ready to analyze and to judge concepts of commercial vehicles as well as to participate competently in the commercial vehicle development.

Content

1. Introduction, definitions, history
2. Development tools
3. Complete vehicle
4. Cab, bodyshell work
5. Cab, interior fitting
6. Alternative drive systems
7. Drive train
8. Drive system diesel engine
9. Intercooled diesel engines

Workload

regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

Course: Fundamentals in the Development of Commercial Vehicles II [T-MACH-105161]

Responsibility: Jörg Zürn

Contained in: [M-MACH-101265] Vehicle Development
[M-MACH-101267] Mobile Machines

ECTS: 1,5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

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Learning Control / Examinations

Oral group examination

Duration: 30 minutes

Auxiliary means: none

Conditions
none


Aim
The students know the advantages and disadvantages of different drives. Furthermore they are familiar with components, such as transfer box, propeller shaft, powered and non-powered frontaxle etc. Beside other mechanical components, such as chassis, axle suspension and braking system, also electric and electronic systems are known. Consequently the student are able to analyze and to judge the general concepts as well as to adjust them precisely with the area of application.

Content
1. Gear boxes of commercial vehicles
2. Intermediate elements of the drive train
3. Axle systems
4. Front axles and driving dynamics
5. Chassis and axle suspension
6. Braking System
7. Systems
8. Excursion

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

**Course: Fundamentals of Automobile Development I [T-MACH-105162]**

**Responsibility:** Rolf Frech  
**Contained in:** [M-MACH-101265] Vehicle Development

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**Learning Control / Examinations**

Written examination

- **Duration:** 90 minutes
- **Auxiliary means:** none
- **Conditions:** none

**Event excerpt: Fundamentals of Automobile Development I (WS 16/17)**

**Aim**

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

**Content**

1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

**Workload**

- regular attendance: 10,5 hours
- self-study: 49,5 hours

**Literature**

The scriptum will be provided during the first lessons
Course: Fundamentals of Automobile Development II [T-MACH-105163]

Responsibility: Rolf Frech

Contained in: [M-MACH-101265] Vehicle Development

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Learning Control / Examinations

Written examination

Duration: 90 minutes

Auxiliary means: none

Conditions
none

Event excerpt: Fundamentals of Automobile Development II (SS 2017)

Aim
The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

Content
1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature
The scriptum will be provided during the first lessons.
Course: Fundamentals of Catalytic Exhaust Gas Aftertreatment [T-MACH-105044]

Responsibility: Egbert Lox

Contained in: [M-MACH-101303] Combustion Engines II

ECTS 4  Language deutsch  Recurrence Jedes Sommersemester  Version 1

Events

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<td>2134138</td>
<td>Fundamentals of catalytic exhaust gas aftertreatment</td>
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<td>Olaf Deutschmann, Jan-Dierk Grunwaldt, Egbert Lox</td>
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Learning Control / Examinations
oral examination, Duration: 25 min., no auxiliary means

Conditions
none

Event excerpt: Fundamentals of catalytic exhaust gas aftertreatment (SS 2017)

Aim
The students can name and explain the scientific fundamentals of the catalytic exhaust gas aftertreatment, as well as the technical, political and economical parameters of its application in engines for passenger cars and HD vehicles.

The students are able to point out and explain which emissions are formed in combustion engines, why these emissions are health-related critical and which measures the legislator has established to reduce the emissions.

Content
1. kind and source of emissions
2. emission legislation
3. principal of catalytic exhaust gas aftertreatment (EGA)
4. EGA at stoichiometric gasoline engines
5. EGA at gasoline engines with lean mixtures
6. EGA at diesel engines
7. economical basic conditions for catalytic EGA

Workload
regular attendance: 36 hours
self-study: 84 hours

Literature
Lecture notes available in the lectures

Course: Fundamentals of X-Ray Optics I [T-MACH-105186]

Responsibility: Arndt Last

Contained in: [M-MACH-101291] Microfabrication
[M-MACH-101292] Microoptics

ECTS 3 Language deutsch Recurrence Jedes Wintersemester Version 1

Events

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<td>X-ray Optics</td>
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<td>SS 2017</td>
<td>2141007</td>
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<td>Vorlesung (V)</td>
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Learning Control / Examinations
oral examination

Conditions
none

Event excerpt: X-ray Optics (WS 16/17)

Aim
The lecture will enable the students to judge capabilities of different X-ray optical imaging methods and instrumentation and to select suitable methods for a given task.

Content
The lecture covers general principles of optics as well as basics, functioning and application of reflective, refractive and diffractive X-ray optical elements and systems. Selected X-ray analytical imaging methods and the necessary optical elements are discussed including their potentials and limitations.

Workload
lecture times plus assignment to review

Literature
M. Born und E. Wolf
Principles of Optics, 7th (expanded) edition
Cambridge University Press, 2010
A. Erko, M. Idir, T. Krist und A. G. Michette
Modern Developments in X-Ray and Neutron Optics
Springer Series in Optical Sciences, Vol. 137
Springer-Verlag Berlin Heidelberg, 2008
D. Attwood
Soft X-Rays and Extreme Ultraviolet Radiation: Principles and Applications
Cambridge University Press, 1999
Course: Fundamentals of X-Ray Optics II [T-MACH-102174]

Responsibility: Arndt Last
Contained in: [M-MACH-101292] Microoptics

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<td>X-ray Optics</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Arndt Last</td>
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Learning Control / Examinations
The assessment will consist of an oral exam (30 min) (following §4 (2), 2 of the examination regulation).

Conditions
Fundamentals of X-ray optics I [2142007] must be examined beforehand.

Modeled Conditions
The following conditions must be met:
- The course [T-MACH-105186] Fundamentals of X-Ray Optics I must have been passed.

Event excerpt: X-ray Optics (WS 16/17)

Aim
The lecture will enable the students to judge capabilities of different X-ray optical imaging methods and instrumentation and to select suitable methods for a given task.

Content
The lecture covers general principles of optics as well as basics, functioning and application of reflective, refractive and diffractive X-ray optical elements and systems. Selected X-ray analytical imaging methods and the necessary optical elements are discussed including their potentials and limitations.

Workload
lecture times plus assignment to review

Literature
M. Born und E. Wolf
Principles of Optics, 7th (expanded) edition
Cambridge University Press, 2010
A. Erko, M. Idir, T. Krist und A. G. Michette
Modern Developments in X-Ray and Neutron Optics
Springer Series in Optical Sciences, Vol. 137
Springer-Verlag Berlin Heidelberg, 2008
D. Attwood
Soft X-Rays and Extreme Ultraviolet Radiation: Principles and Applications
Cambridge University Press, 1999
Course: Gas Engines [T-MACH-102197]

Responsibility: Rainer Golloch

Contained in: [M-MACH-101303] Combustion Engines II

ECTS: 4

Recurrence: Jedes Sommersemester

Version: 1

Learning Control / Examinations
Oral examination, duration 25 min., no auxiliary means

Conditions
none
**Course: Gas-Markets [T-WIWI-102692]**

**Responsibility:** Andrej Marko Pustisek

**Contained in:** [M-WIWI-101451] Energy Economics and Energy Markets

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**Events**

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<td>2581022</td>
<td>Gas-Markets</td>
<td>Vorlesung (V)</td>
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<td>Andrej Marko Pustisek</td>
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**Learning Control / Examinations**

The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

**Conditions**

None

**Recommendations**

None

**V Event excerpt: Gas-Markets (WS 16/17)**

**Aim**

- Technical and economic principles of the natural gas industry
- Assessment of natural gas as energetic source
- Classification and assessment of the natural gas industry in a political and economic context
- Assessment of decisions, actions taken and consequences thereof in the natural gas industry
- Recognition, assessment and valuation of interdependencies between different energy markets
- Development of a qualified market view for natural gas markets

**Content**

- Introduction and principles
  - Definition and composition of natural gas
  - Main physical parameters of natural gas
  - The natural gas value chain and its interdependencies to other fuels

- Natural gas markets
  - Brief overview of sources and production (incl. shale gas)
  - Worldwide reserves of natural gas
  - Worldwide and European natural gas production and consumption
  - Natural gas market structure in Europe and Germany (incl. the role of hubs)
  - European and German energy (esp. natural gas) prices and their development
  - Parameters not harmonized in European natural gas markets and consequences thereof

- Natural gas (commodity) contracts
  - The impact of the market structure modification to contract structure
  - Main elements of natural gas purchase and sales contracts
  - General comparison of traditional and market based pricing

- Natural gas transportation
  - Technical description of pipeline transportation
- Historical development of the European natural gas (pipeline) transportation system (incl. new projects)
- LNG transportation
- Comparison of LNG and pipeline transportation
- Main elements of natural gas transportation contracts
- Costs of natural gas transportation
- Natural gas transportation pricing systems
- Transportation capacity trading

- Natural gas storage
  - Storage functions and parameters
  - Technical description of natural gas storages
  - Storage types
  - Natural gas storage in Europe
  - Main elements of natural gas storage contracts
  - Costs of storage
  - Natural gas storage pricing

- Special topics
  - Selected aspects of regulation and legislation relevant for the natural gas industry
  - Portfolio management and risk management in the natural gas industry
  - “Gas-to-Liquids” – technical description and economic impact
  - Brief overview of revenue management applied in the natural gas industry
  - Brief overview of bio-methane and its impact to natural gas markets in Germany

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.
Course: Gear Cutting Technology [T-MACH-102148]

Responsibility: Markus Klaiber

Contained in: [M-MACH-101284] Specialization in Production Engineering

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<td>Gear Cutting Technology</td>
<td>Vorlesung (V)</td>
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<td>Markus Klaiber</td>
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Learning Control / Examinations

oral exam

Conditions

none

Event excerpt: Gear Cutting Technology (WS 16/17)

Aim
The students ...

- can describe the basic terms of gearings and are able to explain the imparted basics of the gearwheel and gearing theory.
- are able to specify the different manufacturing processes and machine technologies for producing gearings. Furthermore, they are able to explain the functional principles and the dis-/advantages of these manufacturing processes.
- can apply the basics of the gearing theory and manufacturing processes on new problems.
- are able to read and interpret measuring records for gearings.
- are able to make an appropriate selection of a process based on a given application
- can describe the entire process chain for the production of toothed components and their respective influence on the resulting workpiece properties.

Content
Based on the gearing theory, manufacturing processes and machine technologies for producing gearings, the needs of modern gear manufacturing will be discussed in the lecture. For this purpose, various processes for various gear types are taught which represent the state of the art in practice today. A classification in soft and hard machining and furthermore in cutting and non-cutting technologies will be made. For comprehensive understanding the processes, machine technologies, tools and applications of the manufacturing of gearings will be introduced and the current developments presented. For assessment and classification of the applications and the performance of the technologies, the methods of mass production and manufacturing defects will be discussed. Sample parts, reports from current developments in the field of research and an excursion to a gear manufacturing company round out the lecture.

The following topics will be covered:

- Sample applications
- Basics of gearing geometry
- Need of gearboxes
- Soft machining processes
- Hardening processes
- Hard machining processes
- Bevel gear production
- Measurement and testing
- Manufacturing of gearbox components
- Special gearings
Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Lecture Slides
**Course:** Global optimization I [T-WIWI-102726]

**Responsibility:** Oliver Stein

**Contained in:** [M-WIWI-101473] Mathematical Programming

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**Learning Control / Examinations**

Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO) and possibly of a compulsory prerequisite.

The exam is offered in the lecture of semester and the following semester.

The success check can be done also with the success control for “Global optimization II”. In this case, the duration of the written exam is 120 min.

**Conditions**

None

**Modeled Conditions**

The following conditions must be met:

- The course [T-WIWI-103638] *Global optimization I and II* must not have been started.

**Recommendations**

None

**Remarks**

Part I and II of the lecture are held consecutively in the same semester.
Course: Global optimization I and II [T-WIWI-103638]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming

**ECTS** 9  **Recurrence** Jedes Semester  **Version** 1

**Learning Control / Examinations**
The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The examination is held in the semester of the lecture and in the following semester.

**Conditions**
None

**Modeled Conditions**
The following conditions must be met:

1. The course [T-WIWI-102726] Global optimization I must not have been started.
2. The course [T-WIWI-102727] Global optimization II must not have been started.

**Recommendations**
None

**Remarks**
Part I and II of the lecture are held consecutively in the same semester.
Course: Global optimization II [T-WIWI-102727]

Responsibility: Oliver Stein

Contained in: [M-WIWI-101473] Mathematical Programming

<table>
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Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The examination is held in the semester of the lecture and in the following semester.
The examination can also be combined with the examination of “Global optimization I”. In this case, the duration of the written examination takes 120 minutes.

Conditions
None

Modeled Conditions
The following conditions must be met:
- The course [T-WIWI-103638] Global optimization I and II must not have been started.

Remarks
Part I and II of the lecture are held consecutively in the same semester.
Course: Global Production and Logistics - Part 1: Global Production [T-MACH-105158]

Responsibility: Gisela Lanza
Contained in: [M-MACH-101282] Global Production and Logistics

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Events

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<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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<td>WS 16/17</td>
<td>2149610</td>
<td>Global Production and Logistics - Part 1:</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Gisela Lanza</td>
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<td>Global Production</td>
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Learning Control / Examinations
The assessment is carried out as an oral exam. The examination date can be defined individually.

Conditions
none

Event excerpt: Global Production and Logistics - Part 1: Global Production (WS 16/17)

Aim
The students...

- can explain the general conditions and influencing factors of global production.
- are capable to apply defined procedures for site selection and to evaluate site decisions with the help of different methods.
- are able to select the adequate scope of design for site-appropriate production and product construction case-specifically.
- can state the central elements in the planning process of establishing a new production site.
- are capable to make use of the methods to design and scale global production networks for company-individual problems.
- are able to show up the challenges and potentials of the departments sales, procurement as well as research and development on global basis.

Content
Target of the lecture is to depict the challenges and fields of action of global operating companies and to give an overview of central aspects in global production networks as well as establishing a deepening knowledge of established methods and procedures for design and scale. Within the course methods for site selection, procedures for site specific adjustment of product construction and product technology as well as planning approaches to establish a new production site are imparted. The course is rounded off by showing the characteristics of the departments sale, procurement as well as research and development under global aspects.

The topics are:
- Basic conditions and influencing factors of global production (historical development, targets, chances and threats)
- Global sales
- Site selection
- Site specific production adjustment
- Establishing of new production sites
- Global procurement
- Design and management of global production networks
- Global research and development

Workload
regular attendance: 21 hours
self-study: 99 hours
Literature
Lecture Notes
recommended secondary literature:
Course: Global Production and Logistics - Part 2: Global Logistics [T-MACH-105159]

Responsibility: Kai Furmans

Contained in: [M-MACH-101282] Global Production and Logistics

<table>
<thead>
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<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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Events

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Learning Control / Examinations

The assessment consists of a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

Conditions: none

Recommendations

We recommend attending the course “Logistics - organization, design and control of logistic systems ” (2118078) beforehand.

Event excerpt: Global Production and Logistics - Part 2: Global Logistics (SS 2017)

Aim

Students are able to:

- assign basic problems of planning and operation of global supply chains and plan them with appropriate methods,
- describe requirements and characteristics of global trade and transport, and
- evaluate characteristics of the design from logistics chains regarding their suitability.

Content

Characteristics of global trade

- Incoterms
- Customs clearance, documents and export control

Global transport and shipping

- Maritime transport, esp. container handling
- Air transport

Modeling of supply chains

- SCOR model
- Value stream analysis

Location planning in cross-border-networks

- Application of the Warehouse Location Problem
- Transport Planning

Inventory Management in global supply chains

- Stock keeping policies

Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
Inventory management considering lead time and shipping costs

**Workload**
regular attendance: 21 hours  
self-study: 99 hours

**Literature**

**Elective literature:**

- Domschke. *Logistik, Rundreisen und Touren*, Oldenbourg Verlag, 1982
- Domschke/Drexl. *Logistik, Standorte*, Oldenbourg Verlag, 1996
Course: Global Vehicle Evaluation within Virtual Road Test [T-MACH-102177]

Responsibility: Bernhard Schick
Contained in: [M-MACH-101264] Handling Characteristics of Motor Vehicles

<table>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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<td>3</td>
<td>Jedes Sommersemester</td>
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Learning Control / Examinations
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: CarMaker Simulation Environment

Conditions
none
**Course: Graph Theory and Advanced Location Models [T-WIWI-102723]**

**Responsibility:** Stefan Nickel

**Contained in:**
- [M-WIWI-101473] Mathematical Programming
- [M-WIWI-103289] Stochastic Optimization

<table>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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**Learning Control / Examinations**

The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation). The examination is held in the term of the lecture and the following lecture.

**Conditions**

None

**Recommendations**

Basic knowledge as conveyed in the module *Introduction to Operations Research* [WI1OR] is assumed.

**Remarks**

The lecture is offered irregularly. The planned lectures and courses for the next three years are announced online.
**Course: Handling Characteristics of Motor Vehicles I [T-MACH-105152]**

**Responsibility:** Hans-Joachim Unrau

**Contained in:** [M-MACH-101264] Handling Characteristics of Motor Vehicles

<table>
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<th>Language</th>
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<td>2 Lectures</td>
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</table>

**Learning Control / Examinations**

Verbally

Duration: 30 up to 40 minutes

Auxiliary means: none

**Conditions**

none

**Event excerpt: Handling Characteristics of Motor Vehicles I (WS 16/17)**

**Aim**

The students know the basic connections between drivers, vehicles and environment. They can build up a vehicle simulation model, with which forces of inertia, aerodynamic forces and tyre forces as well as the appropriate moments are considered. They have proper knowledge in the area of tyre characteristics, since a special meaning comes to the tire behavior during driving dynamics simulation. Consequently they are ready to analyze the most important influencing factors on the driving behaviour and to contribute to the optimization of the handling characteristics.

**Content**

1. Problem definition: Control loop driver - vehicle - environment (e.g. coordinate systems, modes of motion of the car body and the wheels)

2. Simulation models: Creation from motion equations (method according to D’Alembert, method according to Lagrange, programme packages for automatically producing of simulation equations), model for handling characteristics (task, motion equations)

3. Tyre behavior: Basics, dry, wet and winter-smooth roadway

**Workload**

regular attendance: 22.5 hours
self-study: 97.5 hours

**Literature**

**Course: Handling Characteristics of Motor Vehicles II [T-MACH-105153]**

**Responsibility:** Hans-Joachim Unrau  
**Contained in:** [M-MACH-101264] Handling Characteristics of Motor Vehicles

<table>
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</table>

**Learning Control / Examinations**

**Oral Examination**

- **Duration:** 30 up to 40 minutes
- **Auxiliary means:** none
- **Conditions:** none

### Event excerpt: Handling Characteristics of Motor Vehicles II (SS 2017)

**Aim**

The students have an overview of common test methods, with which the handling of vehicles is gauged. They are able to interpret results of different stationary and transient testing methods. Apart from the methods, with which e.g. the driveability in curves or the transient behaviour from vehicles can be registered, also the influences from cross-wind and from uneven roadways on the handling characteristics are well known. They are familiar with the stability behavior from single vehicles and from vehicles with trailer. Consequently they are ready to judge the driving behaviour of vehicles and to change it by specific vehicle modifications.

**Content**

1. Vehicle handling: Bases, steady state cornering, steering input step, single sine, double track switching, slalom, cross-wind behavior, uneven roadway

2. Stability behavior: Basics, stability conditions for single vehicles and for vehicles with trailer

**Workload**

- Regular attendance: 22,5 hours
- Self-study: 97,5 hours

**Literature**


**Course: Heat Economy [T-WIWI-102695]**

**Responsibility:** Wolf Fichtner  
**Contained in:** [M-WIWI-101452] Energy Economics and Technology

<table>
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**Recommendations**  
None

**Remarks**  
See German version.

### Event excerpt: Heat Economy (SS 2017)

**Aim**  
The student gains detailed knowledge about heat generating technologies and their areas of application, in particular in the area of combined heat and power. The student is able to deal with technical and economic questions in this field.

**Content**  
1. Introduction: Heat economy  
2. CHP technologies (incl. calculation of profitability)  
3. Heat systems (incl. calculation of profitability)  
4. Distribution of heat  
5. Demand for space heating and thermal insulation measures  
6. Heat storage  
7. Legal framework conditions  
8. Laboratory experiment: compression heat pump

**Workload**  
The total workload for this course is approximately 90 hours. For further information see German version.
Course: High Performance Powder Metallurgy Materials [T-MACH-102157]

Responsibility: Rainer Oberacker

Contained in: [M-MACH-101268] Specific Topics in Materials Science

<table>
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Learning Control / Examinations

oral exam

Conditions

none

Event excerpt: Advanced powder metals (SS 2017)

Aim

The students know the basics of powder metallurgy. They are able to assess the conditions for applying either powder metallurgy or competing production methods. They have knowledge on production, properties and application of the most important PM materials.

Content

The lecture gives an overview on production, properties and application of structural and functional powder metallurgy material. The following groups of materials are presented: PM High Speed Steels, Cemented Carbides, PM Metal Matrix Composites, PM Specialities, PM Soft Magnetic and Hard Magnetic Materials.

Workload

regular attendance: 22 hours
self-study: 98 hours

Literature

- R.M. German. “Powder metallurgy and particulate materials processing”. Metal Powder Industries Federation, 2005
## Course: High-Voltage Technology I [T-ETIT-101913]

**Responsibility:** Rainer Badent  
**Contained in:** [M-ETIT-101163] High-Voltage Technology

<table>
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<th>Language</th>
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### Conditions

none
# Course: High-Voltage Technology II [T-ETIT-101914]

**Responsibility:** Rainer Badent  
**Contained in:** [M-ETIT-101163] High-Voltage Technology

<table>
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## Events

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## Conditions

None
### Course: High-Voltage Test Technique [T-ETIT-101915]

**Responsibility:** Rainer Badent  
**Contained in:** [M-ETIT-101164] Generation and transmission of renewable power

<table>
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<th>Language</th>
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<th>Version</th>
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**Events**

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**Conditions**

none
Course: Homework “Project in Public Transportation” [T-BGU-101856]

Responsibility: Eberhard Hohnecker
Contained in: [M-BGU-101113] Project in Public Transportation

ECTS 3
Recurrence Unregelmäßig
Version 1

Conditions
None

Recommendations
None

Remarks
None
**Course:** Homework “Public Transportation Operations” [T-BGU-101857]

**Responsibility:** Eberhard Hohnecker

**Contained in:** [M-BGU-101111] Public Transportation Operations

<table>
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**Conditions**

None

**Recommendations**

None

**Remarks**

None

Responsibility: Eberhard Hohnecker

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<th>Recurrence</th>
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Conditions
None

Recommendations
None

Remarks
None
Course: Incentives in Organizations [T-WIWI-105781]

Responsibility: Petra Nieken

Contained in: [M-WIWI-101510] Cross-functional Management Accounting
[M-WIWI-101500] Microeconomic Theory
[M-WIWI-101505] Experimental Economics

ECTS 4.5 Language englisch Recurrence Jedes Sommersemester Version 1

<table>
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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Conditions
None

Recommendations
Knowledge of microeconomics, game theory, and statistics is assumed.

Remarks
The course is carried out routinely in summer.

Event excerpt: Incentives in Organizations (SS 2017)

Aim
The student
- develops a strategic understanding about incentives systems and how they work.
- analyzes models from personnel economics.
- understands how econometric methods can be used to analyze performance and compensation data.
- knows incentives schemes that are used in companies and is able to evaluate them critically.
- can develop practical implications which are based on theoretical models and empirical data for companies.
- understands the challenges of managing incentive and compensation systems and their relationship with corporate strategy.

Content
The students acquire profound knowledge about the design and the impact of different incentive and compensation systems. Topics covered are, for instance, performance based compensation, team work, intrinsic motivation, multitasking, and subjective performance evaluations. We will use microeconomic or behavioral models as well as empirical data to analyze incentive systems. We will investigate several widely used compensation schemes and their relationship with corporate strategy. Students will learn to develop practical implications which are based on the acquired knowledge of this course.

Workload
The total workload for this course is approximately 135 hours.
Lecture 32h
Preparation of lecture 52h
Exam preparation 51h
**Literature**

Slides

Additional case studies and research papers will be announced in the lecture.
**Course:** Industrial Application of Material Handling Systems in Sorting and Distribution Systems [T-MACH-102092]

**Responsibility:** Jörg Föller

**Contained in:**
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101279] Technical Logistics

### ECTS

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
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<tbody>
<tr>
<td>4</td>
<td>Jedes Sommersemester</td>
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</tbody>
</table>

**Learning Control / Examinations**

- oral 30 min

**Conditions**

- none
Course: Industrial Application of Technological Logistics Instancing Crane Systems [T-MACH-105149]

Responsibility: Markus Golder

Contained in: [M-MACH-101263] Introduction to Logistics
               [M-MACH-101279] Technical Logistics

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
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<tr>
<td>4</td>
<td>Jedes Wintersemester</td>
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</tbody>
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Learning Control / Examinations
The assessment consists of an oral exam according to §4 (2), 2 of the examination regulation. It may be a written exam (according to §4 (2), 1 of the examination regulation) in the case of large number of participants.

Conditions
none
Course: Industrial Services [T-WIWI-102822]

Responsibility: Hansjörg Fromm

Contained in:
- [M-WIWI-101506] Service Analytics
- [M-WIWI-102808] Digital Service Systems in Industry
- [M-WIWI-101448] Service Management

ECTS: 4.5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

<table>
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<th>Term</th>
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Learning Control / Examinations
A final written exam will be conducted

Conditions
None

Recommendations
None

Event excerpt: Industrial Services (WS 16/17)

Aim
Participants understand the interrelation between Front-Office (Customer view, e.g. material availability, technician skills, maintenance quality, repair time) and Back-Office (Provider view, e.g. distribution planning, inventory optimization, technician work schedule, call center). They learn about forecasting algorithms for sporadic demands, which are typical in spare part supply, and they apply common inventory optimization models for stock planning. They also become familiar with full-cost service contracts, as well as with the latest product related services that have been enabled only in recent years by modern IT and mobile technology.

Content
Services are becoming ever more important in business. Today, the gross income share of services in Germany exceeds 70%. Following this trend, many companies that previously focused solely on the sale of goods, strive to an extension of their business model: In order to realize new competitive advantages in domestic and international markets, they enrich their material goods with customer-specific services. This transformation to a provider of integrated solutions is called “Servitization” (Neely 2009). For this reason, so-called industrial services to companies of increasing importance. They benefit from the increasingly detailed data collected (on “Big Data”), e.g. concerning user profiles, failure statistics, usage history, accrued expenses, etc. Only these data allow in principle to end products and spare parts are delivered faster, cheaper and more targeted and technicians can be used more efficiently with the correct skills. This requires, however, also suitable methods of optimization, prognosis or predictive modeling. When used properly, such methods can minimize logistics costs, increase availability, prevent potential failures and improve repair planning. This is also enabled by latest “Technology Enabled Services” along with corresponding data transfer and analysis (“Internet of Things”, automatic error detection, remote diagnostics, centralized collection of consumption data, etc.). The change from goods manufacturer to a provider of integrated solutions requires new services, transformation of business models as well as intelligent new contract types, which are addressed in the course as well.

More specifically, the lessons of this lecture will include:

- Servitization – The Manufacturer’s Transformation to Integrated Solution Provider
- Service Levels – Definitions, Agreements, Measurements and Service Level Engineering
- The “Services Supply Chain”
- Spare Parts Planning – Forecasting, Assortment Planning, Order Quantities and Safety Stocks
Distribution Network Planning – Network Types, Models, Optimization
Service Technician Planning
Condition Monitoring, Predictive Maintenance, Diagnose Systems
Call Center Services
Full Service Contracts
IT-enabled Value-Add Services – Industrial Service Innovation

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
Course: Information Engineering [T-MACH-102209]

Responsibility: Jivka Ovtcharova

Contained in: [M-MACH-101281] Virtual Engineering B
              [M-MACH-101283] Virtual Engineering A

ECTS 3

Recurrence Jedes Sommersemester

Version 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
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<td>2122014</td>
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Learning Control / Examinations
Non exam assessment (following §4(2), 3 of the examination regulation).

Conditions
none
Course: Information Management for public Mobility Services [T-BGU-106608]

Responsibility: Peter Vortisch
Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

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<th>Recurrence</th>
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Events

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Conditions
None

Recommendations
None

Remarks
None
Course: Information management in production [T-MACH-105937]

Responsibility: Oliver Riedel

Contained in:
- [M-MACH-101281] Virtual Engineering B
- [M-MACH-101283] Virtual Engineering A

<table>
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Learning Control / Examinations
- oral exam
- (more than 50 persons: written exam)

Conditions
- none
**Course: Information Service Engineering [T-WIWI-106423]**

**Responsibility:** Harald Sack

**Contained in:**
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

**ECTS**
5

**Language**
englisch

**Recurrence**
Jedes Sommersemester

**Version**
1

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**Learning Control / Examinations**
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

**Conditions**
None

**Remarks**
New course starting summer term 2017.

**Event excerpt: (SS 2017)**

**Aim**
- The students know the fundamentals and measures of information theory and are able to apply those in the context of Information Service Engineering.
- The students have basic skills of natural language processing and are enabled to apply natural language processing technology to solve and evaluate simple text analysis tasks.
- The students have fundamental skills of knowledge representation with ontologies as well as basic knowledge of Semantic Web and Linked Data technologies. The students are able to apply these skills for simple representation and analysis tasks.
- The students have fundamental skills of information retrieval and are enabled to conduct and to evaluate simple information retrieval tasks.
- The students apply their skills of natural language processing, Linked Data engineering, and Information Retrieval to conduct and evaluate simple knowledge mining tasks.
- The students know the fundamentals of recommender systems as well as of semantic and exploratory search.

**Content**
- Information, Natural Language and the Web
- Natural Language Processing
  - NLP and Basic Linguistic Knowledge
  - NLP Applications, Techniques & Challenges
  - Evaluation, Precision and Recall
  - Regular Expressions and Automata
  - Tokenization
  - Language Model and N-Grams
  - Part-of-Speech Tagging
- Linked Data Engineering
- Knowledge Representations and Ontologies
  - What’s in an URI?
  - Resource Description Framework (RDF)
  - Creating new Models with RDFS
  - Querying RDF(S) with SPARQL
  - More Expressivity with Web Ontology Language (OWL)
  - The Web of Data
  - Vocabularies and Ontologies in the Web of Data
  - Wikipedia, DBpedia, and Wikidata

- Information Retrieval
  - Information Retrieval Models
  - Retrieval Evaluation
  - Web Information Retrieval
  - Document Crawling, Text Processing, and Indexing
  - Query Processing and Result Representation
  - Question Answering

- Knowledge Mining
  - From Data to Knowledge
  - Data Mining
  - Machine Learning Basics for Knowledge Mining
  - Mining Knowledge from Wikipedia
  - Named Entity Resolution

- Exploratory Search and Recommender Systems
  - Semantic Search and Entity Centric Search
  - Collaborative Filtering and Content Based Recommendations
  - From Search to Intelligent Browsing
  - Linked Data Based Exploratory Search
  - Fact Ranking

Literature
Course: Information Systems and Supply Chain Management [T-MACH-102128]

Responsibility: Christoph Kilger

Contained in:
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101280] Logistics in Value Chain Networks
- [M-MACH-101282] Global Production and Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>2118094</td>
<td>Information Systems in Logistics and Supply Chain Management</td>
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<td>Christoph Kilger</td>
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</table>

Learning Control / Examinations
oral / written (if necessary)  
examination aids: none

Conditions
none

Event excerpt: Information Systems in Logistics and Supply Chain Management (SS 2017)

Aim
Students are able to:

- Describe requirements of logistical processes regarding IT systems,
- Choose information systems to support logistical processes and use them according to the requirements of a supply chain.

Content
1) Overview of logistics systems and processes
2) Basic concepts of information systems and information technology
3) Introduction to IS in logistics: Overview and applications
4) Detailed discussion of selected SAP modules for logistics support

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
# Course: Information Technology and Business Information [T-WIWI-102635]

**Responsibility:** Bruno Neibecker  
**Contained in:** [M-WIWI-101489] Strategy, Communication, and Data Analysis

<table>
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## Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The examination will be offered latest until winter term 2016/2017 (repeaters only).

**Conditions**
None

**Recommendations**
None
Course: Infrastructure Dimensioning and Running Dynamics Based Railway Alignment [T-BGU-101848]

Responsibility: Eberhard Hohnecker


ECTS 3
Language deutsch
Recurrence Jedes Sommersemester
Version 1

Events

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<td>Exercises on Infrastructure Dimensioning and Running Dynamics of Railway Tracks</td>
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Conditions
None

Recommendations
None

Remarks
None

Event excerpt: Infrastructure Dimensioning and Running Dynamics of Railway Tracks (SS 2017)

Literature
Fiedler: Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
**Course: Infrastructure Equipment of Railway Tracks [T-BGU-101849]**

**Responsibility:** Eberhard Hohnecker

**Contained in:**
- [M-BGU-101111] Public Transportation Operations

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**Conditions**

None

**Recommendations**

None

**Remarks**

None

**Event excerpt: Infrastructure Equipment of Railway Tracks (SS 2017)**

**Literature**

Fiedler: Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf
Course: Infrastructure Management [T-BGU-106300]

Responsibility: Ralf Roos

[M-BGU-100999] Highway Engineering

ECTS: 6
Recurrence: Jedes Sommersemester
Version: 1

Events

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Learning Control / Examinations
written exam, 120 min.

Conditions
none

Recommendations
none

Remarks
none
**Course: Innovation Management: Concepts, Strategies and Methods [T-WIWI-102893]**

**Responsibility:** Marion Weissenberger-Eibl

**Contained in:** [M-WIWI-101507] Innovation Management

[M-WIWI-101488] Entrepreneurship (EnTechnon)

<table>
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<th>Language</th>
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<th>Version</th>
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<td>2545015</td>
<td>Innovation Management: Concepts, Strategies and Methods</td>
<td>Vorlesung (V)</td>
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<td>Marion Weissenberger-Eibl</td>
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**Learning Control / Examinations**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**

None

**Recommendations**

None

---


**Aim**

Students develop a differentiated understanding of the different phases and concepts of the innovation process, different strategies and methods in innovation management.

**Content**

The course ‘Innovation Management: Concepts, Strategies and Methods’ offers scientific concepts which facilitate the understanding of the different phases of the innovation process and resulting strategies and appropriate methodologies suitable for application. The concepts refer to the entire innovation process so that an integrated perspective is made possible. This is the basis for the teaching of strategies and methods which fulfil the diverse demands of the complex innovation process. The course focuses particularly on the creation of interfaces between departments and between various actors in a company’s environment and the organisation of a company’s internal procedures. In this context a basic understanding of knowledge and communication is taught in addition to the specific characteristics of the respective actors. Subsequently methods are shown which are suitable for the profitable and innovation-led implementation of integrated knowledge.

**Workload**

The total workload for this course is approximately 90 hours. For further information see German version.
Course: Innovation theory and -Policy [T-WIWI-102840]

Responsibility: Ingrid Ott

Contained in: [M-WIWI-101514] Innovation Economics
[M-WIWI-101478] Innovation and growth
[M-WIWI-101481] Economic Policy II
[M-WIWI-101497] Agglomeration and Innovation

Events

<table>
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Learning Control / Examinations
The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

Conditions
None

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

Event excerpt: Innovation theory and -policy (SS 2017)

Aim
Students shall be given the ability to

- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- understand the relationships between market structure and the development of innovation
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

Content

- Incentives for the emergence of innovations
- Patents
- Diffusion
- Impact of technological progress
- Innovation Policy

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Excerpt:
• Aghion, P., Howitt, P. (2009), The Economics of Growth, MIT Press, Cambridge MA.
Course: Insurance Marketing [T-WIWI-102601]

Responsibility: Edmund Schwake

Contained in: [M-WIWI-101449] Insurance Management II
[M-WIWI-101469] Insurance Management I

<table>
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Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions
None

Recommendations
None
### Course: Insurance Production [T-WIWI-102648]

**Responsibility:** Ute Werner  
**Contained in:**  
- [M-WIWI-101449] Insurance Management II  
- [M-WIWI-101469] Insurance Management I

<table>
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**Learning Control / Examinations**

The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation). The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only).

**Conditions**

None

**Recommendations**

None

**Remarks**

This course is offered on demand. For further information, see: [http://insurance.fbv.kit.edu](http://insurance.fbv.kit.edu)

### Event excerpt: Insurance Production (SS 2017)

**Aim**

See German version.

**Content**

See German version.

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

**Elective literature:**

Course: Insurance Risk Management [T-WIWI-102636]

Responsibility: Harald Maser

Contained in: [M-WIWI-101449] Insurance Management II
[M-WIWI-101469] Insurance Management I

ECTS: 2.5
Recurrence: Jedes Sommersemester
Version: 1

Events

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Learning Control / Examinations
The assessment consists of a written or an oral exam (according to Section 4 (2), 1 or 2 of the examination regulation). T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017. The examination will be offered latest until summer term 2017 (beginners only).

Conditions
None

Recommendations
None

Remarks
Block course. For organizational reasons, please register with the secretary of the chair: thomas.mueller3@kit.edu.

Event excerpt: Insurance Risk Management (SS 2017)

Aim
Getting to know basic principles of risk management in insurance companies and credit institutions.

Content


Workload
The total workload for this course is approximately 75.0 hours. For further information see German version.

Literature
Elective literature:
- “Mindestanforderungen an ein (Bank-)Risikomanagement”, www.bafin.de
Course: Integrated Production Planning [T-MACH-102106]

Responsibility: Gisela Lanza

Contained in: [M-MACH-101272] Integrated Production Planning

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<td>2150660</td>
<td>Integrated production planning</td>
<td>Vorlesung (VÜ)</td>
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<td>Gisela Lanza</td>
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Learning Control / Examinations

The assessment is carried out as an oral exam. The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

Conditions

none

Event excerpt: Integrated production planning (SS 2017)

Aim

The students . . .

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

Content

As part of this lecture further engineering aspects of production technology are taught. This includes content from the manufacturing technology, machine tools and handling techniques as well as the organization and planning. Planning factories within the context of value networks and integrated production systems (Toyota etc.) requires an integrated perspective for the consideration of all functions included in the “factory” system. This includes the planning of manufacturing systems including the product, the value network and factory production, and the examination of SOPs, the running of a factory and maintenance. Content and theory covered by this lecture are completed with many examples from industry and exercises based on real-life situations and conditions.

Main topics covered by the lecture:

- The basic principles of production planning
- Links between product planning and production planning
- Integrating a production site into a production network
- Steps and methods of factory planning
- Approach to the integrated planning of manufacturing and assembly plants
- Layout of production sites
- Maintenance
- Material flow
- Digital factory
- Process simulation for material flow optimisation
- Start-up
Workload
regular attendance: 63 hours
self-study: 177 hours

Literature
Lecture Notes
Course: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]

Responsibility: Karl-Hubert Schlichtenmayer, Frederik Zanger

Contained in: [M-MACH-101284] Specialization in Production Engineering
[M-MACH-101282] Global Production and Logistics

<table>
<thead>
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<th>Language</th>
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<th>Version</th>
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Events

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<td>SS 2017</td>
<td>2150601</td>
<td>Integrative Strategies in Production and Development of High Performance Cars</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Karl-Hubert Schlichtenmayer</td>
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Learning Control / Examinations

The assessment is carried out as an written exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date.

Conditions

none

Event excerpt: Integrative Strategies in Production and Development of High Performance Cars (SS 2017)

Aim

The students . . .

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

Content

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples. The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

Workload

regular attendance: 21 hours
self-study: 99 hours
Literature
Lecture Slides
Course: Intelligent CRM Architectures [T-WIWI-103549]

Responsibility: Andreas Geyer-Schulz

Contained in: [M-WIWI-101470] Data Science: Advanced CRM

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<td>2540526</td>
<td>Übung zu Intelligent CRM Architectures</td>
<td>Übung (U)</td>
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<td>Fabian Ball</td>
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<td>WS 16/17</td>
<td>2540525</td>
<td>Intelligent CRM Architectures</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Andreas Geyer-Schulz</td>
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Learning Control / Examinations

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively. The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

Conditions

None

Recommendations

It is recommended to additionally review the Bachelor-level lecture “Customer Relationship Management” from the module “CRM and Servicemanagement”.

V Event excerpt: Intelligent CRM Architectures (WS 16/17)

Aim

Students have special knowledge of software architectures and of the methods which are used in their development (System analysis, formal methods for the specification of interfaces and algebraic semantics, UML, and, last but not least, the mapping of conceptual architectures to IT architectures.

Students know important architectural patterns and they can – based on their CRM knowledge – combine these patterns for innovative CRM applications.

Content

The lecture is structured in three parts:

In the first part the methods used for architecture design are introduced (system analysis, UML, formal specification of interfaces, software and analysis patterns, and the separation in conceptual and IT-architectures. The second part is dedicated to learning architectures and machine learning methods. The third part presents examples of learning CRM-Architectures.

Workload

The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m
Sum: 135h 00m
Course: Interactive Systems [T-WIWI-106342]

Responsibility: Alexander Mädche, Silvia Schacht

Contained in: [M-WIWI-103200] Designing Interactive Systems

ECTS: 4,5
Recurrence: Jedes Sommersemester
Version: 1

Events

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</table>

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation. Students receive one aggregated grade consisting of a written exam (70%) and research paper (30%). The exam and the research paper need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the research paper.

Conditions
None

Remarks
The course is held in english.
Course: International Economic Policy [T-WIWI-102897]

Responsibility: Jan Kowalski
Contained in: [M-WIWI-101481] Economic Policy II

ECTS 4,5
Recurrence Jedes Sommersemester
Version 1

Learning Control / Examinations
The examination will be offered latest until summer term 2016 (repeaters only).
The assessment consists of a written exam (60min) according to Setion 4(2), 1 of the examination regulation.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
Previous visit of the lectures Economics II: Macroeconomics [2600014] is recommended.
Course: International Finance [T-WIWI-102646]

Responsibility: Marliese Uhrig-Homburg

Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS: 3
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>2530570</td>
<td>International Finance</td>
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<td>Marliese Uhrig-Homburg, Ulrich Walter</td>
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</table>

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Remarks
See German version.

Event excerpt: International Finance (SS 2017)

Aim
The objective of this course is to become familiar with the basics of investment decisions on international markets and to manage foreign exchange risks.

Content
The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Elective literature:
Course: International Management in Engineering and Production [T-WIWI-102882]

Responsibility: Henning Sasse

Contained in: [M-WIWI-101412] Industrial Production III
[M-WIWI-101471] Industrial Production II

ECTS
Language
Recurrence
Version
3.5
englisch
Jedes Wintersemester
1

Events

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<td>Henning Sasse</td>
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</table>

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Conditions
None

Recommendations
None

Event excerpt: International Management in Engineering and Production (WS 16/17)

Aim
Students are taught advanced knowledge in the field of international production and the internationalization strategies of manufacturing companies. They acquire a basic understanding of international production companies and learn about the relevant business and economic models and schools of thought on the subject. Different approaches of the design of internationalization strategies and production networks are presented and relevant location factors for their particular design are investigated. Students learn about the risks of internationalization and methods of risk minimization. Issues of supply chain management are discussed in the context of different approaches to the discrete manufacturing and the process industry. The course concludes with selected case studies from the process and discrete manufacturing industry.

Content
- Fundamentals of international business
- Forms of international cooperation and value creation
- Site selection
- Cost driven internationalization and site selection
- Sales and customer driven internationalization and site selection
- Challenges, risks and risk mitigation
- Management of international production sites
- Types and case studies of international production

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
Will be announced in the course.
Course: Internet Law [T-INFO-101307]

Responsibility: Thomas Dreier

Contained in: [M-INFO-101215] Intellectual Property Law

ECTS 3
Language deutsch
Recurrence Jedes Wintersemester
Version 1

Events

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<td>Internet Law</td>
<td>Vorlesung (V)</td>
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<td>Thomas Dreier</td>
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Event excerpt: Internet Law (WS 16/17)

Aim
Der/die Studierende hat einen umfassenden Überblick über die Rechtsmaterien, die im Rahmen der Nutzung des Internet tangiert sind. Das reicht vom Recht der Domainnamen über eine Reihe urheberrechtsspezifischer Fragestellungen und Fragen des elektronischen Vertragsschlusses, des Fernabsatz- sowie des elektronischen Geschäftsverkehrvertrages bis hin zu Haftungsfragen und Fragen des Wettbewerbsrechts. Die Studenten erkennen die Zusammenhänge zwischen den wirtschaftlichen Hintergründen, den rechtspolitischen Anliegen, den informations- und kommunikationstechnischen Rahmenbedingungen und dem rechtlichen Regelungsrahmen. Sie kennen die einschlägigen Regelungen des nationalen Rechts lernen und können sie auf praktische Sachverhalte anwenden.

Content
Die Veranstaltung befasst sich mit den rechtlichen Regelungen, die bei der Nutzung des Internet berührt sind und durch die die Nutzung des Internet geregelt wird. Das reicht vom Recht der Domainnamen über eine Reihe urheberrechtsspezifischer Fragestellungen und Fragen des elektronischen Vertragsschlusses, des Fernabsatz- sowie des elektronischen Geschäftsverkehrvertrages bis hin zu Haftungsfragen und Fragen des Wettbewerbsrechts. Die Studenten sollen die Zusammenhänge zwischen den wirtschaftlichen Hintergründen, den rechtspolitischen Anliegen, den informations- und kommunikationstechnischen Rahmenbedingungen und dem rechtlichen Regelungsrahmen erkennen. Sie sollen die einschlägigen Regelungen des nationalen Rechts kennen lernen und auf praktische Sachverhalte anwenden können.

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden, davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungssitzung sowie 22,5 h für die Klausurvorbereitung. \begin{tabular}{l|c|r}
| Aktivität & & Arbeitsaufwand \\ \\
| \hline
| Besuch der Vorlesung & 15 x 90min & 22h 30m \\ \\
| Vor-/Nachbereitung der Vorlesung & 15 x 120min & 30h 00m \\ \\
| Skript 2x wiederholen & 2 x 10h & 20h 00m \\ \\
| Prüfung vorbereiten & & 17h 30m \\ \\
| Summe & & 90h 00m \\ \\
\caption{Arbeitsaufwand für die Lerneinheit "Internetrecht"}
**Course: Introduction to Ceramics [T-MACH-100287]**

**Responsibility:** Michael Hoffmann

**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

<table>
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### Events

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<td>Introduction to Ceramics</td>
<td>Vorlesung (V)</td>
<td>3</td>
<td>Michael Hoffmann</td>
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</table>

### Learning Control / Examinations

The assessment consists of an oral exam (30 min) taking place at a specific date. The re-examination is offered at a specific date.

### Conditions

None

### Event excerpt: Introduction to Ceramics (WS 16/17)

**Aim**
The students know the most relevant crystal structures and defects of non-metallic inorganic materials, are able to read binary and ternary phase diagrams and are familiar with powdertechological shaping techniques, sintering and grain growth. They know the basics of the linear elastic fracture mechanics, are familiar with Weibull statistics, K-concept, subcritical crack growth, creep and the opportunities for microstructural reinforcement of ceramics. The students are able to explain the correlation among chemical bonding, crystal and defect structures and the electrical properties of ceramics.

**Content**

After a short introduction to interatomic bonding, fundamental concepts of crystallography, the stereographic projection and the most important symmetry elements will be given. Different types of crystal structures are explained and the relevance of imperfections are analysed with respect to the mechanical and electrical properties of ceramics. Then, the impact of surfaces, interfaces and grain boundaries for the preparation, microstructural evolution and the resulting properties is discussed. Finally, an introduction is given to ternary phase diagrams.

The second part of the course covers structure, preparation and application aspects of nonmetallic inorganic glasses, followed by an introduction to the properties and processing methods of fine-grained technical powders. The most relevant shaping methods, such as pressing, slip casting, injection moulding and extrusion are introduced. Subsequently, the basics of science of sintering and the mechanisms for normal and abnormal grain growth are discussed. Mechanical properties of ceramics are analysed using basic principles of linear elastic fracture mechanics, Weibull statistics, concepts for subcritical crack growth and creep models to explain the behaviour at elevated temperatures. Furthermore it is demonstrated that mechanical properties can be significantly enhanced by various types of microstructural toughening mechanisms. The electronic and ionic conductivity of ceramic materials are explained based on defect-chemical considerations and band structure models. Finally, the characteristics of a dielectric, pyroelectric, and piezoelectric behaviour is discussed.

**Workload**

regular attendance: 45 hours
self-study: 135 hours

**Literature**

- Kingery, Bowen, Uhlmann, “Introduction To Ceramics”, Wiley
- Y.-M. Chiang, D. Birnie III and W.D. Kingery, “Physical Ceramics”, Wiley
Course: Introduction to Microsystem Technology I [T-MACH-105182]

Responsibility: Andreas Guber, Jan Gerrit Korvink

Contained in: [M-MACH-101287] Microsystem Technology

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<td>WS 16/17</td>
<td>2141861</td>
<td>Introduction to Microsystem Technology I</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Jan Gerrit Korvink</td>
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</table>

Learning Control / Examinations
written examination for implementation in a major field, 30 min oral exam for elective subject

Conditions
none

Event excerpt: Introduction to Microsystem Technology I (WS 16/17)

Aim
The lecture gives an introduction into the basics of microsystems technology. In analogy to processes employed in fabrication of microelectronics circuits the core technologies as well as materials for producing microstructures and components are presented. Finally, various techniques for Silicon micromachining are explained and illustrated with examples for micro-components and micro-systems.

Content
- Introduction in Nano- and Microtechnologies
- Silicon and processes for fabricating microelectronics circuits
- Basic physics background and crystal structure
- Materials for micromachining
- Processing technologies for microfabrication
- Silicon micromachining
- Examples

Workload
Literature: 20 h
Lessons: 21 h
Preparation and Review: 50 h
Exam preparation: 30 h

Literature
M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011
Course: Introduction to Microsystem Technology II [T-MACH-105183]

Responsibility: Andreas Guber
Contained in: [M-MACH-101287] Microsystem Technology

ECTS | Language | Recurrence | Version
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3 | englisch | Jedes Sommersemester | 1

Events

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<td>Introduction to Microsystem Technology II</td>
<td>Vorlesung (V)</td>
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<td>Vlad Badilita, Jan Gerrit Korvink</td>
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</table>

Learning Control / Examinations
written examination for major field, oral exam (30 min) for elective field

Conditions
none

Event excerpt: Introduction to Microsystem Technology II (SS 2017)

Aim
The lecture gives an introduction into the basics of Microsystems technology. In the first part, methods for lithographic pattern transfer are summarized. Then specific techniques such as the LIGA process, micro-machining, and laser-patterning are explained and examples are given. Finally, assembly and packaging methods are presented leading into a discussion of entire Microsystems.

Content
- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

Workload
Literature: 20 h
Lessions: 21 h
Preparation and Review: 50 h
Exam preparation: 30 h

Literature
M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011
Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsibility: Steffen Rebennack

Contained in:
- [M-WIWI-101454] Stochastic Modelling and Optimization
- [M-WIWI-103289] Stochastic Optimization

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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.
Course: IoT platform for engineering [T-MACH-106743]

Responsibility: Jivka Ovtcharova

Contained in: [M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

ECTS: 4
Recurrence: Jedes Semester
Version: 1
**Course: IT-Based Road Design [T-BGU-101804]**

**Responsibility:** Matthias Zimmermann  
**Contained in:** [M-BGU-101066] Safety, Computing and Law in Highway Engineering

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<th>Recurrence</th>
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<td>Vorlesung / Übung 2 (VÜ)</td>
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<td>Matthias Zimmermann</td>
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#### Learning Control / Examinations

Oral exam with 15 minutes

**Conditions**  
None

**Recommendations**  
None

**Remarks**  
None

### Event excerpt: (WS 16/17)

**Aim**  
Die Absolventinnen und Absolventen können DV-gestützte Verfahren für den Entwurf einer Straße in Lage, Höhe und Querschnitt anwenden und neue Straßen bemessen.

**Content**  
Course: IT-Fundamentals of Logistics [T-MACH-105187]

Responsibility: Frank Thomas

Contained in:
[M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Semester
Version: 1

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<td>Vorlesung (V)</td>
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Learning Control / Examinations
oral exam

Conditions
none

Remarks
1) Detailed script can be downloaded online (www.tup.com), updated and enhanced annually.
2) CD-ROM with chapters and exercises at the end of the semester available from the lecturer, also updated and enhanced annually.

Event excerpt: IT-Fundamentals of Logistics (SS 2017)

Aim
Students are able to:

- Describe and classify automation technology for material flow and the information technology necessary,
- identify, analyze and design the business processes in internal logistics,
- identify risks of failure and counteract and
- transfer the knowledge to practical implementations.

Content
This lecture, with exercises, treats automation technology in material flow as well as the information technology that has a direct relationship with it. In the first few chapters and exercises, an overview is given of the motors and conveying technology elements used in materials handling, and the sensors required for the purpose are explained. The target control types as well as the topic of coding techniques and RFID (GS1, barcodes, scanner, etc.) are treated in detail. Material flow controls are defined based on these chapters. Among other things, the functions of a stored-memory controller are explained in this section.Hierarchically classified control structures and their integration in network structures are considered in detail. The principles of communications systems (bus systems etc.) are supplemented with information on the use of the Internet as well as data warehousing strategies. An overview of modern logistics systems, especially in stores administration, illustrates new problem solution strategies in the area of information technology for logistics systems. After an analysis of the causes for system failures, measures are worked out for reducing the risks of failure. Furthermore, the objectives, task areas as well as various scheduling strategies in the area of transport management and control are presented. Worthwhile information on Europe-wide logistics concepts round off this practice-oriented lecture series. The presentation of the lectures will be multimedia-based. Exercises repeat and extend the knowledge principles imparted in the lectures and illustrate the subject with practical examples.

Focuses:
- System architecture for logistics solutions / Modularization of conveyors
- Material Flow Control System (MFCS) / Transport Handling
- GS 1, optical reading devices, RFID
Data communication between controllers, computers and networks
Business processes for internal logistics – software follows function
Adaptive IT - Future-oriented software architecture
System stability and data backup – Software-Engineering
XTS – The Extensible Transport System

Workload
regular attendance: 21 hours
self-study: 99 hours
Course: Knowledge Discovery [T-WIWI-102666]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

ECTS 5 Language Englisch Recurrence Jedes Wintersemester Version 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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<td>2511303</td>
<td>Exercises to Knowledge Discovery</td>
<td>Übung (U)</td>
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<td>Aditya Mogadala, Achim Rettinger, Rudi Studer</td>
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<td>Achim Rettinger, Rudi Studer, Tobias Weller</td>
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<td>2511302</td>
<td>Knowledge Discovery</td>
<td>Vorlesung (V)</td>
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Learning Control / Examinations
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation. Students can be awarded a bonus on their final grade if they successfully complete special assignments.

Conditions
None

Event excerpt: Knowledge Discovery (WS 16/17)

Aim
Students
- know fundamentals of Machine Learning, Data Mining and Knowledge Discovery.
- are able to design, train and evaluate adaptive systems.
- conduct Knowledge Discovery projects in regards to algorithms, representations and applications.

Content
Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empircial evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others featurevector-based learning, text mining and social network analysis.

Workload
- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
- Exam and exam preparation: 37.5 hours

Literature
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley
Course: Laboratory Laser Materials Processing [T-MACH-102154]

Responsibility: Johannes Schneider

Contained in: [M-MACH-101268] Specific Topics in Materials Science

<table>
<thead>
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<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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Events

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<td>2183640</td>
<td>Laboratory &quot;Laser Materials Processing&quot;</td>
<td>Praktikum (P)</td>
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<td>Wilhelm Pfleging, Johannes Schneider</td>
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<tr>
<td>SS 2017</td>
<td>2183640</td>
<td>Laboratory &quot;Laser Materials Processing&quot;</td>
<td>Praktikum (P)</td>
<td>3</td>
<td>Wilhelm Pfleging, Johannes Schneider</td>
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</table>

Learning Control / Examinations

The assessment consists of a colloquium for every single experiment and an overall final colloquium incl. an oral presentation of 20 min.

Conditions

Basic knowledge of physics, chemistry and material science is assumed.

Event excerpt: Laboratory "Laser Materials Processing" (SS 2017)

Aim

The student

- can describe the influence of laser, material and process parameters and can choose suitable parameters for the most important methods of laser-based processing in automotive engineering.
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Content

The laboratory compromises 8 half-day experiments, which address the following laser processing topics of metals, ceramics and polymers:

- safety aspects
- surface hardening and remelting
- melt and reactive cutting
- surface modification by dispersing or alloying
- welding
- surface texturing
- metrology

There are used CO2-, excimer-, Nd:YAG- and high power diode-laser sources within the laboratory.

Workload

regular attendance: 34 hours
self-study: 86 hours

Literature

Course: Laboratory Work Water Chemistry [T-CIWVT-103351]

Responsibility: Gudrun Abbt-Braun, Harald Horn
Contained in: [M-CIWVT-101121] Water Chemistry and Water Technology I

<table>
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<td>22664</td>
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<td>Praktikum (P)</td>
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Conditions
none
Course: Large-scale Optimization [T-WIWI-106549]

Responsibility: Steffen Rebennack

Contained in:
- [M-WIWI-101473] Mathematical Programming
- [M-WIWI-103289] Stochastic Optimization

ECTS: 4,5
Recurrence: Unregelmäßig
Version: 1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.
Course: Laser in Automotive Engineering [T-MACH-105164]

Responsibility: Johannes Schneider

Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS: 4
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

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<td>2182642</td>
<td>Laser in automotive engineering</td>
<td>Vorlesung (V)</td>
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<td>Johannes Schneider</td>
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</table>

Learning Control / Examinations

oral examination (30 min)

no tools or reference materials

Conditions

Basic knowledge of physics, chemistry and material science is assumed. It is not possible to combine this lecture with the lecture Physical basics of laser technology [2181612].

Modeled Conditions

The following conditions must be met:

- The course [T-MACH-102102] Physical Basics of Laser Technology must not have been started.

Event excerpt: Laser in automotive engineering (SS 2017)

Aim

The student

- can explain the principles of light generation, the conditions for light amplification as well as the basic structure and function of Nd:YAG-, CO₂- and high power diode-laser sources.
- can describe the most important methods of laser-based processing in automotive engineering and illustrate the influence of laser, material and process parameters
- can analyse manufacturing problems and is able to choose a suitable laser source and process parameters.
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Content

Based on a short description of the physical basics of laser technology the lecture reviews the most important high power lasers and their various applications in automotive engineering. Furthermore the application of laser light in metrology and safety aspects will be addressed.

- physical basics of laser technology
- laser beam sources (Nd:YAG-, CO₂-, high power diode-laser)
- beam properties, guiding and shaping
- basics of materials processing with lasers
- laser applications in automotive engineering
- economical aspects
- safety aspects

Workload

regular attendance: 22.5 hours
self-study: 97.5 hours
Literature
### Course: Laser Physics [T-ETIT-100741]

**Responsibility:** Christian Koos  
**Contained in:**  
- [M-MACH-101295] Optoelectronics and Optical Communication  
- [M-MACH-101292] Microoptics

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#### Conditions

- none

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**Industrial Engineering and Management (M.Sc.)**  
**Date 05/17/2017**

Responsibility: Eberhard Hohnecker

[M-BGU-101113] Project in Public Transportation
[M-BGU-101111] Public Transportation Operations

<table>
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<td>6234903</td>
<td>Law Aspects of Guided Transport Systems</td>
<td>Vorlesung (V)</td>
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<td>Eberhard Hohnecker, Mitarbeiter/innen</td>
</tr>
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</table>

Conditions

None

Recommendations

None

Remarks

None


Aim

Die Studierenden können die wesentlichen rechtlichen Aspekte des Schienenverkehrs beschreiben, strukturieren und an konkreten juristischen Fallbeispielen anwenden.

Content

- Law Basics
- Public and Administrative Law in Germany
- European Railway Law
- German Railway Law
- Environmental Law in Germany
- Railway Law in the German Federal States
- Financing Law and Public Procurement Law

Literature

Aberle: Transportwirtschaft, Oldenbourg-Verlag
Kunz: Eisenbahnrecht, Nomos, Baden-Baden
**Course: Law of Contracts [T-INFO-101316]**

**Responsibility:** Thomas Dreier  
**Contained in:**  
[**M-INFO-101242**] Governance, Risk & Compliance  
[**M-INFO-101216**] Private Business Law

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### Events

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<td>SS 2017</td>
<td>24671</td>
<td>Law of Contracts</td>
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<td>Alexander Hoff</td>
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</table>

### Event excerpt: Law of Contracts (SS 2017)

**Aim**  

**Content**  

**Workload**  
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt ca. 90 Stunden davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

**Literature**  
Wird in der Vorlesung bekannt gegeben.
Course: Laws concerning Traffic and Roads [T-BGU-106615]

Responsibility: Dietmar Hönig

Contained in: [M-BGU-101066] Safety, Computing and Law in Highway Engineering

ECTS: 3

Recurrence: Jedes Sommersemester

Version: 1

<table>
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<th>Event-No.</th>
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<td>Dietmar Hönig</td>
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Learning Control / Examinations

written exam, 60 min.

Conditions

None

Recommendations

None

Remarks

None
**Course: Lean Construction [T-BGU-100148]**

**Responsibility:** Shervin Haghsheno  
**Contained in:** [M-BGU-101884] Lean Management in Construction

<table>
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<th>Recurrence</th>
<th>Version</th>
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**Events**

<table>
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<th>Term</th>
<th>Event-No.</th>
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<td>6241902</td>
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</table>

**Conditions**  
The project paper Lean Construction has to be attested.

**Modeled Conditions**  
The following conditions must be met:

- The course [T-BGU-101007] *project paper Lean Construction* must have been passed.

**Recommendations**  
None

**Remarks**  
None
Course: Life Cycle Assessment [T-WIWI-103133]

Responsibility: Heiko Keller

Contained in: [M-WIWI-101412] Industrial Production III
[M-WIWI-101471] Industrial Production II

<table>
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<th>Language</th>
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<td>2581995</td>
<td>Life Cycle Assessment</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Heiko Keller</td>
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Recommendations

None

Remarks

The course will be offered from winter term 2015/16 and replace the course “Material Flow Analysis and Life Cycle Assessment [2581995]”.

Event excerpt: Life Cycle Assessment (WS 16/17)

Aim

The students

- understand why it is essential for the future viability of companies and other stakeholders in society to assess products and services based on their whole life cycles.

- know the basics and methodology of life cycle assessment.

- are able to apply life cycle assessment in basic decision contexts.

- are aware for contexts that require further in-depth knowledge in sustainability assessment.

Content

Our society has reached a historically unique material prosperity. At the same time, environmental burdens and resource consumption are continuously reaching new peaks - not only regarding greenhouse gas emissions and oil production rates. It is obvious that the material and energy intensity of products and services has to decrease if we want to keep our current level of material prosperity on the long run. Enormous efficiency gains, as they have been reached e.g. for labour productivity, however, require that environmental burdens and resource consumption per unit of product are in the first place known, transparent and can thus be optimised. This data and its calculation are increasingly requested and sooner or later will have to become as essential for management as e.g. unit labour costs.

Life cycle assessment is a methodology in sustainability assessment that provides this information and deduces optimisation potentials and decision support for companies, politics, consumers etc. To this end, material and energy flows are compiled along the whole life cycle of a product from extraction of raw materials, via production and use of a product until its disposal. Subsequently, environmental impacts of these flows are analysed. This lecture describes structure and individual steps of life cycle assessments in detail. Furthermore, it explains its application in decision support. In interactive phases, participants recapitulate the theoretical basis by own calculations. As an outlook, further instruments in sustainability assessment are introduced that analyse other sustainability aspects.
**Workload**
Total effort required will account for approximately 105h (3.5 credits).

**Literature**
will be announced in the course
Course: Logistics - Organisation, Design and Control of Logistic Systems [T-MACH-102089]

Responsibility: Kai Furmans

Contained in: [M-MACH-101280] Logistics in Value Chain Networks

<table>
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<th>Language</th>
<th>Recurrence</th>
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Events

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<td>Logistics - Organisation, Design, and Control of Logistic Systems</td>
<td>Vorlesung (V)</td>
<td>3</td>
<td>Kai Furmans</td>
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</tbody>
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Learning Control / Examinations
The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation. The grade of the exam may be improved by passing case studies.

Conditions
None

Recommendations
Required are lectures on “Linear Algebra” and “Stochastic”.


Aim
Students are able to:

- Describe logistical tasks,
- Design logistical systems suitable to the respective task,
- Dimension stocastical stock models,
- Determine essential influencing parameters on the bullwhip effect and
- Use optimizing solution methods.

Content
Introduction

- historical overview
- lines of development

Structure of logistics systems
Distribution logistics

- location planning
- Vehicle Routing Planning
- distribution centers

Inventory management

- demand forecasting
- Inventory management policies
- Bullwhip effect

Production logistics
• layout planning
• material handling
• flow control

Supply Management

• information flow
• transportation organization
• controlling and development of a logistics system
• co-operation mechanisms
• Lean SCM
• SCOR model

Identification Technologies

Workload
180 hrs

Literature

• Arnold/Isermann/Kuhn/Tempelmeier. Handbuch Logistik, Springer Verlag, 2002 (Neuaufgabe in Arbeit)
• Domschke. Logistik, Rundreisen und Touren, Oldenbourg Verlag, 1982
• Domschke/Drexl. Logistik, Standorte, Oldenbourg Verlag, 1996
• Gudehus. Logistik, Springer Verlag, 2007
• Neumann-Morlock. Operations-Research, Hanser-Verlag, 1993
• Tempelmeier. Bestandsmanagement in Supply Chains, Books on Demand 2006
Course: Long-distance and Air Traffic [T-BGU-106301]

Responsibility: Bastian Chlond

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

ECTS: 3
Recurrence: Jedes Wintersemester
Version: 1

Events

<table>
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<tr>
<th>Term</th>
<th>Event-No.</th>
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<td>6232904</td>
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<td>Bastian Chlond, KIT Dozenten, Wilko Manz</td>
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Conditions
None

Recommendations
None

Remarks
None
Course: Machine Learning 1 - Basic Methods [T-WIWI-106340]

Responsibility: Johann Marius Zöllner

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

ECTS: 5
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

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<th>Event-No.</th>
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<td>Rüdiger Dillmann, Johann Marius Zöllner</td>
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Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation. The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None.

Remarks

Event excerpt: Machine Learning 1 - Basic methods (WS 16/17)

Aim

- Studierende erlangen Kenntnis der grundlegenden Methoden im Bereich des Maschinellen Lernens.
- Studierende können Methoden des Maschinellen Lernens einordnen, formal beschreiben und bewerten.
- Die Studierenden können ihr Wissen für die Auswahl geeigneter Modelle und Methoden für ausgewählte Probleme im Bereich des Maschinellen Lernens einsetzen.

Content
Das Themenfeld Wissensakquisition und Maschinelles Lernen ist ein stark expandierendes Wissensgebiet und Gegenstand zahlreicher Forschungs- und Entwicklungsvorhaben. Der Wissenserwerb kann dabei auf unterschiedliche Weise erfolgen. So kann ein System Nutzen aus bereits gemachten Erfahrungen ziehen, es kann trainiert werden, oder es zieht Schlüsse aus umfangreichem Hintergrundwissen.


Workload
Vorlesung mit 2 SWS, plus Nachbereitung durch die Studierenden.
Course: Machine Learning 2 – Advanced Methods [T-WIWI-106341]

Responsibility: Johann Marius Zöllner

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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Events

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<tr>
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<td>2511503</td>
<td>Übung (U)</td>
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<td>Johann Marius Zöllner</td>
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<td>SS 2017</td>
<td>2511502</td>
<td>Machine Learning 2 - Advanced methods</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Johann Marius Zöllner</td>
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Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None.

Remarks
New course starting summer term 2017.

Event excerpt: Machine Learning 2 - Advanced methods (SS 2017)

Aim
- Students gain knowledge of the basic methods in the field of machine learning.
- Students understand advanced concepts of machine learning and their application.
- Students can classify, formally describe and evaluate methods of machine learning.
- Students can use their knowledge to select suitable models and methods for selected problems in the field of machine learning.

Content
The subject area of machine intelligence and, in particular, machine learning, taking into account real challenges of complex application domains, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.
The lecture “Machine Learning 2” deals with advanced methods of machine learning such as semi-supervised and active learning, deep neural networks (deep learning), pulsed networks, hierarchical approaches, e.g. As well as dynamic, probabilistic relational methods. Another focus is the embedding and application of machine learning methods in real systems.
The lecture introduces the latest basic principles as well as extended basic structures and elucidates previously developed algorithms. The structure and the mode of operation of the methods and methods are presented and explained by means of some application scenarios, especially in the field of technical (sub) autonomous systems (robotics, neurorobotics, image processing, etc.).

Workload
Vorlesung mit 2 SWS, plus Nachbereitung durch die Studierenden.

Literature
Die Foliensätze sind als PDF verfügbar.
Weiterführende Literatur
- Weitere (spezifische) Literatur zu einzelnen Themen wird in der Vorlesung angegeben.
Learning Control / Examinations
The course has been cancelled. The grade is based on an exam. The exam covers all the material that is taught in the current semester. The exam takes place in the last week of the lecture-free period. Students who fail the exam are allowed to retake it in the following semester (last week of the respective lecture-free period). Throughout the semester we distributed exercises that can be solved by students on a voluntary basis. A student who solves at least 80% of these exercises will obtain a 0.3 bonus on top of his exam grade.

Conditions
None

Recommendations
None
Course: Machine Tools and Industrial Handling [T-MACH-102158]

Responsibility: Jürgen Fleischer

Contained in: [M-MACH-101286] Machine Tools and Industrial Handling

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<td>WS 16/17</td>
<td>2149902</td>
<td>Machine Tools and Industrial Handling</td>
<td>Vorlesung / Übung 6</td>
<td>(VÜ)</td>
<td>Jürgen Fleischer</td>
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### Learning Control / Examinations

The assessment is carried out as an oral exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date.

### Conditions

none

### Event excerpt: Machine Tools and Industrial Handling (WS 16/17)

#### Aim

The students...

- are capable to explain the use and application of machine tools and handling devices as well as differentiate their characteristics and structure.
- are able to name and describe the essential components (frame, main spindles, feed axis, peripheral equipment, control) of machine tools.
- Are capable to distinguish and select and describe the essential components regarding structure, characteristics advantages and disadvantages.
- are enabled to dimension the main components of machine tools.
- are able to name and describe the control principles of machine tools.
- are capable to name examples of machine tools and industrial handling as well as to deduce compare the essential components. Additionally they can allocate manufacturing processes.
- are enabled to identify drawbacks as well as derive and asses measures for improvements.
- are qualified to apply methods for selection and evaluation of machine tools.
- are experienced to deduce the particular failure characteristics of a ball screw.

#### Content

The lecture provides an overview of machine tool and handling devices structures, use and application areas. Within the lecture based and industrially oriented knowledge for selection, dimensioning and evaluation is conveyed. First the components of machine tools are explained systematically. Here the distinctive features of dimensioning machine tools are deduced followed by the integral dimensioning of machine tools. Subsequently the use of machine tools is shown in exemplary application areas e.g. turning, milling, grinding, metal forming, sheet metal forming and gear cutting. The lecture provides an inside view of industrial application and is illustrated with current examples.

The topics are as follows:

- Frame and frame components
- Main drives and main spindles
- Requirements for feed axes
- Electro-mechanical feed axis
- Fluidic feed axes
- Control technologies
- Peripheral components
- Metrological assessment
- Machine maintenance
- Process-diagnosis
- Machinery Directiv
- Machine tool examples

Workload
regular attendance: 63 hours
self-study: 177 hours

Literature
Lecture Notes
Course: Macro-Finance [T-WIWI-106194]

Responsibility: Maxim Ulrich


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<td>WS 16/17</td>
<td>2530363</td>
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<td>Übung (Ü)</td>
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<td>Stephan Florig</td>
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### Learning Control / Examinations

The grade is based on an exam. The exam covers all the material that is taught in the current semester. The exam takes place in the last week of the lecture-free period. Students who fail the exam are allowed to retake it in the following semester (last week of the respective lecture-free period).

### Conditions

None

### Recommendations

None

### Remarks

Course: Management Accounting 1 [T-WIWI-102800]

Responsibility: Marcus Wouters
Contained in: [M-WIWI-101498] Management Accounting

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<td>SS 2017</td>
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<td>Vorlesung (V) 2</td>
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Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester and project that runs for several weeks during the semester. The final grade is the weighted average of the examination and the project assessment.

Conditions
None

Event excerpt: Management Accounting 1 (SS 2017)

Aim
Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

Content
The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing. We will use international material written in English. We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information). The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
- In addition, several papers that will be available on ILIAS.
Course: Management Accounting 2 [T-WIWI-102801]

Responsibility: Marcus Wouters

Contained in: [M-WIWI-101498] Management Accounting

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Learning Control / Examinations

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester and project that runs for several weeks during the semester.

The final grade is the weighted average of the examination and the project assessment.

Conditions

None

Recommendations

It is recommended to take part in the course “Management Accounting 1” before this course.

Event excerpt: Management Accounting 2 (WS 16/17)

Aim

Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

Content

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems and customer value propositions.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- In addition, several papers that will be available on ILIAS.
# Course: Management and Strategy [T-WIWI-102629]

**Responsibility:** Hagen Lindstädt  
**Contained in:** [M-WIWI-101450] Strategic Corporate Management and Organization  

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## Learning Control / Examinations

The assessment consists of a written exam (60 min) taking place at the begin of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**  
None
Course: Management in Public Transport [T-BGU-101795]

Responsibility: Eberhard Hohnecker
Contained in: [M-BGU-101113] Project in Public Transportation

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<td>Eberhard Hohnecker</td>
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Conditions
None

Recommendations
None

Remarks
None

Event excerpt: Management in Public Transport (SS 2017)

Content
- Netzplanung im ÖV
- Haltestellen des ÖV
- Bau und Betrieb im SPNV
- Fahrzeuge im SPNV / ÖPNV
- Organisation des ÖV

Literature
Fiedler, Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf
Pachl, Systemtechnik des Schienenverkehrs, Teubner-Verlag, Stuttgart
Janicki, Fahrzeugtechnik, Eisenbahn-Fachverlag, Heidelberg
Course: Management of IT-Projects [T-WIWI-102667]

Responsibility: Roland Schätzle

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

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Learning Control / Examinations
The assessment of this course is a written examination (60 min) in the first week after lecture period according to Section 4(2). 1 of the examination regulation.

Conditions
None

Event excerpt: Management of IT-Projects (SS 2017)

Aim
Students
- explain the terminology of IT project management and typical used methods for planning, handling and controlling,
- apply methods appropriate to current project phases and project contexts,
- consider organisational and social impact factors.

Content
The lecture deals with the general framework, impact factors and methods for planning, handling, and controlling of IT projects. Especially following topics are addressed:
- project environment
- project organisation
- project planning including the following items:
  - plan of the project structure
  - flow chart
  - project schedule
  - plan of resources
- effort estimation
- project infrastructur
- project controlling
- risk management
- feasibility studies
- decision processes, conduct of negotiations, time management.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam & 1h

Total: 150h

**Literature**

- B. Hindel, K. Hörmann, M. Müller, J. Schmied. Basiswissen Software-Projektmanagement. dpunkt.verlag 2004

Further literature is given in each lecture individually.
Course: Managing New Technologies [T-WIWI-102612]

Responsibility: Thomas Reiß

Contained in: [M-WIWI-101488] Entrepreneurship (EnTechnon)

<table>
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<th>Language</th>
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Learning Control / Examinations
Written exam 100% following §4, Abs. 2.

Conditions
None

Recommendations
None


Aim
New technologies can contribute substantially to the international competitiveness of different industrial sectors. This course provides the necessary knowledge for understanding how industrial enterprises and policy-makers are dealing with the challenge to realise in time the potentials of new technologies and to use them most efficiently. Key tasks of the management of new technologies will be practised.

Content
The course provides an overview of the international development of a selected number of key technologies such as biotechnology, nanotechnology, neurotechnologies, converging technologies. Methods for monitoring new technologies including foresight approaches will be presented and the economic and social impacts of new technologies will be discussed.

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
- Hausschildt/Salomo: Innovationsmanagement; Borchert et al.: Innovations- und Technologiemanagement;
- Specht/Möhrle; Gabler Lexikon Technologiemanagement
**Course: Managing Organizations [T-WIWI-102630]**

**Responsibility:** Hagen Lindstädt

**Contained in:** [M-WIWI-101450] Strategic Corporate Management and Organization

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<td>WS 16/17</td>
<td>2577902</td>
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**Learning Control / Examinations**

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**

None

**Event excerpt: Managing Organizations (WS 16/17)**

**Aim**

After passing this course students are able to

- evaluate strengths and weaknesses of existing organisational structures and rules.
- compare alternatives of organisational structure in practice and assess and interpret them regarding their effectiveness and efficiency.
- assess the management of organisational changes.

**Content**

The course should enable the participants to assess the strengths and weaknesses of existing organisational structures and rules using systematic criteria. Here concepts and models for designing organisation structures, regulating organizational processes and managing organisational changes are presented and discussed using case studies. The course is structured to relate to actions and aims to give students a realistic view of the opportunities and limits of rational design approaches.

**Workload**

The total workload for this course is approximately 105.0 hours. For further information see German version.

**Literature**


The relevant excerpts and additional sources are made known during the course.
Course: Manufacturing Technology [T-MACH-102105]

Responsibility: Volker Schulze, Frederik Zanger

Contained in: [M-MACH-101276] Manufacturing Technology

ECTS 9  Language deutsch  Recurrence Jedes Wintersemester  Version 1

Events

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Learning Control / Examinations
The assessment is carried out as a written exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date.

Conditions
none

Event excerpt: Manufacturing Technology (WS 16/17)

Aim
The students . . .

- are capable to specify the different manufacturing processes and to explain their functions.
- are able to classify the manufacturing processes by their general structure and functionality according to the specific main groups.
- have the ability to perform a process selection based on their specific characteristics.
- are enabled to identify correlations between different processes and to select a process regarding possible applications.
- are qualified to evaluate different processes regarding specific applications based on technical and economic aspects.
- are experienced to classify manufacturing processes in a process chain and to evaluate their specific influence on surface integrity of workpieces regarding the entire process chain.

Content
The objective of the lecture is to look at manufacturing technology within the wider context of production engineering, to provide an overview of the different manufacturing processes and to impart detailed process knowledge of the common processes. The lecture covers the basic principles of manufacturing technology and deals with the manufacturing processes according to their classification into main groups regarding technical and economic aspects. The lecture is completed with topics such as process chains in manufacturing.

The following topics will be covered:

- Quality control
- Primary processing (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming, plastics engineering)
- Cutting (maching with geometrically defined and geometrically undefined cutting edges, separating, abrading)
- Joining
- Coating
- Heat treatment and surface treatment
- Process chains in manufacturing

This lecture provides an excursion to an industry company.

Workload
regular attendance: 63 hours
self-study: 177 hours
Literature
Lecture Notes
Course: Market Engineering: Information in Institutions [T-WIWI-102640]

Responsibility: Christof Weinhardt

Contained in:
- [M-WIWI-101411] Information Engineering
- [M-WIWI-102754] Service Economics and Management
- [M-WIWI-101409] Electronic Markets
- [M-WIWI-101453] Applied Strategic Decisions

ECTS: 4,5
Language: englisch
Recurrence: Jedes Sommersemester
Version: 1

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<td>SS 2017</td>
<td>2540461</td>
<td>Übungen zu Market Engineering: Information in Institutions</td>
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Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) up to 6 bonus points can be obtained. The bonus points only apply to the first and second exam of the semester in which they were obtained.

Conditions
None

Event excerpt: Market Engineering: Information in Institutions (SS 2017)

Aim
The students
- understand the role of an economist as an engineer to design markets,
- compare different markets and market mechanisms to evaluate their efficiency,
- apply game theoretic modelling and mechanism design as well as auction theory for interdisciplinary evaluation.

Content
The ongoing advancements in information technology have revolutionized traditional business processes and given rise to electronic marketplaces. In contrast to physical marketplaces, electronic markets do not just evolve, but must be carefully designed, implemented and monitored and evaluated. Moreover electronic markets demand open and flexible platforms as well as adequate standards and information services. Future Market Engineers must therefore be able to consider the economic, legal and technological dimension of markets simultaneously. The lecture focuses on the discussion of (1) Microstructure, (2) IT infrastructure, and (3) Business Structure of electronic markets. Hence, students will be taught the economic incentives that a market can impose on market participants, development models for implementing markets, and business models for the application of markets.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Course: Market Research [T-WIWI-102811]

Responsibility: Martin Klarmann

Contained in:
- [M-WIWI-101647] Data Science: Evidence-based Marketing
- [M-WIWI-101487] Sales Management

ECTS: 4,5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<thead>
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<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<tr>
<td>SS 2017</td>
<td>2571150</td>
<td>Market Research</td>
<td>Vorlesung (V)</td>
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<td>Martin Klarmann</td>
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<td>SS 2017</td>
<td>2571151</td>
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<td>Übung (Ü)</td>
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<td>Maximilian Lüders</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

Remarks
Please note that this course has to be completed successfully by students interested in master thesis positions at the Marketing & Sales Research Group.

Event excerpt: Market Research (SS 2017)

Aim
Topics addressed in this course are for example:

- Theoretical principles of market research
- Statistical foundations of market research
- Measuring customer attitudes
- Understanding of customer reactions
- Strategical decision making

Content
Topics addressed in this course are for example:

- Theoretical foundations of market research
- Statistical foundations of market research
- Measuring customer attitudes
- Understanding customer reactions
- Strategical decision making

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
# Course: Marketing Analytics [T-WIWI-103139]

**Responsibility:** Martin Klarmann  
**Contained in:** [M-WIWI-101647] Data Science: Evidence-based Marketing

<table>
<thead>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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## Events

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</table>

## Learning Control / Examinations

The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation).

## Conditions

In order to attend Marketing Analytics, students are required to have passed the course Market Research [2571150].

### Modeled Conditions

The following conditions must be met:

- The course [T-WIWI-102811] Market Research must have been passed.

## Recommendations

None

## Remarks

For further information please contact the Marketing and Sales Research Group (marketing.iism.kit.edu).

Exchange students can bypass the requirement of passing Market Research if they can prove that they possess sufficient statistical knowledge based on courses attended at their home institution. This will be examined individually by the Marketing & Sales Research Group.

## Event excerpt: (WS 16/17)

### Aim

**Students**

- receive based on the course market research an overview of advanced empirical methods
- learn in the course of the lecture to handle advanced data collection and data analysis methods
- are based on the acquired knowledge able to interpret results and derive strategic implications

### Content

In this course various relevant market research questions are addressed, as for example measuring and understanding customer attitudes, preparing strategic decisions and sales forecasting. In order to analyze these questions, students learn to handle social media data, panel data, nested observations and experimental design. To analyze the data, advanced methods, as for example multilevel modeling, structural equation modeling and return on marketing models are taught. Also, problems of causality are addressed in-depth. The lecture is accompanied by a computer-based exercise, in the course of which the methods are applied practically.

### Workload

Total workload for 4.5 ECTS: ca. 135 hours
### Course: Marketing Communication [T-WIWI-102902]

**Responsibility:** Ju-Young Kim  
**Contained in:**  
- [M-WIWI-101649] Services Marketing  

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**Events**

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### Learning Control / Examinations

The assessment consists of a written examination (60 min) (according to Section 4 (2).1 of the examination regulation).

**Conditions**

None

**Recommendations**

None

### Event excerpt: Marketing Communication (SS 2017)

**Content**

The aim of this lecture is to provide an overview of research on marketing communication tools, such as offline and online advertising, WOM communication and viral marketing, price promotions and corporate social responsibility activities.

**Literature**

- Esch, F.-R./Herrmann, A./Sattler, H. “Marketing – Eine managementorientierte Einführung”  
- Kroeber-Riel, W./Esch, F.-R. “Strategie und Technik der Werbung”  

See lecture slides for further recommendations on literature
Course: Marketing Strategy Business Game [T-WIWI-102835]

Responsibility: Martin Klarmann

[M-WIWI-101510] Cross-functional Management Accounting

ECTS: 1,5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>Marketing Strategy Business Game</td>
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Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop. Exception: In summer term 2016 exceptionally two courses can be chosen or, in case one course has already been chosen previously, a second course can be chosen.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.
In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

Event excerpt: Marketing Strategy Business Game (SS 2017)

Aim
Students
- are able to operate the strategic marketing simulation software “Markstrat”
- are able to take strategic marketing decisions in groups
- know how to apply strategic marketing concepts to practical contexts (e.g. for market segmentation, product launches, coordination of the marketing mix, market research, choice of the distribution channel or competitive behavior)
- are capable to collect and to select information usefully with the aim of decision-making
- are able to react appropriately to predetermined market conditions
- know how to present their strategies in a clear and consistent way
- are able to talk about the success, problems, critical incidents, external influences and strategy changes during the experimental game and to reflect and present their learning success

Content
Using Markstrat, a marketing strategy business game, students work in groups representing a company that competes on a simulated market against the other groups’ companies.

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.
**Course: Markets and Organizations: Principles [T-WIWI-102821]**

**Responsibility:** Andreas Geyer-Schulz  
**Contained in:** [M-WIWI-101409] Electronic Markets

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**Learning Control / Examinations**

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively. The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

**Conditions**

None

**Recommendations**

None

**Remarks**

The course is not offered at the moment.
**Course: Markov Decision Models I [T-WIWI-102710]**

**Responsibility:** Karl-Heinz Waldmann

**Contained in:** [M-WIWI-101454] Stochastic Modelling and Optimization

<table>
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<td>Markov Decision Models I</td>
<td>Vorlesung (V)</td>
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<td>André Lust, Ellen Platt, Karl-Heinz Waldmann</td>
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<td>WS 16/17</td>
<td>2550681</td>
<td>Übung (U)</td>
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<td>André Lust, Ellen Platt, Karl-Heinz Waldmann</td>
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<td>WS 16/17</td>
<td>2550680</td>
<td>Übung (U)</td>
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<td>André Lust, Ellen Platt, Karl-Heinz Waldmann</td>
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### Learning Control / Examinations

The examination T-WIWI-102710 Markov Decision Models I will be offered latest until summer term 2017 (for beginners). The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

### Conditions

None

---

### Event excerpt: Markov Decision Models I (WS 16/17)

**Aim**

The participants will be enabled to model and analyze stochastic systems with modern techniques. The discussion of practice-oriented case studies pursues two goals. On the one hand, typical problem settings are illustrated and on the other hand, criteria for the evaluation of the performance of stochastic systems are motivated. Properties and characteristics for the evaluation of the performance of Markov Chains, Poisson Processes and queuing systems are developed.

**Content**

Markov Chains, Poisson Processes, Markov Chains in Continuous Time, Queuing Systems

**Workload**

The total workload for this course is approximately 150 hours. For further information see German version.

**Literature**

- Elective literature:
Course: Markov Decision Models II [T-WIWI-102711]

Responsibility: Karl-Heinz Waldmann

Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

<table>
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<th>Recurrence</th>
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Learning Control / Examinations
The examination T-WIWI-102711 Markov Decision Models II will be offered latest until winter term 2016/2017 (for beginners).
The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Recommendations
Foundations in the field of the Markov Decision Models I [2550679] are desired.

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.
Course: Mass Fluxes in River Basins [T-BGU-103648]

Responsibility: Stephan Fuchs

Contained in: [M-BGU-101000] Environmental Management

ECTS: 3  Version: 1

<table>
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<td>Vorlesung (V)  2</td>
<td>Stephan Fuchs</td>
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Conditions
none
Course: Master Thesis [T-WIWI-103142]

Responsibility: Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften


<table>
<thead>
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<th>Version</th>
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Learning Control / Examinations
see module description

Conditions
see module description
Course: Material Flow in Logistic Systems [T-MACH-102151]

Responsibility: Kai Furmans

[M-MACH-101263] Introduction to Logistics

ECTS 6 Language deutsch  Recurrence Jedes Wintersemester  Version 1

Events

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<td>WS 16/17</td>
<td>2117051</td>
<td>Material flow in logistic systems</td>
<td>Vorlesung (V)</td>
<td>3</td>
<td>Kai Furmans</td>
</tr>
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</table>

Learning Control / Examinations
25% written exam at end of semester: solving a case study / planning problem
75% assignments during the semester consisting of solving and presenting case studies, solving exercises and holding small pieces of lectures, partially in group work

Conditions
none

Event excerpt: Material flow in logistic systems (WS 16/17)

Aim
Students are able to:
- describe material flow processes qualitativ and quantitativ,
- assign possibilities of technical solutions to a open operational task,
- plan material flow systems, illustrate them in simple models and analyse them regarding their performance,
- use methods to determine performance indicators like throughput, utilization, etc., and
- evaluate material flow systems regarding performance and availability.

Content
- elements of material flow systems (conveyor elements, fork, join elements)
- models of material flow networks using graph theory and matrices
- queuing theory, calculation of waiting time, utilization
- warehousing and order-picking
- shuttle systems
- sorting systems
- simulation
- calculation of availability and reliability
- value stream analysis

Literature
Arnold, Dieter; Furmans, Kai: Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 2009
Course: Materials and Processes for Body Lightweight Construction in the Automotive Industry [T-MACH-105166]

Responsibility: Stefan Kienzle, Dieter Steegmüller
Contained in: [M-MACH-101284] Specialization in Production Engineering

ECTS Language Recurrence Version
4 deutsch Jedes Wintersemester 1

Events

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<td>Materials and Processes for Body Lightweight Construction in the Automotive Industry</td>
<td>Vorlesung (V)</td>
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<td>Stefan Kienzle, Dieter Steegmüller</td>
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Learning Control / Examinations
The assessment is carried out as an oral exam. The examination is offered every semester. Reexaminations are offered at every ordinary examination date.

Conditions
none

Event excerpt: Materials and Processes for Body Lightweight Construction in the Automotive Industry (WS 16/17)

Aim
The students . . .

- are able to name the various lightweight approaches and identify possible areas of application.
- are able to identify the different production processes for manufacturing lightweight structures and explain their functions.
- are able to perform a process selection based on the methods and their characteristics.
- are able to evaluate the different methods against lightweight applications on the basis of technical and economic aspects.

Content
The objective of the lecture is to build up an overview of the relevant materials and processes for the production of a lightweight body. This includes both the actual production and the joining for the body. The lecture covers the different lightweight approaches and possible fields of application in the automotive industry. The methods are discussed with practical examples from the automotive industry.

The following topics will be covered:

- lightweight designs
- aluminum and steel for lightweight construction
- fibre-reinforced plastics by the RTM and SMC process
- joining of steel and aluminum (clinching, riveting, welding)
- bonding
- coating
- finishing
- quality assurance
- virtual factory

Workload
regular attendance: 21 hours
self-study: 99 hours
Literature
Lecture Notes
**Course: Mathematical Models and Methods for Production Systems [T-MACH-105189]**

**Responsibility:** Kai Furmans

**Contained in:** [M-MACH-101278] Material Flow in Networked Logistic Systems

<table>
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<th>Language</th>
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<th>Version</th>
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<td>2117059</td>
<td>Mathematical models and methods for Production Systems</td>
<td>Vorlesung (V)</td>
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<td>Kai Furmans, Judith Stoll</td>
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</table>

**Learning Control / Examinations**

The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

**Conditions**

none

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**Event excerpt: Mathematical models and methods for Production Systems (WS 16/17)**

**Aim**

Students are able to:

- Describe material flow systems with analytical solvable stochastic models,
- Derive approaches for control systems (KANBAN) based on easy models of queueing theory,
- Execute practical exercises on workstations and
- Use simulation and exact methods.

**Content**

- single server systems: M/M/1, M/G/1: priority rules, model of failures
- networks: open and closed approximations, exact solutions and approximations
- application to flexible manufacturing systems, AGV (automated guided vehicles) - systems
- modeling of control approaches like constant work in process (ConWIP) or kanban
- discrete-time modeling of queuing systems

**Workload**

regular attendance: 42 hours
self-study: 198 hours

**Literature**

Shanthikumar, Buzacott: Stochastic Models of Manufacturing Systems
Course: Mathematical Theory of Democracy [T-WIWI-102617]

Responsibility: Andranik Melik-Tangian
Contained in: [M-WIWI-101504] Collective Decision Making

<table>
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<th>Recurrence</th>
<th>Version</th>
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Events

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<td>Andranik Melik-Tangian</td>
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</table>

Learning Control / Examinations

The lecture will not be offered from winter term 2017/2018. The last examination takes place in summer term 2017 (only for repeaters).

The assessment consists of a written exam (120 min.) according to §4 (2), 1 of the examination regulation. It may be an oral exam (20 - 30 min.) (according to §4 (2), 2 of the examination regulation) in the case of poor attendance.

Conditions

None

Event excerpt: Mathematical Theory of Democracy (WS 16/17)

Aim

The student understands the foundations of democracy and the implementation problems and the masters the operationalization of the problems by mathematical models.

Content

The mathematical theory of democracy deals with the selection of representatives who make decisions on behalf of the whole society. The concept of representation is operationalized with the popularity index (average percentage of the population represented on a number of issues), and with the universality index (percentage of cases when a majority of the population is represented). With these indexes, the characteristics of individual representatives (president, dictator) and representative bodies (parliament, coalition, cabinet, council, jurors) are investigated. To bridge the representative and direct democracies, an alternative election method is proposed, which is not based on voting, but on the indexing of the candidates with regard to the political profile of the electorate. In addition, societal applications (federal election, surveys) and non-social applications (multi-criteria decisions, finances, traffic control) are considered.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Course: Metal Forming [T-MACH-105177]

Responsibility: Florian Herlan
Contained in: [M-MACH-101284] Specialization in Production Engineering

**Events**

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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Learning Control / Examinations

Oral examination

Conditions

none

**Event excerpt: Metal Forming (SS 2017)**

**Aim**

The students

- are able to reflect the basics, forming processes, tools, Machines and equipment of metal forming in an integrated and systematic way.
- are capable to illustrate the differences between the forming processes, tools, machines and equipment with concrete examples and are qualified to analyze and assess them in terms of their suitability for the particular application.
- are also able to transfer and apply the acquired knowledge to other metal forming problems.

**Content**

At the beginning of the lecture the basics of metal forming are briefly introduced. The focus of the lecture is on massive forming (forging, extrusion, rolling) and sheet forming (car body forming, deep drawing, stretch drawing). This includes the systematic treatment of the appropriate metal forming Machines and the corresponding tool technology. Aspects of tribology, as well as basics in material science and aspects of production planning are also discussed briefly. The plastic theory is presented to the extent necessary in order to present the numerical simulation method and the FEM computation of forming processes or tool design. The lecture will be completed by product samples from the forming technology.

The topics are as follows:

- Introduction and basics
- Hot forming
- Metal forming machines
- Tools
- Metallographic fundamentals
- Plastic theory
- Tribology
- Sheet forming
- Extrusion
- Numerical simulation

**Workload**

regular attendance: 21 hours
self-study: 99 hours

**Literature**

Lecture Notes

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Methods and Models in Transportation Planning [T-BGU-101797]

Responsibility: Peter Vortisch
Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management

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<td>Mitarbeiter/innen, Peter Vortisch</td>
<td></td>
</tr>
</tbody>
</table>

Conditions
None

Recommendations
None

Remarks
None
**Course: Methods in Economic Dynamics [T-WIWI-102906]**

**Responsibility:** Ingrid Ott  
**Contained in:** [M-WIWI-101514] Innovation Economics

**ECTS** 1,5  
**Language** deutsch  
**Recurrence** Jedes Sommersemester  
**Version** 1

### Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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<tr>
<td>SS 2017</td>
<td>2560240</td>
<td>Methods in Economic Dynamics</td>
<td>Vorlesung (V)</td>
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<td>Vladimir Korzinov, Ingrid Ott</td>
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</table>

### Learning Control / Examinations

Non exam assessment according to § 4 paragraph 3 of the examination regulation (SPO 2015).

**Conditions**  
None

**Recommendations**  
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012] and Economics II [2600014]. Further, it is assumed that students have interest in using quantitative-mathematical methods.

### Event excerpt: Methods in Economic Dynamics (SS 2017)

**Aim**  
Students shall be given the ability to:

- work with fundamental theoretical innovation models and to implement them in appropriate computer algebra systems  
- query appropriate data sources and to analyse and visualise them using statistical methods

**Content**  
The workshop offers the possibility to deepen the understanding about different aspects of theoretical modelling of innovation-based growth and induced economic effects. This includes the implementation of formal models in computer algebra systems as well as recording, processing and econometric analysis of related data from relational databases (concerning for example patents or trademarks). Moreover, methods of network theory are discussed.

**Workload**  
The total workload for this course is approximately 45 hours.  
Lecture: 15h  
Preparation of lecture/exam: 30h
Course: Microactuators [T-MACH-101910]

Responsibility: Manfred Kohl

Contained in:
- [M-MACH-101287] Microsystem Technology
- [M-ETIT-101158] Sensor Technology I
- [M-MACH-101290] BioMEMS
- [M-MACH-101292] Microoptics
- [M-ETIT-101159] Sensor Technology II

ECTS: 3 Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Term Event-No. Events Type SWS Lecturers
SS 2017 2142881 Microactuators Vorlesung (V) 2 Manfred Kohl

Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: Microactuators (SS 2017)

Aim
- Knowledge of the actuation principles including pros and cons
- Knowledge of important fabrication technologies
- Explanation of layout and function of the microactuators
- Calculation of important properties (time constants, forces, displacements, etc.)
- Development of a layout based on specifications

Content
- Basic knowledge in the material science of the actuation principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications

The lecture includes amongst others the following topics:
- Microelectromechanical systems: linear actuators, microrelais, micromotors
- Medical technology and life sciences: Microvalves, micropumps, microfluidic systems
- Microrobotics: Microgrippers, polymer actuators (smart muscle)
- Information technology: Optical switches, mirror systems, read/write heads

Workload
lecture time 1.5 h/week
self preparation: 8.5 h/week

Literature
- Lecture notes
- M. Kohl, Shape Memory Microactuators, M. Kohl, Springer-Verlag Berlin, 2004
Course: Microoptics and Lithography [T-MACH-105176]

Responsibility: Timo Mappes
Contained in: [M-MACH-101292] Microoptics

ECTS 3
Recurrence Jedes Sommersemester
Version 1

Learning Control / Examinations
oral, duration 20 minutes, aids: none

Conditions
none
**Course: Mixed Integer Programming I [T-WIWI-102719]**

**Responsibility:** Oliver Stein

**Contained in:**
- [M-WIWI-101473] Mathematical Programming
- [M-WIWI-103289] Stochastic Optimization

<table>
<thead>
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<th>Recurrence</th>
<th>Version</th>
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</thead>
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</table>

**Learning Control / Examinations**
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester. Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite. The examination can also be combined with the examination of *Mixed Integer Programming II* [25140]. In this case, the duration of the written examination takes 120 minutes.

**Conditions**
None

**Recommendations**
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

**Remarks**
The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).
**Course: Mixed Integer Programming I and II [T-WIWI-102733]**

**Responsibility:** Oliver Stein  
**Contained in:** [M-WIWI-101473] Mathematical Programming

<table>
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<th>Recurrence</th>
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</thead>
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**Learning Control / Examinations**  
The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation.

**Conditions**  
None.
Course: Mixed Integer Programming II [T-WIWI-102720]

Responsibility: Oliver Stein

Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization

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Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of Mixed Integer Programming I [2550138]. In this case, the duration of the written examination takes 120 minutes.

Conditions
None

Recommendations
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks
The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).
Course: Mobile Machines [T-MACH-105168]

Responsibility: Marcus Geimer

Contained in: [M-MACH-101267] Mobile Machines

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Events

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<th>Term</th>
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<th>Type</th>
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<th>Lecturers</th>
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<td>SS 2017</td>
<td>2114073</td>
<td>Mobile Machines</td>
<td>Vorlesung (V)</td>
<td>4</td>
<td>Chris Geiger, Marcus Geimer, Jan Siebert</td>
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</table>

Learning Control / Examinations

The assessment consists of an oral exam taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions

none

Event excerpt: Mobile Machines (SS 2017)

Aim

After completion of the course the students have knowledge of:

- a wide range of mobile machines
- operation modes and working cycles of important mobile machines
- selected subsystems and components

Content

- Introduction of the required components and machines
- Basics of the structure of the whole system
- Practical insight in the development techniques

Workload

- regular attendance: 42 hours
- self-study: 184 hours
Course: Mobility Services and new Forms of Mobility [T-BGU-103425]

Responsibility: Martin Kagerbauer

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>SS 2017</td>
<td>6232811</td>
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<td>Martin Kagerbauer</td>
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Conditions
None

Recommendations
None

Remarks
None
Course: Model Based Application Methods [T-MACH-102199]

Responsibility: Frank Kirschbaum

Contained in: [M-MACH-101303] Combustion Engines II

<table>
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<th>Recurrence</th>
<th>Version</th>
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</thead>
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<td>Jedes Sommersemester</td>
<td>1</td>
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</tbody>
</table>

Learning Control / Examinations
take-home exam, short presentation with oral examination

Conditions
none
Course: Modeling and Analyzing Consumer Behavior with R [T-WIWI-102899]

Responsibility: Verena Dorner, Christof Weinhardt

Contained in:
- [M-WIWI-101506] Service Analytics
- [M-WIWI-103118] Data Science: Data-Driven User Modeling
- [M-WIWI-101448] Service Management

ECTS: 4.5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>2540470</td>
<td>Modeling and Analyzing Consumer Behaviour with R</td>
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<td>Verena Dorner, Dominik Jung, Ewa Lux</td>
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<td>SS 2017</td>
<td>2540471</td>
<td>Übung (U)</td>
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<td>Verena Dorner, Dominik Jung</td>
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</tbody>
</table>

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

Conditions
None

Recommendations
None

Remarks
Limited number of slots
The course has been added summer term 2015.


Aim
The students
- learn to use the statistic software R on an advanced level
- understand the approach on how to model and simulate decision support systems
- know methods for evaluating, analyzing, and visualizing data

Content
The students use the R software for handling case studies from the fields of e-commerce and decision support system (DSS). On the implementation level, participants learn to write functions in R to simulate data, e.g., corporate data. On the user level, participants learn methods for analyzing and visualizing data, e.g., for the analysis of product reviews.

Main topics covered by the lecture:
1. Data types and programming concepts in R
2. Data selection and restructuring in data frames
3. Text Mining with R
4. Optimization with R
5. Visualization with R

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
Literature
Wickham, Hadley, ggplot2: Elegant Graphics for Data Analysis (Use R!), Springer 2009 (2nd edition)
Course: Modeling and OR-Software: Advanced Topics [T-WIWI-106200]

Responsibility: Stefan Nickel

Contained in:
- [M-WIWI-102808] Digital Service Systems in Industry

ECTS 4,5
Recurrence Jedes Semester
Version 2

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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<th>Lecturers</th>
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<td>WS 16/17</td>
<td>2550489</td>
<td></td>
<td>Praktikum (P)</td>
<td>2/1</td>
<td>Tanya Gonser, Stefan Nickel, Melanie Reuter-Oppermann</td>
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</table>

Learning Control / Examinations
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the software laboratory and the following term.

Conditions
None.

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research is assumed.
Successful completion of the course Modeling and OR-Software: Introduction.

Remarks
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.
The lecture is held in every term. The planned lectures and courses for the next three years are announced online.
Course: Modeling Mass Fluxes in River Basins [T-BGU-106681]

Responsibility: Stephan Fuchs
Contained in: [M-BGU-103308] Environmental Management

<table>
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Events

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<th>Lecturers</th>
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<td>Vorlesung / Übung 2 (VÜ)</td>
<td>Stephan Fuchs</td>
<td></td>
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</table>

Conditions
The learning control Environmental Management (T-BGU-106682) has to be begun, i.e. at least the registration has to be made.

Modeled Conditions
The following conditions must be met:

- The course [T-BGU-106682] *Environmental Management* must have been started.
Course: Modeling Mass Fluxes in River Basins [T-BGU-103649]

Responsibility: Stephan Fuchs

Contained in: [M-BGU-101000] Environmental Management

ECTS: 3  Version: 1

Conditions
The learning control Mass Fluxes in River Basins has to be taken.

Modeled Conditions
The following conditions must be met:

- The course [T-BGU-103648] Mass Fluxes in River Basins must have been started.
### Course: Modeling Strategic Decision Making [T-WIWI-102803]

<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>Hagen Lindstädt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contained in:</td>
<td>[M-WIWI-101509] Strategic Decision Making and Organization</td>
</tr>
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<td></td>
<td>[M-WIWI-101510] Cross-functional Management Accounting</td>
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<td>[M-WIWI-101450] Strategic Corporate Management and Organization</td>
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<th>Recurrence</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,5</td>
<td>Jedes Sommersemester</td>
<td>1</td>
</tr>
</tbody>
</table>

**Learning Control / Examinations**
The course will not be offered anymore from winter term 2016/2017 on. The examination will be offered latest until summer term 2017 (repeaters only).
Written exam 100% following §4, Abs. 2.

**Conditions**
None

**Recommendations**
None
Course: Modelling, Measuring and Managing of Extreme Risks [T-WIWI-102841]

Responsibility: Ute Werner

Contained in: [M-WIWI-101449] Insurance Management II
[M-WIWI-101469] Insurance Management I

ECTS: 2.5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

<table>
<thead>
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<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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<th>Lecturers</th>
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<td>SS 2017</td>
<td>2530355</td>
<td>Modelling, Measuring and Managing of Extreme Risks</td>
<td>Vorlesung (V)</td>
<td>Stefan Hochrainer-Stigler</td>
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Learning Control / Examinations
Non exam assessment (following §4(2), 3 of the examination regulation).
T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).

Conditions
None

Recommendations
None

Event excerpt: Modelling, Measuring and Managing of Extreme Risks (SS 2017)

Aim
See German version.

Content

- Threshold models, generalized pareto distribution, threshold selection, parameter estimation, point process characterization, estimation under maximum domain: Pickands's estimator, Hill's estimator, Deckers-Einmahl-de Haan estimator.
- Case study presentations: Household level index based insurance systems (India, Ethiopia, SriLanka, China), insurance back-up systems coupled with public private partnerships (France, US), Reinsurance approaches (Munich Industrial Engineering and Management (M.Sc.)
Re, Swiss Re, Allianz).

- Climate Change topics: IPCC report, global and climate change.

**Workload**
The total workload for this course is approximately 75.0 hours. For further information see German version.

**Literature**

Course: Morphodynamics [T-BGU-101859]

Responsibility: Franz Nestmann

Contained in: [M-WIWI-101642] Natural Hazards and Risk Management 1
[M-WIWI-101644] Natural Hazards and Risk Management 2

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<td>6222805</td>
<td>Morphodynamics</td>
<td>Vorlesung / Übung 2</td>
<td>Franz Nestmann</td>
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</table>

Learning Control / Examinations
See German version.

Conditions
None
Course: Multivariate Statistical Methods [T-WIWI-103124]

Responsibility: Oliver Grothe

Contained in:
- [M-WIWI-103289] Stochastic Optimization
- [M-WIWI-101637] Analytics and Statistics
- [M-WIWI-101639] Econometrics and Statistics II

ECTS: 4,5

Recurrence: Jedes Sommersemester

Version: 1

Events

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<td>SS 2017</td>
<td>2550555</td>
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<td>Übung (Ü)</td>
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<td>Oliver Grothe</td>
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</table>

Learning Control / Examinations

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4).

The exam is offered every semester. Re-examinations are offered only for repeaters.

Conditions

None

Recommendations

The course covers highly advanced statistical methods with a quantitative focus. Hence, participants are necessarily expected to have advanced statistical knowledge, e.g. acquired in the course “Advanced Statistics”. Without this, participation in the course is not advised.

Previous attendance of the course Analysis of Multivariate Data is recommended. Alternatively, the script can be provided to interested students.
Course: Nanotechnology for Engineers and Natural Scientists [T-MACH-105180]

Responsibility: Martin Dienwiebel, Hendrik Hölscher, Stefan Walheim

Contained in: [M-MACH-101294] Nanotechnology

ECTS: 4 Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

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<th>Lecturers</th>
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<td>WS 16/17</td>
<td>2142861</td>
<td>Nanotechnology for Engineers and Natural Scientists</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Martin Dienwiebel, Hendrik Hölscher, Stefan Walheim</td>
</tr>
</tbody>
</table>

Learning Control / Examinations
written or oral exam

Conditions
none

Event excerpt: Nanotechnology for Engineers and Natural Scientists (WS 16/17)

Aim
The student can

- explain the most common measurement principles of nanotechnology especially scanning probe methods and is able to use them for the characterisation of chemical and physical properties of surfaces
- describe interatomic forces and their influence on nanotechnology
- describe methods of micro- and nanofabrication and of nanolithography
- explain simple models used in contact mechanics and nanotribology
- describe basic concepts used for nanoscale components

Content
1) Introduction into nanotechnology
2) History of scanning probe techniques
3) Scanning tunneling microscopy (STM)
4) Atomic force microscopy (AFM)
5) Dynamic Modes (DFM, ncAFM, MFM, KPFM, . . . )
6) Friction force microscopy & nanotribology
7) Nanolithography
8) Other families of the SPM family

Workload
lectures 30 h
self study 30 h
preparation for examination 30 h

Literature
1. Lecture notes, slides, script
**Course: Nanotechnology with Clusterbeams [T-MACH-102080]**

**Responsibility:** Jürgen Gspann

**Contained in:**
- [M-MACH-101294] Nanotechnology
- [M-MACH-101287] Microsystem Technology

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<table>
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<td>Vorlesung (V)</td>
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<td>Jürgen Gspann</td>
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</table>

### Learning Control / Examinations

- written examination
- presence in more than 70% of the lectures
- Duration: 1 h

**Conditions**

- none

#### Event excerpt: Nanotechnology with Clusterbeams (WS 16/17)

**Aim**

Nanotechnology is presented on the basis of a technology for nano- and microstructuring by accelerated nanoparticles (clusters), mainly in view of nanomechanics.

**Content**

Nanotechnology in biology
Nanosystemstechnology
Cluster beam generation, ionisation and acceleration; cluster properties
Structure generation using accelerated metal clusters
Structuring via gas cluster impact; reactive accelerated cluster erosion (RACE)
Atomic force microscopy of impact structures; nanotribology
Comparison with femtosecond laser machining (Winter term only)
Simulations; Fullerene synthesis, impact structures, visionary nanomachinery

**Literature**

Foil copies with short commentaries are distributed during the lectures.
Course: Nanotribology and -Mechanics [T-MACH-102167]

Responsibility: Martin Dienwiebel, Hendrik Hölscher

Contained in: [M-MACH-101291] Microfabrication
[M-MACH-101294] Nanotechnology

ECTS: 3
Recurrence: Jedes Semester
Version: 1

<table>
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<th>Event-No.</th>
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<td>Martin Dienwiebel</td>
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</table>

Learning Control / Examinations
presentation (40%) and oral examination (30 min, 60%)

no tools or reference materials

Conditions
none

Event excerpt: Nanotribology and -Mechanics (WS 16/17)

Aim
The student can

- explain the physical foundations and common models used in the field of nanotribology and nanomechanics
- describe the most important experimental methods in nanotribology
- critically evaluate scientific papers on nanotribological issues with respect to their substantial quality

Content
Part 1: Basics:
- Nanotechnology
- Forces at nanometer scale
- contact mechanics models (Hertz, JKR, DMT)
- Experimental methods (SFA, QCM, FFM)
- Prandtl-Tomlinson model
- Superlubricity
- Atomic-Scale Wear

Part 2: Topical papers

Workload
regular attendance: 22,5 hours
preparation for presentation: 22,5 hours
self-study: 75 hours

Literature
Lecture notes, slides and copies of articles

Event excerpt: Nanotribology and -Mechanics (SS 2017)
Aim

The student can

- explain the physical foundations and common models used in the field of nanotribology and nanomechanics
- describe the most important experimental methods in nanotribology
- critically evaluate scientific papers on nanotribological issues with respect to their substantial quality

Content

Part 1: Basics:

- Nanotechnology
- Forces at nanometer scale
- contact mechanics models (Hertz, JKR, DMT)
- Experimental methods (SFA, QCM, FFM)
- Prandtl-Tomlinson model
- Superlubricity
- Atomic-Scale Wear

Part 2: Topical papers

Workload

regular attendance: 22.5 hours
preparation for presentation: 22.5 hours
self-study: 75 hours

Literature

Lecture notes, slides and copies of articles
Course: Nature-Inspired Optimisation Methods [T-WIWI-102679]

Responsibility: Pradyumn Kumar Shukla

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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Learning Control / Examinations

The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation) and an additional written examination called “bonus exam”, 60 min (according Section 4(2), 3 of the examination regulation) or a selection of exercises. The bonus exam may be split into several shorter written tests.

The grade of this course is the achieved grade in the written examination. If this grade is at least 4.0 and at most 1.3, a passed bonus exam will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

Event excerpt: (SS 2017)

Aim
To learn:

1. Different nature-inspired methods: local search, simulated annealing, tabu search, evolutionary algorithms, ant colony optimization, particle swarm optimization
2. Different aspects and limitation of the methods
3. Applications of such methods
4. Multi-objective optimization methods
5. Constraint handling methods
6. Different aspects in parallelization and computing platforms

Content
Many optimization problems are too complex to be solved to optimality. A promising alternative is to use stochastic heuristics, based on some fundamental principles observed in nature. Examples include evolutionary algorithms, ant algorithms, or simulated annealing. These methods are widely applicable and have proven very powerful in practice. During the course, such optimization methods based on natural principles are presented, analyzed and compared. Since the algorithms are usually quite computational intensive, possibilities for parallelization are also investigated.

Literature
* E. Bonabeau, M. Dorigo, G. Theraulaz: ‘Swarm Intelligence’. Oxford University Press, 1999
Course: Non- and Semiparametrics [T-WIWI-103126]

Responsibility: Melanie Schienle

Contained in:
- [M-WIWI-101638] Econometrics and Statistics I
- [M-WIWI-101639] Econometrics and Statistics II

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Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Knowledge of the contents covered by the course “Applied Econometrics” [2520020]
Course: Nonlinear Optimization I [T-WIWI-102724]

Responsibility: Oliver Stein

Contained in: [M-WIWI-101473] Mathematical Programming

ECTS

Recurrence

Version

Jedes Semester

2

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Learning Control / Examinations

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of Nonlinear Optimization II [2550113]. In this case, the duration of the written examination takes 120 minutes.

Conditions

The module component exam T-WIWI-103637 “Nonlinear Optimization I und II” may not be selected.

Modeled Conditions

The following conditions must be met:

- The course [T-WIWI-103637] Nonlinear Optimization I und II must not have been started.

Remarks

Part I and II of the lecture are held consecutively in the same semester.

Event excerpt: (WS 16/17)

Aim

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)
Constrained problems are the contents of part II of the lecture. The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
**Course: Nonlinear Optimization I und II [T-WIWI-103637]**

**Responsibility:** Oliver Stein  
**Contained in:** [M-WIWI-101473] Mathematical Programming

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**Learning Control / Examinations**
The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The exam takes place in the semester of the lecture and in the following semester.

**Conditions**
None.

**Modeled Conditions**
The following conditions must be met:

1. The course [T-WIWI-102724] Nonlinear Optimization I must not have been started.
2. The course [T-WIWI-102725] Nonlinear Optimization II must not have been started.

**Remarks**
Part I and II of the lecture are held consecutively in the same semester.

**V Event excerpt: (WS 16/17)**

**Aim**
The student
- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Content**
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)
Constrained problems are the contents of part II of the lecture. The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993

Event excerpt: (WS 16/17)

Aim
The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
## Course: Nonlinear Optimization II [T-WIWI-102725]

### Responsibility:
Oliver Stein

### Contained in:
[M-WIWI-101473] Mathematical Programming

### ECTS
4.5

### Recurrence
Jedes Wintersemester

### Version
2

### Events

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### Learning Control / Examinations

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

The exam can also be combined with the examination of Nonlinear Optimization I [2550111]. In this case, the duration of the written exam takes 120 minutes.

### Conditions

None.

### Modeled Conditions

The following conditions must be met:

- The course [T-WIWI-103637] Nonlinear Optimization I und II must not have been started.

### Remarks

Part I and II of the lecture are held consecutively in the same semester.

### Event excerpt: (WS 16/17)

### Aim

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

### Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

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- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

### Literature

Elective literature:
- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
Course: Novel Actuators and Sensors [T-MACH-102152]

Responsibility: Manfred Kohl, Martin Sommer

Contained in: [M-MACH-101295] Optoelectronics and Optical Communication
[M-MACH-101294] Nanotechnology
[M-MACH-101287] Microsystem Technology

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<td>WS 16/17</td>
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<td>Novel actuators and sensors</td>
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<td>Manfred Kohl, Martin Sommer</td>
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</table>

Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: Novel actuators and sensors (WS 16/17)

Aim
- Knowledge of the principles of actuation and sensing including pros and cons
- Explanation of layout and function of important actuators and sensors
- Calculation of important properties (time constants, forces, displacements, sensitivity, etc.)
- Development of a layout based on specifications

Content
Contents: - Basic knowledge in the material science of actuator and sensor principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications
Index: The lecture includes amongst others the following topics:

- Piezo actuators
- Magnetostrictive actuators
- Shape memory actuators
- Electro-/magnetorheological actuators
- Sensors: Concepts, materials, fabrication
- Micromechanical sensors: Pressure, force, inertia sensors
- Temperature sensors
- Micro sensors for bio analytics
- Mechano-magnetic sensors

The lecture addresses students in the fields of mechanical engineering, mechatronics and information technology, materials science and engineering, electrical engineering and economic sciences. A comprehensive introduction is given in the basics and current developments on the macroscopic length scale. The lecture is core subject of the major course “Actuators and Sensors” of the specialization “Mechatronics and Microsystems Technology” in Mechanical Engineering.

Workload
Work Lecture:
time of attendance: 1.5 hours/week
Self-study: 7 hours/week

**Work Tutorial:**
time of attendance: 1.5 hours/week
Self-study: 3.5 hours/week

**Literature**
- Lecture notes
- Donald J. Leo, Engineering Analysis of Smart Material Systems, John Wiley & Sons, Inc., 2007
Course: Online Marketing [T-WIWI-103141]

Responsibility: Ju-Young Kim

Contained in: [M-WIWI-101649] Services Marketing

ECTS: 4.5
Recurrence: Jedes Wintersemester
Version: 1

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Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

Remarks
new course starting winter term 2015/2016

Event excerpt: (WS 16/17)

Aim
Students

- know about current topics (research and practice) in online marketing and learn how the transparency of the internet provides new opportunities to measure the success of marketing instruments
- learn about relevant marketing metrics
- know how to differentiate terms like SEO, SEM, social media, content marketing and gamification.
- are able to implement their marketing knowledge in a practical context

Content
The aim of this lecture is to provide an overview of research on online marketing tools. Students learn about current topics (research and practice) in online marketing and learn how the transparency of the internet provides new opportunities to measure the success of marketing instruments.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
See lecture slides for further recommendations on literature
Course: Open Innovation - Concepts, Methods and Best Practices [T-WIWI-102901]

Responsibility: Alexander Hahn

ECTS 1,5
Language englisch
Recurrence Jedes Sommersemester
Version 1

Events

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Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.ism.kit.edu) shortly before the lecture period in summer term starts.

Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.

Exception: In summer term 2016 exceptionally two courses can be chosen or, in case one course has already been chosen previously, a second course can be chosen.

Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

V Event excerpt: Open Innovation – Concepts, Methods and Best Practices (SS 2017)

Aim
Students

- know approaches, objectives, advantages and disadvantages of Open Innovation,
- know strategy, processes, methods and fields of application of Open Innovation,
- understand success factors by means of best practices from real life projects,
- can apply Open Innovation methods on their own.

Content
Joy’s Law: “No matter who you are, most of the smartest people work for someone else” (Bill Joy, Co-Founder Sun Microsystems)

This lecture conveys an understanding and practical application of Open Innovation, i.e. the collaborative opening of the innovation process to customers, suppliers, partners, competitors, new markets.... The contents encompass among others:

- approaches, objectives, advantages and disadvantages of Open Innovation
- knowledge of approaches, objectives, advantages and disadvantages of Open Innovation
- strategy, processes, methods and fields of application of Open Innovation
• focus mainly on customer integration into the innovation process (e.g. Netnography, Crowdsourcing, Lead User, Trend Receiver,...)
• Independent application of Open Innovation methods.

Workload
Total workload for 1.5 ECTS: ca. 45 hours

Literature
To be announced in the course.
Course: Operation Methods for Earthmoving [T-BGU-101801]

Responsibility: Heinrich Schlick

Contained in: [M-BGU-101110] Process Engineering in Construction

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<th>Recurrence</th>
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Conditions
None

Recommendations
None

Remarks
None
**Course: Operation Methods for Foundation and Marine Construction [T-BGU-101832]**

**Responsibility:** Harald Schneider  
**Contained in:** [M-BGU-101110] Process Engineering in Construction  

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**Conditions**  
None

**Recommendations**  
None

**Remarks**  
None
Course: Operation Systems and Track Guided Infrastructure Capacity [T-BGU-101824]

Responsibility: Eberhard Hohnecker
Contained in: [M-BGU-101113] Project in Public Transportation

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Conditions
None

Recommendations
None

Remarks
None

Event excerpt: Operation Systems and Track Guided Infrastructure Capacity (SS 2017)

Content
- Blocking Time and Minimum Headway Time
- Signal Box Technologies
- Capacity of Railway Infrastructure
- Modelling Operational Processes

Literature
Fiedler, Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf
Hausmann, Enders, Grundlagen des Bahnbetriebs, Bahn-Fachverlag, Heidelberg
Pachl, Systemtechnik des Schienenverkehrs, Teubner-Verlag, Stuttgart
Course: Operations Research in Health Care Management [T-WIWI-102884]

Responsibility: Stefan Nickel

Contained in:
- [M-WIWI-102805] Service Operations

ECTS
Recurrence Version
4.5 Unregelmäßig 1

Learning Control / Examinations
The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation). The examination is held in the term of the lecture and the following lecture.

Conditions
None

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research [WI1OR] is assumed.

Remarks
The lecture is planned to be held in the summer term 2016. The planned lectures and courses for the next three years are announced online.
**Course: Operations Research in Supply Chain Management [T-WIWI-102715]**

**Responsibility:** Stefan Nickel

**Contained in:**
- [M-WIWI-101473] Mathematical Programming
- [M-WIWI-103289] Stochastic Optimization
- [M-WIWI-102805] Service Operations

**Events**

<table>
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<th>Event-No.</th>
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**Learning Control / Examinations**

The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation). The examination is held in the term of the lecture and the following lecture.

**Conditions**

None

**Recommendations**

Basic knowledge as conveyed in the module *Introduction to Operations Research* and in the lectures *Facility Location and Strategic SCM*, *Tactical and operational SCM* is assumed.

**Remarks**

The lecture is planned to be held in the winter term 2016/17. The planned lectures and courses for the next three years are announced online.

---

**V Event excerpt: Operations Research in Supply Chain Management (WS 16/17)**

**Aim**

The student

- knows and applies basic and advanced modeling techniques playing an important role in today’s problem solving occurring in supply networks
- models problems with a mathematical approach to technical-economical problems, and derives optimal solutions,
- classifies problems both conceptually and mathematically by identifying central variables and parameters in a specific problem setting,
- evaluates current developments in operations research and supply chain management.

**Content**

Supply Chain Management constitutes a general tool for logistics process planning in supply networks. To an increasing degree quantitative decision support is provided by methods and models from Operations Research. The lecture “OR in Supply Chain Management” conveys concepts and approaches for solving practical problems and presents an insight to current research topics. The lecture’s focus is set on modeling and solution methods for applications originating in different domains of a supply chain. The emphasis is put on mathematical methods like mixed integer programming, valid inequalities or column generation, and the derivation of optimal solution strategies.

In form and content, the lecture addresses all levels of Supply Chain Management: After a short introduction, the tactical and operational level will be discussed with regard to inventory models, scheduling as well as cutting and packing. The strategic level will be discussed in terms of layout planning. Another main focus of the lecture is the application of
methods from online optimization. This optimization discipline has gained more and more importance in the optimization of supply chains over the several past years due to an increasing amount of dynamic data flows.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
- Dyckhoff, H.; Finke, U.: Cutting and Packing in Production and Distribution - A Typology and Bibliography, Physica-Verlag, 1992
Course: Optical Transmitters and Receivers [T-ETIT-100639]

Responsibility: Wolfgang Freude

Contained in: [M-MACH-101295] Optoelectronics and Optical Communication

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Conditions

none
Course: Optical Waveguides and Fibers [T-ETIT-101945]

Responsibility: Christian Koos
Contained in: [M-MACH-101295] Optoelectronics and Optical Communication
[M-MACH-101292] Microoptics

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Conditions
none
Course: Optimization in a Random Environment [T-WIWI-102628]

Responsibility: Karl-Heinz Waldmann
Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

ECTS
4,5

Recurrence
Unregelmäßig

Version
1

Learning Control / Examinations
There are no further examination dates for this course.
The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.
Course: Optoelectronic Components [T-ETIT-101907]

Responsibility: Wolfgang Freude
Contained in: [M-MACH-101287] Microsystem Technology

ECTS 4  Version 1

Conditions
none
Course: OR-Oriented Modeling and Analysis of Real Problems (Project) [T-WIWI-102730]

Responsibility: Karl-Heinz Waldmann
Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

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Learning Control / Examinations
There are no further examination dates for this course.
Presentation and documentation of the results.

Conditions
None

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.
**Course: P&C Insurance Simulation Game [T-WIWI-102797]**

**Responsibility:** Ute Werner

**Contained in:**
- [M-WIWI-101449] Insurance Management II
- [M-WIWI-101469] Insurance Management I

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**Learning Control / Examinations**
T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on.

**Conditions**
None

**Recommendations**
See German version.
**Course: Panel Data [T-WIWI-103127]**

**Responsibility:** Wolf-Dieter Heller

**Contained in:**
- [M-WIWI-101638] Econometrics and Statistics I
- [M-WIWI-101639] Econometrics and Statistics II

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<td>Wolf-Dieter Heller, Carlo Siebenschuh</td>
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**Conditions**

None
Course: Parametric Optimization [T-WIWI-102855]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming

ECTS: 4,5
Recurrence: Unregelmäßig
Version: 1

Events

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Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester. Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Conditions
None

Recommendations
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks
The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

V Event excerpt: (WS 16/17)

Aim
The student

- knows and understands the fundamentals of parametric optimization,
- is able to choose, design and apply modern techniques of parametric optimization in practice.

Content
Parametric Optimization deals with the impact of parameter changes on the solution of optimization problems. In practical applications this is of fundamental importance, for example, to assess the quality of a numerically computed solution or to derive quantitative statements about its parameter dependence. Moreover, many optimization algorithms are controlled by varying parameters, and applications may be found in noncooperative game theory, geometric optimization and robust optimization. The lecture provides a mathematically sound introduction to these topics and is structured as follows:

- Introductory examples and terminology
- Sensitivity
- Stability and regularity conditions
- Applications: semi-infinite optimization and Nash games

Literature
Elective literature:


Aim

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.
Course: Personalization and Services [T-WIWI-102848]

Responsibility: Andreas Sonnenbichler

Contained in: [M-WIWI-101470] Data Science: Advanced CRM
[M-WIWI-101410] Business & Service Engineering

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<td>Personalization &amp; Services</td>
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<td>Thomas Hummel, Andreas Sonnenbichler</td>
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<td>Exercise Personalization &amp; Services</td>
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Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2). 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively. The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from excersise work will be added.

Conditions
None

Recommendations
None

Event excerpt: Personalization & Services (WS 16/17)

Aim
The student
- knows the options and opportunities of personalization, especially in the area of Internet based services
- knows important methods for authentication, authorization, and accounting
- can use these methods practically in internet-based services.

Content
- Personalization of Services and Applications
- User Modeling
- User Profiles
- Authentication
- Authorization
- Applications in e-Commerce and for internet-based Services
- Personalized Web Search
- Privacy

Workload
The total workload for this course is approximately 135 hours (4.5 credits):
Time of attendance
- Attending the lecture: 15 x 90min = 22h 30m
• Attending the exercise classes: 7 x 90min = 10h 30m
• Examination: 1h 00m

Self-study
• Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
• Preparing the exercises: 25h 00m
• Preparation of the examination: 31h 00m

Sum: 135h 00m
Course: PH APL-ING-TL01 [T-WWI-106291]

Responsibility:

Contained in: [M-WWI-101404] Extracurricular Module in Engineering

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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: PH APL-ING-TL02 [T-WIWI-106292]

Responsibility:

Contained in: [M-WIWI-101404] Extracurricular Module in Engineering

ECTS: 3
Recurrence: Einmalig
Version: 1
Course: PH APL-ING-TL03 [T-WIWI-106293]

Responsibility:

Contained in: [M-WIWI-101404] Extracurricular Module in Engineering

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<th>Recurrence</th>
<th>Version</th>
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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: PH APL-ING-TL04 ub [T-WIWI-106294]

Responsibility:

Contained in: [M-WIWI-101404] Extracurricular Module in Engineering

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Course: PH APL-ING-TL05 ub [T-WIWI-106295]

Responsibility:

Contained in: [M-WIWI-101404] Extracurricular Module in Engineering

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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
**Course:** PH APL-ING-TL06 ub [T-WIWI-106296]

**Responsibility:**

**Contained in:** [M-WIWI-101404] Extracurricular Module in Engineering

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**Course:** Photovoltaics [T-ETIT-100724]

**Responsibility:** N.N.
**Contained in:** [M-ETIT-101164] Generation and transmission of renewable power

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**Conditions**

none
Course: Physical Basics of Laser Technology [T-MACH-102102]

Responsibility: Johannes Schneider

Contained in: [M-MACH-101268] Specific Topics in Materials Science

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<td>Physical basics of laser technology</td>
<td>Vorlesung / Übung 3</td>
<td>Johannes Schneider</td>
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Learning Control / Examinations
oral examination (30 min)

no tools or reference materials

Conditions
Basic knowledge of physics, chemistry and material science is assumed.
It is not possible, to combine this lecture with the lecture Laser Application in Automotive Engineering [2182642]

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105164] Laser in Automotive Engineering must not have been started.

Event excerpt: Physical basics of laser technology (WS 16/17)

Aim
The student

- can explain the principles of light generation, the conditions for light amplification as well as the basic structure and function of different laser sources.
- can describe the influence of laser, material and process parameters for the most important methods of laser-based materials processing and choose laser sources suitable for specific applications.
- can illustrate the possible applications of laser sources in measurement and medicine technology
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Content
Based on the description of the physical basics about the formation and the properties of laser light the lecture goes through the different types of laser beam sources used in industry these days. The lecture focuses on the usage of lasers especially in materials engineering. Other areas like measurement technology or medical applications are also mentioned. An excursion to the laser laboratory of the Institute for Applied Materials (IAM) will be offered.

- physical basics of laser technology
- laser beam sources (solid state, diode, gas, liquid and other lasers)
- beam properties, guiding and shaping
- lasers in materials processing
- lasers in measurement technology
- lasers for medical applications
- safety aspects

The lecture is complemented by a tutorial.

**Workload**
- regular attendance: 33.5 hours
- self-study: 146.5 hours

**Literature**
Course: Physics for Engineers [T-MACH-100530]

Responsibility: Peter Gumbsch, Alexander Nesterov-Müller

Contained in: [M-MACH-101291] Microfabrication
[M-MACH-101287] Microsystem Technology

ECTS: 6  Language: deutsch  Recurrence: Jedes Sommersemester  Version: 1

Events

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<td>Physics for Engineers</td>
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Learning Control / Examinations

written exam

Conditions

none

Event excerpt: Physics for Engineers (SS 2017)

Aim

The student

- has the basic understanding of the physical foundations to explain the relationship between the quantum mechanical principles and the optical as well as electrical properties of materials
- can describe the fundamental experiments, which allow the illustration of these principles

Content

1) Foundations of solid state physics

- Wave particle dualism
- Tunnelling
- Schrödinger equation
- H-atom

2) Electrical conductivity of solids

- solid state: periodic potentials
- Pauli Principle
- band structure
- metals, semiconductors and isolators
- p-n junction / diode

3) Optics

- quantum mechanical principles of the laser
- linear optics
- non-linear optics
Workload
regular attendance: 22.5 hours (lecture) and 22.5 hours (exercises 2142891)
self-study: 97.5 hours and 49 hours (exercises 2142891)

Literature

- Tipler und Mosca: Physik für Wissenschaftler und Ingenieure, Elsevier, 2004
Course: Planning and Management of Industrial Plants [T-WIWI-102631]

Responsibility: Frank Schultmann

Contained in: [M-WIWI-101471] Industrial Production II

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Learning Control / Examinations

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions

None

Recommendations

None

Event excerpt: Planning and Management of Industrial Plants (WS 16/17)

Aim

- Students shall be able to describe the tasks of plant management.
- Students shall be proficient in using selected methods of investment and cost estimates.
- Students shall be able to consider necessary processing and logistical requirements of designing industrial plants.
- Students shall be able to discuss interdependencies between capacity planning, process design and plant optimization.
- Students shall be proficient in discussing and applying selected methods of quality management, plant maintenance and plant dismantling.

Content

Industrial plant management incorporates a complex set of tasks along the entire life cycle of an industrial plant, starting with the initiation and erection up to operating and dismantling.

During this course students will get to know special characteristics of industrial plant management. Students will learn important methods to plan, realize and supervise the supply, start-up, maintenance, optimisation and shut-down of industrial plants. Alongside, students will have to handle the inherent question of choosing between technologies and evaluating each of them. This course pays special attention to the specific characteristics of plant engineering, commissioning and investment.

Workload

Total effort required will account for approximately 165h (5.5 credits).

Literature

will be announced in the course
Course: PLM for Product Development in Mechatronics [T-MACH-102181]

Responsibility: Martin Eigner
Contained in: [M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

ECTS Language Recurrence Version
4 deutsch Jedes Semester 1

Events

<table>
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<td>2122376</td>
<td>PLM for product development in mechatronics</td>
<td>Vorlesung (V)</td>
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<td>Martin Eigner</td>
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Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: PLM for product development in mechatronics (SS 2017)

Aim
Students have a basic overview about product data management and product lifecycle management.
Students know components and core functions of PLM solutions
Students can describe trends in research and practice in the environment of PLM

Workload
The total workload for this course is approximately 120 hours. For further information see German version.
Course: PLM-CAD Workshop [T-MACH-102153]

Responsibility: Jivka Ovtcharova

Contained in: [M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

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Learning Control / Examinations
See module specification

Conditions
none

Event excerpt: PLM-CAD Workshop (SS 2017)

Aim
Ziel des Workshops ist es, den Nutzen der kollaborativen Produktentwicklung mit PLM aufzuzeigen und deren Mehrwert gegenüber einer klassischen CAD- Entwicklung hervorzuheben. Den Studierenden wird im Einzelnen vermittelt, wie durch PLM produktbeschreibende Daten, wie z. B. Stücklisten und Zeichnungen, ganzheitlich und transparent verwaltet werden, sowie Abläufe in der Produktentwicklung automatisiert gesteuert werden können.

Content
Im Rahmen des Workshops wird eine Produktentwicklung als Projektauftrag innerhalb des Produktlebenszyklus durch den Einsatz moderner PLM/PDM- und CAD- Systeme abgewickelt.
Course: Polymer Engineering I [T-MACH-102137]

Responsibility: Peter Elsner

Contained in: Specific Topics in Materials Science

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**Learning Control / Examinations**

Oral examination

**Conditions**

none

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Event excerpt: Polymer Engineering I (WS 16/17)

**Aim**

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, to equip the students with knowledge and technical skills, and to use the material “polymer” meeting its requirements in an economical and ecological way.

The students

- are able to describe and classify polymers based on the fundamental synthesis processing techniques
- can find practical applications for state-of-the-art polymers and manufacturing technologies
- are able to apply the processing techniques, the application of polymers and polymer composites regarding to the basic principles of material science
- can describe the special mechanical, chemical and electrical properties of polymers and correlate these properties to the chemical bindings.
- can define application areas and the limitation in the use of polymers

**Content**

1. Economical aspects of polymers
2. Introduction of mechanical, chemical and electrical properties
3. Processing of polymers (introduction)
4. Material science of polymers
5. Synthesis

**Workload**

regular attendance: 21 hours
self-study: 99 hours

**Literature**

Recommended literature and selected official lecture notes are provided in the lecture.
Course: Polymerengineering II [T-MACH-102138]

Responsibility: Peter Elsner

Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS: 4  Language: deutsch  Recurrence: Jedes Semester  Version: 1

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Learning Control / Examinations

Oral examination

Duration: 20-30 Minutes

Conditions: none

Recommendations

Knowledge in Polymerengineering I

Event excerpt: Polymer Engineering II (SS 2017)

Aim
The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, that the students gather knowledge and technical skills to use the material “polymer” meeting its requirements in an economical and ecological way.

The students

- can describe and classify different processing techniques
- and can exemplify mould design principles based on technical parts.
- know about practical applications and processing of polymer parts
- are able to design polymer parts according to given restrictions
- can choose appropriate polymers based on the technical requirements
- can decide how to use polymers regarding the production, economical and ecological requirements

Content
1. Processing of polymers
2. Properties of polymer components
   - Based on practical examples and components
   - 2.1 Selection of material
   - 2.2 Component design
   - 2.3 Tool engineering
   - 2.4 Production technology
   - 2.5 Surface engineering
   - 2.6 Sustainability, recycling

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Recommended literature and selected official lecture notes are provided in the lecture
Course: Polymers in MEMS A: Chemistry, Synthesis and Applications [T-MACH-102192]

Responsibility: Bastian Rapp

Contained in: [M-MACH-101291] Microfabrication

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Learning Control / Examinations

Oral examination

Conditions

none

Event excerpt: Polymers in MEMS A: Chemistry, Synthesis and Applications (WS 16/17)

Aim

The aim of the lecture is providing mechanical or chemical engineers, as well as interested students from the life or material sciences the basic knowledge required for understanding what polymers are and how they are made, highlighting their importance for modern MEMS systems with a wide view to applications in everyday life.

After attending the lecture the students will be able:

- ... to understand the physic/chemical basics of organic chemistry in polymer synthesis.
- ... to state the most important polymers and polymer classes and to develop application examples for these.
- ... to state the most important polymers in MEMS.
- ... to understand the most important techniques for rapid prototyping.
- ... to state and to understand the most important resists in MEMS.
- ... to understand the chemical synthesis of polymers.
- ... to correctly estimate the application scope of the individual classes of polymers.

Content

We all come in contact with numerous polymeric products in everyday life. From water bottles to packaging to the cover of the iPad, many things are made of polymers. Polymers are also important materials for modern microelectromechanical systems (MEMS) allowing cost effective mass market compatible products, e.g., in the life sciences or diagnostics. But polymers are not just cost-effective replacements for more expensive classical materials in MEMS (such as, e.g., silicon) – some polymers have intrinsic properties that make them ideal materials for sensors, actuators or templates for biology and chemistry in MEMS.

This lecture will introduce the basics of organic chemistry required for understanding what polymers are, how they are manufactured and which mechanisms are responsible for their unique properties. The lecture will highlight (in the context of MEMS but also in a wider scope) where and why polymers are applied with a strong focus on their chemical and physical properties (and on their synthesis).

Some of the topics covered are:

- What is the basic chemistry of polymers? What are monomers, what are macromolecules and how are they formed?
- How are polymers produced on industrial scale – but also on the laboratory scale? Numerous examples of how to make (commonly and lesser known) polymers will be discussed including materials such as Plexiglas.
- Why are polymers so important for biochemistry and tissue engineering?
- How do photoresists work and why do some polymers contract when exposed to light?
- What are high-performance polymers and why do they have such a wide application range, e.g., in implants?
• What polymers fuel the household 3D printing community and what materials do 3D printers such as, e.g., the RepRap work with?
• How does 3D printing and rapid prototyping work and which polymers can be employed for which techniques?
• Why does silicone always smell like vinegar and why is this material so important for modern day microfluidics? How do you build fluid-logic devices using silicone?
• How do shape memory polymers remember their shape?
• What are polymer foams and why are they not only important for heat insulation but also for organic chemistry?
• How do glues work? Why are there two-component glues, what is superglue and how can you make glue from potatoes?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu). Preregistration is not necessary.

The examination will be held in oral form at the end of the lecture. The lecture can be chosen as “Nebenfach” or part of a “Hauptfach”. The second lecture of the lecture series “Polymers in MEMS B – Physics, manufacturing and applications” (which is also held in winter semester) can be combined with this lecture as part of a “Hauptfach”. In summer semester, the third part of the lecture series “Polymers in MEMS C – Biopolymers, Biopolymers and applications” will be given which may be combined with lectures A and B to form a complete “Hauptfach”.

Workload

• lecture: 15 * 1.5 h (22 h)
• lecture preparation (before and after lecture): 15 * 2 h (30 h)
• preparation of final exam: 70 h
Course: Polymers in MEMS B: Physics, Microstructuring and Applications [T-MACH-102191]

Responsibility: Matthias Worgull
Contained in: [M-MACH-101291] Microfabrication

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<td>Vorlesung (V)</td>
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Learning Control / Examinations

Oral examination

Conditions

none

Event excerpt: Polymers in MEMS B: Physics, Microstructuring and Applications (WS 16/17)

Aim
The aim of the lecture is providing mechanical or chemical engineers, as well as interested students from the life or material sciences the basic knowledge required for understanding what polymers are and how they are made, highlighting their importance for modern MEMS systems with a wide view to applications in everyday life.

After attending the lecture the students will be able:

- ... to understand the properties of polymers as a consequence of their morphology.
- ... to describe the most important structuring techniques and technologies for polymers in MEMS.
- ... to understand the mathematical basis of the most important physical models for polymers.
- ... to correctly judge polymer properties and the applicability of the polymers for their industrial processability.
- ... to understand the basics of process simulation in polymer structuring.
- ... to state the most important technical thermoplasts in MEMS and to understand their properties.
- ... to correctly classify the various types of polymers, blends, composite materials.

Content
We all come in contact with numerous polymeric products in everyday life. From water bottles to packaging to the cover of the iPad, many things are made of polymers. Polymers are also important materials for modern microelectromechanical systems (MEMS) allowing cost effective mass market compatible products, e.g., in the life sciences or diagnostics. But polymers are not just cost-effective replacements for more expensive classical materials in MEMS (such as, e.g., silicon) – some polymers have intrinsic properties that make them ideal materials for sensors, actuators or templates for biology and chemistry in MEMS.

This lecture will introduce the basics of physics and material science required for the understanding of the mechanical behavior seen from the engineers view. Micro and nanostructuring of polymers allows the fabrication of micro parts fulfilling their tasks in mostly invisible different applications. But also the fabrication of polymer parts with functional surfaces inspired from Bionics will be presented in this lesson. The lesson will give further an overview over the polymer based structuring processes and will underline the importance by a number of applications e.g. photonic structures or Lotus-like structures.

Some of the topics covered are:

- How can polymers described from the view of engineers?
- What are the differences between polymers and metals?
- Rheology of polymer melts – How does polymer melts flow?
- How can polymers be formed and demolded?
- Which structuring processes (replication) processes are available?
- How does stress influence molded parts (e.g. the deformation of a CD in a hot car)
- Shrinkage of polymers – which precision is achievable
- Gluing or welding – How can polymers be assembled?
- Simulation of replication processes
- Characterization of polymers – which properties can be measured?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

The examination will be held in oral form at the end of the lecture. The lecture can be chosen as “Nebenfach” or part of a “Hauptfach”. The second lecture of the lecture series “Polymers in MEMS A – Chemistry, synthesis and applications” (which is also held in winter semester) can be combined with this lecture as part of a “Hauptfach”. In summer semester, the third part of the lecture series “Polymers in MEMS C – Biopolymers, Biopolymers and applications” will be given which may be combined with lectures A and B to form a complete “Hauptfach”.

**Workload**

- lecture: 15 * 1.5 h (22 h)
- lecture preparation (before and after lecture): 15 * 2 h (30 h)
- preparation of final exam: 70 h
**Course:** Polymers in MEMS C: Biopolymers and Bioplastics [T-MACH-102200]

**Responsibility:** Bastian Rapp, Matthias Worgull

**Contained in:** [M-MACH-101291] Microfabrication

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**Learning Control / Examinations**

Oral examination

**Conditions**

none

**Event excerpt: (SS 2017)**

**Aim**

The aim of the lecture is providing mechanical or chemical engineers, as well as interested students from the life or material sciences the basic knowledge of biopolymers and bioplastics, highlighting their importance for modern MEMS systems with a wide view to applications in everyday life.

After attending the lecture the students will be able:

- ... to correctly classify biopolymers and bioplastics.
- ... to correctly state their properties, advantages and disadvantages.
- ... to correctly estimate their application scope in MEMS.
- ... to understand their usage in everyday life.
- ... to correctly judge their sustainability.
- ... to develop further applications of this class of materials.

... to correctly estimate the suitability of biopolymers and bioplastics, especially compared to conventionally polymers.

**Content**

Polymers are ubiquitous in everyday life: from packaging materials all the way to specialty products in medicine and medical engineering. Today it is difficult to find a product which does not (at least in parts) consist of polymeric materials. The question of how these materials can be improved with respect to their disposal and consumption of (natural) resources during manufacturing is often raised. Today polymers must be fully recycled in Germany and many other countries due to the fact that they do not (or only very slowly) decompose in nature. Furthermore significant reductions of crude oil consumption during synthesis are of increasing importance in order to improve the sustainability of this class of materials. With respect to disposal polymers which do not have to be disposed by combustion but rather allow natural decomposition (composting) are of increasing interest. Polymers from renewable sources are also of interest for modern microelectromechanical systems (MEMS) especially if the systems designed are intended as single-use products. This lecture will introduce the most important classes of these so-called biopolymers and bioplastics. It will also discuss and highlight polymers which are created from naturally created analogues (e.g. via fermentation) to petrochemical polymer precursors and describe their technical processing. Numerous examples from MEMS as well as everyday life will be given.

Some of the topics covered are:

- What are biopolyurethanes and how can you produce them from castor oil?
- What are “natural glues” and how are they different from chemical glues?
- How do you make tires from natural rubbers?
- What are the two most important polymers for life on earth?
How can you make polymers from potatoes?
Can wood be formed by injection molding?
How do you make buttons from milk?
Can you play music on biopolymers?
Where and how do you use polymers for tissue engineering?
How can you built LEGO with DNA?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu) and PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

Workload

- lecture: 15 * 1.5 h (22 h)
- lecture preparation (before and after lecture): 15 * 2 h (30 h)

preparation of final exam: 70 h

Literature

Additional literature is not required.
Course: Portfolio and Asset Liability Management [T-WIWI-103128]

Responsibility: Mher Safarian

Contained in: [M-WIWI-101639] Econometrics and Statistics II

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Learning Control / Examinations

The assessment of this course consists of a written examination (following §4(2), 1 SPOs) and of possible additional assignments during the course (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions

None

Event excerpt: Portfolio and Asset Liability Management (SS 2017)

Aim
Introduction and deepening of various portfolio management techniques in the financial industry.

Content
Portfolio theory: principles of investment, Markowitz-portfolio analysis, Modigliani-Miller theorems and absence of arbitrage, efficient markets, capital asset pricing model (CAPM), multi factorial CAPM, arbitragepricing theory (APT), arbitrage and hedging, multi factorial models, equity-portfolio management, passive strategies, active investment Asset liability: statistical portfolio analysis in stock allocation, measures of success, dynamic multi seasonal models, models in building scenarios, stochastic programming in bond and liability management, optimal investment strategies, integrated asset liability management

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.

Elective literature:
To be announced in lecture.
Course: Power Network [T-ETIT-100830]

Responsibility: Thomas Leibfried
Contained in: [M-ETIT-101164] Generation and transmission of renewable power

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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Power Transmission and Power Network Control [T-ETIT-101941]

Responsibility: Thomas Leibfried

Contained in: [M-ETIT-101164] Generation and transmission of renewable power

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Conditions
none
Course: Practical Course Polymers in MEMS [T-MACH-10556]

Responsibility: Bastian Rapp, Matthias Worgull
Contained in: [M-MACH-101291] Microfabrication

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Learning Control / Examinations
The practical course will close with an oral examination. There will be only passed and failed results, no grades.

Conditions
none

Event excerpt: (SS 2017)

Aim
The practical course will provide mechanical or chemical engineers, as well as interested students from the life or material sciences a deeper understanding of polymers, their synthesis and their processing.

After attending the lecture the students will be able:

- ... to synthesize relevant polymers on a laboratory scale.
- ... to characterize these materials.
- ... to structure these polymers.
- ... to use these polymers in exemplary MEMS applications..

Content
This practical course complements the lectures “Polymers in MEMS A”, “Polymers in MEMS B” and “Polymers in MEMS C” and will allow students to gain a deeper understanding of polymers and their processing. During the course of this practical course, various polymers will be synthesized and molded into components suitable for microelectromechanical systems (MEMS) applications. The aim of the course is to bring a polymer all the way from synthesis to application. The practical course will be given in German language unless non-German speaking students attend. In this case, the course will be given in English (with some German translations of technical vocabulary). Lecture notes for the experiments are in English language and will be handed out to the students. The practical course will be held “en block” at the end of the semester (presumably beginning of October)

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu) and PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is mandatory. The number of participants is limited to 5 students.

Workload

- practical course: 3 * 8 h (24 h)
- experiment preparation (before and after lecture): 30 h

preparation of final exam: 66 h

Literature
Scripts of the corresponding lectures, further literature as named there.
**Course: Practical Course Technical Ceramics [T-MACH-105178]**

**Responsibility:** Rainer Oberacker  
**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

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**Events**

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<td>2125751</td>
<td>Practical Course Technical Ceramics</td>
<td>Praktikum (P)</td>
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<td>Rainer Oberacker</td>
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**Learning Control / Examinations**

Colloquium and laboratory report for the respective experiments.

**Conditions**

none

**Event excerpt: Practical Course Technical Ceramics (WS 16/17)**

**Aim**
The students are able to understand and to apply a number of basic laboratory methods used in processing and characterization of ceramic materials. They are qualified to apply new methods on the basis of standards and descriptions of experiments.

**Content**
Based on alumina as a model material, major test methods for the characterization of raw materials, intermediate and final products are practically applied. Topics:

- powder characterization
- Shaping of powder compacts
- sintering
- microstructural characterization
- mechanical testing

On the basis of short descriptions of the methods, the students prepare themselves, carry out the experiments and write a laboratory report.

**Workload**
regular attendance: 30 hours  
self-study: 90 hours

**Literature**

Richerson, D. R.: Modern Ceramic Engineering, CRC Taylor & Francis, 2006
Course: Practical Seminar Digital Service Systems [T-WIWI-106563]

Responsibility: Wolf Fichtner, Alexander Mädche, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt

Contained in: [M-WIWI-102808] Digital Service Systems in Industry

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<td>Seminar (S)</td>
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<td>Alexander Mädche</td>
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Learning Control / Examinations
The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Conditions
None

Recommendations
None

Remarks

Event excerpt: (SS 2017)

Aim
The students will:

- Explore a real-world digital service design challenge
- Learn and apply selected digital service design practices & tools
- Understand capabilities of state-of-the-art digital platforms and realize a digital service prototype

Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes
Course: Practical Seminar Service Innovation [T-WIWI-102799]

Responsibility: Gerhard Satzger

Contained in: [M-WIWI-102806] Service Innovation, Design & Engineering
[M-WIWI-101410] Business & Service Engineering

ECTS: 4,5
Recurrence: Unregelmäßig
Version: 1

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.
Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.
The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Conditions
None

Modeled Conditions
The following conditions must be met:

- The course [T-WIWI-105774] Practical Seminar: Digital Service Design must not have been started.

Recommendations
Knowledge of Service Innovation Methods is assumed. Therefore it is recommended to attend the course Service Innovation [2540468] beforehand.

Remarks
Due to the project work, the number of participants is limited and participation requires knowledge about models, concepts and approaches that are taught in the Service Innovation lecture. Having taken the Service Innovation lecture or demonstrating equivalent knowledge is a prerequisite for participating in this Practical Seminar. Details for registration will be announced on the web pages for this course.
Learning Control / Examinations
The assessment consists of practical work in the field of crowd analytics, a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Conditions
None

Recommendations
At least one module offered by the institute should have been chosen before attending this seminar.

Remarks
The course is held in English.
Course: Practical Seminar: Data-Driven Information Systems [T-WIWI-106207]

Responsibility: Alexander Mädche, Thomas Setzer, Christof Weinhardt

Contained in: [M-WIWI-103117] Data Science: Data-Driven Information Systems

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Learning Control / Examinations
The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Conditions
None

Recommendations
At least one module offered by the institute should have been chosen before attending this seminar.

Remarks
The course is held in english.
Course: Practical Seminar: Digital Service Design [T-WIWI-105774]

Responsibility: Norbert Koppenhagen, Alexander Mädche

Contained in: [M-WIWI-102806] Service Innovation, Design & Engineering
[M-WIWI-103200] Designing Interactive Systems

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Learning Control / Examinations
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Conditions
None.

Modeled Conditions
The following conditions must be met:
- The course [T-WIWI-102799] Practical Seminar Service Innovation must not have been started.

Recommendations
Attending the course „Digital Service Design“ is recommended, but not mandatory.

Remarks
The course is held in English.

Event excerpt: (SS 2017)

Aim
The students will:
- Explore a real-world digital service design challenge
- Learn and apply selected digital service design practices & tools
- Understand capabilities of state-of-the-art digital platforms and realize a digital service prototype

Content
- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes
Course: Practical Seminar: Health Care Management (with Case Studies) [T-WIWI-102716]

Responsibility: Stefan Nickel

Contained in:
[M-WIWI-102805] Service Operations

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<td>(Veranst.)</td>
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<td>Stefan Nickel, Melanie Reuter-Oppermann, Anne Zander</td>
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Learning Control / Examinations
The assessment consists in a case study, the writing of a corresponding paper, and an oral exam (according to §4(2), 2 of the examination regulation).

Conditions
None.

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research is assumed.

Remarks
The credits have been reduced to 4,5 starting summer term 2016.
The lecture is offered every term.
The planned lectures and courses for the next three years are announced online.
Course: Practical Training in Basics of Microsystem Technology [T-MACH-102164]

Responsibility: Arndt Last

contained in:
- [M-MACH-101291] Microfabrication
- [M-MACH-101294] Nanotechnology
- [M-MACH-101287] Microsystem Technology
- [M-MACH-101290] BioMEMS
- [M-MACH-101292] Microoptics

ECTS: 3
Language: deutsch
Recurrence: Jedes Semester
Version: 1

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<tr>
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<td>Praktikum (P)</td>
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Learning Control / Examinations
The assessment consists of a written exam

Conditions
none

Event excerpt: Introduction to Microsystem Technology - Practical Course (SS 2017)

Aim

- Deepening of the contents of the lecture MST I resp. II
- Understanding the technological processes in the micro system technology
- Experience in lab-work at real workplaces where normally research is carried out

Content

In the practical training includes nine experiments:
1. Hot embossing of plastics micro structures
2. Micro electroforming
4. UV-lithography
5. Optical waveguides
6. Capillary electrophoresis on a chip
7. SAW gas sensor
8. Metrology
9. Atomic force microscopy

Each student takes part in only five experiments.
The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

Workload

Time of attendance: 21 h + 2 h exam
Privat studies: 5 h preparing experiments + 10 h preparing the exam

Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997
Unterlagen zum Praktikum zur Vorlesung ‘Grundlagen der Mikrosystemtechnik’
Course: Predictive Mechanism and Market Design [T-WIWI-102862]

Responsibility: Johannes Philipp Reiß

[M-WIWI-101505] Experimental Economics

ECTS 4,5  Recurrence Unregelmäßig  Version 1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Remarks
See German version
Course: Price Management [T-WIWI-105946]

Responsibility: Andreas Geyer-Schulz, Paul Glenn

Contained in: [M-WIWI-101409] Electronic Markets

<table>
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<td>Price Management</td>
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Learning Control / Examinations

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively.

The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

Conditions

None

Recommendations

None

Remarks

The lecture is offered for the first time in summer term 2016.

Event excerpt: Price Management (SS 2017)

Aim

Students

- know the conceptual and methodic basics of price management (price-sales function, price elasticity and adequate measurement, estimation and optimization techniques)
- know pricing strategies and the managerial instruments of price management (including price communication, enforcement and control)
- know methods of price formation in complex environments (product-spanning price optimization, bundling, services and solutions) and can make use of them
- know and understand pricing processes and the involved pricing department(s) in firms
- know and understand special topics in price management (pricing on the internet, yield management and international price management)
- know the regulatory framework of European competition law

Content

1. Introduction to Price Management
2. Pricing Strategies
3. Price-Sales Function und Price Elasticity
4. Willingness of Payment, Value and Methods of Measuring Value
5. Methods of Price Formation
6. Multidimensional Pricing and Price Differentiation
7. Product-Spanning Price Optimization and Bundling
9. Price Management for Services and Solutions
10. Pricing on the Internet
11. Excursion: Yield Management
12. Enforcing Prices, Discounting and Systems of Terms and Conditions
13. Price Communication and Controlling
15. Excursion: Pricing and European Competition Law
16. Pricing Processes and Organization of Pricing in Enterprises

**Workload**
The total workload for this course is approximately 135 hours (4.5 credits):

**Time of attendance**
- Attending the lecture: $15 \times 90\text{min} = 22\text{h} 30\text{m}$
- Attending the exercise classes: $7 \times 90\text{min} = 10\text{h} 30\text{m}$
- Examination: $1\text{h} 00\text{m}$

**Self-study**
- Preparation and wrap-up of the lecture: $15 \times 180\text{min} = 45\text{h} 00\text{m}$
- Preparing the exercises: $25\text{h} 00\text{m}$
- Preparation of the examination: $31\text{h} 00\text{m}$

**Sum: 135h 00m**
Course: Price Negotiation and Sales Presentations [T-WIWI-102891]

Responsibility: Martin Klarmann, Marc Schröder

Contained in: [M-WIWI-101487] Sales Management

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<td>2572198</td>
<td>Price Negotiation and Sales Presentations</td>
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Learning Control / Examinations

Conditions
None

Recommendations
None

Event excerpt: Price Negotiation and Sales Presentations (WS 16/17)

Aim
Students

- gain a clear impression of the theoretical knowledge about price negotiations and sales presentations
- improve their own negotiation abilities

Content

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.
**Course: Pricing [T-WIWI-102883]**

**Responsibility:** Ju-Young Kim

**Contained in:**
- [M-WIWI-101489] Strategy, Communication, and Data Analysis
- [M-WIWI-101509] Strategic Decision Making and Organization
- [M-WIWI-101487] Sales Management
- [M-WIWI-101649] Services Marketing
- [M-WIWI-101510] Cross-functional Management Accounting

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**Learning Control / Examinations**

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Conditions**

None

**Recommendations**

None

**V Event excerpt: Pricing (WS 16/17)**

**Aim**

See German version.

**Content**

This course addresses central elements and peculiarities of pricing goods and services. The topics are below others:

- Price demand functions
- Concept of the price elasticity of demand
- Key concepts of behavioral pricing
- Decision-making areas in pricing

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

Course: Principles of Ceramic and Powder Metallurgy Processing [T-MACH-102111]

Responsibility: Rainer Oberacker

Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS 4 Language deutsch Recurrence Jedes Wintersemester Version 1

<table>
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<td>Basic principles of powder metallurgical and ceramic processing</td>
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Learning Control / Examinations
The assessment consists of an oral exam (20-30 min) taking place at the agreed date. The re-examination is offered upon agreement.

Conditions
none

Event excerpt: Basic principles of powder metallurgical and ceramic processing (WS 16/17)

Aim
The students know the basics of characterization of powders, pastes and suspensions. They have a fundamental understanding of the process technology for shaping of particulate systems. They are able to use these fundamentals to design selected wet- and dry forming processes.

Content
The course covers fundamentals of the process technology for shaping of ceramic or metal particle systems. Important shaping methods are reviewed. The focus is on characterization and properties of particulate systems, and, in particular, on process technology for shaping of powders, pastes, and suspensions.

Workload
regular attendance: 25 hours
self-study: 95 hours

Literature
- R.M. German. "Powder metallurgy and particulate materials processing. Metal Powder Industries Federation, 2005
Course: Principles of Food Process Engineering [T-CIWVT-101874]

Responsibility: Volker Gaukel

Contents: Principles of Food Process Engineering

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| SS 2017    | 22214     |        | Vorlesung (V)| 2   | Volker Gaukel                                  |

**Conditions**

none
Course: Principles of Information Engineering and Management [T-WIWI-102638]

Responsibility: Timm Teubner, Christof Weinhardt
Contained in: [M-WIWI-101411] Information Engineering

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<td>WS 16/17</td>
<td>2540450</td>
<td>Principles of Information Engineering and Management</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Timm Teubner</td>
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</tbody>
</table>

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

Event excerpt: Principles of Information Engineering and Management (WS 16/17)

Aim
The students should be able to understand and analyze the central role of information as an economic good, a production factor, and a competitive factor in today’s societies. Students are supposed to be able to identify, evaluate, price, and market information goods with the help of the concepts and methods taught in the lecture. Furthermore, students learn basic aspects about information systems and information flows within and between organizations, as well as their design parameters.

Content
Information plays a central role in today’s society. The resulting structures and processes cannot be explained intuitively with traditional approaches of economic theory. Formerly, information has only been implicitly treated as a production factor; its role as a competitive factor used to be neglected. In order to deal with the central role of information we developed the concept of the “information lifecycle” that systematizes all phases from information generation to information distribution. The single phases of that cycle,

- extraction/generation,
- storage,
- transformation,
- evaluation,
- marketing
- and usage of information

are analyzed from the business administration perspective and the microeconomic perspective. The state of the art of economic theory is presented across this information lifecycle within the lectures. The content of the lecture is deepened in accompanying lecture courses.

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
Course: Principles of Insurance Management [T-WIWI-102603]

Responsibility: Ute Werner

Contained in: [M-WIWI-101449] Insurance Management II
[M-WIWI-101469] Insurance Management I

ECTS: 4.5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).
The examination will be offered latest until summer term 2017 (beginners only).

Conditions
None

Recommendations
None

Event excerpt: Principles of Insurance Management (SS 2017)

Aim
See German version.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Elective literature:
Will be announced during the lecture.
Course: Problem Solving, Communication and Leadership [T-WIWI-102871]

Responsibility: Hagen Lindstädt
Contained in: [M-WIWI-101450] Strategic Corporate Management and Organization

Learning Control / Examinations
The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None
**Course: Process Engineering [T-BGU-101844]**

**Responsibility:** Harald Schneider  
**Contained in:** [M-BGU-101110] Process Engineering in Construction

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<th>Version</th>
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### Conditions
None

### Recommendations
None

### Remarks
None
Course: Product and Innovation Management [T-WIWI-102812]

Responsibility: Martin Klarmann

Contained in:
- Marketing Management [M-WIWI-101490]
- Cross-functional Management Accounting [M-WIWI-101510]
- Innovation Economics [M-WIWI-101514]

ECTS 3
Language deutsch
Recurrence Jedes Sommersemester
Version 1

Events

<table>
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<th>Term</th>
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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Remarks
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Event excerpt: Product and Innovation Marketing (SS 2017)

Aim
See German version.

Content
This course addresses topics around the management of new as well as existing products. After the foundations of product management, especially the product choice behavior of customers, students get to know in detail different steps of the innovation process. Another section regards the management of the existing product portfolio.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
**Course: Production and Logistics Controlling [T-WIWI-103091]**

**Responsibility:** Helmut Wlcek

**Contained in:**
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101280] Logistics in Value Chain Networks
- [M-MACH-101282] Global Production and Logistics
- [M-MACH-101279] Technical Logistics

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**Learning Control / Examinations**
The assessment consists of a written exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**
None
Course: Production and Logistics Management [T-WIWI-102632]

Responsibility: Frank Schultmann

Contained in: [M-WIWI-101412] Industrial Production III

ECTS: 5.5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

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<td>SS 2017</td>
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Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following § 4(2), 1 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

Conditions
None

Recommendations
None

Event excerpt: Production and Logistics Management (SS 2017)

Aim
- Students discuss the basic tasks of an operative production and logistics management.
- Students discuss approaches to solve these tasks and shall be able to apply certain ones.
- Students explain the interdependencies between the tasks and methods to solve.
- Students discuss possible IT tools for production and logistics management.
- Students describe emerging trends in production and logistics management.

Content
This course covers central tasks and challenges of operational production and logistics management. Systems analytically, central planning tasks are discussed. Exemplary solution approaches for these tasks are presented. Further practical approaches are explained. Students get to know the set-up and mode of operation of planning systems such as PPS-, ERP- and Advanced Planning Systems to cope with the accompanying planning tasks. Alongside to MRP II, students will be introduced to integrated supply chain management approaches in Supply Chain Management.

Workload
Total effort required will account for approximately 165h (5.5 credits).

Literature
will be announced in the course
Course: Production Technology and Management in Automotive Industry [T-MACH-102189]

Responsibility: Volker Michael Stauch

Contained in: [M-MACH-101284] Specialization in Production Engineering
[M-MACH-101282] Global Production and Logistics

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<td>Volker Michael Stauch</td>
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</table>

Learning Control / Examinations
written exam

Conditions
none

Event excerpt: Production Technology and Management in Automotive (WS 16/17)

Aim
The students . . .

• are capable to specify the current challenges in automotive industry and to explain approaches to solve them.
• are able to classify the main parts of an automotive plant and its key elements (production facilities).
• are qualified to identify interlinkages between development processes and production systems (such as lean production).
• have the ability to classify modern concepts of logistics and tasks in management and design of value added networks.
• are enabled to explain the importance of an integrated quality management in product development and production as well as related methods.
• are able to characterize methodical approaches of analytical assessment and optimization of production planning tasks.

Content
The lecture deals with the technical and organizational aspects of automotive production. The course starts with an introduction to the automotive industry, current trends in vehicle technology and integrated product development. A selection of manufacturing processes are subjects of the second lecture block. Experiences of the applications of the Mercedes Production System in production, logistics and maintenance are the subject of the third event. During the last block approaches to quality management, global networks and current analytical planning methods in research are discussed. The course is strongly oriented towards the practice and is provided with many current examples. Mr. Stauch was Head of Powertrain Production Mercedes Benz Cars and plant manager Untertürkheim until 2010.

The following topics will be covered:

• Introduction to Automotive Industry and Technology
• Basics of Product Development
• Selected Automotive Manufacturing Technologies
• Automotive Production Systems
• Logistics
• Quality Assurance
• Global Networks
• Analytical Approaches of Production Planning
Workload
regular attendance: 21 hours
calendar: 99 hours

Literature
Lecture Slides
Course: Programming Internship: Solving Computational Risk and Asset Management Problems [T-WIWI-103110]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-101512] Computational Finance

<table>
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<th>Recurrence</th>
<th>Version</th>
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<tbody>
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<td>Jedes Wintersemester</td>
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Learning Control / Examinations
There are weekly learning controls in the form of weekly programming problem sets. During the first three weeks, problem sets are voluntary to set expectations on the workload and degree of difficulty that is to be expected. Starting in week 4, all weekly problem sets are part of the course wide exam. The final course grade coincides with the equal weighted average across all weekly programming problem sets (starting in week 4). It is planned that programming problem sets can be solved in a group of 2 students. Every student has to submit his own solution and must document for which part of the solution he has been responsible (to satisfy KIT exam regulations). More information will be shared at the first day of class.

Conditions
The lecture Computational Risk and Asset Management has to be attended in the same semester.

Recommendations
None

Remarks
New course starting winter term 2015/16.
Course: Project Management [T-WWI-103134]

Responsibility: Frank Schultmann

Contained in: [M-WWI-101412] Industrial Production III
[M-WWI-101471] Industrial Production II

ECTS 3.5 Language englisch Recurrence Jedes Wintersemester Version 1

Events

<table>
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<th>Term</th>
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<tr>
<td>WS 16/17</td>
<td>2581963</td>
<td>Project Management</td>
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<td>Felix Hübner, Carmen Mayer, Frank Schultmann, Kira Schumacher, Rebekka Volk, Marcus Wiens</td>
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</tbody>
</table>

Learning Control / Examinations

The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Conditions

None

Recommendations

None

Remarks

The course will be offered from winter term 2015/16 and replace the course “The Management of RandD Projects with Case Studies [2581963]”.

Event excerpt: Project Management (WS 16/17)

Aim

The students get to know the context, rationale, strategy and tactics of project management with emphasis on the importance of project planning and project control and by identifying and examining project phases. The students discuss various approaches and standards of project management. They explain the iterative processes and the core skills required by successful project managers. The context and learning of the course enable the participants to apply project management skills to projects in a variety of industries including engineering, information technology, consulting, production, procurement, maintenance, logistics and supply chain, construction, and manufacturing. By focusing on providing knowledge in core areas of scope, time, cost and quality, and facilitating areas of risk, procurement, HR, integration, and communication management, the participants are able to confidently deal with the ever growing complexities and challenges of project management.

Content

1. Introduction
2. Principles of Project Management
3. Project Scope Management
4. Time Management and Resource Scheduling
5. Cost Management
6. Quality Management
7. Risk Management
8. Stakeholder
9. Communication, Negotiation and Leadership
10. Project Controlling

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
will be announced in the course
**Course:** Project Management in Construction and Real Estate Industry I [T-BGU-103432]

**Responsibility:** Shervin Haghsheno

**Contained in:**
- [M-BGU-101888] Project Management in Construction
- [M-BGU-101884] Lean Management in Construction

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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### Events

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**Conditions**
None

**Recommendations**
None

**Remarks**
None
Course: Project Management in Construction and Real Estate Industry II [T-BGU-103433]

Responsibility: Shervin Haghsheno

Contained in: [M-BGU-101888] Project Management in Construction
[M-BGU-101884] Lean Management in Construction

<table>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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Events

<table>
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Conditions
None

Recommendations
None

Remarks
None

Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
Course: project paper Lean Construction [T-BGU-101007]

Responsibility: Shervin Haghsheno
Contained in: [M-BGU-101884] Lean Management in Construction

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Events

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Conditions
None

Recommendations
None

Remarks
None
Course: Project Studies [T-BGU-101847]

Responsibility:  Sascha Gentes

Contained in: [M-BGU-101110] Process Engineering in Construction

ECTS 3
Recurrence Jedes Sommersemester
Version 1

Events

<table>
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<th>Term</th>
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Conditions
None

Recommendations
None

Remarks
None
**Course: Project Workshop: Automotive Engineering [T-MACH-102156]**

**Responsibility:** Michael Frey, Frank Gauterin, Martin Gießler

**Contained in:**
- [M-MACH-101266] Automotive Engineering
- [M-MACH-101265] Vehicle Development
- [M-MACH-101264] Handling Characteristics of Motor Vehicles

**Events**

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<th>Term</th>
<th>Event-No.</th>
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**Learning Control / Examinations**

Oral examination

**Conditions**

none

**V Event excerpt: Project Workshop: Automotive Engineering (SS 2017)**

**Aim**

The students are familiar with typical industrial development processes and working style. They are able to apply knowledge gained at the university to a practical task. They are able to analyze and to judge complex relations. They are ready to work self-dependently, to apply different development methods and to work on approaches to solve a problem, to develop practice-oriented products or processes.

**Content**

During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

**Workload**

regular attendance: 49 hours
self-study: 131 hours

**Literature**

The scripts will be supplied in the start-up meeting.
Course: Projectseminar [T-GEISTSOZ-101958]

Responsibility: Gerd Nollmann
Contained in: [M-GEISTSOZ-101169] Sociology

ECTS: 4  Version: 1

Conditions
None.
**Course: Public Management [T-WIWI-102740]**

**Responsibility:** Berthold Wigger

**Contained in:**
- [M-WIWI-101509] Strategic Decision Making and Organization
- [M-WIWI-101504] Collective Decision Making
- [M-WIWI-101511] Advanced Topics in Public Finance

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<td>WS 16/17</td>
<td>2561127</td>
<td>Public Management</td>
<td>Vorlesung  / Übung 3</td>
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**Learning Control / Examinations**

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

**Conditions**

None

**Recommendations**

Basic knowledge of Public Finance is required.

**Event excerpt: Public Management (WS 16/17)**

**Aim**

See German version.

**Content**

The lecture “Public Management” deals with the economic theory of public sector administration. It is divided into four parts. The first section gives an overview of the legal framework of governmental administration in the Federal Republic of Germany and introduces the classical theory of administration as developed by Weber. Part two studies concepts of public decision-making, which have a significant impact on the operation of public sector administrations and where one focus is on consistency problems of collective decision-making. The third chapter deals with efficiency problems arising in conventionally organized public administrations and companies. X-inefficiency, information and control problems, the isolated consideration of income-spending-relations as well as rent-seeking problems will be considered. In section four the concept of New Public Management, which is a new approach to public sector administration that is mainly based in contract theory, is introduced. Its foundations in institutional economics are developed, with a focus on the specific incentive structures in self-administered administrations. Finally, the achievements of New Public Management approaches are discussed.

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

**Elective literature:**

Course: Public Media Law [T-INFO-101311]

Responsibility: Thomas Dreier

Contained in: [M-INFO-101217] Public Business Law

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<td>Public Media Law</td>
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Event excerpt: Public Media Law (WS 16/17)

Aim

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

Literature
Course: Public Revenues [T-WIWI-102739]

Responsibility: Berthold Wigger

Contained in: [M-WIWI-101511] Advanced Topics in Public Finance

**Events**

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**Learning Control / Examinations**
The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

**Conditions**
None

**Recommendations**
Basic knowledge of Public Finance is required.

**Event excerpt: Public Revenues (SS 2017)**

**Aim**
See German version.

**Content**
The Public Revenues lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**
Elective literature:
Course: Quality Control I [T-WIWI-102728]

Responsibility: Karl-Heinz Waldmann

Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

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Learning Control / Examinations
There are no further examination dates for this course.

The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.
Course: Quality Control II [T-WIWI-102729]

Responsibility: Karl-Heinz Waldmann

Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

Learning Control / Examinations
There are no further examination dates for this course. The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.
Course: Quality Management [T-MACH-102107]

Responsibility: Gisela Lanza

Contained in: [M-MACH-101284] Specialization in Production Engineering
[M-MACH-101282] Global Production and Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Semester
Version: 1

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<td>Quality Management</td>
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</table>

Learning Control / Examinations
written exam

Conditions
none

Event excerpt: Quality Management (WS 16/17)

Aim
The students . . .

- are capable to comment on the content covered by the lecture.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the lecture to new problems from the context of the lecture.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the lecture for a specic problem.

Content
Based on the quality philosophies Total Quality Management (TQM) and Six Sigma, the lecture deals with the requirements of modern quality management. Within this context, the process concept of a modern enterprise and the process-specific elds of application of quality assurance methods are presented. The lecture covers the current state of the art in preventive and non-preventive quality management methods in addition to manufacturing metrology, statistical methods and service-related quality management. The content is completed with the presentation of certication possibilities and legal quality aspects.

Main topics of the lecture:
- The term “quality”
- Total Quality Management (TQM) and Six Sigma
- Universal methods and tools
- QM during early product stages – product denition
- QM during product development and in procurement
- QM in production – manufacturing metrology
- QM in production – statistical methods
- QM in service
- Quality management systems
- Legal aspects of QM

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Lecture Notes

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Quantitative Methods in Energy Economics [T-WIWI-102889]

Responsibility: Dogan Keles, Patrick Plötz


Events

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</table>

Learning Control / Examinations
The assessment consists of a written exam (following §4(2), 1 of the examination regulation).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
None

Event excerpt: Quantitative Methods in Energy Economics (WS 16/17)

Aim
The student

- knows and understands selected quantitative methods of energy economics
- is able to use selected quantitative methods of energy economics
- understands they range of usage, limits and is autonomously able to adress new problems by them.

Content
Energy economics makes use of many quantitative methods in exploration and analysis of data as well as in simulations and modelling. This lecture course aims at introducing students of energy economics into the application of quantitative methods and techniques as taught in elementary courses to real problems in energy economics. The focus is mainly on regression, simulation, time series analysis and related statistical methods as applied in energy economics.

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
Wird in der Vorlesung bekannt gegeben.
Course: Quantum Functional Devices and Semiconductor Technology [T-ETIT-100740]

Responsibility: Christian Koos

Contained in: [M-MACH-101295] Optoelectronics and Optical Communication
[M-MACH-101294] Nanotechnology

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Conditions
none

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Real Estate Economics and Sustainability Part 1: Basics and Valuation [T-WIWI-102838]

Responsibility:

Contained in:  [M-WIWI-101508] Real Estate Economics and Sustainability

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<td>Real Estate Economics and Sustainability</td>
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<td>2586407</td>
<td>Part 1: Basics and Valuation</td>
<td>Vorlesung (V)</td>
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<td>David Lorenz</td>
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Learning Control / Examinations
The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place. Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Conditions
None

Recommendations
A combination with courses in the area of

- Finance
- Insurance
- Civil engineering and architecture

is recommended.
Particularly recommended is the successful completion of the following Bachelor-Modules:

- Real Estate Management I and II
- Design, Construction and Assessment of Green Buildings I and II

V Event excerpt: Real Estate Economics and Sustainability Part 1: Basics and Valuation (WS 16/17)

Aim
The student

- possesses an overview of key interrelationships within the real estate industry concerning macro- and microeconomic questions as well as the interaction of the industry’s key players;
- is aware of the basics concerning the sustainable development debate and knows about the possible contribution of buildings and the real estate industry to a more sustainable development;
- knows the basics, key methods and tools of property valuation and is able to apply them;
- is aware of the key influencing factors of a building’s market value and is able to factor in sustainability considerations into market value estimates;

Content
This course is concerned with the implementation of sustainable development principles within the real estate industry. The focus lies on the role of property valuation and of property professionals.
The basics, key methods and tools of property valuation are explained in detail and are discussed within the context of the sustainable development debate. The tutorial provides examples in order to practice the application of theoretical knowledge to practical problems; i.e. valuation assignments.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.
Course: Real Estate Economics and Sustainability Part 2: Reporting and Rating [T-WIWI-102839]

Responsibility: David Lorenz

Contained in: [M-WIWI-101508] Real Estate Economics and Sustainability

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<th>Event-No.</th>
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Learning Control / Examinations

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place. Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Conditions

None

Recommendations

A combination with courses in the area of
- Finance
- Insurance
- Civil engineering and architecture

is recommended. Particularly recommended is the successful completion of the following Bachelor-Modules:
- Real Estate Management I and II
- Design, Construction and Assessment of Green Buildings I and II

Event excerpt: Real Estate Economics and Sustainability Part 2: Reporting and Rating (SS 2017)

Aim

The student
- possesses an overview of important methods and processes which are applied within the real estate industry to assess property related risks (e.g. property ratings);
- is aware of key instruments to communicate property performance towards third parties (e.g. sustainability assessment of buildings and sustainability reporting of companies).

Content

This course is concerned with the implementation of sustainable development principles within the real estate industry. The course explains important methods and procedures – besides property valuation – which are applied within the industry in order to assess property related risks (e.g. property rating) and discusses them within the context of the sustainable development debate. Further topics in this regard are:
• sustainability assessment of buildings,
• sustainability reporting of companies,
• sustainable property investment products,
• assessment of real estate funds and investment vehicles, and
• sustainability and real estate lending.

The tutorial provides examples in order to practice the application of theoretical knowledge to practical real estate related problems.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
### Course: Recommender Systems [T-WIWI-102847]

**Responsibility:** Andreas Geyer-Schulz  
**Contained in:**  
- [M-WIWI-101470] Data Science: Advanced CRM  
- [M-WIWI-101410] Business & Service Engineering

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### Learning Control / Examinations

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively. The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

### Conditions

None

### Recommendations

None

### Event excerpt: Recommender Systems (SS 2017)

#### Aim

The student

- is proficient in different statistical, data-mining, and game theory methods of computing implicit and explicit recommendations
- evaluates recommender systems and compares these with related services

#### Content

At first, an overview of general aspects and concepts of recommender systems and its relevance for service providers and customers is given. Next, different categories of recommender systems are discussed. This includes explicit recommendations like customer reviews as well as implicit services based on behavioral data. Furthermore, the course gives a detailed view of the current research on recommender systems at the Chair of Information Services and Electronic Markets.

#### Workload

The total workload for this course is approximately 135 hours (4.5 credits):

**Time of attendance**

- Attending the lecture: $15 \times 90\text{min} = 22h\ 30m$
- Attending the exercise classes: $7 \times 90\text{min} = 10h\ 30m$
- Examination: $1h\ 00m$

**Self-study**

- Preparation and wrap-up of the lecture: $15 \times 180\text{min} = 45h\ 00m$
- Preparing the exercises: $25h\ 00m$
Preparation of the examination: 31h 00m

**Sum:** 135h 00m

**Literature**


**Elective literature:**

**Course: Regulation Theory and Practice [T-WIWI-102712]**

**Responsibility:** Kay Mitusch

**Contained in:**
- [M-WIWI-101406] Network Economics

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**Learning Control / Examinations**

Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

**Conditions**

None

**Recommendations**

Basic knowledge and skills of microeconomics from undergraduate studies (bachelor’s degree) are expected. Particularly helpful but not necessary: Industrial Economics and Principal-Agent- or Contract theories. Prior attendance of the lecture *Competition in Networks* [26240] is helpful in any case but not considered a formal precondition.

**Event excerpt: Regulation Theory and Practice (SS 2017)**

**Aim**

Students

- will learn the basic aims and possibilities as well as the problems and limits of regulation
- will achieve an understanding of regulation as an incentive system under severe problems of asymmetric information and corporate governance
- will be able to apply general formal methods to the practice of regulation.

The lecture is suited for all students who want to work in companies of the network sectors – or who would like to become active on the side of regulators or in the respective political areas.

**Content**

The lecture begins with a short description about the history of regulation and its relation to competition policies. Then it turns to the aims, the possibilities and the practice of regulation which are presented and analyzed critically. This happens from both a theoretical (microeconomic modelling) perspective as well as from a practical perspective with the help of various examples.

**Workload**

The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**

Literature and lecture notes are handed out during the course.
Course: Regulatory Management and Grid Management - Economic Efficiency of Network Operation  [T-WIWI-103131]

Responsibility:

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<td>N.N., Christof Weinhardt</td>
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Learning Control / Examinations
The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation. The exam is offered every semester. Re-examinations are offered on every ordinary examination date.

Conditions
None

Recommendations
None

Remarks
New course starting winter term 2015/2016
Course: Replication Technologies in Micro System Technology [T-MACH-102168]

Responsibility: Matthias Worgull
Contained in: [M-MACH-101291] Microfabrication
[M-MACH-101290] BioMEMS

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Learning Control / Examinations
Oral examination

Conditions
none
Course: Report Urban Water Infrastructure and Management [T-BGU-106667]

Responsibility: Stephan Fuchs
Contained in: [M-BGU-101001] Water Supply and Sanitation

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<td>Vorlesung / Übung 4 (VÜ)</td>
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### Learning Control / Examinations

attested learning control (SPO/ER § 4 par. 3), report on practical training / project, appr. 8-15 pages

### Conditions

none

### Recommendations

none

### Remarks

none
**Course: Requirements Analysis and Requirements Management [T-WIWI-102759]**

**Responsibility:** Ralf Kneuper

**Contained in:**
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

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**Learning Control / Examinations**
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

**Conditions**
None

**Event excerpt: Requirements Analysis and Requirements Management (WS 16/17)**

**Aim**
The students have a full understanding of the foundations of the analysis and management of requirements as part of the development process of software and systems. They know the main terminology and approaches of this topic, and are able to express requirements themselves using different description methods.

**Content**
The analysis and management of requirements is a central task in the development of software and systems, addressing the border between the application discipline and computer science. The adequate performance of this task has a decisive influence on the whether or not a development project will be successful. The lecture provides an introduction to this topic, using the syllabus for the “Certified Professional for Requirements Engineering” (CPRE) as a guideline.

Lecture structure:
1. Introduction and overview, motivation
2. Identifying requirements
3. Documenting requirements (in natural language or using a modelling language such as UML)
4. Verification and validation of requirements
5. Management of requirements
6. Tool support

**Workload**
Workload: 120h overall,
Lecture 30h
Review and preparation of lectures 60h
Exam preparation 29h
Exam 1h

**Literature**
Literature will be given in the lecture.
## Course: Risk Communication [T-WIWI-102649]

**Responsibility:** Ute Werner  
**Contained in:**  
- [M-WIWI-101449] Insurance Management II  
- [M-WIWI-101469] Insurance Management I

<table>
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<th>Version</th>
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### Events

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<thead>
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### Learning Control / Examinations

The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation). The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

### Conditions

None

### Recommendations

None
Course: Risk Management in Industrial Supply Networks [T-WIWI-102826]

Responsibility: Marcus Wiens

Contained in: [M-WIWI-101412] Industrial Production III
[M-WIWI-101471] Industrial Production II

ECTS 3.5
Language englisch
Recurrence Jedes Wintersemester
Version 1

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Learning Control / Examinations
The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following § 4(2), 1 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

Conditions
None

Recommendations
None

Event excerpt: Risk Management in Industrial Supply Networks (WS 16/17)

Aim
Students shall learn methods and tools to manage risks in complex and dynamically evolving supply chain networks. Students learn the characteristics of modern logistics and supply chain management including trends such as globalization, lean production and e-business and learn to identify and analyze the arising risks. On the basis of this overview on supply chain management, the students gain knowledge about approaches and methods of industrial risk management. These approaches will be adapted to answer the specific questions arising in supply chain management. Key aspects include the identification of major risks, which provide the basis for the development of robust networks, and the design of strategic and tactic risk prevention and mitigation measures. In this manner, students will gain knowledge in designing and steering of robust internal and external value-creating networks.

Content
- supply chain management: introduction, aims and trends
- industrial risk management
- definition und characterization of risks: sourcing and procurement, demand, production and infrastructure
- identification of risks
- risk controlling
- risk assessment and decision support tools
- risk prevention and mitigation strategies
- robust design of supply chain networks
- supplier selection
- capacity management
- business continuity management

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
will be announced in the course
Course: River and Floodplain Ecology [T-BGU-102997]

Responsibility: Florian Wittmann

Contained in:
- [M-WIWI-101642] Natural Hazards and Risk Management 1
- [M-WIWI-101644] Natural Hazards and Risk Management 2

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Conditions
None

Recommendations
None

Remarks
None
Course: Roadmapping [T-WIWI-102853]

Responsibility: Daniel Jeffrey Koch

Contained in: [M-WIWI-101507] Innovation Management
[M-WIWI-101488] Entrepreneurship (EnTechnon)

ECTS: 3
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

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Learning Control / Examinations

Conditions
None

Recommendations
Prior attendance of the course Innovation Management [2545015] is recommended.

Remarks
See German version.

Event excerpt: Roadmapping (SS 2017)

Aim
Students develop a differentiated understanding of Roadmapping by working on different thematic aspects linked with the roadmapping method and by actively participating.

Content
Roadmapping is a method used to support innovation decisions in the early phase of innovation management. The roadmapping process addresses the procedure of constructing roadmaps which can then be assessed. Roadmapping provides structured and graphical visualizations of preferably future-oriented topics which have innovation potentials. The benefits of the roadmapping method lie in the structured bundling of both technology- and market-driven individual topics and the joint setting of priorities and processes to achieve predetermined corporate targets. As a rule, roadmaps represent a consensus reached by the people involved in their compilation. For this reason, roadmaps are suited to the designation and initial prioritization of emerging technologies and corresponding development projects.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.
Course: Safe mechatronic systems [T-MACH-105277]

Responsibility: Markus Golder

Contained in:
- [M-MACH-101284] Specialization in Production Engineering
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101279] Technical Logistics

**Events**

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**Learning Control / Examinations**

The assessment is carried out as oral exam (30min.) or written exam (60min.) (according to Section 4(2), 1 of the examination regulation). The examinations are offered every semester. Re-examinations are offered at every ordinary examination date.

**Remarks**

The lecture will be held in the winter term in German language and in the summer term in English language.

Event excerpt: Safe mechatronic systems (SS 2017)

**Aim**

The students are capable to

- describe the general meaning of safety and safety technology
- name and apply the technical rules and standards in the area of machine safety
- define the term “risk” in a safety-related context
- describe and apply the approach of risk assessment
- distinguish and apply relevant approaches to quantify safety
- demonstrate well-established safety concepts
- describe safety functions and to validate them
- name examples of different safety-related aspects

**Content**

This course provides in-depth knowledge on safety technology, safety-related terminology and their definitions will be discussed and distinguished from each other. Besides an introduction on relevant technical rules and standards, the emphasis will be on their application to be capable to identify and assess risks. Thus, the quantification of safety with the help of mathematical models will be studied in details. In this respect, this course will discuss and highlight the importance of the parameters Performance Level (PL) vs. Safety Integrity Level (SIL). Especially the application of PL and SIL on real-life cases will be emphasized. Furthermore, safety concepts and their possible implementation in design will be discussed as well as safety functions of mechatronic systems. In particular, safe bus systems, safe sensors, safe actuators and safe controls will be highlighted and in this respect, a differentiation between safety systems and assistance systems will be conducted. Further examples of safe mechatronic systems from the area of material handling, drive technology, control technology or even signal transmission and processing will demonstrate the safety aspects as described above and show possible implementation approaches of integrated safety in an industrial environment.

**Workload**

- presence 31.5h
- self-study approx. 100h
Literature
Recommendations during the lecture.
Course: Safe structures for machines in material handling [T-MACH-105200]

Responsibility: Markus Golder

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS: 4
Recurrence: Jedes Wintersemester
Version: 1

Events

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Learning Control / Examinations

The assessment of this course is an oral examination (20-30 min) according to §4(2) of the examination regulation. Exam dates on appointment.

Conditions

none

Recommendations

Knowledge of the course „Basics of Technical Logistics“ are beneficial but not a requirement

Event excerpt: Safe structures for machines in material handling (WS 16/17)

Aim

Students are capable to

- explain and apply relevant terms and their definitions like load, stress and strain
- name technical rules and standards applicable in machines for material handling
- explain and discuss the importance of safety factors and dynamic factors
- name and describe the required verification measures in design of material handling equipment
- describe the objective, approach and aspects when transferring the dynamic behaviour of a structure into an elasto-kinetic model

Content

This course discusses the safe dimensioning of structures for machines in material handling. Using the example of industrial bridge cranes relevant terms, their definitions and relationships, as well as content from important technical rules, standards and guidelines will be discussed and demonstrated. Special attention will be put on safety factors and dynamic factors, verification measures and applicable methods with regards to the dimensioning of supporting structures.

Using selected examples (bridge cranes, tower cranes, stacker cranes), operating conditions and environmental/influencing factors on material handling system are concretized and their impacts on stress, strain, stability and fatigue strength of material handling machines are highlighted. The resulting dynamic behaviour of supporting structures will be transferred into models which illustrate the approach of determining the dynamic factors. Based on these models, the importance of simulations and its possibilities to evaluate the quality of different parameter values are highlighted.

Workload

Attendance: 32 hours
Self-study: approx. 88 hours
Course: Safety Engineering [T-MACH-105171]

Responsibility: Hans-Peter Kany

Contained in: [M-MACH-101263] Introduction to Logistics
[M-MACH-101279] Technical Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Semester
Version: 1

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<th>Event-No.</th>
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Learning Control / Examinations
oral / written

Conditions
none

Event excerpt: Safety Engineering (WS 16/17)

Aim
Students are able to:

- Name and describe relevant safety concepts of safety engineering,
- Discuss basics of health at work and labour protection in Germany,
- Evaluate the basics for the safe methods of design of machinery with the national and European safety regulations and
- Realize these objectives by using examples in the field of storage and material handling systems.

Content
The course provides basic knowledge of safety engineering. In particular the basics of health at the working place, job safety in Germany, national and European safety rules and the basics of safe machine design are covered. The implementation of these aspects will be illustrated by examples of material handling and storage technology. This course focuses on: basics of safety at work, safety regulations, basic safety principles of machine design, protection devices, system security with risk analysis, electronics in safety engineering, safety engineering for storage and material handling technique, electrical dangers and ergonomics. So, mainly, the technical measures of risk reduction in specific technical circumstances are covered.

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Course: Safety Management in Highway Engineering [T-BGU-101674]

Responsibility: Matthias Zimmermann
Contained in: [M-BGU-101066] Safety, Computing and Law in Highway Engineering

<table>
<thead>
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<th>Recurrence</th>
<th>Version</th>
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Learning Control / Examinations
oral exam with 15 minutes

Conditions
None

Recommendations
None

Remarks
None

Event excerpt: (WS 16/17)

Aim
Die Absolventinnen und Absolventen können grundsätzlich Methoden und Verfahren zur Erhöhung der Verkehrssicherheit auf Straßen anwenden, die Verkehrssicherheit von Straßen, Streckenabschnitten und Knotenpunkten beurteilen, Unfallschwerpunkte identifizieren, Unfälle und deren Ursachen analysieren sowie Maßnahmen zur Erhöhung der Verkehrssicherheit entwickeln und in ihrer Wirkung bewerten.

Content
In dieser Lehrveranstaltung werden die Inhalte der Verkehrssicherheitsarbeit von Seiten der Baulastträger, der Straßenverkehrsbehörden und der Polizei (Unfallaufnahme, Unfallanalyse, Beurteilung der Verkehrssicherheit von Netzen, Strecken und Knotenpunkten etc.), von Seiten der Wissenschaft (sicherheitsrelevante Aspekte im technischen Regelwerk) und im Lebenszyklus einer Straße (Sicherheitsaudits in der Planung, im Entwurf und während des Betriebs) vorgestellt, erörtert und grundsätzliche Verbesserungsmöglichkeiten diskutiert.
### Course: Sales Management and Retailing [T-WIWI-102890]

**Responsibility:** Martin Klarmann  
**Contained in:** [M-WIWI-101487] Sales Management

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<th>Language</th>
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<th>Version</th>
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#### Learning Control / Examinations

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

**Conditions**

None

**Recommendations**

None

**Remarks**

For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

### Event excerpt: Sales Management and Retailing (WS 16/17)

#### Aim

Students
- know challenges regarding the organization of distribution systems
- have knowledge in the field of forecasting and are able to predict the expected sales with the help of different approaches (e.g. exponential smoothing and moving averages)
- are able to plan and to put into practice customer satisfaction measurements
- know the main goals of customer relationship management and are able to implement them with the suitable instruments (e.g. loyalty programs, cross selling and customers-recruit-customers programs)
- are capable to put customer prioritization into place and to calculate the customer lifetime value
- know and have mastered the processes to generate recommendations (e.g. collaborative filtering process and affinity analysis)
- have well-founded knowledge of complaint management and customer recovery
- understand the transaction cost theory and know its meaning in practice
- know different kinds of sales channels and can analyze their success
- are aware of power sources and conflicts between producer and retailer and can use this knowledge for a successful vertical marketing
- know the particularities of trade marketing regarding the components of the extended marketing mix
- have well-founded knowledge of quantitative determining of retail prices

#### Content

The aim of the course “Sales Management and Retailing” is on the one hand to give insights into the challenging realization of a successful sales management and on the other hand to discuss peculiarities of retailing contexts. The contents are below others:

- Customer relationship management (word-of-mouth-analysis, key account management, loyalty programs, complain management etc.)
- Retail marketing (trends, point of sale design etc.)
- Retailer-producer relationships

#### Workload

The total workload for this course is approximately 90 hours. For further information see German version.
Literature
Course: Selected Applications of Technical Logistics [T-MACH-102160]

Responsibility: Vladimir Madzharov, Martin Mittwollen

Contained in: [M-MACH-101279] Technical Logistics

ECTS 4 Language deutsch Recurrence Jedes Sommersemester Version 1

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Learning Control / Examinations
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Conditions
none

Recommendations
Knowledge out of Basics of Technical Logistics / Elements and Systems of Technical Logistics preconditioned.

Event excerpt: Selected Applications of Technical Logistics (SS 2017)

Aim
Students are able to:

- Model the dynamic behaviour of material handling systems
- Based on this calculate the dynamical behavior
- Transfer this approach autonomous to further, different material handling installations
- Discuss the knowledge with subject related persons

Content

- design and dimension of machines from intralogistics
- static and dynamic behaviour
- operation properties and specifics
- Inside practical lectures: sample applications and calculations in addition to the lectures

Workload
presence: 36h
rework: 84h

Literature
Recommendations during lessons
Course: Selected Applications of Technical Logistics and Project [T-MACH-102161]

Responsibility: Vladimir Madzharov, Martin Mittwollen

Contained in: [M-MACH-101279] Technical Logistics

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Learning Control / Examinations
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Recommendations
Knowledge out of Basics of Technical Logistics / Elements and Systems of Technical Logistics preconditioned

Event excerpt: Selected Applications of Technical Logistics and Project (SS 2017)

Aim
Students are able to:

- Model the dynamic behaviour of material handling systems and based on this calculate the dynamical behaviour
- Transfer this approach autonomous to further, different material handling installations,
- Discuss the knowledge with subject related persons
- Judge about systems in place and justify it in front of subject related persons.

Content

- design and dimension of machines from intralogistics
- static and dynamic behaviour
- operation properties and specifics
- Inside practical lectures: sample applications and calculations in addition to the lectures

Workload
presence: 48h
rework: 132h

Literature
Recommendations during lessons
**Course: Selected Topics on Optics and Microoptics for Mechanical Engineers [T-MACH-102165]**

**Responsibility:** Timo Mappes  
**Contained in:**  
- [M-MACH-101287] Microsystem Technology  
- [M-MACH-101290] BioMEMS  
- [M-MACH-101292] Microoptics

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**Learning Control / Examinations**

**Oral examination**

**Conditions**

none

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**Event excerpt: Selected Topics on Optics and Microoptics for Mechanical Engineers (SS 2017)**

**Aim**

Die Vorlesung “Ausgewählte Kapitel der Optik und Mikrooptik für Maschinenbauer” verfolgt folgende Lernziele:  
(a) Die Studierenden können den Aufbau eines optischen Instruments beschreiben und erklären.  
(b) Die Studierenden können Fertigungsverfahren (mikro)optischer Bauteile gegeneinander abwägen und bewerten sowie Ansätze zu neuen Fertigungsprozessen entwickeln.  
(c) Die Studierenden können die Ursachen von Aberrationen Beschreiben und unterschiedliche optische Effekte in die technische Nutzung übertragen.  
(d) Die Studierenden können Kontrastverfahren zur optimalen Sichtbarmachung mikroskopischer Strukturen im Auf- und Durchlicht problemorientiert auswählen.  
(e) Die Studierenden wenden das Wissen um den Aufbau und die Fertigungsverfahren eines optischen Instruments im Design eines Instruments mit ungewöhnlichen Anforderungen konkret an und skizzieren die Vor- und Nachteile der entwickelten Konstruktionsansätze.  
(f) Die Studierenden können die erlernten Techniken (Auslegung eines optischen Strahlengangs, Funktionsweisen einfacher mikroskopischer Kontrastverfahren und zudem des Projektmanagements) in einem der Aufgabe entsprechenden Format präsentieren.

**Content**


**Workload**

Präsenzzeit: 26 Stunden  
Selbststudium: 94 Stunden

**Literature**

(a) Hecht Eugene: Optik; 5., überarb. Aufl.; Oldenbourg Verlag, München und Wien, 2009  
(b) Folien der Vorlesung als *.pdf
**Course: Semantic Web Technologies [T-WIWI-102874]**

**Responsibility:** Andreas Harth, York Sure-Vetter

**Contained in:**
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

**Events**

<table>
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<td>Vorlesung (V)</td>
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**Learning Control / Examinations**
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

**Conditions**
None

**Recommendations**
Lectures on Informatics of the Bachelor on Information Management (Semester 1-4) or equivalent are required.

**Event excerpt: Semantic Web Technologies (SS 2017)**

**Aim**
The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

**Content**
The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

**Workload**

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
• Exam and exam preparation: 37.5 hours

Literature


Additional Literature

Course: Seminar in Business Administration A (Master) [T-WIWI-103474]


Contained in: [M-WIWI-101808] Seminar Module

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Events

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<td>Michael Pelz, Marcus Wouters</td>
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</tbody>
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Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.

Event excerpt: Hospital Management (SS 2017)
Aim
The student

- knows the scope of duties and decisions of a hospital manager and
- is able to give profound guidance.

Content
The seminar ‘Hospital Management’ presents internal organization structures, work conditions and work environments at the example of hospitals and relates this to common and expected conditions of other service industries. Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Workload
The total workload for this course is approximately 90 hours.

Aim
Students

- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Content**
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**
Will be announced in the course.

---

**Event excerpt: Seminar Management Accounting (SS 2017)**

**Aim**
Students
- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Content**
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

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Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**
Will be announced in the course.

---

**Event excerpt: Seminar in Finance (SS 2017)**

**Aim**
The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance. Through the presentations in this seminar the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

**Content**
Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures. The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.
Literature
Will be announced at the end of the foregoing semester.

Event excerpt: (WS 16/17)
Aim
Learning to identify, to analyse and to assess business risks; this serves as a basis for strategy and policy design regarding risks and opportunities of an enterprise. Introduction to approaches that allow to consider area-specific risk objectives, risk-bearing capacity and risk acceptance.

Content
1. Concepts and practice of risk management, based on decision theory
2. Goals, strategies and policies for the identification, analysis, assessment and management of risks
3. Insurance as an instrument for loss-financing
4. Selected aspects of risk management: e.g. environmental protection, organizational failure and D&O-coverage, development of a risk management culture
5. Organisation of risk management
6. Approaches for determining optimal combinations of risk management measures considering their investment costs and outcomes.

Workload
The overall amount of work necessary for this course is approx. 135 hours (4.5 ECTS-Credits).

Literature

Elective literature:
Additional literature is recommended during the course.

Event excerpt: Seminar in strategic and behavioral marketing (WS 16/17)
Aim
Students
- do literature search based on a given topic, identify relevant literature and evaluate this literature,
- give presentations in a scientific context in front of an auditorium to present the results of the research,
- present results of the research in a seminar thesis as a scientific publication using format requirements such as those recommended by well-known publishers.

Content
In the seminar the student should learn to apply the research methods to a predefined topic area. The topics are based on research questions in marketing. This problem analysis requires an interdisciplinary examination. As a special option, the implementation of methodological solutions for market research can be accomplished and discussed with respect to its application.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be allocated according the individual topics.

Event excerpt: (WS 16/17)
Aim
Students
• can exploit a literature field systematically
• are able to write an academic paper in a formally correct way
• can assess the relevance and quality of sources
• are able to get an overview of sources very quickly
• know how to find relevant sources for a literature field
• are capable to write a convincing outline
• know how to categorize a subject under a research field
• understand how to systematize literature fields theoretically and empirically with the help of literature tables
• can identify the most important findings in a huge number of sources
• are able to present a research field
• can discuss the theoretical and practical implications of a topic
• are capable to identify interesting research gaps

**Content**

Im Rahmen des Seminars sollen die Teilnehmer lernen, sich einen systematischen Überblick über ein Literaturgebiet im Marketing zu verschaffen – eine wichtige Grundvoraussetzung für eine erfolgreiche Masterarbeit. Zentrale Aspekte der Leistung sind die Identifikation relevanter Quellen, die Systematisierung der Literatur, das Herausarbeiten zentraler Erkenntnisse, die klare und einfache sprachliche Darstellung der Ergebnisse und die Identifikation interessanter Forschungslücken.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.

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**Event excerpt: Seminar: Energy Informatics (WS 16/17)**

**Aim**


Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart zu präsentieren, wie es in wissenschaftlichen Publikationen der Fall ist.

**Content**


Daher sollen im Rahmen des Seminars „Seminar: Energieinformatik“, unterschiedliche Algorithmen, Simulationen und Modellierungen bzgl. ihrer Vor- und Nachteile in den verschiedenen Bereichen der Netzinfrastruktur untersucht werden.

**Workload**

4 LP entspricht ca. 120 Stunden
ca. 21 Std. Besuch des Seminars,
ca. 45 Std. Analyse und Bearbeitung des Themas,
ca. 27 Std. Vorbereitung und Erstellung der Präsentation, und
ca. 27 Std. Schreiben der Ausarbeitung.

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**Event excerpt: Seminar Management Accounting and Innovation (SS 2017)**

**Aim**

Students
are largely independently able to identify a distinct topic in Management Accounting,
• are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and
relationships from relatively unstructured information,
• can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific
approach (structuring, terminology, sources).

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups,
and present this in the final week. You are to a large extent free to select your own topic. The seminar course is
concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should
identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail.
Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case.
Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

Event excerpt: Special Topics in Management Accounting (SS 2017)

Aim
Students
• are largely independently able to identify a distinct topic in Management Accounting,
• are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and
relationships from relatively unstructured information,
• can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific
approach (structuring, terminology, sources).

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups,
and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four meetings
that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should
identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail.
Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case.
Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

Event excerpt: Seminar Human Resource Management (SS 2017)

Aim
The student
• looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
• trains his / her presentation skills.
• learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to
sum up the crucial facts.
• cultivates the discussion of research approaches.
Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

Literature
Selected journal articles and books.
## Course: Seminar in Business Administration B (Master) [T-WIWI-103476]

### Responsibility:
Wolf Fichtner, Hansjörg Fromm, Andreas Geyer-Schulz, Ju-Young Kim, Martin Klarmann, Peter Knauth, Hagen Lindstädt, David Lorenz, Torsten Luedecke, Thomas Lützkendorf, Alexander Mädche, Bruno Neibecker, Stefan Nickel, Petra Nieken, Martin Ruckes, Gerhard Satzger, Frank Schultmann, Thomas Setzer, Orestis Terzidis, Marliese Uhrig-Homburg, Maxim Ulrich, Christof Weinhardt, Marion Weissenberger-Eibl, Ute Werner, Marcus Wouters

### Contained in:
[M-WIWI-101808] Seminar Module

### ECTS Language Recurrence Version
3 deutsch/englisch Jedes Semester 1

### Events

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Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

Event excerpt: Hospital Management (SS 2017)

Aim
The student

- knows the scope of duties and decisions of a hospital manager and
- is able to give profound guidance.

Content
The seminar ‘Hospital Management’ presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.
Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Workload
The total workload for this course is approximately 90 hours.


Aim
Students

- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

**Meeting 1:** Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

**Meeting 2 and 3:** The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

**Meeting 4:** In the third week we are going to present and discuss the final papers.

**Workload**

The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**

Will be announced in the course.

---

**Event excerpt: Seminar Management Accounting (SS 2017)**

**Aim**

Students

- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

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The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

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**Meeting 4:** In the third week we are going to present and discuss the final papers.

**Workload**

The total workload for this course is approximately 90 hours. For further information see German version.

**Literature**

Will be announced in the course.

---

**Event excerpt: Seminar in Finance (SS 2017)**

**Aim**

The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance.

Through the presentations in this seminar the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

**Content**

Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.

The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

**Workload**

The total workload for this course is approximately 90 hours. For further information see German version.
Literature
Will be announced at the end of the foregoing semester.

V Event excerpt: (WS 16/17)

Aim
Learning to identify, to analyse and to assess business risks; this serves as a basis for strategy and policy design regarding risks and opportunities of an enterprise. Introduction to approaches that allow to consider area-specific risk objectives, risk-bearing capacity and risk acceptance.

Content
1. Concepts and practice of risk management, based on decision theory
2. Goals, strategies and policies for the identification, analysis, assessment and management of risks
3. Insurance as an instrument for loss-financing
4. Selected aspects of risk management: e.g. environmental protection, organizational failure and D&O-coverage, development of a risk management culture
5. Organisation of risk management
6. Approaches for determining optimal combinations of risk management measures considering their investment costs and outcomes.

Workload
The overall amount of work necessary for this course is approx. 135 hours (4.5 ECTS-Credits).

Literature

Elective literature:
Additional literature is recommended during the course.

V Event excerpt: Seminar in strategic and behavioral marketing (WS 16/17)

Aim
Students
- do literature search based on a given topic, identify relevant literature and evaluate this literature,
- give presentations in a scientific context in front of an auditorium to present the results of the research,
- present results of the research in a seminar thesis as a scientific publication using format requirements such as those recommended by well-known publishers.

Content
In the seminar the student should learn to apply the research methods to a predefined topic area. The topics are based on research questions in marketing. This problem analysis requires a interdisciplinary examination. As a special option, the implementation of methodological solutions for market research can be accomplished and discussed with respect to its application.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be allocated according the individual topics.
- can exploit a literature field systematically
- are able to write an academic paper in a formally correct way
- can assess the relevance and quality of sources
- are able to get an overview of sources very quickly
- know how to find relevant sources for a literature field
- are capable to write a convincing outline
- know how to categorize a subject under a research field
- understand how to systematize literature fields theoretically and empirically with the help of literature tables
- can identify the most important findings in a huge number of sources
- are able to present a research field
- can discuss the theoretical and practical implications of a topic
- are capable to identify interesting research gaps

**Content**

Im Rahmen des Seminars sollen die Teilnehmer lernen, sich einen systematischen Überblick über ein Literaturgebiet im Marketing zu verschaffen – eine wichtige Grundvoraussetzung für eine erfolgreiche Masterarbeit. Zentrale Aspekte der Leistung sind die Identifikation relevanter Quellen, die Systematisierung der Literatur, das Herausarbeiten zentraler Erkenntnisse, die klare und einfache sprachliche Darstellung der Ergebnisse und die Identifikation interessanter Forschungslücken.

**Workload**

The total workload for this course is approximately 90 hours. For further information see German version.

---

**Event excerpt: Seminar: Energy Informatics (WS 16/17)**

**Aim**


Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart zu präsentieren, wie es in wissenschaftlichen Publikationen der Fall ist.

**Content**


Daher sollen im Rahmen des Seminars „Seminar: Energieinformatik“, unterschiedliche Algorithmen, Simulationen und Modellierungen bzgl. ihrer Vor- und Nachteile in den verschiedenen Bereichen der Netzinfrastruktur untersucht werden.

**Workload**

4 LP entspricht ca. 120 Stunden
ca. 21 Std. Besuch des Seminars,
ca. 45 Std. Analyse und Bearbeitung des Themas,
ca. 27 Std. Vorbereitung und Erstellung der Präsentation, und
ca. 27 Std. Schreiben der Ausarbeitung.

---

**Event excerpt: Seminar Management Accounting and Innovation (SS 2017)**

**Aim**

Students
are largely independently able to identify a distinct topic in Management Accounting,
• are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
• can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

Event excerpt: Special Topics in Management Accounting (SS 2017)

Aim
Students
• are largely independently able to identify a distinct topic in Management Accounting,
• are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
• can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

Event excerpt: Seminar Human Resource Management (SS 2017)

Aim
The student
• looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
• trains his / her presentation skills.
• learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
• cultivates the discussion of research approaches.
Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

Literature
Selected journal articles and books.
### Course: Seminar in Economic Policy [T-WIWI-102789]

**Responsibility:** Ingrid Ott  
**Contained in:** [M-WIWI-101514] Innovation Economics

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### Learning Control / Examinations
The assessment is carried out through a term paper within the range of 12 to 15 pages, a presentation of the results of the work in a seminar meeting, and active participation in the discussions of the seminar meeting (§ 4 (2), 3 SPO).

The final grade is composed of the weighted graded examinations. (Essay 50%, 40% oral presentation, active participation 10%).

### Conditions
None

### Recommendations
At least one of the lectures “Theory of Endogenous Growth” or “Innovation Theory and Policy” should be attended in advance, if possible.
Course: Seminar in Economics A (Master) [T-WIWI-103478]

Responsibility: Johannes Brumm, Jan Kowalski, Kay Mitsch, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger

Contained in: [M-WIWI-101808] Seminar Module

ECTS: 3  Language: deutsch/englisch  Recurrence: Jedes Semester  Version: 1

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Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

Event excerpt: (WS 16/17)

Aim
The student develops an own idea for an economic experiment in this research direction.

Workload
About 90 hours.

Literature
James Heckman (fostering of young children), Ernst Fehr (egalitarianism and fairness), Uri Gneezy (gender differences), Matthias Sutter (delay of gratification), and Walter Mischel (the famous Marshmallow Experiment).
**Course: Seminar in Economics B (Master) [T-WIWI-103477]**

**Responsibility:** Johannes Brumm, Jan Kowalski, Kay Mitsuč, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger

**Contained in:** [M-WIWI-101808] Seminar Module

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### Learning Control / Examinations

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- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

### Conditions

None.

### Recommendations

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

### Remarks

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### Event excerpt: (WS 16/17)

**Aim**

The student develops an own idea for an economic experiment in this research direction.

**Workload**

About 90 hours.

**Literature**

James Heckman (fostering of young children), Ernst Fehr (egalitarianism and fairness), Uri Gneezy (gender differences), Matthias Sutter (delay of gratification), and Walter Mischel (the famous Marshmallow Experiment).
Course: Seminar in Engineering Science (Master) [T-WIWI-103147]

Responsibility: Fachvertreter ingenieurwissenschaftlicher Fakultäten
Contained in: [M-WIWI-101808] Seminar Module

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Learning Control / Examinations
See German version.

Conditions
See module description.

Recommendations
None
### Course: Seminar in Informatics A (Master) [T-WIWI-103479]

**Responsibility:** Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner  
**Contained in:** [M-WIWI-101808] Seminar Module  

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Learning Control / Examinations
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- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Developing IT-based Business Models (WS 16/17)

Aim
The Student

- analyzes and develops in small teams a business model from an idea to a complete business plan or
- treats a special topic from the area of Semantic Web in businesses and entrepreneurship.
- learns about basic concepts and problem areas and considers these while building the business plan for a particular business idea.
- understands and considers the viewpoints of different stakeholders in the area of entrepreneurship and their influences on an own business idea.

Content
Semantic technologies such as RDF, SPARQL, OWL, and RIF are still standardised only in their first versions. Still, the multitude of integrated technologies provides the basis for development of new applications and creates, with the help of the initial standardisations, a foundation for attracting investors. The potential and future developments in the field are exemplified by the growing popularity and importance of data, being published as Linked Data, as well as by the increase
in applications developed outside the scope of research. The seminar “Developing Business Models for the Semantic Web” aims to explore these opportunities for new business models and business ventures.

The seminar takes place on a weekly basis and consists of two main parts. The first part is a series of presentations, held by external experts who share their experience in the area of entrepreneurship. The aim is to engage a wide variety of presenters, including applicants to programs for supporting young business ventures, startup founders, and people in leadership positions in established companies. Further guest lecturers include experts in the field of business and startup development, tax and enterprise law, as well as entrepreneurs, who have sold their startups or had to give up their ideas. The second part consists of the contributions of seminar participants. They are required to develop a business model, starting with the initial idea and building it up to a complete business plan. This development process is accompanied by feedback sessions, pitches, mid-term presentations and a final presentation. The student presentations alternate with presentations given by external experts. Furthermore, besides the development of a business plan, student can work on a specific topic such as “Analysing Existing Business Models on the Web” or “Using Open Source in Startups”.

The seminar pass can be obtained by submitting a completed seminar thesis (i.e. the business plan or the specific topic) and by regularly attending the seminar presentations.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

V Event excerpt: Smart Services and the IoT (WS 16/17)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

V Event excerpt: Applications of Semantic MediaWiki (WS 16/17)

Content
Topics of interest include, but are not limited to:

- Analysis of Medical Processes
- Correlation analysis of medical data
- Visualization of data in SMW
- Sentiment analysis of Twitter data
- Upload Interface for SMW
- Process Matching of process data

V Event excerpt: (SS 2017)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

Literature
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
Event excerpt: Seminar Service Science, Management & Engineering (WS 16/17)

Aim
The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
The student will receive the necessary literature for his research topic.

V

Event excerpt: Seminar: Energy Informatics (WS 16/17)

Aim

Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart darstellen, wie es in wissenschaftlichen Publikationen der Fall ist.

Content

Workload
4 LP entspricht ca. 120 Stunden
c. 21 Std. Besuch des Seminars,
c. 45 Std. Analyse und Bearbeitung des Themas,
c. 27 Std. Vorbereitung und Erstellung der Präsentation, und
Workload

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media
## Course: Seminar in Informatics B (Master) [T-WIWI-103480]

**Responsibility:** Andreas Oberweis, Harald Sack, Hartmut Schmeck, York Sure-Vetter, Johann Marius Zöllner

**Contained in:** [M-WIWI-101808] Seminar Module

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<td>Jochem, Hartmut Schmeck, Dorothea Wagner, Franziska Wegner</td>
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<td>Maribel Acosta Deibe, Andreas Harth, Tobias Christof Käfer, Rudi</td>
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<td>2</td>
<td>Stefanie Betz, Andreas Fritsch, Andreas Oberweis</td>
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</table>
Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Developing IT-based Business Models (WS 16/17)

Aim
The Student

- analyzes and develops in small teams a business model from an idea to a complete business plan or
- treats a special topic from the area of Semantic Web in businesses and entrepreneurship.
- learns about basic concepts and problem areas and considers these while building the business plan for a particular business idea.
- understands and considers the viewpoints of different stakeholders in the area of entrepreneurship and their influences on an own business idea.

Content
Semantic technologies such as RDF, SPARQL, OWL, and RIF are still standardised only in their first versions. Still, the multitude of integrated technologies provides the basis for development of new applications and creates, with the help of the initial standardisations, a foundation for attracting investors. The potential and future developments in the field are exemplified by the growing popularity and importance of data, being published as Linked Data, as well as by the increase
in applications developed outside the scope of research. The seminar “Developing Business Models for the Semantic Web” aims to explore these opportunities for new business models and business ventures. The seminar takes place on a weekly basis and consists of two main parts. The first part is a series of presentations, held by external experts who share their experience in the area of entrepreneurship. The aim is to engage a wide variety of presenters, including applicants to programs for supporting young business ventures, startup founders, and people in leadership positions in established companies. Further guest lecturers include experts in the field of business and startup development, tax and enterprise law, as well as entrepreneurs, who have sold their startups or had to give up their ideas. The second part consists of the contributions of seminar participants. They are required to develop a business model, starting with the initial idea and building it up to a complete business plan. This development process is accompanied by feedback sessions, pitches, mid-term presentations and a final presentation. The student presentations alternate with presentations given by external experts. Furthermore, besides the development of a business plan, student can work on a specific topic such as “Analysing Existing Business Models on the Web” or “Using Open Source in Startups”. The seminar pass can be obtained by submitting a completed seminar thesis (i.e. the business plan or the specific topic) and by regularly attending the seminar presentations.

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.

**Event excerpt: Smart Services and the IoT (WS 16/17)**

**Content**
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

**Event excerpt: Applications of Semantic MediaWiki (WS 16/17)**

**Content**
Topics of interest include, but are not limited to:

- Analysis of Medical Processes
- Correlation analysis of medical data
- Visualization of data in SMW
- Sentiment analysis of Twitter data
- Upload Interface for SMW
- Process Matching of process data

**Event excerpt: (SS 2017)**

**Content**
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

**Literature**
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
Aim
The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
The student will receive the necessary literature for his research topic.

---

Aim

Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart präsentieren, wie es in wissenschaftlichen Publikationen der Fall ist.

Content

Workload
4 LP entspricht ca. 120 Stunden
c.a. 21 Std. Besuch des Seminars,
c.a. 45 Std. Analyse und Bearbeitung des Themas,
c.a. 27 Std. Vorbereitung und Erstellung der Präsentation, und
ca. 27 Std. Schreiben der Ausarbeitung.

**Event excerpt: (WS 16/17)**

**Workload**
Topic of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media
Course: Seminar in Mathematics (Master) [T-MATH-105944]

Responsibility: Martin Folkers, Günter Last

Contained in: [M-WIWI-101808] Seminar Module

ECTS: 3
Version: 1
Course: Seminar in Operations Research A (Master) [T-WIWI-103481]

Responsibility: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann

Contained in: [M-WIWI-101808] Seminar Module

ECTS 3  Language deutsch  Recurrence Jedes Semester  Version 1

Events

<table>
<thead>
<tr>
<th>Term</th>
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<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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<td>Mitarbeiter, Stefan Nickel, Anne Zander</td>
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Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

Event excerpt: Seminar: Recent Topics in OR (SS 2017)

Aim
The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
• acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.

Event excerpt: Seminar: Recent Topics in OR (SS 2017)

Aim
The student

• illustrates and evaluates classic and current research questions in discrete optimization,
• applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
• successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
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Content
The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.
Course: Seminar in Operations Research B (Master) [T-WIWI-103482]

Responsibility: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann

Contained in: [M-WIWI-101808] Seminar Module

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<th>Recurrence</th>
<th>Version</th>
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### Events

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<td></td>
<td>Steffen Rebennack, Bismark Singh</td>
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<td>SS 2017</td>
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<td>Peter Kirst, Robert Mohr, Christoph Neumann, Oliver Stein</td>
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<td>SS 2017</td>
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</table>

### Learning Control / Examinations

The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

### Conditions

None.

### Recommendations

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

### Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

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**V Event excerpt: Seminar: Recent Topics in OR (SS 2017)**

### Aim

The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
• acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.

Event excerpt: Seminar: Recent Topics in OR (SS 2017)

Aim
The student

• illustrates and evaluates classic and current research questions in discrete optimization,
• applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
• successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
• acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.
Course: Seminar in Statistics A (Master) [T-WIWI-103483]

Responsibility: Oliver Grothe, Melanie Schienle

Contained in: [M-WIWI-101808] Seminar Module

ECTS
3

Recurrence
Jedes Semester

Version
1

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.
Course: Seminar in Statistics B (Master) [T-WIWI-103484]

Responsibility: Oliver Grothe, Melanie Schienle
Contained in: [M-WIWI-101808] Seminar Module

ECTS: 3
Recurrence: Jedes Semester
Version: 1

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.
Course: Seminar in Transportation [T-BGU-100014]

Responsibility: Bastian Chlond, Peter Vortisch

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
       [M-BGU-101064] Fundamentals of Transportation

ECTS: 3  Recurrence: Jedes Semester  Version: 1

Events

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</table>

Conditions
None

Recommendations
None

Remarks
None
Course: Seminar Mobility Services (Master) [T-WIWI-103174]

Responsibility: Gerhard Satzger, Carola Stryja

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

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</table>

Learning Control / Examinations
A final written exam will be conducted.

Conditions
None
**Course: Seminar Sensors [T-ETIT-100707]**

**Responsibility:** Wolfgang Menesklou

**Contained in:***
- [M-ETIT-101158] Sensor Technology I
- [M-ETIT-101159] Sensor Technology II

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**Events**

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<td>Wolfgang Menesklou</td>
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</tbody>
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**Industrial Engineering and Management (M.Sc.)**

*Date 05/17/2017*

**Aim**

**Workload**
Der gesamte Arbeitsaufwand beträgt ca. 75-100 h, davon sind 22,5 h Präsenzzeit.

### Event excerpt: Governance, Risk & Compliance (SS 2017)

**Aim**
Der/die Studierende hat vertiefte Kenntnisse hinsichtlich der Thematik “Governance, Risk & Compliance” sowohl auf regulatorischer Ebene als auch auf betriebswirtschaftlicher Ebene. Er/sie ist in der Lage, eine konkrete Fragestellung schriftlich in Form einer Seminararbeit auszuarbeiten sowie anschließend im mündlichen Vortrag zu präsentieren.

**Content**

**Workload**
21 h Präsenzzeit, 60 h schriftliche Ausarbeitung, 9h Vortrag vorbereiten.
Course: Seminar: Legal Studies II [T-INFO-105945]

Responsibility: Thomas Dreier

Contained in: [M-WIWI-101808] Seminar Module

ECTS 3  Version 1
Course: Sensor Systems [T-ETIT-100709]

**Responsibility:** Wolfgang Menesklou

**Contained in:**
- [M-ETIT-101158] Sensor Technology I
- [M-ETIT-101159] Sensor Technology II

<table>
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<th>ECTS</th>
<th>Recurrence</th>
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<tr>
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<td>Jedes Sommersemester</td>
<td>1</td>
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Course: Sensors [T-ETIT-101911]

Responsibility: Wolfgang Menesklou

Contained in: [M-ETIT-101158] Sensor Technology I

<table>
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<tbody>
<tr>
<td>3</td>
<td>deutsch</td>
<td>Jedes Wintersemester</td>
<td>1</td>
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<td>WS 16/17</td>
<td>23231</td>
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<td>2</td>
<td>Wolfgang Menesklou</td>
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Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
Course: Sensors and Actuators Laboratory [T-ETIT-100706]

Responsibility: Wolfgang Menesklou

Contained in: [M-ETIT-101158] Sensor Technology I
[M-ETIT-101159] Sensor Technology II

ECTS: 6
Recurrence: Jedes Sommersemester
Version: 1
**Course: Service Analytics A [T-WIWI-105778]**

**Responsibility:** Sebastian Blanc, Hansjörg Fromm, Thomas Setzer

**Contained in:**
- [M-WIWI-103117] Data Science: Data-Driven Information Systems
- [M-WIWI-101470] Data Science: Advanced CRM
- [M-WIWI-101506] Service Analytics
- [M-WIWI-101448] Service Management

**ECTS**
- 4,5

**Language**
- deutsch

**Recurrence**
- Jedes Sommersemester

**Version**
- 1

### Events

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<td>Hansjörg Fromm, Thomas Setzer</td>
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</table>

**Learning Control / Examinations**

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

**Conditions**

None

**Recommendations**

The lecture is addressed to students with interests and basic knowledge in the topics of Operations Research, descriptive and inductive statistics.

### Event excerpt: Service Analytics A (SS 2017)

**Aim**

Participants are able to structure large sets of available data and to use that data for planning, operation, personalization of complex services, in particular for IT services. They learn a step-by-step approach starting with analyzing possibly incomplete data, techniques of multivariate statistics to filter data and to extract key features, to predict future behavior and system dynamics, and finally to formulate data and fact-based service planning and decision models.

**Content**

Today's service-oriented companies are starting to optimize the way services are planned, operated, and personalized by analyzing vast amounts of data from customers, IT-systems, or sensors. As the statistical learning and business optimization world continues to progress, skills and expertise in advanced data analytics and data and fact-based optimization become vital for companies to be competitive. In this lecture, relevant methods and tools will be considered as a package, with a strong focus on their inter-relations. Students will learn to analyze and structure large amounts of potentially incomplete and unreliable data, to apply multivariate statistics to filter data and to extract key features, to predict future behavior and system dynamics, and finally to formulate data and fact-based service planning and decision models.

More specifically, the lessons of this lecture will include:

- Co-Creation of Value Across Enterprises
- Instrumentation, Measurement, Monitoring of Service Systems
- Descriptive, predictive, and prescriptive Analytics
- Usage Characteristics and Customer Dynamics
- Big Data, Dimensionality Reduction, and Real-Time Analytics
- System Models and What-If-Analysis

Industrial Engineering and Management (M.Sc.)

Date 05/17/2017
- Robust Mechanisms for Service Management
- Industry Applications of Service Analytics

**Tutorials**
Students will conduct lecture accompanying, guided exercises throughout the semester.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**
- Business Analytics for Managers, Jank, W., Springer, 2011

**Online Sources:**
- The data deluge, The Economist, Feb. 2010

Further readings will be provided in the lecture.
Course: Service Analytics B - Enterprise Data Reduction and Prediction [T-WIWI-105779]

Responsibility: Sebastian Blanc, Thomas Setzer
Contained in: [M-WIWI-101506] Service Analytics

<table>
<thead>
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<th>Recurrence</th>
<th>Version</th>
</tr>
</thead>
<tbody>
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<td>4,5</td>
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<td>1</td>
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</tbody>
</table>

Learning Control / Examinations

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

Conditions
None

Recommendations
None

Remarks
The course has been added summer term 2016.
Limited number of slots
Course: Service Innovation [T-WIWI-102641]

Responsibility: Gerhard Satzger

Contained in:
- [M-WIWI-102806] Service Innovation, Design & Engineering
- [M-WIWI-101410] Business & Service Engineering
- [M-WIWI-101448] Service Management

ECTS: 4,5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

| Term    | Event-No. | Events            | Type       | SWS | Lecturers                                                      |
|---------|-----------|-------------------|------------|-----|                                                               |
| SS 2017 | 2595468   | Service Innovation| Vorlesung (V) | 2   | Niels Feldmann, Fabian Hunke, Gerhard Satzger, Ronny Schüritz |

Learning Control / Examinations
The assessment consists of an 1h written exam (following §4(2) 1 of the examination regulations) and of assignments during the course as an non exam assessment (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Recommendations
None

Event excerpt: Service Innovation (SS 2017)

Aim
Understand the difference between innovation and invention and gain an overview of different types of innovations. Understand particular challenges of innovation in services. Know the ambidexterity challenge for service organizations and ways to deal with it. Know examples for innovation in processes, organization and business models; understand how service and product innovation differ. Get to know several methods and tools that support service innovation (service design thinking, open innovation, technology and strategic foresight, etc.)

Content
While innovation in manufacturing can leverage a considerable body of research, experience and best practice, innovation in services has not reached the same level of maturity. In practice, while many organizations have a well-understood process for innovating in the product business, innovating in services is often still a fuzzy and complex undertaking. In this lecture we will discuss the state of research, compare product and service innovation and understand how innovation diffusion works. We examine case studies on service innovation, compare open vs. closed innovation and learn how to apply different innovation tools, methods and strategies (e.g. service design thinking as a human-centered approach to innovation or technology and strategic foresight, as methods supporting the generation of assumptions on the impact of technology).

Workload
Total workload: approximately 136 hours
Attendance time: 30 hours
Self-study: 105 hours

Literature
- von Hippel, Erich (2007) Horizontal innovation networks - by and for users. Industrial and Corporate Change, 16:2

**Elective literature:**

Course: Service Oriented Computing  [T-WIWI-105801]

Responsibility: York Sure-Vetter

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

ECTS 5  Language deutsch/englisch  Recurrence Jedes Sommersemester  Version 1

<table>
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<th>Event-No.</th>
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<td>SS 2017</td>
<td>2511309</td>
<td>Exercises to Service Oriented Computing</td>
<td>Übung (U)</td>
<td>1</td>
<td>Felix Leif Keppmann, Maria Maleshkova, York Sure-Vetter</td>
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<tr>
<td>SS 2017</td>
<td>2511308</td>
<td>Service Oriented Computing</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Maria Maleshkova, York Sure-Vetter</td>
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</tbody>
</table>

Learning Control / Examinations
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

Conditions
None

Event excerpt: Service Oriented Computing (SS 2017)

Aim
Students will extend their knowledge and proficiency in the area of modern service-oriented technologies. Thereby, they acquire the capability to understand, apply and assess concepts and methods that are of innovative and scientific nature.

Content
Building upon basic Web service technologies the lecture introduces selected topics from advanced service computing and service engineering. In particular, focus will be placed on new Web-based architectures and applications leveraging Web 2.0, Cloud Computing, Semantic Web and other emerging technologies.

Workload
- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
- Exam and exam preparation: 37.5 hours

Literature
Literature will be announced in the lecture.
Course: Services Marketing [T-WIWI-103140]

Responsibility: Ju-Young Kim
Contained in: [M-WIWI-101649] Services Marketing

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<td>Vorlesung (V)</td>
<td>2</td>
<td>Ju-Young Kim</td>
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Learning Control / Examinations
The assessment consists of semester-accompanying tasks, oral participation, a short presentation as well as a final examination. The grade consists of:

- written papers and oral participation during the semester (weighting 40%)
- a written final examination (weighting 60%).

Conditions
None

Recommendations
None

Remarks
new course starting summer term 2016

Event excerpt: (SS 2017)

Aim
Students

- understand the importance of a customer relationship management
- learn the standards of service design
- learn about the 4ps in the service context
- gain knowledge about content and strategies of services marketing
- learn about methods and models to measure service quality

Content
The aim of this lecture is to provide an overview of marketing management in the service context. The lecture starts with foundations for service marketing such as consumer behavior and expectations in services. Then students learn about the importance of the customer relationship for services. They also learn about the 4ps in the service context and gain knowledge about content and strategies of services marketing. They further learn about methods and models for services marketing.

Workload
Gesamtlaufwand bei 3 Leistungspunkten: ca. 90 Stunden Präsenzzeit: 30 Stunden Vor – und Nachbereitung der LV: 45.0 Stunden Prüfung und Prüfungsvorbereitung: 15.0 Stunden

Literature
Course: Simulation Game in Energy Economics [T-WIWI-102693]

Responsibility: Massimo Genoese

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<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<td>2581025</td>
<td>Simulation Game in Energy Economics</td>
<td>Vorlesung</td>
<td>Übung 2</td>
<td>Massimo Genoese</td>
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Learning Control / Examinations
The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
None

Recommendations
Visiting the course “Introduction to Energy Economics”

Remarks
See German version.

Event excerpt: Simulation Game in Energy Economics (SS 2017)

Aim
Students

- understand market mechanisms, pricing and investment decisions in a liberalised electricity market,
- apply methods and instruments in a subarea of “Energy Economics”,
- choose the appropriate methods to solve given problems (unit dispatch, investment planning) and apply them,
- find and discuss arguments for solution approaches.

Content

- Introduction
- Agents and market places in the electricity industry
- Selected planning tasks of energy service companies
- Methods of modelling in the energy sector
- Agent-based simulation: The PowerACE model
- Simulation game: Simulation in energy economics (electricity and emission trading, investment decisions)

The lecture is structured in a theoretical and a practical part. In the theoretical part, the students are taught the basics to carry out simulations themselves in the practical part which comprises amongst others the simulation of the power exchange. The participants of the simulation game take a role as a power trader in the power market. Based on various sources of information (e.g. prognosis of power prices, available power plants, fuel prices), they can launch bids in the power exchange.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature

Elective literature:
Course: Simulation I [T-WIWI-102627]

Responsibility: Karl-Heinz Waldmann

Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

ECTS
4,5

Recurrence
Jedes Sommersemester

Version
1

Learning Control / Examinations
The examination Simulation I will be offered latest until winter term 2016/2017 (for beginners). The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Recommendations
None

Remarks
The course will be offered in the summer term 2015 and the summer term 2016.
Course: Simulation II [T-WIWI-102703]

Responsibility: Karl-Heinz Waldmann

Contained in: [M-WIWI-101454] Stochastic Modelling and Optimization

<table>
<thead>
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<th>Recurrence</th>
<th>Version</th>
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<td>WS 16/17</td>
<td>2550665</td>
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<td>Andre Lust, Ellen Platt, Karl-Heinz Waldmann</td>
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<td>Ubung (U)</td>
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<td>Karl-Heinz Waldmann</td>
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</table>

Learning Control / Examinations
The examination T-WIWI-102703 Simulation II will be offered latest until summer term 2017 (for beginners).
The assessment consists of an 1h written exam following Section 4(2), 1 of the examination regulations. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by a 2/3 step of a full grade (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Recommendations
Foundations in the field of Simulation I [2550662] are desired.

Remarks
The course will be offered in the winter term 2015/2016.

V Event excerpt: (WS 16/17)

Aim
The participants will be enabled to model and analyze discrete event systems that underlie stochastic influences with efficient simulation techniques. The discussion of practice-oriented case studies illustrates the limits of standard simulation techniques for stochastic discrete event systems regarding the simulation effort to obtain statistical significant results. Variance reducing techniques will be introduced in theory as modern and efficient techniques and will be exemplified by examples from quality management, financial engineering and insurance. The main scope of the applications discussed in the course is the efficient simulation of stochastic processes. The facultative computer exercise course under utilization of the programming language Java comprises a practice-oriented case study, in which the participants implement certain variance reducing techniques in order to analyze the reduction in computer effort in comparison to standard techniques.

Content
Variance reducing techniques, simulation of stochastic processes, case studies.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.
**Course: Simulation of Coupled Systems [T-MACH-105172]**

**Responsibility:** Marcus Geimer

**中含有:**
[M-MACH-101265] Vehicle Development
[M-MACH-101267] Mobile Machines

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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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### Events

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<th>Event-No.</th>
<th>Events</th>
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<td>Simulation of Coupled Systems</td>
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<td>Marcus Geimer, Marco Wydra</td>
</tr>
</tbody>
</table>

### Learning Control / Examinations

- oral exam

### Conditions

- none

---


**Aim**

After completion of the course, students are able to:

- building a coupled simulation
- parameterize models
- Perform simulations
- do Troubleshooting
- check results for plausibility

**Content**

- Knowledge of the basics of multi-body and hydraulic simulation programs
- Possibilities of coupled simulations
- Development of a simulation model by using the example of a wheel loader
- Documentation of the result in a short report

**Workload**

- regular attendance: 21 hours
- total self-study: 92 hours

**Literature**

**Elective literature:**

- miscellaneous guides according the software-tools pdf-shaped
- information to the wheel-type loader
Course: Simulation of Stochastic Systems [T-WIWI-106552]

Responsibility: Oliver Grothe, Steffen Rebennack

Contained in: [M-WIWI-103289] Stochastic Optimization

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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<tbody>
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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.
Course: Site Management [T-BGU-103427]

Responsibility: Shervin Haghsheno

Contained in: [M-BGU-101888] Project Management in Construction
[M-BGU-101884] Lean Management in Construction

ECTS 1.5
Recurrence Jedes Sommersemester
Version 1

Events

<table>
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<th>Term</th>
<th>Event-No.</th>
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<td>SS 2017</td>
<td>6241807</td>
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<td>Peter Steffek</td>
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Conditions
None

Recommendations
None

Remarks
None
**Course: Social Choice Theory [T-WIWI-102859]**

**Responsibility:** Clemens Puppe

**Contained in:**
- [M-WIWI-101500] Microeconomic Theory
- [M-WIWI-101504] Collective Decision Making

**ECTS:** 4.5

**Language:** englisch

**Recurrence:** Jedes Sommersemester

**Version:** 1

<table>
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<td>SS 2017</td>
<td>2520539</td>
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<td>Michael Müller, Clemens Puppe</td>
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</table>

**Learning Control / Examinations**
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Conditions**
None

**Event excerpt: Social Choice Theory (SS 2017)**

**Aim**
The student should acquire knowledge of formal theories of collective decision making and learn to apply them to real life situations.

**Content**
The course provides a comprehensive treatment of preference and judgement aggregation, including proofs of general results that have Arrow’s famous impossibility theorem and Gibbard’s oligarchy theorem as corollaries. The second part of the course is devoted to voting theory. Among other things, we prove the Gibbard-Satterthwaite theorem.

**Workload**
The total workload for this course is approximately 135.0 hours. For further information see German version.

**Literature**
Main texts:

Secondary texts:
Course: Social Network Analysis in CRM [T-WIWI-102642]

Responsibility: Andreas Geyer-Schulz

Contained in: [M-WIWI-101470] Data Science: Advanced CRM

<table>
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<th>Recurrence</th>
<th>Version</th>
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Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation (versions prior 2015) or following §4 (3) of the examination regulation (version 2015), respectively. The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 10) from exercise work will be added.

Conditions
None

Recommendations
None

Remarks
The course is currently not offered.
Course: Software Quality Management [T-WIWI-102895]

Responsibility: Andreas Oberweis

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

ECTS: 5
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

<table>
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<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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<td>SS 2017</td>
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<td>Software Quality Management</td>
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<td>Andreas Oberweis</td>
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<td>SS 2017</td>
<td>2511209</td>
<td>Software Quality Management</td>
<td>Übung (Ü)</td>
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<td>Andreas Oberweis</td>
</tr>
</tbody>
</table>

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

Remarks
This course was formerly named “Software Technology: Quality Management”.

Event excerpt: Software Quality Management (SS 2017)

Aim
Students

- explain the relevant quality models,
- apply methods to evaluate the software quality and evaluate the results,
- know the mail models of software certification, compare and evaluate these models,
- write scientific theses in the area of software quality management and find own solutions for given problems.

Content
This lecture imparts fundamentals of active software quality management (quality planning, quality testing, quality control, quality assurance) and illustrates them with concrete examples, as currently applied in industrial software development. Keywords of the lecture content are: software and software quality, process models, software process quality, ISO 9000-3, CMM(I), BOOTSTRAP, SPICE, software tests.

Workload
Lecture 30h
Exercise 15h
Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature
Further literature is given in lectures.
Course: Spatial Economics [T-WIWI-103107]

Responsibility: Ingrid Ott

Contained in:
- [M-WIWI-101496] Growth and Agglomeration
- [M-WIWI-101485] Transport infrastructure policy and regional development
- [M-WIWI-101497] Agglomeration and Innovation

ECTS 4.5 Language englisch Recurrence Jedes Wintersemester Version 1

Events

<table>
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<th>Term</th>
<th>Event-No.</th>
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<td>David Bälz, Ingrid Ott</td>
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<td>WS 16/17</td>
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<td>Spatial Economics</td>
<td>Vorlesung (V)</td>
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<td>Ingrid Ott</td>
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</table>

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required. The attendance of the course Introduction to economic policy [2560280] is recommended.

Event excerpt: Spatial Economics (WS 16/17)

Aim
The student
- analyses how spatial distribution of economic activity is determined
- uses quantitative methods within the context of economic models
- has basic knowledge of formal-analytic methods
- understands the link between economic theory and its empirical applications
- understands to what extent concentration processes result from agglomeration and dispersion forces
- is able to determine theory based policy recommendations

Content
Geography, trade and development
Geography and economic theory
Core models of economic geography and empirical evidence
Agglomeration, home market effect, and spatial wages
Applications and extensions

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Steven Brakman, Harry Garretsen, Charles van Marrewijk (2009), The New Introduction to Geographical Economics
Further literature recommendations will be announced in the course of the lecture.
Course: Special Sociology [T-GEISTSOZ-101957]

Responsibility: Gerd Nollmann
Contained in: [M-GEISTSOZ-101169] Sociology

ECTS 4  Version 1

Conditions
None.
**Course:** Special Topics in Highway Engineering and Environmental Impact Assessment [T-BGU-101860]

**Responsibility:** Ralf Roos
**Contained in:** [M-BGU-100999] Highway Engineering

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Jedes Sommersemester</td>
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### Events

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<th>Event-No.</th>
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<th>SWS</th>
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### Learning Control / Examinations

- **oral exam with 15 minutes**

### Conditions

None

### Recommendations

None

### Remarks

None
Course: Special Topics in Information Engineering & Management [T-WIWI-102706]

Responsibility: Christof Weinhardt

Contained in:
[M-WIWI-101411] Information Engineering
[M-WIWI-101506] Service Analytics
[M-WIWI-101410] Business & Service Engineering

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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</thead>
<tbody>
<tr>
<td>4,5</td>
<td>Jedes Semester</td>
<td>1</td>
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</table>

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.
Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.
The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Conditions
None

Recommendations
None

Remarks
All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Engineering & Management course. The current topics of the practical seminars are available at the following homepage: www.iism.kit.edu/im/lehre

The Special Topics Information Engineering and Management is equivalent to the practical seminar, as it was only offered for the major in “Information Management and Engineering” so far. With this course students majoring in “Industrial Engineering and Management” and “Economics Engineering” also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Engineering and Management can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.
Course: Special Topics of Efficient Algorithms [T-WIWI-10267]

<table>
<thead>
<tr>
<th>Responsibility:</th>
<th>Hartmut Schmeck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contained in:</td>
<td>[M-WIWI-101472] Informatics</td>
</tr>
<tr>
<td></td>
<td>[M-WIWI-101630] Electives in Informatics</td>
</tr>
<tr>
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<td>[M-WIWI-101628] Emphasis in Informatics</td>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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<td>5</td>
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<td>1</td>
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**Learning Control / Examinations**
The assessment consists of assignments or of a bonus exam (wrt §4 (2), 3 SPO), and a written exam (60 min.) in the week after the end of the lecturing period (§4 (2), 1 SPO). The exam will be offered in every semester and can be repeated on regular examination dates.
If the mark obtained in the written exam is in between 1.3 and 4.0, a successful completion of the assignments or the bonus exam will improve the mark by one level (i.e. by 0.3 or 0.4).

**Conditions**
None

**Remarks**
This course can be particularly used for recognising the external courses with the topics in the area of algorithms, data-structures and computer infrastructures but are not associated in other courses in this subject area.
Course: Special Topics of Enterprise Information Systems [T-WIWI-102676]

Responsibility: Andreas Oberweis

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

<table>
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<th>ECTS</th>
<th>Recurrence</th>
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Events

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<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
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<tr>
<td>WS 16/17</td>
<td>2511224</td>
<td></td>
<td>Vorlesung (V)</td>
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<td>Stefanie Betz</td>
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Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Conditions
None
Course: Special Topics of Knowledge Management [T-WIWI-102671]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

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<td>Jedes Semester</td>
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Learning Control / Examinations
Assessment is provided by a written exam of 60 minutes or an oral exam during the first few weeks after the lecturing period (acc. to §4(2), 1 or 2 SPO). The exam is offered each semester and may be repeated at the regular examination day.

Conditions
None

Remarks
see german version
Course: Special Topics of Software- and Systemsengineering [T-WIWI-102678]

Responsibility: Andreas Oberweis

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

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<td>Jedes Semester</td>
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Learning Control / Examinations
The assessment consists of an 1h written exam in the first week after lecture period.

Conditions
None

Remarks
This course can be used in particular for the acceptance of external courses whose content is in the broader area of software and systems engineering, but cannot assigned to another course of this topic.
Course: Specialization in Food Process Engineering [T-CIWVT-101875]

Responsibility: Volker Gaukel

Contains in: [M-CIWVT-101119] Specialization in Food Process Engineering

<table>
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<th>Language</th>
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<td>Azad Emin</td>
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<td>WS 16/17</td>
<td>22207</td>
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<td>Bernhard Watzl</td>
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<tr>
<td>SS 2017</td>
<td>22633</td>
<td>Microbiology for Engineers</td>
<td>Vorlesung (V)</td>
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<td>Thomas Schwartz</td>
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<td>SS 2017</td>
<td>22215</td>
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<td>Vorlesung (V)</td>
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<td>Peter Braun, Ulrich Bröckel, Guenter Esper, Mario Hirth, Matthias Kind, Frank Müller, Hermann Nirschl, Matthias Sass, Heike Schuchmann, Michael Türk</td>
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<td>SS 2017</td>
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<td>Mirko Bunzel</td>
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</table>

Conditions

The Module “Principles of Food Process Engineering” must be passed.

Modeled Conditions

The following conditions must be met:

- The module [M-CIWVT-101120] Principles of Food Process Engineering must have been passed.
Course: Specific Aspects in Taxation [T-WIWI-102790]

Responsibility: Armin Bader, Berthold Wigger

Contained in: [M-WIWI-101511] Advanced Topics in Public Finance

<table>
<thead>
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<th>Language</th>
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Learning Control / Examinations

The assessment consists of a 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Conditions

None

Recommendations

Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course “Öffentliche Einnahmen” beforehand.

Event excerpt: Specific Aspects in Taxation (WS 16/17)

Aim

See German version.

Content

The lecture “Special Aspects of Taxation” focuses on the effects of different taxes. The main emphasis is on German tax legislation. In addition to that, international aspects of taxation, in particular with respect to the European integration, will be discussed.

The lecture consists of four parts: First specific tax problems of corporate, income and consumption taxes are treated. Part two introduces the advantages and disadvantages of each of these taxes, in particular their incidence (“Who actually carries the tax burden?”) and their effects within the value chain. The third part then deals with the question how the different taxes contribute to public revenues. Finally, the last part compares tax systems within and outside Europe. As a special feature, guest lecturers will provide insight into practical aspects of taxation.

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Elective literature:

**Course:** Statistical Modeling of generalized regression models [T-WIWI-103065]

**Responsibility:** Wolf-Dieter Heller

**Contained in:**
- [M-WIWI-101638] Econometrics and Statistics I
- [M-WIWI-101639] Econometrics and Statistics II

**ECTS:** 4.5

**Recurrence:** Jedes Wintersemester

**Version:** 1

### Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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<th>Lecturers</th>
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</table>

### Learning Control / Examinations

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

**Conditions**

None

**Recommendations**

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

### Event excerpt: (WS 16/17)

**Aim**

The student

- shows comprehensive knowledge of regression techniques

**Workload**

The total workload for this course is approximately 135 hours (4.5 credits).

- regular attendance: 30 hours
- self-study: 65 hours
- exam preparation: 40 hours
Course: Stochastic Calculus and Finance [T-WIWI-103129]

Responsibility: Mher Safarian

Contained in: [M-WIWI-101639] Econometrics and Statistics II

ECTS 4.5  Language deutsch  Recurrence Jedes Wintersemester  Version 1

Events

<table>
<thead>
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<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
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<td>Mher Safarian</td>
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</table>

Learning Control / Examinations
The assessment of this course consists of a written examination (§4(2), 1 SPOs) and of possible additional assignments during the course (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

Remarks
For more information see http://statistik.econ.kit.edu/

Event excerpt: (WS 16/17)

Aim
After successful completion of the course students will be familiar with many common methods of pricing and portfolio models in finance. Emphasis will be put on both finance and the theory behind it.

Content
The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:


Stochastic processes (Poisson-process, Brownian motion, martingales), stochastic integral (Integral, quadratic und covariation, Ito-formula), stochastic differential equation for price-processes, trading strategies, option pricing(Feynman-Kac), neutral risk rating(equivalent martingale measure, Girsanov theorem), term structure models

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.

Elective literature:
- An Introduction to Stochastic Integration (Probability and its Applications) by Kai L. Chung, Ruth J. Williams, Birkhaueser,
- Methods of Mathematical Finance by Ioannis Karatzas, Steven E. Shreve, Springer 1998
Course: Strategic and Innovative Decision Making in Marketing [T-WIWI-102618]

Responsibility: Bruno Neibecker

Contained in: [M-WIWI-101489] Strategy, Communication, and Data Analysis

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
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<tbody>
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<td>Jedes Sommersemester</td>
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Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The examination will be offered latest until winter term 2016/2017 (repeaters only).

Conditions
None

Recommendations
None
Course: Strategic Brand Management [T-WIWI-102842]

Responsibility: Joachim Blickhäuser, Martin Klarmann

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
</tr>
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<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
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<td>SS 2017</td>
<td>2571185</td>
<td>Strategic Brand Management</td>
<td>Block (B)</td>
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<td>Joachim Blickhäuser, Martin Klarmann</td>
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</table>

Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop. Exception: In summer term 2016 exceptionally two courses can be chosen or, in case one course has already been chosen previously, a second course can be chosen.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

Event excerpt: Strategic Brand Management (SS 2017)

Aim
See German version.

Content

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.
Course: Strategic Management of Information Technology [T-WIWI-10269]

Responsibility: Thomas Wolf

Contained in:
- [M-WIWI-101472] Informatics
- [M-WIWI-101630] Electives in Informatics
- [M-WIWI-101628] Emphasis in Informatics

<table>
<thead>
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Events

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<tr>
<td>SS 2017</td>
<td>2511603</td>
<td></td>
<td>Übung (U)</td>
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Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Conditions
None

Event excerpt: Strategic Management of Information Technology (SS 2017)

Aim
Students know the outer frame of IT in an enterprise and know which functions IT has within an enterprise. They understand the organization and the content of these functions.

Content
The following topics will be covered: strategic planning of ICT, architecture of ICT, overall planning of ICT, outsourcing, operation and controlling of ICT.

Literature
Course: Strategic Transport Planning [T-BGU-103426]

Responsibility: Volker Waßmuth

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
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<th>Type</th>
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Conditions
None

Recommendations
None

Remarks
None
Course: Strategical Aspects of Energy Economy [T-WIWI-102633]

Responsibility: Armin Ardone

Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS 3.5 Language deutsch
Recurrence Jedes Wintersemester Version 1

Events

<table>
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<td>Armin Ardone</td>
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Learning Control / Examinations
The assessment consists of a written exam according to Section 4 (2),1 of the examination regulation.

Conditions None

Recommendations None

Event excerpt: Strategical Aspects of Energy Economy (WS 16/17)

Aim
Students
- have in-depth knowledge of current and future technologies for power generation,
- know methods and approaches regarding short- to long-term electricity system planning and market modeling - in particular the cost of generating electricity.

Content
1) Energy supply
   1.1 Basic concepts
   1.2 Global supply & demand (oil, coal, gas, electricity)
2) Power plant types
   2.1 Thermal power plants
   2.2 Renewables
3) Cost of electricity generation
   3.1 Cost depending on the investment (CAPEX)
   3.2 Operational fixed cost (OPEX)
   3.3 Variable cost
   3.4 Full cost of power generation
4) Electricity markets
   4.1 Development of power markets
5) Energy system planning
   5.1 basic concepts
   5.2 Drivers
   5.3 Stages of power planning
   5.4 Short-term optimization: dispatch decisions
   5.5 Mid-term optimization: fuel procurement and overhaul planning
   5.6 Long-term optimization: additions & Retirements
   5.7 Mathematical tools for system planning and market modeling

Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.
Literature
Will be announced in the lecture.
Course: Structural and Phase Analysis [T-MACH-102170]

Responsibility: Susanne Wagner

Contained in: [M-MACH-101268] Specific Topics in Materials Science

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
</tr>
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<td>Susanne Wagner</td>
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</tbody>
</table>

Learning Control / Examinations

Oral examination

Conditions

none

Event excerpt: Structural and phase analysis (WS 16/17)

Aim

The students know the fundamentals of crystallography, the generation and detection of x-rays as well as their interaction with the microstructure of crystalline materials. They have detailed knowledge about the different methods of x-ray diffraction measurements and are able to analyse x-ray spectra using modern methods of x-ray analysis both qualitatively and quantitatively.

Content

The course gives an overview to generation and detection of x-rays as well as their interaction with matter. It provides an introduction to crystallography and describes modern measurement and analysis methods of x-ray diffraction. It is arranged in the following units:

- Generation and properties of X-Ray’s
- Crystallography
- Fundamentals and application of different measuring methods
- Qualitative and quantitative phase analysis
- Texture analysis (pole figures)
- Residual stress measurements

Workload

regular attendance: 30 hours
self-study: 90 hours

Literature

1. Moderne Röntgenbeugung - Röntgendiffraktometrie für Materialwissenschaftler, Physiker und Chemiker, Spieß, Lothar / Schwarz, Robert / Behnken, Herfried / Teichert, Gerd B.G. Teubner Verlag 2005
Course: Structural Ceramics [T-MACH-102179]

Responsibility: Michael Hoffmann

Contained in: [M-MACH-101268] Specific Topics in Materials Science

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<th>Lecturers</th>
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<td>Michael Hoffmann</td>
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</table>

Learning Control / Examinations

Oral examination

Conditions
none

Event excerpt: Structural Ceramics (SS 2017)

Aim
The students know the most relevant structural ceramics (silicon carbide, silicon nitride, alumina, boron nitride, zirconia, fibre-reinforced ceramics) and their applications. They are familiar with the microstructural features, fabrication methods, and mechanical properties.

Content
The lecture gives an overview on structure and properties of the technical relevant structural ceramics silicon nitride, silicon carbide, alumina, zirconia, boron nitride and fibre-reinforced ceramics. All types of structural ceramics will be discussed in detail in terms of preparation methods of the raw materials, shaping techniques, densification, microstructural development, mechanical properties and application fields.

Workload
regular attendance: 21 hours  
self-study: 99 hours

Literature


## Course: Superhard Thin Film Materials [T-MACH-102103]

**Responsibility:** Sven Ulrich  
**Contained in:** [M-MACH-101268] Specific Topics in Materials Science

### Events

<table>
<thead>
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<th>Event-No.</th>
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### Learning Control / Examinations

- Oral examination

### Conditions

- None

### Event excerpt: Superhard Thin Film Materials (WS 16/17)

**Aim**

Superhard materials are solids with a hardness higher than 4000 HV 0.05. The main topics of this lecture are modelling, deposition, characterization and application of superhard thin film materials.

**Content**

**Introduction**

Basics

Plasma diagnostics

Particle flux analysis

Sputtering and ion implantation

Computer simulations

Properties of materials, thin film deposition technology, thin film analysis and modelling of superhard materials

Amorphous hydrogenated carbon

Diamond like carbon

Diamond
Cubic Boronitride

Materials of the system metall-boron-carbon-nitrogen-silicon

**Workload**
regular attendance: 22 hours
self-study: 98 hours

**Literature**
G. Kienel (Ed.): Vakuumbeschichtung 1 - 5, VDI Verlag, Düsseldorf, 1994

Copies with figures and tables will be distributed
Course: Supplementary Claim Management [T-BGU-103428]

Responsibility: Shervin Haghsheno
Contained in: [M-BGU-101888] Project Management in Construction

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**Conditions**

None

**Recommendations**

None

**Remarks**

None
**Course: Supply Chain Management [T-MACH-105181]**

**Responsibility:** Knut Alicke

**Contained in:** [M-MACH-101280] Logistics in Value Chain Networks

**ECTS**

**Language**

deutsch

**Recurrence**

Jedes Semester

**Version**

1

### Events

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</table>

**Learning Control / Examinations**

Oral examination

**Conditions**

none

---

**Event excerpt: Supply chain management (WS 16/17)**

**Aim**

Students are able to:

- Discuss the requirements on modern supply chains,
- Use the basic concepts of demand forecast, stock optimization and supply in practical exercises,
- Analyse the typical questions of dimensioning a supply chain and evaluate a supply chain with the results.

**Content**

- Bullwhip-Effect, Demand Planning & Forecasting
- Conventional planning processes (MRP + MRPII)
- Stock keeping strategy
- Data acquisition and analysis
- Design for logistics (Postponement, Mass Customization, etc.)
- Logistic partnerships (VMI, etc.)
- Distribution structures (central vs. distributed, Hub&Spoke)
- SCM-metrics (performance measurement) e-business
- Special sectors as well as guest lectures

**Workload**

regular attendance: 42 hours  
self-study: 138 hours

**Literature**

Alicke, K.: Planung und Betrieb von Logistiknetzwerken

Simchi-Levi, D., Kaminsky, P.: Designing and Managing the Supply Chain

Goldratt, E., Cox, J.: The Goal
Course: Supply Chain Management in the Automotive Industry [T-WIWI-102828]

Responsibility: Tilman Heupel, Hendrik Lang

Contained in: [M-WIWI-101412] Industrial Production III
[M-WIWI-101471] Industrial Production II

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<td>Supply Chain Management in the automotive industry</td>
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<td>Tilman Heupel, Hendrik Lang</td>
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Learning Control / Examinations

The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Conditions

None

Recommendations

None

Event excerpt: Supply Chain Management in the automotive industry (WS 16/17)

Aim

Students are taught knowledge, methods and tools in the field of automotive supply chain management. With the help of concrete examples of a global automotive company, they acquire a basic understanding of challenges in the implementation of those solutions. Students learn about theoretic concepts and their transfer to practice in designing value-added structures, procurement logistics, risk management, quality engineering, cost engineering, and purchasing. They are able to identify, analyze and assess problems and to design adequate solutions within those aspects. In the end of the lecture, students can integrate the aspects into the general context of automotive supply chain management and development process.

Content

- Automotive industry significance
- The automotive supply chain
- Adding value structures of the automotive supply chain and mastering of the production systems as factors of success in the SCM
- Strategic procurement logistics
- Risk management
- Quality engineering and management in the automotive supply chain
- Cost engineering and management in the automotive supply chain
- Purchasing (Supplier selection, contract management)
- Performance measurement of the supply chain / organization

Workload

The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature

Will be announced in the course.
Course: Supply Chain Management in the Process Industry [T-WIWI-102860]

Responsibility: Stefan Nickel

Contained in:
- [M-WIWI-102805] Service Operations

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<td>Supply Chain Management in the Process Industry</td>
<td>Vorlesung / Übung 3</td>
<td>VU</td>
<td>Robert Blackburn</td>
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</table>

Learning Control / Examinations
The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation) (individual grading), case study presentation by student teams (team grading) and classroom participation (individual grading). The examination is held in the term of the lecture.

Conditions
None

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research is assumed.
Advanced knowledge of Operations Research (e.g., as conveyed in the lectures Facility Location and Strategic SCM, Tactical and operational SCM) is recommended.

Remarks
The number of participants is restricted due to the execution of interactive case studies and the resulting examination effort. Due to these capacity restrictions, registration before course start is required according to the information on the course website. The course is planned to be held every winter term. The planned lectures and courses for the next three years are announced online.

Event excerpt: Supply Chain Management in the Process Industry (WS 16/17)

Aim
The student
- knows and classifies state-of-the art approaches for designing, planning and managing global supply chains in the process industry
- distinguishes quality in supply chains and identifies important building blocks, repeating patterns and concepts crucial to supply chain strategy, design and planning,
- explains specific challenges and approaches towards supply chain operations within the process industry with regards to transportation and warehousing, and describes the interdisciplinary linkage of SCM with information systems, performance management, project management, risk management and sustainability management,
- transfers gained knowledge into practice by using SCM case studies and SCM real life project documentations.

Content
The course “Supply Chain Management in the Process Industry” covers fundamental concepts in the field of supply chain management with special focus on process industry. Strategic, planning and operational topics within the end-to-end supply chain are examined, covering relevant approaches in design, processes and performance measurement. Additional focus within the course is on showing the interdisciplinary linkages SCM has with information systems, performance management, project management, risk management and sustainability management. The course is enriched by various insights from the world’s leading chemical company BASF, provided by executive management as real life examples and cases.
Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
- Various case studies, which will be provided during the course

Aim
This lecture deals with supply chain management from a practitioner’s perspective with a special emphasis on the software solution SAP SCM and the planning domain. First, the term supply chain management is defined and its scope is determined. Methods to analyze supply chains as well as indicators to measure supply chains are derived. Second, the structure of an APS (advanced planning system) is discussed in a generic way. Later in the lecture, the software solution SAP SCM is mapped to this generic structure. The individual planning tasks and software modules (demand planning, supply network planning, production planning / detailed scheduling, transportation planning / vehicle scheduling, global available-to-promise) are presented by discussing the relevant business processes, providing academic background, describing planning processes for a fictive company and showing the user interface and user-related processes in the software solution.

The lecture is supported by a self-explanatory tutorial, in which students can explore the software solution for the fictive company offline on their own.

Content
1. Introduction to Supply Chain Management
   1.1. Supply Chain Management Fundamentals
   1.2. Supply Chain Management Analytics
2. Structure of Advanced Planning Systems
3. SAP SCM
   3.1. Introduction / SCM Solution Map
   3.2. Demand Planning
   3.3. Supply Network Planning
   3.4. Production Planning and Detailed Scheduling
   3.5. Deployment
   3.6. Transportation Planning and Vehicle Scheduling
   3.7. [Optional] Global Available to Promise
4. SAP SCM in Practice
   4.1. Success Stories
   4.2. SAP Implementation Methodology
Workload
The total workload for this course is approximately 105 hours. For further information see German version.
Course: Systematic Materials Selection [T-MACH-100531]

Responsibility: Stefan Dietrich

Contents in: [M-MACH-101268] Specific Topics in Materials Science

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<td>SS 2017</td>
<td>2174577</td>
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<td>Stefan Dietrich, Mitarbeiter</td>
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Learning Control / Examinations

written exam

Event excerpt: Systematic Materials Selection (SS 2017)

Aim
The students are able to select the best material for a given application. They are proficient in selecting materials on base of performance indices and materials selection charts. They can identify conflicting objectives and find sound compromises. They are aware of the potential and the limits of hybrid material concepts (composites, bimaterials, foams) and can determine whether following such a concept yields a useful benefit.

Content
Important aspects and criteria of materials selection are examined and guidelines for a systematic approach to materials selection are developed. The following topics are covered:

- Information and introduction
- Necessary basics of materials
- Selected methods / approaches of the material selection
- Examples for material indices and materials property charts
- Trade-off and shape factors
- Sandwich materials and composite materials
- High temperature alloys
- Regard of process influences
- Material selection for production lines
- Incorrect material selection and the resulting consequences
- Abstract and possibility to ask questions

Workload
regular attendance: 33 hours
self-study: 87 hours

Literature
Lecture notes; Problem sheets; Textbook: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.); Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006
ISBN: 3-8274-1762-7
Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]

Responsibility: Stefan Nickel


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## Events

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</table>

## Learning Control / Examinations

The exam takes place in every semester. Prerequisite for admission to examination is the successful completion of the online assessments.

## Conditions

Prerequisite for admission to examination is the successful completion of the online assessments.

## Recommendations

None

## Remarks

The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

### Event excerpt: (SS 2017)

**Aim**

The student

- gathers expertise in fundamental techniques from procurement and distribution logistics, methods from inventory management and lot sizing,
- acquires the ability to efficiently utilize quantitative models from transportation planning (long-distance and distribution planning), inventory management and lot sizing in production,
- applies the introduced methods in more detail and in industry-relevant case-studies.

**Content**

The lecture covers basic quantitative methods in location planning in the context of strategic Supply Chain Planning. Besides the discussion of several criteria for the evaluation of the locations of facilities, the students are acquainted with classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models). The exercises accompanying the lecture offer the possibility to apply the considered models to practical problems.

**Literature**

**Elective Literature**

- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
### Course: Tax Law I [T-INFO-101315]

**Responsibility:** Thomas Dreier  
**Contained in:**  
- [M-INFO-101242] Governance, Risk & Compliance  
- [M-INFO-101216] Private Business Law

**ECTS** | **Language** | **Recurrence** | **Version**  
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3 | deutsch | Jedes Wintersemester | 1

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### Event excerpt: Tax Law I (WS 16/17)

**Aim**  
Ziel der Vorlesung ist eine Einführung in das nationale Unternehmenssteuerrecht. Die auf mehrere Einzelsteuergesetzte verteilten Rechtsnormen, die für die Besteuerung der Unternehmen und deren Inhaber maßgebend sind, werden behandelt. Praktisch verwertbares steuerliches Grundlagenwissen als Bestandteil der modernen Betriebswirtschaftslehre steht im Vordergrund.

**Content**  

**Workload**  
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

**Literature**  
- Grashoff Steuerrecht, Verlag C. H. Beck, in der neuesten Auflage  
- Tipke/Lang Steuerrecht, Verlag C. H. Beck, in der neuesten Auflage

**Weiterführende Literatur**
Course: Tax Law II [T-INFO-101314]

Responsibility: Detlef Dietrich, Thomas Dreier
Contained in: [M-INFO-101216] Private Business Law

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V Event excerpt: Tax Law II (SS 2017)

Aim

Content

Workload
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

Literature
- Spangemacher, Gewerbesteuer, Band 5, Grüne Reihe, Erich Fleischer Verlag
- Falterbaum/Bolk/Reiß/Eberhart, Buchführung und Bilanz, Band 10, Grüne Reihe, Erich Fleischer Verlag
- Tipke, K./Lang, J., Steuerrecht,Köln, in der neuesten Auflage.
- Jäger/Lang Körperschaftsteuer, Band 6, Grüne Reihe, Erich Fleischer Verlag
- Lippross Umsatzsteuer, Band 11, Grüne Reihe, Erich Fleischer Verlag
- Plückebaum/Wendt/ Niemeier/Schierenkämper Einkommensteuer, Band 3, Grüne Reihe, Erich Fleischer Verlag

Weiterführende Literatur
Course: Team Work in the Area of Service Oriented Architectures [T-WIWI-102849]

Responsibility: Gerhard Satzger, Christof Weinhardt
Contained in: [M-WIWI-101503] Service Design Thinking

ECTS 9
Language: englisch
Recurrence: Unregelmäßig
Version: 1

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<td>Christof Weinhardt</td>
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Learning Control / Examinations

Conditions
The course is compulsory and must be examined.

Recommendations
See German version.

Remarks
Due to the project nature of the course, the number of participants is limited. For further information see german version.

Event excerpt: Service Design Thinking (SS 2017)

Aim
- Deep knowledge of the innovation method “Design Thinking”, as introduced and promoted by Stanford University
- Development of new, creative solutions through extensive observation of oneself and one’s environment, in particular with regard to the relevant service users
- Know how to use prototyping and experimentation to visualize one’s ideas, to test and iteratively develop them, and to converge on a solution
- Communicate, work and present in an interdisciplinary and international project setting

Content
- Paper Bike: Learning about the basic method elements by building a paper bike that has to fulfill a given set of challenges.
- Design Space Exploration: Exploring the problem space through customer and user observation.
- Critical Function Prototype: Identification of critical features from the customer’s perspective that can contribute to the solution of the overarching problem. Building and testing prototypes that integrate these functionalities.
- Dark Horse Prototype: Inverting earlier assumptions and experiences, which leads to the inclusion of new features and solutions.
- Funky Prototype: Integration of the individually tested and successful functions to a complete solution, which is further tested and developed.
- Functional Prototype: Further selection and convergence of existing ideas. Building a higher resolution prototype that can be tested by customers.
- Final Prototype: Preparing and presenting the final solution to the customer.

Workload
The total workload for this course is approximately 270 hours. For further information see German version.
Course: Technical conditions met [T-WIWI-106623]

Responsibility:

ECTS Recurrence Version
0 Jedes Semester 1

Learning Control / Examinations
This module element is intended to record the Bachelor-examination “Introduction to Game Theory”. In the master module M-WIWI-101453 “Applied Strategic Decisions”, this means that the obligatory course “Advanced Game Theory” is not required.

Conditions
None
**Course: Technological Change in Energy Economics [T-WIWI-102694]**

**Responsibility:** Martin Wietschel  
**Contained in:** [M-WIWI-101452] Energy Economics and Technology

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**Learning Control / Examinations**
The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation).

**Recommendations**
None

**Event excerpt: Technological Change in Energy Economics (WS 16/17)**

**Aim**
The student
- has an understanding of innovation theory, innovation economy, and innovation systems,
- has skills in different quantitative method for the forecast of technology change in the energy sector, such as technology cycle models, optimization and simulation models as well as indicators and is able to select the adequate approach depending from the task,
- is able to evaluate most important technological developments in the energy sector (energy supply, energy demand, alternative fuels and propulsion systems in the transport sector, and infrastructure (storage, grids)) from a technoeconomic perspective.

**Content**
I. Wichtige Rahmenbedingungen für den technologischen Wandel  
Energienachfrageentwicklung und Ressourcensituation  
Der Klimawandel und weitere umweltpolitische Herausforderungen  
Charakteristika der Energiewirtschaft und Liberalisierung in der Energiewirtschaft  
Grundlagen zur Innovationsökonomie  
Innovationssystem
II. Methoden zur Abbildung des technologischen Wandels  
Wachstumskurven  
Einführung in die Modellbildung  
Optimiermethoden  
Simulationsmethoden  
Indikatorik  
Foresight und Delphi-Methode  
III. Übersicht zu neuen technologischen Entwicklungen  
Kernspaltung und -fusion  
Konventionelle Kraftwerke  
Erneuerbare Kraftwerke  
Rationelle Energienutzung  
Wasserstoff und Brennstoffzelle  
Energy-to-Mobility (Elektromobilität, Biokraftstoffe)

**Workload**
The total workload for this course is approximately 90 hours. For further information see German version.
Literature
Wird in der Vorlesung bekannt gegeben.
Course: Technologies for Innovation Management [T-WIWI-102854]

Responsibility: Daniel Jeffrey Koch

Contained in: [M-WIWI-101507] Innovation Management

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Events

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<td>2545018</td>
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<td>Daniel Jeffrey Koch</td>
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</table>

Learning Control / Examinations

Conditions
None

Recommendations
Prior attendance of the course Innovation Management [2545015] is recommended.
Course: Technology Assessment [T-WIWI-102858]

Responsibility: Daniel Jeffrey Koch

Contained in: [M-WIWI-101507] Innovation Management

ECTS 3
Recurrence Jedes Sommersemester
Version 1

Learning Control / Examinations

Conditions
None

Recommendations
Prior attendance of the course Innovation Management [2545015] is recommended.

Remarks
See German version.
Course: Telecommunication and Internet Economics [T-WIWI-102713]

Responsibility: Kay Mitusch

Contained in:
- [M-WIWI-101409] Electronic Markets
- [M-WIWI-101406] Network Economics

ECTS
Language: deutsch
Recurrence: Jedes Wintersemester
Version: 1

Events

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<td>WS 16/17</td>
<td>2561232</td>
<td>Telecommunication and Internet Economics</td>
<td>Vorlesung (V)</td>
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<tr>
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</table>

Learning Control / Examinations
Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Conditions
None

Recommendations
Basic knowledge and skills of microeconomics from undergraduate studies (bachelor’s degree) are expected. Particularly helpful but not necessary: Industrial Economics. Prior attendance of the lecture „Competition in Networks“ [26240] or “Industrial Organisation” is helpful in any case but not considered a formal precondition. The english taught course “Communications Economics” is complementary and recommendet for anyone interested in the sector.

Event excerpt: Telecommunication and Internet Economics (WS 16/17)

Aim
The students
- will know economically relevant technological and organization characteristics of telecommunication networks - fixed and mobile - as well as of the internet
- will understand the complex competition processes in the telecommunication and internet sector
- will be able to analyse these competitive processes by means of analytic instruments and to assess current debates on economic and regulation policies

The lecture is suited for all students who will deal with these sectors in their professional life.

Content
Among the network sectors the telecommunication and internet sector is the most dynamic one and the one with and highest variety of phenomena. Problems of natural monopoly still exist in some parts. But there is also competition, not only at the service level but also at the infrastructural level. Both levels are characterized by (vertical) quality differentiations and by high technology dynamics. What should the regulation of this sector look like? How should the mutual network access prices of two telecommunication providers be regulated and how can regulators set incentives for infrastructure investments?
The internet is a free market par excellence, because everybody can open internet businesses without high entry costs. Why then can a company like ebay dominate the market for internet-auction platforms so strongly? The causes of market concentration on the internet will be analyzed. So will be the economic implications of the Next Generations Networks.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Further literature will be provided during the lecture
**Course: Telecommunications Law [T-INFO-101309]**

**Responsibility:** Nikolaus Marsch  
**Contained in:** [M-INFO-101217] Public Business Law

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**Events**

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</table>

**Event excerpt: (SS 2017)**

**Aim**
Die Telekommunikation ist die technische Grundlage der Informationswirtschaft. In welcher Art und Weise beispielsweise UMTS reguliert wird, ist von maßgeblicher Bedeutung für die Bereitstellung von Diensten in der Welt der mobilen Inhaltsdienste. Die zentralen Vorgaben der Telekommunikationsregulierung finden sich im Telekommunikationsgesetz (TKG).

**Content**
Die Vorlesung bietet einen Überblick über das neue TKG. Dabei wird die ganze Bandbreite der Regulierung behandelt: Von den materiellrechtlichen Instrumenten der wettbewerbsschaffenden ökonomischen Regulierung (Markt-, Zugangs-, Entgeltregulierung sowie besondere Missbrauchsaufsicht) und der nicht-ökonomischen Regulierung (Kundenschutz; Rundfunkübertragung; Vergabe von Frequenzen, Nummern und Wegerechten; Fernmeldegeheimnis; Datenschutz und öffentliche Sicherheit) bis hin zur institutionellen Ausgestaltung der Regulierung. Zum besseren Verständnis werden zu Beginn der Vorlesung die technischen und ökonomischen Grundlagen sowie die gemeinschafts- und verfassungsrechtlichen Vorgaben geklärt.

**Workload**
Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt bei 3 Leistungspunkten 90 h, davon 22,5 Präsenz.

**Literature**
Da der Rechtsstoff teilweise im Diskurs mit den Studierenden erarbeitet werden soll, ist eine aktuelle Version des TKG zur Vorlesung mitzubringen.
Weitere Literatur wird in der Vorlesung angegeben.

**Weiterführende Literatur**
Erweiterte Literaturangaben werden in der Vorlesung bekannt gegeben.
Course: Tendering, Planning and Financing in Public Transport [T-BGU-101005]

Responsibility: Peter Vortisch

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management
[M-BGU-101064] Fundamentals of Transportation

ECTS 3
Recurrence Jedes Sommersemester
Version 1

Events

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Conditions
None

Recommendations
None

Remarks
None
Course: Theoretical Sociology [T-GEISTSOZ-101962]

Responsibility: Gerd Nollmann
Contained in: [M-GEISTSOZ-101169] Sociology

ECTS 2
Version 1

Conditions
None.
Course: Theory of Business Cycles [T-WIWI-102824]

Responsibility: Marten Hillebrand

Contained in: [M-WIWI-101462] Macroeconomic Theory

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Learning Control / Examinations
Please note: There are no further examination dates for this course.
The assessment consists of 60 min. written exam (according to Section 4 (2), 1 of the examination regulation).
Exams are confined to the following dates: Beginning of the recess period (mid February) and beginning of the summer semester (early April).

Recommendations
Basic knowledge in micro- and macroeconomics, as conveyed in the courses Economics I: Microeconomics [2600012] and Economics II: Macroeconomics [2600014], is assumed.
Participants are expected to bring a strong interest in mathematical economics and quantitative model building.

Remarks
All classes will be held in English.
Course: Theory of Economic Growth [T-WIWI-102825]

Responsibility: Marten Hillebrand  
Contained in: [M-WIWI-101462] Macroeconomic Theory

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Learning Control / Examinations
Please note: There are no further examination dates for this course.  
The assessment consists of a 60 min. written exam (according to Section 4 (2), 1 of the examination regulation).  
Examinations are confined to the following dates: At the beginning of the recess period (mid July) and of the winter semester (early October).

Conditions
None

Recommendations
The courses Economics I: Microeconomics [2600012] and Economics II: Macroeconomics [2600014] have to be completed beforehand.  
According the focus of the course quantitativ-mathematical modelling should be in participant’s interest.

Remarks
All classes will be held in English.
**Course: Theory of Endogenous Growth [T-WIWI-102785]**

**Responsibility:** Ingrid Ott

**Contained in:** [M-WIWI-101478] Innovation and growth  
[M-WIWI-101462] Macroeconomic Theory  
[M-WIWI-101496] Growth and Agglomeration

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<td>2561503</td>
<td>Theory of endogenous growth</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Ingrid Ott</td>
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</table>

### Learning Control / Examinations

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date. Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

### Conditions

None

### Recommendations

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

### Event excerpt: Theory of endogenous growth (WS 16/17)

#### Aim

Students shall be given the ability to understand, analyze and evaluate selected models of endogenous growth theory.

#### Content

- Basic models of endogenous growth
- Human capital and economic growth
- Modelling of technological progress
- Diversity Models
- Schumpeterian growth
- Directional technological progress
- Diffusion of technologies

#### Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

#### Literature

Excerpt:

Course: Tires and Wheel Development for Passenger Cars [T-MACH-102207]

Responsibility: Günter Leister

Contained in: [M-MACH-101265] Vehicle Development

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

Events

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Learning Control / Examinations

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Conditions

none

Event excerpt: Tires and Wheel Development for Passenger Cars (SS 2017)

Aim
The students are informed about the interactions of tires, wheels and chassis. They have an overview of the processes regarding the tire and wheel development. They have knowledge of the physical relationships.

Content
1. The role of the tires and wheels in a vehicle
2. Geometrie of Wheel and tire, Package, load capacity and endurance, Book of requirement
3. Mobility strategy, Minispare, runflat systems and repair kit.
4. Project management: Costs, weight, planning, documentation
5. Tire testing and tire properties
6. Wheel technology including Design and manufacturing methods, Wheeltesting
7. Tire pressure: Indirect and direct measuring systems
8. Tire testing subjective and objective

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
Manuscript to the lecture
### Course: Topics in Experimental Economics [T-WIWI-102863]

**Responsibility:** Johannes Philipp Reiß  
**Contained in:** [M-WIWI-101505] Experimental Economics

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</table>

### Learning Control / Examinations
The assessment consists of a written exam (following §4(2), 1 of the examination regulation).

### Conditions
None

### Recommendations
Basic knowledge of Experimental Economics is assumed. Therefore, it is strongly recommended to attend the course Experimental Economics beforehand.

### Remarks
The course is offered in summer 2016 for the first time. The course is not offered in every academic year.
**Course:** Track Guided Transport Systems - Operational Logistics & Management [T-BGU-100060]

**Responsibility:** Eberhard Hohnecker

**Contained in:** [M-BGU-101111] Public Transportation Operations

**ECTS** 6  
**Language** deutsch  
**Recurrence** Jedes Sommersemester  
**Version** 1

### Events

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<td>Management in Public Transport</td>
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<td>Eberhard Hohnecker</td>
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<td>SS 2017</td>
<td>6234804</td>
<td>Operation Systems abd Track Guided Infrastructure Capacity</td>
<td>Vorlesung (V)</td>
<td>2</td>
<td>Eberhard Hohnecker, Mitarbeiter/innen</td>
</tr>
</tbody>
</table>

**Conditions**

None

**Recommendations**

None

**Remarks**

None

---

**V Event excerpt: Management in Public Transport (SS 2017)**

**Content**

- Netzplanung im ÖV
- Haltestellen des ÖV
- Bau und Betrieb im SPNV
- Fahrzeuge im SPNV / ÖPNV
- Organisation des ÖV

**Literature**

Fiedler, Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf  
Pachl, Systemtechnik des Schienenverkehrs, Teubner-Verlag, Stuttgart  
Janicki, Fahrzeugtechnik, Eisenbahn-Fachverlag, Heidelberg

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**V Event excerpt: Operation Systems abd Track Guided Infrastructure Capacity (SS 2017)**

**Content**

- Blocking Time and Minimum Headway Time  
- Signal Box Technologies  
- Capacity of Railway Infrastructure  
- Modelling Operational Processes

**Literature**

Fiedler, Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf  
Hausmann, Enders, Grundlagen des Bahnbetriebs, Bahn-Fachverlag, Heidelberg  
Pachl, Systemtechnik des Schienenverkehrs, Teubner-Verlag, Stuttgart
**Course: Track Guided Transport Systems - Technical Design and Components [T-BGU-100052]**

**Responsibility:** Eberhard Hohnecker  
**Contained in:** [M-BGU-101112] Track Guided Transport Systems / Engineering

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<td>Track Guided Transport Systems - Technical Design and Components</td>
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<td>WS 16/17</td>
<td>6234702</td>
<td>Exercises in Track Guided Transport Systems - Technical Design and Components</td>
<td>Übung (Ü)</td>
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<td>Eberhard Hohnecker, Mitarbeiter/innen</td>
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### Conditions

None

### Recommendations

None

### Remarks

None


**Aim**  
Die Studierenden sind in der Lage, das Fachgebiet „Spurgeführte Transportsysteme“ in seiner thematischen Komplexität zu analysieren, Zusammenhänge zu erkennen und daraus bei bei Problemstellungen Lösungsvorschläge zu erarbeiten.

**Content**  
- Law, Organisation and History of Railways  
- Basics of Running Dynamics  
- Construction and Design of Railway Tracks  
- Basics of Railway Stations  
- Basics of Signal Systems  
- Development of Railway Traffic

**Literature**  
Zilch, Diederichs, Katzenbach: Handbuch f. Bauingenieure, Springer-Verlag
**Course: Trademark and Unfair Competition Law [T/INFO-101313]**

**Responsibility:** Yvonne Matz  
**Contained in:** Intellectual Property Law

**Events**

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<td>Yvonne Matz</td>
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</table>

**Event excerpt: Trademark and Unfair Competition Law (WS 16/17)**

**Aim**


**Content**

Die Vorlesung befasst sich mit den Grundfragen des Markenrechts: was ist eine Marke, wie erhalte ich Markenschutz, welche Rechte habe ich als Markeninhaber, welche Rechte anderer Markeninhaber muss ich beachten, welche anderen Kennzeichenrechte gibt es, etc. Die Studenten werden auch in die Grundlagen des europäischen und internationalen Kennzeichenrechts eingeführt.

**Workload**

Der Gesamtarbeitsaufwand für diese Lerneinheit beträgt 90 h, davon 22,5 h Präsenz, 45 h Vor- und Nachbereitungszeit sowie 22,5 h für die Klausurvorbereitung.

**Literature**

Course: Traffic Engineering [T-BGU-101798]

Responsibility: Peter Vortisch

Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management

ECTS 3

Recurrence Jedes Wintersemester

Version 1

<table>
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Conditions
None

Recommendations
None

Remarks
None
## Course: Traffic Flow Simulation [T-BGU-101800]

### Responsibility:
Peter Vortisch

### Contained in:
[M-BGU-101065] Transportation Modelling and Traffic Management

### ECTS
3

### Recurrence
Jedes Sommersemester

### Version
1

### Events

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### Conditions
None

### Recommendations
None

### Remarks
None
**Course: Traffic Infrastructure [T-BGU-100066]**

**Responsibility:** Eberhard Hohnecker

**Contained in:** [M-BGU-101113] Project in Public Transportation

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<td>6234904</td>
<td>Standard Valuation in Public Transport. Using an Example</td>
<td>Übung (U)</td>
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<td>SS 2017</td>
<td>6234811</td>
<td>Exercises on Determination of Demand, Timetable Construction and Alignment</td>
<td>Übung (U)</td>
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<td>6234810</td>
<td>Determination of Demand, Timetable Construction and Alignment</td>
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**Recommendations**

None

**Remarks**

None

**Event excerpt: Determination of Demand, Timetable Construction and Alignment (SS 2017)**

**Content**

Teil 1 des Moduls “ÖV-Verkehrerschließung”

Nachfrageermittlung im ÖV

Verkehrszenlenmatrix

Netzbildung im ÖV

Betriebskonzept

Trassierung (Strecke, Haltestellen usw.)

Fahrzeitrechnung und Fahrplankonzept

**Literature**

Fiedler, Grundlagen der Bahntechnik, Werner-Verlag, Düsseldorf

Hausmann, Enders, Grundlagen des Bahnbetriebs, Bahn-Fachverlag, Heidelberg

Pachl, Systemtechnik des Schienenverkehrs, Teubner-Verlag, Stuttgart
Course: Traffic Management and Transport Telematics [T-BGU-101799]

Responsibility: Peter Vortisch
Contained in: [M-BGU-101065] Transportation Modelling and Traffic Management

ECTS: 3
Recurrence: Jedes Sommersemester
Version: 1

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Conditions
None

Recommendations
None

Remarks
None
Course: Transport Economics [T-WIWI-100007]

Responsibility: Kay Mitusch, Eckhard Szimba

Contained in:
- [M-WIWI-101468] Environmental Economics
- [M-WIWI-101485] Transport infrastructure policy and regional development
- [M-WIWI-101406] Network Economics

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Learning Control / Examinations

The assessment is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Conditions

None

Event excerpt: Transport Economics (SS 2017)

Aim

Die Studierenden

- kennen die wirtschaftlich relevanten technologischen und organisatorisch-politischen Eigenschaften der verschiedenen Verkehrssektoren
- kennen wichtige verkehrsrelevante Themen, Kontroversen, Instrumente und Optionen
- können mithilfe des analytischen verkehrsökonomischen Instrumentariums Verkehr analysieren und die laufenden wirtschafts- und regulierungspolitischen Diskussionen einschätzen und beurteilen
- Die Veranstaltung eignet sich für alle, die im Berufsleben mit diesen Sektoren zu tun haben werden.

Content

The course shall provide an overview of transport economics. It will be demonstrated, using new microeconomic models, which impacts regulation and pricing in transport have on the economic actions of individuals and logisticians and which benefits and costs apply. The following topics will be discussed:

- demand and supply in transport
- empirical analysis of transport demand
- assessment of transport infrastructure projects
- external effects in transport
- transport policy
- cost structures of transport infrastructure
- Project evaluation from the perspective of the public sector

Workload

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Will be announced in the lecture.

(for literature to prepare the lecture - see additional literature)

Elective literature:
### Course: Transportation Data Analysis [T-BGU-100010]

**Responsibility:** Martin Kagerbauer  
**Contained in:** [M-BGU-101065] Transportation Modelling and Traffic Management

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#### Conditions

None

#### Recommendations

None

#### Remarks

None
Course: Transportation Systems [T-BGU-106610]

Responsibility: Peter Vortisch

Contained in: [M-BGU-101064] Fundamentals of Transportation

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Conditions
None

Recommendations
None

Remarks
None
Course: Tunnel Construction and Blasting Engineering [T-BGU-101846]

Responsibility: Shervin Haghsheno
Contained in: [M-BGU-101110] Process Engineering in Construction

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### Conditions

None

### Recommendations

None

### Remarks

None
Course: Turnkey Construction I - Processes and Methods [T-BGU-103430]

Responsibility: Shervin Haghsheno

Contained in:
[M-BGU-101888] Project Management in Construction
[M-BGU-101884] Lean Management in Construction

ECTS: 1.5
Recurrence: Jedes Sommersemester
Version: 1

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Conditions
None

Recommendations
None

Remarks
None
Course: Turnkey Construction II - Trades and Technology [T-BGU-103431]

Responsibility: Shervin Haghsheno

Contained in: [M-BGU-101888] Project Management in Construction
[M-BGU-101884] Lean Management in Construction

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Conditions
None

Recommendations
None

Remarks
None
Course: Urban Water Infrastructure and Management [T-BGU-106600]

Responsibility: Stephan Fuchs
Contained in: [M-BGU-101001] Water Supply and Sanitation

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**Learning Control / Examinations**
Written exam with 60 minutes

**Conditions**
The term paper Report Urban Water Infrastructure and Management (T-BGU-106667) has to be begun, i.e. at least the registration has to be made.

**Modeled Conditions**
The following conditions must be met:

- The course [T-BGU-106667] Report Urban Water Infrastructure and Management must have been started.

**Recommendations**
None

**Remarks**
None
Course: Valuation [T-WIWI-102621]

Responsibility: Martin Ruckes

Contained in:
- [M-WIWI-101480] Finance 3
- [M-WIWI-101482] Finance 1
- [M-WIWI-101483] Finance 2
- [M-WIWI-101510] Cross-functional Management Accounting

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Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Event excerpt: (WS 16/17)

Content
Students learn to assess and compare corporate investment projects from a financial point of view.

Literature

Elective Literature
Course: Vehicle Comfort and Acoustics I [T-MACH-105154]
Responsibility: Frank Gauterin
Contained in: [M-MACH-101264] Handling Characteristics of Motor Vehicles

ECTS: 3   Language: deutsch   Recurrence: Jedes Wintersemester   Version: 1

Events

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Learning Control / Examinations
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Conditions
Can not be combined with lecture T-MACH-102206

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-102206] Vehicle Ride Comfort & Acoustics I must not have been started.

Event excerpt: Vehicle Comfort and Acoustics I (WS 16/17)

Aim
The students know what noises and vibrations mean, how they are generated, and how they are perceived by human beings. They have knowledge about the requirements given by users and the public. They know which components of the vehicle are participating in which way on noise and vibration phenomenon and how they could be improved. They are ready to apply different tools and methods to analyze relations and to judge them. They are able to develop the chassis regarding driving comfort and acoustic under consideration of goal conflicts.

Content
1. Perception of noise and vibrations

3. Fundamentals of acoustics and vibrations

3. Tools and methods for measurement, computing, simulation and analysis of noise and vibrations

4. The relevance of tire and chassis for the acoustic and mechanical driving comfort: phenomena, influencing parameters, types of construction, optimization of components and systems, conflict of goals, methods of development

An excursion will give insights in the development practice of a car manufacturer or a system supplier.
Workload
regular attendance: 22.5 hours
self-study: 97.5 hours

Literature

2. Russel C. Hibbeler, Technische Mechanik 3, Dynamik, Pearson Studium, München, 2006


The script will be supplied in the lectures
Course: Vehicle Comfort and Acoustics II [T-MACH-105155]

Responsibility: Frank Gauterin

Contained in: [M-MACH-101264] Handling Characteristics of Motor Vehicles

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Learning Control / Examinations

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Conditions

Can not be combined with lecture T-MACH-102205

Modeled Conditions

The following conditions must be met:

- The course [T-MACH-102205] Vehicle Ride Comfort & Acoustics II must not have been started.

Event excerpt: Vehicle Comfort and Acoustics II (SS 2017)

Aim

The students have knowledge about the noise and vibration properties of the chassis components and the drive train. They know what kind of noise and vibration phenomena do exist, what are the generation mechanisms behind, which components of the vehicle participate in which way and how could they be improved. They have knowledge in the subject area of noise emission of automobiles: Noise impact, legal requirements, sources and influencing parameters, component and system optimization, target conflicts and development methods. They are ready to analyze, to judge and to optimize the vehicle with its single components regarding acoustic and vibration phenomena. They are also able to contribute competently to the development of a vehicle regarding the noise emission.

Content

1. Summary of the fundamentals of acoustics and vibrations

2. The relevance of road surface, wheel imperfections, springs, dampers, brakes, bearings and bushings, suspensions, engines and drive train for the acoustic and mechanical driving comfort:
   - phenomena
   - influencing parameters
   - types of construction
   - optimization of components and systems
   - conflicts of goals
   - methods of development
3. Noise emission of motor vehicles
   - noise stress
   - sound sources and influencing parameters
- legal restraints
- optimization of components and systems
- conflict of goals
- methods of development

**Workload**
regular attendance: 22.5 hours
self-study: 97.5 hours

**Literature**
The script will be supplied in the lectures.
Course: Vehicle Mechatronics I [T-MACH-105156]

Responsibility: Dieter Ammon

Contained in: [M-MACH-101265] Vehicle Development
[M-MACH-101264] Handling Characteristics of Motor Vehicles

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Learning Control / Examinations

Written examination

Duration: 90 minutes

Auxiliary means: none

Conditions

none

Event excerpt: Vehicle Mechatronics I (WS 16/17)

Aim

The students have an overview of the system science field of mechatronics and its application in the area of vehicle conception, especially in the context of vehicle system dynamics. They know the tools and methods for a systematical analysis, conception, and design of mechatronic systems, focussing on mechatronically extended suspension systems. They are ready to analyze, to judge and to optimize mechatronic systems.

Content

1. Introduction: Mechatronics in vehicle technology
2. Vehicle Control systems
   Brake- and traction controls (ABS, ASR, automated power train controls)
   Active and semiactive suspension systems, active stabilizor bars
   Vehicle dynamics controls, driver assistance systems
3. Modelling technology
   Mechanics - multi body dynamics
   Electrical and electronical systems, control systems
4. Computer simulation technology
   Numerical integration methods
   Quality (validation, operating areas, accuracy, performance)
   Simulator-coupling (hardware-in-the-loop, software-in-the-loop)
5. Systemdesign (example: brake control)
   Demands, requirements (funktion, safety, robustness)
   Problem setup (analysis - modelling - model reduction)
   Solution approaches
   Evaluation (quality, efficiency, validation area, concept ripeness)

Workload

regular attendance: 22,5 hours

Industrial Engineering and Management (M.Sc.)
Date 05/17/2017
self-study: 97.5 hours

**Literature**
1. Ammon, D., Modellbildung und Systementwicklung in der Fahrzeugdynamik, Teubner, Stuttgart, 1997
5. Roddeck, W., Einführung in die Mechatronik, Teubner, Stuttgart, 1997
Course: Vehicle Ride Comfort & Acoustics I [T-MACH-102206]

Responsibility: Frank Gauterin
Contained in: [M-MACH-101264] Handling Characteristics of Motor Vehicles

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Learning Control / Examinations

Oral examination

Conditions
Can not be combined with lecture Fahrzeugkomfort und -akustik I T-MACH-105154

Event excerpt: Vehicle Ride Comfort & Acoustics I (SS 2017)

Aim
The students know what noises and vibrations mean, how they are generated, and how they are perceived by human beings.
They have knowledge about the requirements given by users and the public. They know which components of the vehicle are participating in which way on noise and vibration phenomenon and how they could be improved. They are ready to apply different tools and methods to analyze relations and to judge them. They are able to develop the chasis regarding driving comfort and acoustic under consideration of goal conflicts.

Content
1. Perception of noise and vibrations

3. Fundamentals of acoustics and vibrations

3. Tools and methods for measurement, computing, simulation and analysis of noise and vibrations

4. The relevance of tire and chasis for the acoustic and mechanical driving comfort: phenomena, influencing parameters, types of construction, optimization of components and systems, conflict of goals, methods of development

An excursion will give insights in the development practice of a car manufacturer or a system supplier.

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature

2. Russel C. Hibbeler, Technische Mechanik 3, Dynamik, Pearson Studium, München, 2006

The script will be supplied in the lectures
**Course: Vehicle Ride Comfort & Acoustics II [T-MACH-102205]**

Responsibility: Frank Gauterin  
Contained in: [M-MACH-101264] Handling Characteristics of Motor Vehicles

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**Learning Control / Examinations**

Oral examination

**Conditions**

Can not be combined with lecture Fahrzeugkomfort und -akustik II T-MACH-105155

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**Event excerpt: Vehicle Ride Comfort & Acoustics II (SS 2017)**

**Aim**

The students have knowledge about the noise and vibration properties of the chassis components and the drive train. They know what kind of noise and vibration phenomena do exist, what are the generation mechanisms behind, which components of the vehicle participate in which way and how could they be improved. They have knowledge in the subject area of noise emission of automobiles: Noise impact, legal requirements, sources and influencing parameters, component and system optimization, target conflicts and development methods. They are ready to analyze, to judge and to optimize the vehicle with its single components regarding acoustic and vibration phenomena. They are also able to contribute competently to the development of a vehicle regarding the noise emission.

**Content**

1. Summary of the fundamentals of acoustics and vibrations

2. The relevance of road surface, wheel imperfections, springs, dampers, brakes, bearings and bushings, suspensions, engines and drive train for the acoustic and mechanical driving comfort:
   - phenomena
   - influencing parameters
   - types of construction
   - optimization of components and systems
   - conflicts of goals
   - methods of development

3. Noise emission of motor vehicles
   - noise stress
   - sound sources and influencing parameters
   - legal restraints
   - optimization of components and systems
   - conflict of goals
   - methods of development

**Workload**

regular attendance: 22,5 hours  
self-study: 97,5 hours
Literature
The script will be supplied in the lectures.
Course: Virtual Engineering I [T-MACH-102123]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-101283] Virtual Engineering A

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Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: Virtual Engineering I (WS 16/17)

Aim
Students are introduced to Product Lifecycle Management to understand its application in the scope of Virtual Engineering. They should be able to apply CAD/PLM systems in different phases of the product development process. Furthermore, students should have an extensive knowledge of data models, specific modules and functions of CAD systems. They should be conscious about the IT fundament of CAx systems as well as integration issues and possible approaches. Students are given an overview on various CAE analysis methods along with possible application, constraints and limitations. They learn about different functions of preprocessors, solvers and postprocessors in CAE systems, different approaches for integrating CAD/CAE systems including advantages and disadvantages of the methods. Students will learn how to integrate CAM modules or systems with CAD systems and are able to define and simulate production processes in CAM modules. Fundamental understanding of the Virtual Engineering philosophy and virtual factory are communicated. They should be able to identify the advantages of Virtual Engineering compared to conventional approaches.

Content
The lecture communicates IT aspects required for understanding virtual product development processes. For this purpose, the focus is set on systems used in industry supporting the process chain of Virtual Engineering:

- Product Lifecycle Management is an approach for managing product related data across the entire lifecycle of the product, beginning with the concept phase until disassembling and recycling.
- CAx-systems for virtual product development allow modeling digital products regarding design, construction, manufacturing and maintenance.
- Validation systems enable the analysis of products regarding statics, dynamics, safety and manufacturing feasibility.

The objective of the lecture is to clarify the relationship between construction and validation operations by applying virtual prototypes and VR/AR/MR visualization techniques in combination with PDM/PLM-systems. This is taught by introducing each particular system in applied exercises.

Workload
Präsenzzeit: 52,5 Stunden
Selbststudium: 115 Stunden
Course: Virtual Engineering II [T-MACH-102124]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-101281] Virtual Engineering B

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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Events

<table>
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<th>Event-No.</th>
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<td>SS 2017</td>
<td>2122378</td>
<td>Virtual Engineering II</td>
<td>Vorlesung (V)</td>
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<td>Mitarbeiter, Jivka Ovtcharova</td>
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</table>

Learning Control / Examinations
oral exam

Conditions
none

Event excerpt: Virtual Engineering II (SS 2017)

Aim
Students are introduced to Virtual Reality, how to achieve stereoscopic visualization and which technologies can be used to create this effect.

They are able to model a scene in VR and store VR data structures. Students should understand the functionality of VR pipelines for visualizing scenes. They should be familiar with several interaction systems and devices in a VR environment and should be able to assess the advantages and disadvantages of interaction and tracking devices.

Furthermore, they should know which validation tests could be carried out in product development processes with using virtual mock-up (VMU). The difference between VMU, physical mock-up (PMU) and virtual prototypes (VP) is introduced.

The vision of an integrated virtual product development is communicated to understand the challenges to achieve this vision.

Content
The lecture presents the IT aspects required for understanding virtual product development processes:

- Corresponding models can be visualized in Virtual Reality Systems, from individual parts to complete assemblies.
- Virtual Prototypes combine CAD-data and information about properties of components and assemblies for immersive visualization, functionality tests and functional validation in VR/AR/MR environments.
- Integrated Virtual Product Development explains product development processes from the point of view of Virtual Engineering.

The objective of this lecture is to clarify the relationship between construction and validation operations by using virtual prototypes and VR/AR/MR visualization techniques in combination with PDM/PLM-systems. This will be achieved by introducing each particular IT-system with practical-oriented exercises.

Workload
Präsenszeit: 31,5 Stunden
Selbststudium: 87 Stunden
Course: Virtual Engineering Lab [T-MACH-106740]

Responsibility: Jivka Ovtcharova

Contained in:
[M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

<table>
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<th>Recurrence</th>
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T Course: Virtual Reality Practical Course [T-MACH-102149]

Responsibility: Jivka Ovtcharova

Contained in: [M-MACH-101281] Virtual Engineering B
[M-MACH-101283] Virtual Engineering A

<table>
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Events

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<td>2123375</td>
<td>Virtual Reality Practical Course</td>
<td>Praktikum (P)</td>
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<td>Mitarbeiter, Jivka Ovtcharova</td>
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</table>

Learning Control / Examinations
The assessment is carried out as assessment of another type and is made up of a Presentation of the project work (40%), the individual project participation (30%), a written test (20%) and soft skills (10%).

Conditions
none

V Event excerpt: Virtual Reality Practical Course (WS 16/17)

Aim
The students are able to operate and use virtual reality hardware and software. They can:

- design complex tasks as team members
- solve subtasks in specific work packages keeping the interfaces in mind
- combining all parts to the final product.

Content
The lab course consists of:

1. Introduction and basics in virtual reality (hardware, software, application)
2. Introduction in 3DVIA Virtools tool kit as an application development system
3. IMplementation and practice by developing a driving simulator in small groups.

Workload
Präsenszeit: 31,5 Stunden
Selbststudium: 86 Stunden
Course: Virtual training factory 4.X [T-MACH-106741]

Responsibility: Jivka Ovtcharova

Contained in:
- [M-MACH-101281] Virtual Engineering B
- [M-MACH-101283] Virtual Engineering A

<table>
<thead>
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<th>ECTS</th>
<th>Recurrence</th>
<th>Version</th>
</tr>
</thead>
<tbody>
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</table>
Course: Warehousing and Distribution Systems [T-MACH-105174]

Responsibility: Kai Furmans

Contained in:
- [M-MACH-101263] Introduction to Logistics
- [M-MACH-101280] Logistics in Value Chain Networks
- [M-MACH-101279] Technical Logistics

ECTS: 4
Language: deutsch
Recurrence: Jedes Sommersemester
Version: 1

Events

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<td>2118097</td>
<td>Warehousing and distribution systems</td>
<td>Vorlesung (V)</td>
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<td>Kai Furmans, Christoph Kunert</td>
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</table>

Learning Control / Examinations
The assessment consists of a 60 minutes written examination (according to §4(2), 1 of the examination regulation).

Conditions
none

Event excerpt: Warehousing and distribution systems (SS 2017)

Aim
Students are able to:

- Describe the areas of typical warehouse and distribution systems with the respective processes and can illustrate it with sketches,
- Use and choose strategies of warehouse and distribution systems according to requirements,
- Classify typical systems using criteria discussed in the lecture, and
- Reason about the choice of appropriate technical solutions.

Content

- Introduction
- Yard management
- Receiving
- Storage and picking
- Workshop on cycle times
- Consolidation and packing
- Shipping
- Added Value
- Overhead
- Case Study: DCRM
- Planning of warehouses
- Case study: Planning of warehouses
- Distribution networks
- Lean Warehousing

Workload
regular attendance: 21 hours
self-study: 99 hours
Literature
ARNOLD, Dieter, FURMANS, Kai (2005)
Materialfluss in Logistiksystemen, 5. Auflage, Berlin: Springer-Verlag
ARNOLD, Dieter (Hrsg.) et al. (2008)
Handbuch Logistik, 3. Auflage, Berlin: Springer-Verlag
Warehouse Science
GUDEHUS, Timm (2005)
Logistik, 3. Auflage, Berlin: Springer-Verlag
FRAZELLE, Edward (2002)
World-class warehousing and material handling, McGraw-Hill
MARTIN, Heinrich (1999)
Praxiswissen Materialflußplanung: Transport, Hanshaben, Lagern, Kommissionieren, Braunschweig, Wiesbaden: Vieweg
WISSE, Jens (2009)
Der Prozess Lagern und Kommissionieren im Rahmen des Distribution Center Reference Model (DCRM); Karlsruhe : Universitätsverlag
A comprehensive overview of scientific papers can be found at:
ROODBERGEN, Kees Jan (2007)
Warehouse Literature
Course: Wastewater and Storm Water Treatment [T-BGU-106601]

Responsibility: Stephan Fuchs, Erhard Hoffmann

Contained in: [M-BGU-101001] Water Supply and Sanitation

ECTS: 6
Recurrence: Jedes Sommersemester
Version: 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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</table>

Learning Control / Examinations

Conditions
None

Recommendations
None

Remarks
None
Course: Water Chemistry and Water Technology I [T-CIWVT-101900]

Responsibility: Harald Horn

ECTS: 6

Events

<table>
<thead>
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<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
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</table>

Conditions

T-CIWVT-103351 - Wasserchemisches Praktikum must be passed.
Course: Water Chemistry and Water Technology II [T-CIWVT-101901]

Responsibility: Harald Horn

Contained in: [M-CIWVT-101122] Water Chemistry and Water Technology II

ECTS Language Version
9 englisch 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
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<td>Harald Horn, Florencia Saravia</td>
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Conditions
The module “Water Chemistry and Water Technology I” must be passed.

Modeled Conditions
The following conditions must be met:

- The module [M-CIWVT-101121] Water Chemistry and Water Technology I must have been passed.

Responsibility: Jürgen Ihringer

Contained in:
[M-WIWI-101642] Natural Hazards and Risk Management 1
[M-WIWI-101644] Natural Hazards and Risk Management 2

ECTS: 3  Version: 1

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Learning Control / Examinations
See German version.

Conditions
None
**Course: Water Supply and Sanitation [T-BGU-101788]**

**Responsibility:** Stephan Fuchs

**Contained in:** [M-BGU-101001] Water Supply and Sanitation

<table>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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**Events**

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<th>Lecturers</th>
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</table>

**Conditions**

None

**Recommendations**

None

**Remarks**

None
Course: Web Science [T-WIWI-103112]

Responsibility: York Sure-Vetter

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

<table>
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<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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Events

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<td>WS 16/17</td>
<td>2511313</td>
<td>Exercises to Web Science</td>
<td>Übung (Ü)</td>
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<td>York Sure-Vetter, Tobias Weller</td>
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Learning Control / Examinations

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation. The exam takes place every semester and can be repeated at every regular examination date.

Conditions

None

Remarks


Event excerpt: Web Science (WS 16/17)

Aim

The students

- look critically into current research topics in the field of Web Science and learns in particular about the topics small-world-problem, network theory, social network analysis, bibliometrics, as well as link analysis and search.
- apply interdisciplinary thinking.
- train the application of technological approaches to social science problems.

Content

This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
- Exam and exam preparation: 37.5 hours

Literature

Course: Welding Technology [T-MACH-105170]

Responsibility: Majid Farajian
Contained in: [M-MACH-101268] Specific Topics in Materials Science

ECTS 4 Language deutsch Recurrence Jedes Semester Version 1

Events

<table>
<thead>
<tr>
<th>Term</th>
<th>Event-No.</th>
<th>Events</th>
<th>Type</th>
<th>SWS</th>
<th>Lecturers</th>
</tr>
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</table>

Learning Control / Examinations
Oral examination

Conditions
none

Event excerpt: Welding Technology (WS 16/17)

Aim
The students have knowledge and understanding of the most important welding processes and its industrial application.

They are able to recognize, understand and handle problems occurring during the application of different welding processes relating to design, material and production.

They know the classification and the importance of welding technology within the scope of connecting processes (advantages/disadvantages, alternatives).

Content
definition, application and differentiation: welding, welding processes,
alternative connecting technologies.

history of welding technology

sources of energy for welding processes

Survey: fusion welding,
pressure welding.
seam preparation/design
welding positions

weldability
gas welding, thermal cutting

manual metal-arc welding
submerged arc welding

IV characteristics: arc/sources of energy

gas-shielded metal-arc welding

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours
Literature
Handbuch der Schweißtechnik I bis III
Werkstoffe
Verfahren und Fertigung
Konstruktive Gestaltung der Bauteile
Jürgen Ruge
Springer-Verlag GmbH & Co, Berlin

Schweißtechnische Fertigungsverfahren 1 bis 3
Schweiß- und Schneidtechnologien
Verhalten der Werkstoffe beim Schweißen
Gestaltung und Festigkeit von Schweißkonstruktionen
Ulrich Dilthey (1-3), Annette Brandenburger(3)
Springer-Verlag GmbH & Co, Berlin

Fachbuchreihe Schweißtechnik Band 76/I und II
DVS-Verlag

DIN/DVS -TASCHENBÜCHER
Schweißtechnik 1,2 ff...
Beuth-Verlag GmbH, Berlin
Course: Wildcard - Introduction to Logistics [T-MACH-10659]

Responsibility: [M-MACH-101263] Introduction to Logistics

ECTS: 2
Version: 1
Course: Wildcard Key Competences Seminar 1 [T-WIWI-104680]

Responsibility:

Contained in: [M-WIWI-101808] Seminar Module

ECTS 1
Version 1
Course: Wildcard Key Competences Seminar 3 [T-WIWI-104682]

Responsibility:

Contained in: [M-WIWI-101808] Seminar Module

ECTS
3

Version
1
Course: Wildcard Key Competences Seminar 4 [T-WIWI-104683]

Responsibility:

Contained in: [M-WIWI-101808] Seminar Module

ECTS
Version

1
1
Course: Wildcard Key Competences Seminar 5 [T-WIWI-104684]

Responsibility: [M-WIWI-101808] Seminar Module

ECTS: 2
Version: 1
Course: Wildcard Key Competences Seminar 7 [T-WIWI-105955]

Responsibility:

Contained in: [M-WIWI-101808] Seminar Module

ECTS 4  Version 1
Course: Wildcard Key Competences Seminar 8 [T-WIWI-105956]

Responsibility:

Contained in: [M-WIWI-101808] Seminar Module

ECTS
4

Version
1
Course: Workflow-Management [T-WIWI-102662]

Responsibility: Andreas Oberweis

Contained in: [M-WIWI-101472] Informatics
[M-WIWI-101630] Electives in Informatics
[M-WIWI-101628] Emphasis in Informatics

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Language</th>
<th>Recurrence</th>
<th>Version</th>
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<tbody>
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Events

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<td>Andreas Oberweis</td>
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Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

Event excerpt: Workflow-Management (SS 2017)

Aim
Students

- explain the concepts and principles of workflow management concepts and systems and their applications,
- create and evaluatel business process models,
- analyze static and dynamic properties of workflows.

Content
A workflow is that part of a business process which is automatically executed by a computerized system. Workflow management includes the design, modelling, analysis, execution and management of workflows. Workflow management systems are standard software systems for the efficient control of processes in enterprises and organizations. Knowledge in the field of workflow management systems is especially important during the design of systems for process support. The course covers the most important concepts of workflow management. Modelling and design techniques are presented and an overview about current workflow management systems is given. Standards, which have been proposed by the workflow management coalition (WfMC), are discussed. Petri nets are proposed as a formal modelling and analysis tool for business processes. Architecture and functionality of workflow management systems are discussed. The course is a combination of theoretical foundations of workflow management concepts and of practical application knowledge.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h
Literature


Further literature is given in the lecture.
Inhalt

Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Wirtschaftsingenieurwesen 777
Studien- und Prüfungsordnung
des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Wirtschaftsingenieurwesen

vom 24. September 2015


Der Präsident hat seine Zustimmung gemäß § 20 Absatz 2 KITG iVm. § 32 Absatz 3 Satz 1 LHG am 24. September 2015 erteilt.

Inhaltsverzeichnis

I. Allgemeine Bestimmungen
§ 1 Geltungsbereich
§ 2 Ziele des Studiums, akademischer Grad
§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte
§ 4 Modulprüfungen, Studien- und Prüfungsleistungen
§ 5 Anmeldung und Zulassung zu den Modulprüfungen und Lehrveranstaltungen
§ 6 Durchführung von Erfolgskontrollen
§ 6 a Erfolgskontrollen im Antwort-Wahl-Verfahren
§ 6 b Computergestützte Erfolgskontrollen
§ 7 Bewertung von Studien- und Prüfungsleistungen
§ 8 Wiederholung von Erfolgskontrollen, endgültiges Nichtbestehen
§ 9 Verlust des Prüfungsanspruchs
§ 10 Abmeldung; Versäumnis, Rücktritt
§ 11 Täuschung, Ordnungsverstoß
§ 12 Mutterschutz, Elternzeit, Wahrnehmung von Familienpflichten
§ 13 Studierende mit Behinderung oder chronischer Erkrankung
§ 14 Modul Masterarbeit
§ 15 Zusatzleistungen
§ 15 a Überfachliche Qualifikationen
§ 16 Prüfungsausschuss
§ 17 Prüfende und Beisitzende
§ 18 Anerkennung von Studien- und Prüfungsleistungen, Studienzeiten
II. Masterprüfung
§ 19 Umfang und Art der Masterprüfung
§ 20 Bestehen der Masterprüfung, Bildung der Gesamtnote
§ 21 Masterzeugnis, Masterurkunde, Diploma Supplement und Transcript of Records

III. Schlussbestimmungen
§ 22 Bescheinigung von Prüfungsleistungen
§ 23 Aberkennung des Mastergrades
§ 24 Einsicht in die Prüfungsakten
§ 25 Inkrafttreten, Übergangsvorschriften
Präambel

Das KIT hat sich im Rahmen der Umsetzung des Bologna-Prozesses zum Aufbau eines europäischen Hochschulraumes zum Ziel gesetzt, dass am Abschluss des Studiums am KIT der Mastergrad stehen soll. Das KIT sieht daher die am KIT angebotenen konsekutiven Bachelor- und Masterstudiengänge als Gesamtkonzept mit konsekutivem Curriculum.

I. Allgemeine Bestimmungen

§ 1 Geltungsbereich
Diese Masterprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Masterstudiengang Wirtschaftsingenieurwesen am KIT.

§ 2 Ziel des Studiums, akademischer Grad
(1) Im konsekutiven Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft, verbreitert, erweitert oder ergänzt werden. Ziel des Studiums ist die Fähigkeit, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite für die Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bewerten.
(2) Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science (M.Sc.)“ für den Masterstudiengang Wirtschaftsingenieurwesen verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte
(1) Die Regelstudienzeit beträgt vier Semester.
(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studien- und Prüfungsleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 120 Leistungspunkte.
(5) Lehrveranstaltungen können nach vorheriger Ankündigung auch in englischer Sprache angeboten werden.

§ 4 Modulprüfungen, Studien- und Prüfungsleistungen
Erfolgskontrollen gliedern sich in Studien- oder Prüfungsleistungen.
(2) Prüfungsleistungen sind:
1. schriftliche Prüfungen,  
2. mündliche Prüfungen oder  
3. Prüfungsleistungen anderer Art.

(3) Studienleistungen sind schriftliche, mündliche oder praktische Leistungen, die von den Studierenden in der Regel lehrveranstaltungs begleitend erbracht werden. Die Masterprüfung darf nicht mit einer Studienleistung abgeschlossen werden.

(4) Von den Modulprüfungen sollen mindestens 70 % benotet sein.

(5) Bei sich ergänzenden Inhalten können die Modulprüfungen mehrerer Module durch eine auch modulübergreifende Prüfungsleistung (Absatz 2 Nr.1 bis 3) ersetzt werden.

§ 5 Anmeldung und Zulassung zu den Modulprüfungen und Lehrveranstaltungen

(1) Um an den Modulprüfungen teilnehmen zu können, müssen sich die Studierenden online im Studierendenportal zu den jeweiligen Erfolgskontrollen anmelden. In Ausnahmefällen kann eine Anmeldung schriftlich im Studierendenservice oder in einer anderen vom Studierendenservice autorisierten Einrichtung erfolgen. Für die Erfolgskontrollen können durch die Prüfenden Anmeldefristen festgelegt werden. Die Anmeldung der Masterarbeit ist im Modulhandbuch geregelt.


(3) Zu einer Erfolgskontrolle ist zuzulassen, wer
   1. in den Masterstudiengang Wirtschaftsingenieurwesen am KIT eingeschrieben ist; die Zulassung beurlaubter Studierender ist auf Prüfungsleistungen beschränkt; und
   2. nachweist, dass er die im Modulhandbuch für die Zulassung zu einer Erfolgskontrolle festgelegten Voraussetzungen erfüllt und
   3. nachweist, dass er in dem Masterstudiengang Wirtschaftsingenieurwesen den Prüfungsanspruch nicht verloren hat.

(4) Nach Maßgabe von § 30 Abs. 5 LHG kann die Zulassung zu einzelnen Pflichtveranstaltungen beschränkt werden. Der/die Prüfende entscheidet über die Auswahl unter den Studierenden, die sich rechtzeitig bis zu dem von dem/dem Prüfenden festgesetzten Termin angemeldet haben unter Berücksichtigung des Studienfortschritts dieser Studierenden und unter Beachtung von § 13 Abs. 1 Satz 1 und 2, sofern ein Abbau des Überhangs durch andere oder zusätzliche Veranstaltungen nicht möglich ist. Für den Fall gleichen Studienfortschritts sind durch die KIT-Fakultäten weitere Kriterien festzulegen. Das Ergebnis wird den Studierenden rechtzeitig bekannt gegeben.


§ 6 Durchführung von Erfolgskontrollen

(1) Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach, durchgeführt.

(2) Die Art der Erfolgskontrolle (§ 4 Abs. 2 Nr. 1 bis 3, Abs. 3) wird von der/dem Prüfenden der betreffenden Lehrveranstaltung in Bezug auf die Lerninhalte der Lehrveranstaltung und die
Lernziele des Moduls festgelegt. Die Art der Erfolgskontrolle, ihre Häufigkeit, Reihenfolge und Gewichtung sowie gegebenenfalls die Bildung der Modulnote müssen mindestens sechs Wochen vor Vorlesungsbeginn im Modulhandbuch bekannt gemacht werden. Im Einvernehmen von Prüfendem und Studierendem bzw. Studierendem können die Art der Prüfungsleistung sowie die Prüfungssprache auch nachträglich geändert werden; im ersten Fall ist jedoch § 4 Abs. 4 zu berücksichtigen. Bei der Prüfungsorganisation sind die Belange Studierender mit Behinderung oder chronischer Erkrankung gemäß § 13 Abs. 1 zu berücksichtigen. § 13 Abs. 1 Satz 3 und 4 gelten entsprechend.

(3) Bei unvertretbar hohem Prüfungsaufwand kann eine schriftlich durchzuführende Prüfungsleistung auch mündlich, oder eine mündlich durchzuführende Prüfungsleistung auch schriftlich abgenommen werden. Diese Änderung muss mindestens sechs Wochen vor der Prüfungsleistung bekannt gegeben werden.

(4) Bei Lehrveranstaltungen in englischer Sprache (§ 3 Abs. 6) können die entsprechenden Erfolgskontrollen in dieser Sprache abgenommen werden. § 6 Abs. 2 gilt entsprechend.


(6) Mündliche Prüfungen (§ 4 Abs. 2 Nr. 2) sind von einer/einem Prüfenden in Gegenwart einer oder eines Beisitzenden als Gruppen- oder Einzelprüfungen abzunehmen und zu bewerten. Vor der Festsetzung der Note hört die/der Prüfende die anderen an der Kollegialprüfung mitwirkenden Prüfenden an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 60 Minuten pro Studierenden.

Die wesentlichen Gegenstände und Ergebnisse der mündlichen Prüfung sind in einem Protokoll festzuhalten. Das Ergebnis der Prüfung ist den Studierenden im Anschluss an die mündliche Prüfung bekannt zu geben.

Studierende, die sich in einem späteren Semester der gleichen Prüfung unterziehen wollen, werden entsprechend den räumlichen Verhältnissen und nach Zustimmung des Prüflings als Zuhörerinnen und Zuhörer bei mündlichen Prüfungen zugelassen. Die Zulassung erstreckt sich nicht auf die Beratung und Bekanntgabe der Prüfungsergebnisse.

(7) Für Prüfungsleistungen anderer Art (§ 4 Abs. 2 Nr. 3) sind angemessene Bearbeitungsfristen einzuräumen und Abgabetermin festzulegen. Dabei ist durch die Art der Aufgabenstellung und durch entsprechende Dokumentation sicherzustellen, dass die erbrachte Prüfungsleistung dem/den Studierenden zurechenbar ist. Die wesentlichen Gegenstände und Ergebnisse der Erfolgskontrolle sind in einem Protokoll festzuhalten.

Bei mündlich durchgeführten Prüfungsleistungen anderer Art muss neben der/dem Prüfenden ein/e Beisitzende/r anwesend sein, die/der zusätzlich zum/zur Prüfenden das Protokoll zeichnet.

Schriftliche Arbeiten im Rahmen einer Prüfungsleistung anderer Art haben dabei die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Trägt die Arbeit diese Erklärung nicht, wird sie nicht angenommen. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

§ 6 a Erfolgskontrollen im Antwort-Wahl-Verfahren

Das Modulhandbuch regelt, ob und in welchem Umfang Erfolgskontrollen im Wege des Antwort-Wahl-Verfahrens abgelegt werden können.
§ 6 b Computergestützte Erfolgskontrollen


(3) Im Übrigen gelten für die Durchführung von computergestützten Erfolgskontrollen die §§ 6 bzw. 6 a.

§ 7 Bewertung von Studien- und Prüfungsleistungen

(1) Das Ergebnis einer Prüfungsleistung wird von den jeweiligen Prüfenden in Form einer Note festgesetzt.

(2) Folgende Noten sollen verwendet werden:

- sehr gut (very good): hervorragende Leistung,
- gut (good): eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt,
- befriedigend (satisfactory): eine Leistung, die durchschnittlichen Anforderungen entspricht,
- ausreichend (sufficient): eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt,
- nicht ausreichend (failed): eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt.

Zur differenzierten Bewertung einzelner Prüfungsleistungen sind nur folgende Noten zugelassen:

- 1,0; 1,3: sehr gut
- 1,7; 2,0; 2,3: gut
- 2,7; 3,0; 3,3: befriedigend
- 3,7; 4,0: ausreichend
- 5,0: nicht ausreichend

(3) Studienleistungen werden mit „bestanden“ oder mit „nicht bestanden“ gewertet.

(4) Bei der Bildung der gewichteten Durchschnitte der Modulnoten, der Fachnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

(5) Jedes Modul und jede Erfolgskontrolle darf in demselben Studiengang nur einmal gewertet werden.

(6) Eine Prüfungsleistung ist bestanden, wenn die Note mindestens „ausreichend“ (4,0) ist.

(7) Die Modulprüfung ist bestanden, wenn alle erforderlichen Erfolgskontrollen bestanden sind. Die Modulprüfung und die Bildung der Modulnote sollen im Modulhandbuch geregelt werden. Sofern das Modulhandbuch keine Regelung über die Bildung der Modulnote enthält, errechnet
sich die Modulnote aus einem nach den Leistungspunkten der einzelnen Teilmodule gewichteter Notendurchschnitt. Die differenzierten Noten (Absatz 2) sind bei der Berechnung der Modulnoten als Ausgangsdaten zu verwenden.

(8) Die Ergebnisse der Erfolgskontrollen sowie die erworbenen Leistungspunkte werden durch den Studierendenservice des KIT verwaltet.

(9) Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein.

(10) Die Gesamtnote der Masterprüfung, die Fachnoten und die Modulnoten lauten:

<table>
<thead>
<tr>
<th>Note</th>
<th>Wertung</th>
</tr>
</thead>
<tbody>
<tr>
<td>sehr gut</td>
<td>bis 1,5</td>
</tr>
<tr>
<td>gut</td>
<td>von 1,6 bis 2,5</td>
</tr>
<tr>
<td>befriedigend</td>
<td>von 2,6 bis 3,5</td>
</tr>
<tr>
<td>ausreichend</td>
<td>von 3,6 bis 4,0</td>
</tr>
</tbody>
</table>

§ 8 Wiederholung von Erfolgskontrollen, endgültiges Nichtbestehen

(1) Studierende können eine nicht bestandene schriftliche Prüfung (§ 4 Absatz 2 Nr. 1) einmal wiederholen. Wird eine schriftliche Wiederholungsprüfung mit „nicht ausreichend“ (5,0) bewertet, so findet eine mündliche Nachprüfung im zeitlichen Zusammenhang mit dem Termin der nicht bestandenen Prüfung statt. In diesem Falle kann die Note dieser Prüfung nicht besser als „ausreichend“ (4,0) sein.

(2) Studierende können eine nicht bestandene mündliche Prüfung (§ 4 Absatz 2 Nr. 2) einmal wiederholen.

(3) Wiederholungsprüfungen nach Absatz 1 und 2 müssen in Inhalt, Umfang und Form (mündlich oder schriftlich) der ersten entsprechen. Ausnahmen kann der zuständige Prüfungsausschuss auf Antrag zulassen.

(4) Prüfungsleistungen anderer Art (§ 4 Absatz 2 Nr. 3) können einmal wiederholt werden.

(5) Studienleistungen können mehrfach wiederholt werden.

(7) Die Prüfungsleistung ist endgültig nicht bestanden, wenn die mündliche Nachprüfung im Sinne des Absatzes 1 mit „nicht ausreichend“ (5,0) bewertet wurde. Die Prüfungsleistung ist ferner endgültig nicht bestanden, wenn die mündliche Prüfung im Sinne des Absatzes 2 oder die Prüfungsleistung anderer Art gemäß Absatz 4 zweimal mit „nicht bestanden“ bewertet wurde.

(8) Das Modul ist endgültig nicht bestanden, wenn eine für sein Bestehen erforderliche Prüfungsleistung endgültig nicht bestanden ist.

(9) Eine zweite Wiederholung derselben Prüfungsleistung gemäß § 4 Abs. 2 ist nur in Ausnahmefällen auf Antrag des/der Studierenden zulässig („Antrag auf Zweitwiederholung“). Der Antrag ist schriftlich beim Prüfungsausschuss in der Regel bis zwei Monate nach Bekanntgabe der Note zu stellen.


(10) Die Wiederholung einer bestandenen Prüfungsleistung ist nicht zulässig.

§ 9 Verlust des Prüfungsanspruchs


§ 10 Abmeldung; Versäumnis, Rücktritt


(3) Die Abmeldung von Prüfungsleistungen anderer Art sowie von Studienleistungen ist im Modulhandbuch geregelt.

(4) Eine Erfolgskontrolle gilt als mit „nicht ausreichend“ (5,0) bewertet, wenn die Studierenden einen Prüfungstermin ohne triftigen Grund versäumen oder wenn sie nach Beginn der Erfolgskontrolle ohne triftigen Grund von dieser zurücktreten. Dasselbe gilt, wenn die Masterarbeit nicht innerhalb der vorgesehenen Bearbeitungszeit erbracht wird, es sei denn, der/die Studierende hat die Fristüberschreitung nicht zu vertreten.


§ 11 Täuschung, Ordnungsverstoß

(1) Versuchen Studierende das Ergebnis ihrer Erfolgskontrolle durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5,0) bewertet.

(2) Studierende, die den ordnungsgemäßen Ablauf einer Erfolgskontrolle stören, können von der/dem Prüfenden oder der Aufsicht führenden Person von der Fortsetzung der Erfolgskontrolle ausgeschlossen werden. In diesem Fall gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5,0) bewertet. In schwerwiegenden Fällen kann der Prüfungsausschuss diese Studierenden von der Erbringung weiterer Erfolgskontrollen ausschließen.

(3) Näheres regelt die Allgemeine Satzung des KIT zur Redlichkeit bei Prüfungen und Praktika in der jeweils gültigen Fassung.

§ 12 Mutterschutz, Elternzeit, Wahrnehmung von Familienpflichten


(3) Der Prüfungsausschuss entscheidet auf Antrag über die flexible Handhabung von Prüfungsfristen entsprechend den Bestimmungen des Landeshochschulgesetzes, wenn Studierende Familienpflichten wahrzunehmen haben. Absatz 2 Satz 4 bis 6 gelten entsprechend.

§ 13 Studierende mit Behinderung oder chronischer Erkrankung


(2) Weisen Studierende eine Behinderung oder chronische Erkrankung nach und folgt daraus, dass sie nicht in der Lage sind, Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen Zeit oder Form abzulegen, kann der Prüfungsausschuss gestatten, die Erfolgskontrollen in einem anderen Zeitraum oder einer anderen Form zu erbringen. Insbesondere ist behinderten Studierenden zu gestatten, notwendige Hilfsmittel zu benutzen.

(3) Weisen Studierende eine Behinderung oder chronische Erkrankung nach und folgt daraus, dass sie nicht in der Lage sind, die Lehrveranstaltungen regelmäßig zu besuchen oder die gemäß § 19 erforderlichen Studien- und Prüfungsleistungen zu erbringen, kann der Prüfungsausschuss auf Antrag gestatten, dass einzelne Studien- und Prüfungsleistungen nach Ablauf der in dieser Studien- und Prüfungsordnung vorgesehenen Fristen absolviert werden können.

§ 14 Modul Masterarbeit

(1) Voraussetzung für die Zulassung zum Modul Masterarbeit ist, dass die/der Studierende Modulprüfungen im Umfang von mindestens 60 LP erfolgreich abgelegt hat. Über Ausnahmen entscheidet der Prüfungsausschuss auf Antrag der/des Studierenden.

(2) Die Masterarbeit kann von Hochschullehrer/innen und leitenden Wissenschaftler/innen gemäß § 14 Abs. 3 Ziff. 1 KITG vergeben werden. Darüber hinaus kann der Prüfungsausschuss weitere Prüfende gemäß § 17 Abs. 2 und 3 zur Vergabe des Themas berechtigen. Den Studi-

(3) Thema, Aufgabenstellung und Umfang der Masterarbeit sind von dem Betreuer bzw. der Betreuerin so zu begrenzen, dass sie mit dem in Absatz 4 festgelegten Arbeitsaufwand bearbeitet werden kann.


(5) Bei der Abgabe der Masterarbeit haben die Studierenden schriftlich zu versichern, dass sie die Arbeit selbstständig verfasst haben, ohne fremde Quellen und Hilfsmittel benutzt haben, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung des KIT zur Sicherung der wissenschaftlichen Praxis der jeweils gültigen Fassung beachtet haben. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Die Erklärung kann wie folgt lauten: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig verfasst, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde sowie die Satzung des KIT zur Sicherung der wissenschaftlichen Praxis in der jeweils gültigen Fassung beachtet zu haben.“ Bei Abgabe einer unwahren Versicherung wird die Masterarbeit mit „nicht ausreichend“ (5,0) bewertet.

(6) Der Zeitpunkt der Ausgabe des Themas der Masterarbeit ist durch die Betreuerin/ den Betreuer und die/den Studierenden festzuhalten und dies beim Prüfungsausschuss aktenkundig zu machen. Der Zeitpunkt der Abgabe der Masterarbeit ist durch den/die Prüfende/n beim Prüfungsausschuss aktenkundig zu machen. Das Thema kann nur einmal und nur innerhalb des ersten Monats der Bearbeitungszeit zurückgegeben werden. Macht der oder die Studierende einen triftigen Grund geltend, kann der Prüfungsausschuss die in Absatz 4 festgelegte Bearbeitungszeit um höchstens drei Monate verlängern. Wird die Masterarbeit nicht fristgerecht abgeliefert, gilt sie als mit „nicht ausreichend“ (5,0) bewertet, es sei denn, dass die Studierenden dieses Versäumnis nicht zu vertreten haben.


§ 15 Zusatzleistungen

(1) Es können auch weitere Leistungspunkte (Zusatzleistungen) im Umfang von höchstens 30 LP aus dem Gesamtangebot des KIT erworben werden. § 3 und § 4 der Prüfungsordnung bleiben davon unberührt. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt- und Modulnoten ein. Die bei der Festlegung der Modulnote nicht berücksichtigten LP werden als Zusatzleistungen im Transcript of Records aufgeführt und als Zusatzleistungen gekennzeichnet.

(2) Die Studierenden haben bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

§ 16 Prüfungsausschuss


(4) Der Prüfungsausschuss kann die Erledigung seiner Aufgaben für alle Regelfälle auf die/den Vorsitzende/n des Prüfungsausschusses übertragen. In dringenden Angelegenheiten, deren Erledigung nicht bis zur nächsten Sitzung des Prüfungsausschusses warten kann, entscheidet die/den Vorsitzende/n des Prüfungsausschusses.


(6) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen KIT-Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses eine fachlich zuständige und von der betroffenen KIT-Fakultät zu nennende prüfungsbevollmächtigte Person hinzuzuziehen.

§ 17 Prüfende und Beisitzende
(1) Der Prüfungsausschuss bestellt die Prüfenden. Er kann die Bestellung der/dem Vorsitzenden übertragen.

(2) Prüfende sind Hochschullehr/innen sowie leitende Wissenschaftler/innen gemäß § 14 Abs. 3 Ziff. 1 KITG, habilitierte Mitglieder und akademische Mitarbeiter/innen gemäß § 52 LHG, welche der einer KIT-Fakultät angehören und denen die Prüfungsbeufugnis übertragen wurde; desgleichen kann wissenschaftlichen Mitarbeitern gemäß § 14 Abs. 3 Ziff. 2 KITG die Prüfungsbeufugnis übertragen werden. Bestellt werden darf nur, wer mindestens die dem jeweiligen Prüfungsgegenstand entsprechende fachwissenschaftliche Qualifikation erworben hat.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zu Prüfenden bestellt werden, sofern eine KIT-Fakultät eine Prüfungsbeufugnis erteilt hat und sie die gemäß Absatz 2 Satz 2 vorausgesetzte Qualifikation nachweisen können.

(4) Die Beisitzenden werden durch die Prüfenden benannt. Zu Beisitzenden darf nur bestellt werden, wer einen akademischen Abschluss in einem Masterstudiengang der Wirtschafts- oder Ingenieurwissenschaften oder einen gleichwertigen akademischen Abschluss erworben hat.

§ 18 Anerkennung von Studien- und Prüfungsleistungen, Studienzeiten
(1) Studien- und Prüfungsleistungen sowie Studienzeiten, die in Studiengängen an staatlichen oder staatlich anerkannten Hochschulen und Berufsakademien der Bundesrepublik Deutschland oder an ausländischen staatlichen oder staatlich anerkannten Hochschulen erbracht wurden, werden auf Antrag der Studierenden anerkannt, sofern hinsichtlich der erworbenen Kompetenzen kein wesentlicher Unterschied zu den Leistungen oder Abschlüssen besteht, die ersetzt werden sollen. Dabei ist kein schematischer Vergleich, sondern eine Gesamtbetrachtung vorzunehmen. Bezüglich des Umfangs einer zur Anerkennung vorgelegten Studienleistung (Anrechnung) werden die Grundsätze des ECTS herangezogen.

(2) Die Studierenden haben die für die Anerkennung erforderlichen Unterlagen vorzulegen. Studierende, die neu in den Masterstudiengang Wirtschaftsingenieurwesen immatrikuliert wurden, haben den Antrag mit den für die Anerkennung erforderlichen Unterlagen innerhalb eines Semesters nach Immatrikulation zu stellen. Bei Unterlagen, die nicht in deutscher oder englischer Sprache vorliegen, kann eine amtlich beglaubigte Übersetzung verlangt werden. Die Beweislast dafür, dass der Antrag die Voraussetzungen für die Anerkennung nicht erfüllt, liegt beim Prüfungsausschuss.

(3) Werden Leistungen angerechnet, die nicht am KIT erbracht wurden, werden sie im Zeugnis als „anerkannt“ ausgewiesen. Liegen Noten vor, werden die Noten, soweit die Notensysteme vergleichbar sind, übernommen und in die Berechnung der Modulnoten und der Gesamtnote einbezogen. Sind die Notensysteme nicht vergleichbar, können die Noten umgerechnet werden. Liegen keine Noten vor, wird der Vermerk „bestanden“ aufgenommen.

(4) Bei der Anerkennung von Studien- und Prüfungsleistungen, die außerhalb der Bundesrepublik Deutschland erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(5) Außerhalb des Hochschulsystems erworbenen Kenntnisse und Fähigkeiten werden angerechnet, wenn sie nach Inhalt und Niveau den Studien- und Prüfungsleistungen gleichwertig sind, die ersetzt werden sollen und die Institution, in der die Kenntnisse und Fähigkeiten erworben wurden, ein genormtes Qualitätssicherungssystem hat. Die Anrechnung kann in Teilen versagt werden, wenn mehr als 50 Prozent des Hochschulstudiums ersetzt werden soll.

(6) Zuständig für Anerkennung und Anrechnung ist der Prüfungsausschuss. Im Rahmen der Feststellung, ob ein wesentlicher Unterschied im Sinne des Absatz 1 vorliegt, sind die zuständigen Fachvertreter/innen zu hören. Der Prüfungsausschuss entscheidet in Abhängigkeit von Art...
II. Masterprüfung

§ 19 Umfang und Art der Masterprüfung

(1) Die Masterprüfung besteht aus den Modulprüfungen nach Absatz 2 sowie der Modul Masterarbeit.

(2) Es sind Modulprüfungen in folgenden Pflichtfächern abzulegen:

1. Betriebswirtschaftslehre: Modul(e) im Umfang von 18 LP,
2. Volkswirtschaftslehre: Modul(e) im Umfang von 9 LP,
3. Informatik: Modul(e) im Umfang von 9 LP,
4. Operations Research: Modul(e) im Umfang von 9 LP,
5. Ingenieurwissenschaften: Modul(e) im Umfang von 18 LP,
6. Wahlpflichtbereich: Modul(e) im Umfang von 27 LP.

Die Festlegung der zur Auswahl stehenden Module und deren Fachzuordnung werden im Modulhandbuch getroffen.

§ 20 Bestehen der Masterprüfung, Bildung der Gesamtnote

(1) Die Masterprüfung ist bestanden, wenn alle in § 19 genannten Modulprüfungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Masterprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt der Fachnoten und dem Modul Masterarbeit.

(3) Haben Studierende die Masterarbeit mit der Note 1,0 und die Masterprüfung mit einem Durchschnitt von 1,1 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen.

§ 21 Masterzeugnis, Masterurkunde, Diploma Supplement und Transcript of Records


(3) Mit dem Zeugnis erhalten die Studierenden ein Diploma Supplement in deutscher und englischer Sprache, das den Vorgaben des jeweils gültigen ECTS Users’ Guide entspricht, sowie ein Transcript of Records in deutscher und englischer Sprache.

Die Masterurkunde, das Masterzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studierendenservice des KIT ausgestellt.

### III. Schlussbestimmungen

#### § 22 Bescheinigung von Prüfungsleistungen

Haben Studierende die Masterprüfung endgültig nicht bestanden, wird ihnen auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Studien- und Prüfungsleistungen und deren Noten enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

#### § 23 Aberkennung des Mastergrades

(1) Haben Studierende bei einer Prüfungsleistung getäuscht und wird diese Tatsache nach der Aushändigung des Zeugnisses bekannt, so können die Noten der Modulprüfungen, bei denen getäuscht wurde, berichtigt werden. Gegebenenfalls kann die Modulprüfung für „nicht ausreichend“ (5,0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass die/den Studierende darüber täuschten wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat die/den Studierende die Zulassung vorsätzlich zu Unrecht erworben, so kann die Modulprüfung für „nicht ausreichend“ (5,0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(3) Vor einer Entscheidung des Prüfungsausschusses ist Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Mit dem unrichtigen Zeugnis ist auch die Masterurkunde einzuziehen, wenn die Masterprüfung aufgrund einer Täuschung für „nicht bestanden“ erklärt wurde.


(6) Die Aberkennung des akademischen Grades richtet sich nach § 36 Abs. 7 LHG.

#### § 24 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Masterprüfung wird den Studierenden auf Antrag innerhalb eines Jahres Einsicht in das Prüfungsexemplar ihrer Masterarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.

(2) Für die Einsichtnahme in die schriftlichen Modulprüfungen, schriftlichen Modulteilprüfungen bzw. Prüfungsprotokolle gilt eine Frist von einem Monat nach Bekanntgabe des Prüfungsergebnisses.

(3) Der/die Prüfende bestimmt Ort und Zeit der Einsichtnahme.

(4) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.
§ 25 Inkrafttreten, Übergangsvorschriften

(1) Diese Studien- und Prüfungsordnung tritt am 01. Oktober 2015 in Kraft und gilt für
1. Studierende, die ihr Studium im Masterstudiengang Wirtschaftsingenieurwesen am KIT im ersten Fachsemester aufnehmen, sowie
2. für Studierende, die ihr Studium im Masterstudiengang Wirtschaftsingenieurwesen am KIT in einem höheren Fachsemester aufnehmen, sofern dieses Fachsemester nicht über dem Fachsemester liegt, das der erste Jahrgang nach Ziff. 1 erreicht.

1. Studierende, die ihr Studium im Masterstudiengang Wirtschaftsingenieurwesen am KIT zuletzt im Sommersemester 2015 aufgenommen haben, sowie
2. für Studierende, die ihr Studium im Masterstudiengang Wirtschaftsingenieurwesen am KIT ab dem Wintersemester 2015/16 in einem höheren Fachsemester aufnehmen, sofern das Fachsemester über dem liegt, das der erste Jahrgang nach Absatz 1 Ziff. 1 erreicht hat. Im Übrigen tritt sie außer Kraft.


Karlsruhe, den 24. September 2015

Professor Dr.-Ing. Holger Hanselka
(Präsident)
Prüfungs- und Studienordnung der Universität Karlsruhe (TH) für den Masterstudiengang Wirtschaftsingenieurwesen


Der Rektor hat seine Zustimmung am 06.03.2007 erteilt.

Aus Gründen der Lesbarkeit ist in dieser Satzung nur die männliche Sprachform gewählt worden. Alle personenbezogenen Aussagen gelten jedoch stets für Frauen und Männer gleichermäßen.

Inhaltsverzeichnis

I. Allgemeine Bestimmungen
   § 1 Geltungsbereich, Ziele
   § 2 Akademischer Grad
   § 3 Regelstudienzeit, Studienaufbau, Leistungspunkte
   § 4 Aufbau der Prüfungen
   § 5 Anmeldung und Zulassung zu den Prüfungen
   § 6 Durchführung von Prüfungen und Erfolgskontrollen
   § 7 Bewertung von Prüfungen und Erfolgskontrollen
   § 8 Erlöschen des Prüfungsanspruchs, Wiederholung von Prüfungen und Erfolgskontrollen
   § 9 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß
   § 10 Mutterschutz, Elternzeit
   § 11 Masterarbeit
   § 12 Zusatzmodule, Zusatzleistungen
   § 13 Prüfungsausschuss
   § 14 Prüfer und Beisitzende
   § 15 Anrechnung von Studienzeiten, Anerkennung von Studienleistungen und Modulprüfungen

II. Masterprüfung
   § 16 Umfang und Art der Masterprüfung
   § 17 Bestehen der Masterprüfung, Bildung der Gesamtnote
   § 18 Masterzeugnis, Masterurkunde, Transcript of Records und Diploma Supplement

III. Schlussbestimmungen
   § 19 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen
   § 20 Aberkennung des Mastergrades
   § 21 Einsicht in die Prüfungsakten
   § 22 In-Kraft-Treten
I. Allgemeine Bestimmungen

§ 1 Geltungsbereich, Ziele
(1) Diese Masterprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Masterstudiengang Wirtschaftsingenieurwesen an der Universität Karlsruhe (TH).

(2) Im Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft oder ergänzt werden. Der Studierende soll in der Lage sein, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite für die Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bewerten.

§ 2 Akademischer Grad
Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science“ (abgekürzt: „M.Sc.“) für den Masterstudiengang Wirtschaftsingenieurwesen verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte
(1) Die Regelstudienzeit beträgt vier Semester. Sie umfasst Prüfungen und die Masterarbeit.

(2) Die im Studium zu absolvierenden Lehrinhalte sind auf Fächer verteilt. Die Fächer sind in Module gegliedert, die jeweils aus einer Lehrveranstaltung oder mehreren thematisch und zeitlich aufeinander bezogenen Lehrveranstaltungen bestehen. Studienplan oder Modulhandbuch beschreiben Art, Umfang und Zuordnung der Module zu einem Fach sowie die Möglichkeiten, Module untereinander zu kombinieren. Die Fächer und ihr Umfang werden in § 16 definiert.


(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studienleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 120 Leistungspunkte.

(5) Die Leistungspunkte sind in der Regel gleichmäßig auf die Semester zu verteilen.

(6) Lehrveranstaltungen/Prüfungen können auch in englischer Sprache angeboten/abgenommen werden.

§ 4 Aufbau der Prüfungen

(2) Erfolgskontrollen sind:
1. schriftliche Prüfungen,
2. mündliche Prüfungen,
3. Erfolgskontrollen anderer Art.

Erfolgskontrollen anderer Art sind z. B. Vorträge, Marktstudien, Projekte, Fallstudien, Experimente, schriftliche Arbeiten, Berichte, Seminararbeiten und Klausuren, sofern sie nicht als schriftliche oder mündliche Prüfung in der Modul- oder Lehrveranstaltungsbeschreibung im Modulhandbuch ausgewiesen sind.
(3) In den Fachprüfungen (nach § 16 Absatz 2 Nr. 1 bis 6) sind mindestens 50 vom Hundert einer Modulprüfung in Form von schriftlichen oder mündlichen Prüfungen (Absatz 2 Nr. 1 und 2) abzulegen, die restliche Prüfung erfolgt durch Erfolgskontrollen anderer Art (Absatz 2 Nr. 3).

§ 5 Anmeldung und Zulassung zu den Prüfungen
(1) Die Zulassung zu den Prüfungen nach § 4 Absatz 2 Nr. 1 und 2 sowie zur Masterarbeit erfolgt im Studienbüro.

Um zu Prüfungen in einem Modul zugelassen zu werden, muss beim Studienbüro eine bindende Erklärung über die Wahl des betreffenden Moduls und dessen Zuordnung zu einem Fach, wenn diese Wahlmöglichkeit besteht, abgegeben werden.

(2) Die Zulassung darf nur abgelehnt werden, wenn der Studierende in einem mit Wirtschaftingenieurwesen vergleichbaren oder einem verwandten Studiengang bereits eine Diplomvorprüfung, Diplomprüfung, Bachelor- oder Masterprüfung endgültig nicht bestanden hat, sich in einem Prüfungsverfahren befindet oder den Prüfungsanspruch in einem solchen Studiengang verloren hat.

In Zweifelsfällen entscheidet der Prüfungsausschuss.

§ 6 Durchführung von Prüfungen und Erfolgskontrollen
(1) Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach, durchgeführt.

(2) Die Art der Erfolgskontrollen (§ 4 Absatz 2 Nr. 1 bis 3) eines Moduls wird im Studienplan oder Modulhandbuch in Bezug auf die Lehrinhalte der betreffenden Lehrveranstaltungen und die Lehrziele des Moduls festgelegt. Die Art der Erfolgskontrollen, ihre Häufigkeit, Reihenfolge und Gewichtung, die Grundsätze zur Bildung der Modulteilprüfungsnoten und der Modulenote sowie Prüfer müssen mindestens sechs Wochen vor Semesterbeginn bekannt gegeben werden. Im Einvernehmen von Prüfer und Studierendem kann die Art der Erfolgskontrolle auch nachträglich geändert werden. Dabei ist jedoch § 4 Absatz 3 zu berücksichtigen.


Wird die Wiederholungsprüfung einer schriftlichen Prüfung in mündlicher Form abgelegt, entfällt die mündliche Nachprüfung nach § 8 Absatz 2.

(4) Macht ein Studierender glaubhaft, dass er wegen länger andauernder oder ständiger körperlicher Behinderung nicht in der Lage ist, die Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen Form abzulegen, entscheidet der Prüfungsausschuss über eine alternative Form der Erfolgskontrollen.

(5) Bei Lehrveranstaltungen in englischer Sprache werden die entsprechenden Erfolgskontrollen in der Regel in englischer Sprache abgenommen.


(7) Mündliche Prüfungen (§ 4 Absatz 2 Nr. 2) sind von mehreren Prüfern (Kollegialprüfung) oder von einem Prüfer in Gegenwart eines Beisitzenden als Gruppen- oder Einzelprüfungen abzu-
nehmen und zu bewerten. Vor der Festsetzung der Note hört der Prüfer die anderen an der Kollegialprüfung mitwirkenden Prüfer an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 45 Minuten pro Studierendem.


(10) Für Erfolgskontrollen anderer Art sind angemessene Bearbeitungsfristen einzuräumen und Abgabetermine festzulegen. Dabei ist durch die Art der Aufgabenstellung und durch entsprechende Dokumentation sicherzustellen, dass die erbrachte Studienleistung dem Studierenden zurechenbar ist.

(11) Schriftliche Arbeiten im Rahmen einer Erfolgskontrolle anderer Art haben dabei die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Trägt die Arbeit diese Erklärung nicht, wird diese Arbeit nicht angenommen.

(12) Bei mündlich durchgeführten Erfolgskontrollen anderer Art muss neben dem Prüfer ein Beisitzer anwesend sein, der zusätzlich zum Prüfer die Protokolle zeichnet.

§ 7 Bewertung von Prüfungen und Erfolgskontrollen

(1) Das Ergebnis einer Erfolgskontrolle wird von den jeweiligen Prüfern in Form einer Note festgesetzt.

(2) Im Masterzeugnis dürfen nur folgende Noten verwendet werden:

<table>
<thead>
<tr>
<th>1</th>
<th>sehr gut (very good)</th>
<th>hervorragende Leistung</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>gut (good)</td>
<td>eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt</td>
</tr>
<tr>
<td>3</td>
<td>befriedigend (satisfactory)</td>
<td>eine Leistung, die durchschnittlichen Anforderungen entspricht</td>
</tr>
<tr>
<td>4</td>
<td>ausreichend (sufficient)</td>
<td>eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt</td>
</tr>
<tr>
<td>5</td>
<td>nicht ausreichend (failed)</td>
<td>eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt</td>
</tr>
</tbody>
</table>

Für die Masterarbeit und die Modulteilprüfungen sind zur differenzierten Bewertung nur folgende Noten zugelassen:

| 1 | 1.0, 1.3 | sehr gut |
| 2 | 1.7, 2.0, 2.3 | gut |
| 3 | 2.7, 3.0, 3.3 | befriedigend |
| 4 | 3.7, 4.0 | ausreichend |
| 5 | 4.7, 5.0 | nicht ausreichend |

Diese Noten müssen in den Protokollen und in den Anlagen (Transcript of Records und Diploma Supplement) verwendet werden.
Für Erfolgskontrollen anderer Art kann die Benotung „bestanden“ (passed) oder „nicht bestanden“ (failed) vergeben werden.

Bei der Bildung der gewichteten Durchschnitte der Fachnoten, Modulnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

Jedes Modul, jede Lehrveranstaltung und jede Erfolgskontrolle darf jeweils nur einmal angerechnet werden.

Erfolgskontrollen anderer Art dürfen in Modulteilprüfungen oder Modulprüfungen nur einge-rechnet werden, wenn die Benotung nicht nach Absatz 3 erfolgt ist. Die zu dokumentierenden Erfolgskontrollen und die daran geknüpfte Bedingungen werden im Studienplan oder Modulhandbuch festgelegt.

Eine Modulteilprüfung ist bestanden, wenn die Note mindestens „ausreichend“ (4.0) ist.


Eine Fachprüfung ist bestanden, wenn die für das Fach erforderliche Anzahl von Leistungspunkten über die im Studienplan oder Modulhandbuch definierten Modulprüfungen nachgewiesen wird.

Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein.

Die Ergebnisse der Masterarbeit, der Modulprüfungen bzw. der Modulteilprüfungen, der Erfolgskontrollen anderer Art sowie die erworbenen Leistungspunkte werden durch das Studienbüro der Universität erfasst.

Innerhalb der Regelstudienzeit, einschließlich der Urlaubssemester für das Studium an einer ausländischen Hochschule (Regelprüfungszeit), können in einem Fach auch mehr Leistungspunkte erworben werden als für das Bestehen der Fachprüfung erforderlich sind. In diesem Fall werden bei der Festlegung der Fachnote nur die Modulnoten berücksichtigt, die unter Abdeckung der erforderlichen Leistungspunkte die beste Fachnote ergeben.

Die in diesem Sinne für eine Fachprüfung nicht gewerteten Erfolgskontrollen und Leistungspunkte können im Rahmen der Zusatzfachprüfung nach § 12 nachträglich geltend gemacht werden.

Die Gesamtnote der Masterprüfung, die Fachnoten und die Modulnoten lauten:

<table>
<thead>
<tr>
<th>Notenbereich</th>
<th>Bewertung</th>
</tr>
</thead>
<tbody>
<tr>
<td>bis 1,5</td>
<td>sehr gut</td>
</tr>
<tr>
<td>1.6 bis 2.5</td>
<td>gut</td>
</tr>
<tr>
<td>2.6 bis 3.5</td>
<td>befriedigend</td>
</tr>
<tr>
<td>3.6 bis 4.0</td>
<td>ausreichend</td>
</tr>
</tbody>
</table>
Zusätzlich zu den Noten nach Absatz 2 werden ECTS-Noten für Fachprüfungen, Modulprüfungen und für die Masterprüfung nach folgender Skala vergeben:

<table>
<thead>
<tr>
<th>ECTS-Note</th>
<th>Quote</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>gehört zu den besten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben</td>
</tr>
<tr>
<td>B</td>
<td>25</td>
<td>gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben</td>
</tr>
<tr>
<td>C</td>
<td>30</td>
<td>gehört zu den nächsten 30 % der Studierenden, die die Erfolgskontrolle bestanden haben</td>
</tr>
<tr>
<td>D</td>
<td>25</td>
<td>gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben</td>
</tr>
<tr>
<td>E</td>
<td>10</td>
<td>gehört zu den letzten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben</td>
</tr>
<tr>
<td>FX</td>
<td>nicht bestanden (failed) – es sind Verbesserungen erforderlich, bevor die Leistungen anerkannt werden</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>nicht bestanden (failed) – es sind erhebliche Verbesserungen erforderlich</td>
<td></td>
</tr>
</tbody>
</table>

Die Quote ist als der Prozentsatz der erfolgreichen Studierenden definiert, die diese Note in der Regel erhalten. Dabei ist von einer mindestens fünfjährigen Datenbasis über mindestens 30 Studierende auszugehen. Für die Ermittlung der Notenverteilungen, die für die ECTS-Noten erforderlich sind, ist das Studienbüro der Universität zuständig.

§ 8 Erlöschen des Prüfungsanspruchs, Wiederholung von Prüfungen und Erfolgskontrollen

(1) Studierende können eine nicht bestandene schriftliche Prüfung (§ 4 Absatz 2 Nr. 1) einmal wiederholen. Wird eine schriftliche Wiederholungsprüfung mit „nicht ausreichend“ bewertet, so findet eine mündliche Nachprüfung im zeitlichen Zusammenhang mit dem Termin der nicht bestandenen Prüfung statt. In diesem Falle kann die Note dieser Prüfung nicht besser als 4.0 (ausreichend) sein.

(2) Studierende können eine nicht bestandene mündliche Prüfung (§ 4 Absatz 2 Nr. 2) einmal wiederholen.


(4) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Absatz 2 Nr. 3) wird im Modulhandbuch geregelt.


Bei nicht bestandener Erfolgskontrolle sind dem Kandidaten Umfang und Frist der Wiederholung in geeigneter Weise bekannt zu machen.

(6) Die Wiederholung einer bestandenen Erfolgskontrolle ist nicht zulässig.

(7) Eine Fachprüfung ist nicht bestanden, wenn mindestens ein Modul des Faches nicht bestanden ist.

(9) Ist gemäß § 34 Absatz 2 Satz 3 LHG die Masterprüfung bis zum Beginn der Vorlesungszeit des achten Fachsemesters einschließlich etwaiger Wiederholungen nicht vollständig abgelegt, so erlischt der Prüfungsanspruch im Studiengang, es sei denn, dass der Studierende die Fristüberschreitung nicht zu vertreten hat. Die Entscheidung darüber trifft der Prüfungsausschuss.

(10) Der Prüfungsanspruch erlischt endgültig, wenn mindestens einer der folgenden Gründe vorliegt:
1. Der Prüfungsausschuss lehnt einen Antrag auf Fristverlängerung nach Absatz 9 ab.
2. Die Masterarbeit ist endgültig nicht bestanden.
3. Eine Erfolgskontrolle nach § 4 Absatz 2 Nr. 1 und 2 ist in einem Fach endgültig nicht bestanden.

Eine Erfolgskontrolle ist dann endgültig nicht bestanden, wenn keine Wiederholungsmöglichkeit im Sinne von Absatz 2 mehr besteht oder gemäß Absatz 5 genehmigt wird. Dies gilt auch sinngemäß für die Masterarbeit.

§ 9 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß


Wird der Grund anerkannt, wird ein neuer Termin anberaumt. Die bereits vorliegenden Prüfungsergebnisse sind in diesem Fall anzurechnen.

Bei Modulprüfungen, die aus mehreren Prüfungen bestehen, werden die Prüfungsleistungen dieses Moduls, die bis zu einem anerkannten Rücktritt bzw. einem anerkannten Versäumnis einer Prüfungsleistung dieses Moduls erbracht worden sind, angerechnet.

(4) Versucht der Studierende das Ergebnis einer Erfolgskontrolle durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5.0) bewertet.


Näheres regelt die Allgemeine Satzung der Universität Karlsruhe (TH) über die Redlichkeit bei Prüfungen und Praktika.

§ 10 Mutterschutz, Elternzeit


§ 11 Masterarbeit

Voraussetzung für die Zulassung zur Masterarbeit ist, dass der Studierende sich in der Regel im 2. Studienjahr befindet und nicht mehr als vier der Fachprüfungen laut § 16 Absatz 2 Nr. 1 bis 6 noch nachzuweisen sind.

Vor Zulassung sind Betreuer, Thema und Anmeldedatum dem Prüfungsausschuss bekannt zu geben und im Falle einer Betreuung außerhalb der Fakultät für Wirtschaftswissenschaften durch den Prüfungsausschuss zu genehmigen.


Die Masterarbeit kann von jedem Prüfer nach § 14 Absatz 2 vergeben und betreut werden. Soll die Masterarbeit außerhalb der Fakultät angefertigt werden, so bedarf dies der Genehmigung des Prüfungsausschusses gemäß Absatz 1. Dem Studierenden ist Gelegenheit zu geben,
für das Thema Vorschläge zu machen. Die Masterarbeit kann auch in Form einer Gruppenarbeit zugelassen werden, wenn der als Prüfungsleistung zu bewertende Beitrag des einzelnen Studierenden aufgrund objektiver Kriterien, die eine eindeutige Abgrenzung ermöglichen, deutlich unterscheidbar ist und die Anforderung nach Absatz 3 erfüllt.

(5) Bei der Abgabe der Masterarbeit hat der Studierende schriftlich zu versichern, dass er die Arbeit selbstständig verfasst hat und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt hat, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung der Universität Karlsruhe (TH) zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet hat. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Bei Abgabe einer unwahren Versicherung wird die Masterarbeit mit „nicht ausreichend“ (5.0) bewertet.


**§ 12 Zusatzmodule, Zusatzleistungen**

(1) Der Studierende kann sich weiteren Prüfungen in Modulen unterziehen. § 3, § 4 und § 8 Absatz 10 der Prüfungsordnung bleiben davon unberührt.


(3) Der Studierende hat bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

**§ 13 Prüfungsausschuss**


(2) Der Vorsitzende, sein Stellvertreter, die weiteren Mitglieder des Prüfungsausschusses sowie deren Stellvertreter werden vom Fakultätsrat bestellt, die Mitglieder der Gruppe der wissenschaftlichen Mitarbeiter nach § 10 Absatz 1 Satz 2 Nr. 2 LHG und der Vertreter der Studierenden
auf Vorschlag der Mitglieder der jeweiligen Gruppe; Wiederbestellung ist möglich. Der Vorsitzende und dessen Stellvertreter müssen Professor oder Juniorprofessor sein. Der Vorsitzende des Prüfungsausschusses nimmt die laufenden Geschäfte wahr und wird durch ein Prüfungssekretariat unterstützt.

(3) Der Prüfungsausschuss regelt die Auslegung und die Umsetzung der Prüfungsordnung in die Prüfungspraxis der Fakultät. Er achtet darauf, dass die Bestimmungen der Prüfungsordnung eingehalten werden. Er berichtet regelmäßig dem Fakultätsrat über die Entwicklung der Prüfungen und Studienzeiten sowie über die Verteilung der Fach- und Gesamtnoten und gibt Anregungen zur Reform des Studienplans und der Prüfungsordnung.

(4) Der Prüfungsausschuss kann die Erledigung seiner Aufgaben in dringenden Angelegenheiten und für alle Regelfälle auf den Vorsitzenden des Prüfungsausschusses übertragen.


(6) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses ein fachlich zuständiger und von der betroffenen Fakultät zu nennender Professor, Juniorprofessor, Hochschul- oder Privatdozent hinzuzuziehen. Er hat in diesem Punkt Stimmrecht.


§ 14 Prüfer und Beisitzende

(1) Der Prüfungsausschuss bestellt die Prüfer und die Beisitzenden. Er kann die Bestellung dem Vorsitzenden übertragen.

(2) Prüfer sind Hochschullehrer und habilitierte Mitglieder sowie wissenschaftliche Mitarbeiter der jeweiligen Fakultät, denen die Prüfungsbefugnis übertragen wurde. Bestellt werden darf nur, wer mindestens die dem jeweiligen Prüfungsgegenstand entsprechende fachwissenschaftliche Qualifikation erworben hat. Bei der Bewertung der Masterarbeit muss ein Prüfer Hochschullehrer sein.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zum Prüfer bestellt werden, wenn die Fakultät ihnen eine diesbezügliche Prüfungsbefugnis erteilt hat.

(4) Zum Beisitzenden darf nur bestellt werden, wer einen dem jeweiligen Prüfungsgegenstand entsprechenden akademischen Abschluss erworben hat.

§ 15 Anrechnung von Studienzeiten, Anerkennung von Studienleistungen und Modulprüfungen

(2) Werden Leistungen angerechnet, so werden die Noten – soweit die Notensysteme vergleichbar sind – übernommen und in die Berechnung der Modulnoten und der Gesamtnote einbezogen. Falls es sich dabei um Leistungen handelt, die im Rahmen eines Auslandsstudiums erbracht werden, während der Studierende an der Universität Karlsruhe (TH) für Wirtschaftsingenieurwesen immatrikuliert ist, kann der Prüfungsausschuss für ausgewählte Sprachen die Dokumentation anerkannter Studienleistungen im Transcript of Records mit ihrer fremdsprachlichen Originalbezeichnung festlegen. Liegen keine Noten vor, wird die Leistung nicht anerkannt. Der Studierende hat die für die Anrechnung erforderlichen Unterlagen vorzulegen.

(3) Bei der Anrechnung von Studienzeiten und der Anerkennung von Studienleistungen und Modulprüfungen, die außerhalb der Bundesrepublik erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(4) Absatz 1 gilt auch für Studienzeiten, Studienleistungen und Modulprüfungen, die in staatlich anerkannten Fernstudien und an anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufskademien erworben wurden.

(5) Die Anerkennung von Teilen der Masterprüfung kann versagt werden, wenn in einem Studiengang mehr als die Hälfte aller Erfolgskontrollen und/oder mehr als die Hälfte der erforderlichen Leistungspunkte und/oder die Masterarbeit anerkannt werden sollen.

(6) Zuständig für die Anrechnungen ist der Prüfungsausschuss. Vor Feststellungen über die Gleichwertigkeit sind die zuständigen Fachvertreter zu hören. Der Prüfungsausschuss entscheidet in Abhängigkeit von Art und Umfang der anzurechnenden Studien- und Prüfungsleistungen über die Einstufung in ein höheres Fachsemester.

II. Masterprüfung

§ 16 Umfang und Art der Masterprüfung

(1) Die Masterprüfung besteht aus den Fachprüfungen nach Absatz 2, einem Seminarmodul nach Absatz 3 sowie der Masterarbeit nach § 11.

(2) Es sind Fachprüfungen im Umfang von neun Modulen mit je neun Leistungspunkten abzulegen. Die Module verteilen sich wie folgt auf die Fächer:

1. Betriebswirtschaftslehre: zwei Module im Umfang von je 9 Leistungspunkten,
2. Volkswirtschaftslehre: ein Modul im Umfang von 9 Leistungspunkten,
3. Informatik: ein Modul im Umfang von 9 Leistungspunkten,
4. Operations Research: ein Modul im Umfang von 9 Leistungspunkten,
5. Ingenieurwissenschaften: zwei Module im Umfang von je 9 Leistungspunkten,


(4) Die Module, die ihnen zugeordneten Lehrveranstaltungen und Leistungspunkte sowie die Zuordnung der Module zu Fächern sind im Studienplan oder im Modulhandbuch geregelt.
Studienplan oder Modulhandbuch können auch Mehrfachmodule definieren, die aus 18 Leistungspunkten (Doppelmodul) bzw. 27 Leistungspunkten (Dreifachmodul) bestehen und für Fachprüfungen nach 1. bis 6. bei in Summe mindestens gleicher Leistungspunktezahl entsprechend anrechenbar sind. Auch die Mehrfachmodule mit ihren zugeordneten Lehrveranstaltungen, Leistungspunkten und Fächern bzw. Fächerkombinationen sind im Studienplan oder Modulhandbuch geregelt.

(5) Im Studienplan oder Modulhandbuch können darüber hinaus inhaltliche Schwerpunkte definiert werden, denen Module zugeordnet werden können.

Legen die Studierenden ihre Fachprüfungen nach Absatz 2 und 3 in Modulen ab, die nach Art und Umfang den im Studienplan oder Modulhandbuch definierten Anforderungen an diese inhaltlichen Schwerpunkte entsprechen, und wird darüber hinaus die Masterarbeit diesem inhaltlichen Schwerpunkt zugeordnet, so wird der inhaltliche Schwerpunkt auf Antrag des Studierenden in das Diploma Supplement aufgenommen.

§ 17 Bestehen der Masterprüfung, Bildung der Gesamtnote

(1) Die Masterprüfung ist bestanden, wenn alle in § 16 genannten Prüfungsleistungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Masterprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt. Dabei werden die Fachprüfungen nach § 16 Absatz 2, das Seminarmodul nach § 16 Absatz 3 und die Masterarbeit nach § 11 mit ihren Leistungspunkten gewichtet.

(3) Hat der Studierende die Masterarbeit mit der Note 1.0 und die Masterprüfung mit einem Durchschnitt von 1.1 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen.

§ 18 Masterzeugnis, Masterurkunde, Transcript of Records und Diploma Supplement


(2) Das Zeugnis enthält die in den Fachprüfungen, den Modulprüfungen sowie dem Seminarmodul und der Masterarbeit erzielten Noten, deren zugeordnete Leistungspunkte und ECTS-Noten und die Gesamtnote und die ihr entsprechende ECTS-Note. Das Zeugnis ist vom Dekan der Fakultät und vom Vorsitzenden des Prüfungsausschusses zu unterzeichnen.


(4) Die Abschrift der Studiendaten (Transcript of Records) enthält in strukturierter Form alle erbrachten Prüfungsleistungen. Dies beinhaltet alle Fächer, Fachnoten und ihre entsprechende ECTS-Note samt den zugeordneten Leistungspunkten, die dem jeweiligen Fach zugeordneten Module mit den Modulnoten, entsprechender ECTS-Note und zugeordneten Leistungspunkten sowie die den Modulen zugeordneten Lehrveranstaltungen samt Noten und zugeordneten Leistungspunkten. Aus der Abschrift der Studiendaten soll die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen und die Zugehörigkeit der Module zu den einzelnen Fächern sowie
bei entsprechendem Antrag des Studierenden zum möglichen inhaltlichen Schwerpunkt gemäß § 16 Absatz 4 deutlich erkennbar sein. Angerechnete Studienleistungen sind im Transcript of Records aufzunehmen.

(5) Die Masterurkunde, das Masterzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studienbüro der Universität ausgestellt.

III. Schlussbestimmungen

§ 19 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen

(1) Der Bescheid über die endgültig nicht bestandene Masterprüfung wird dem Studierenden durch den Prüfungsausschuss in schriftlicher Form erteilt. Der Bescheid ist mit einer Rechtsbehelfsbelehrung zu versehen.

(2) Hat der Studierende die Masterprüfung endgültig nicht bestanden, wird ihm auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Prüfungsleistungen und deren Noten sowie die zur Prüfung noch fehlenden Prüfungsleistungen enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 20 Aberkennung des Mastergrades

(1) Hat der Studierende bei einer Prüfungsleistung getäuscht und wird diese Tatsache nach der Aushändigung des Zeugnisses bekannt, so können die Noten der Modulprüfungen, bei denen getäuscht wurde, berichtigt werden. Gegebenenfalls kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass der Studierende darüber täuschen wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat der Studierende die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(3) Vor einer Entscheidung ist Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Mit dem unrichtigen Zeugnis ist auch die Masterurkunde einzuziehen, wenn die Masterprüfung auf Grund einer Täuschung für nicht bestanden erklärt wurde.


(6) Die Aberkennung des akademischen Grades richtet sich nach den gesetzlichen Vorschriften.

§ 21 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Masterprüfung wird dem Studierenden auf Antrag innerhalb eines Jahres Einsicht in seine Masterarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.


(3) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.
§ 22 In-Kraft-Treten


Karlsruhe, den 06.03.2007

Professor Dr. sc. tech. Horst Hippler
(Rektor)
Aufbau des Masterstudiengangs Wirtschaftsingenieurwesen

Die Regelstudienzeit im Masterstudiengang Wirtschaftsingenieurwesen beträgt vier Semester. Im Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft oder ergänzt werden. Der Studierende soll in die Lage versetzt werden, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite bei der Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bearbeiten.


<table>
<thead>
<tr>
<th>Semester</th>
<th>Modul BWL 9</th>
<th>Modul ING 9</th>
<th>Modul Info 9</th>
<th>Modul Wahlpflicht 9</th>
<th>Seminare + SQ 6 + 3</th>
<th>Masterarbeit 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>2.</td>
<td>Modul VWL 9</td>
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<td>Modul OR 9</td>
<td></td>
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<td>30</td>
</tr>
<tr>
<td>3.</td>
<td>Modul BWL 8</td>
<td>Modul Wahlpflicht 9</td>
<td>Modul Seminare + SQ 6 + 3</td>
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<td></td>
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<td>4.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Gesamt: 120
## Index

### A

- Advanced Game Theory (T) .................................................. 236
- Advanced Lab Informatics (T) .............................................. 237
- Advanced Management Accounting (T) ................................ 240
- Advanced Statistics (T) ...................................................... 241
- Advanced Stochastic Optimization (T) ................................. 242
- Advanced Topics in Economic Theory (T) ............................ 243
- Advanced Topics in Public Finance (M) ............................... 130
- Agglomeration and Innovation (M) ...................................... 133
- Airport Logistics (T) ......................................................... 244
- Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines (T) ............................................. 245
- Analysis Tools for Combustion Diagnostics (T) .................... 246
- Analytics and Statistics (M) .................................................. 224
- Applied Ecology and Water Quality (T) ............................... 247
- Applied Informatics II - IT Systems for eCommerce (T) ........ 248
- Applied Strategic Decisions (M) ............................................ 126
- Asset Pricing (T) ............................................................... 249
- Auction Theory (T) ............................................................. 250
- Automated Financial Advisory (T) ...................................... 251
- Automated Manufacturing Systems (M) ............................... 209
- Automated Manufacturing Systems (T) ............................... 252
- Automation of Discrete Event and Hybrid Systems (T) ........ 254
- Automotive Engineering (M) ............................................... 151
- Automotive Engineering I (T) .............................................. 255, 257
- Automotive Engineering II (T) ............................................. 259
- Automotive Logistics (T) ..................................................... 260

### B

- Basics of Liberalised Energy Markets (T) ............................. 261
- Basics of Technical Logistics (T) ......................................... 263
- Bayesian Methods for Financial Economics (T) ..................... 264
- Bayesian Risk Analytics and Machine Learning (T) ............. 265
- Behavioral Approaches in Marketing (T) ............................. 266
- BioMEMS (M) ................................................................. 192
- BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I (T) .................................................. 267
- BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II (T) ............................................. 268
- BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III (T) ............................................. 270
- Bionics for Engineers and Natural Scientists (T) .................. 271
- Building Laws (T) .............................................................. 272
- BUS-Controls (T) ............................................................... 273
- Business & Service Engineering (M) ................................... 103
- Business Administration in Information Engineering and Management (T) ............................................. 274
- Business and IT Service Management (T) ............................. 276
- Business data strategy (T) .................................................. 277
- Business Dynamics (T) ....................................................... 278
- Business Intelligence Systems (T) ....................................... 280
- Business Models in the Internet: Planning and Implementation (T) .................................................. 281
- Business Planning (T) .......................................................... 282

### C

- CAD-NX Training Course (T) .............................................. 286
- Case Studies in Sales and Pricing (T) .................................. 287
- Case Studies Seminar: Innovation Management (T) ............ 288
- CATIA CAD Training Course (T) ........................................ 289
- Ceramic Processing Technology (T) .................................... 290
- Challenges in Supply Chain Management (T) ..................... 291
- Characteristics of Transportation Systems (T) ...................... 293
- Chemical, Physical and Material Scientific Aspects of Poly- mers in Microsystem Technologies (T) ................. 294
- Civil Law for Advanced (T) .................................................. 295
- Collective Decision Making (M) ......................................... 118
- Combustion Engines I (M) ................................................. 156
- Combustion Engines I (T) .................................................. 296
- Combustion Engines II (M) ................................................. 165
- Combustion Engines II (T) .................................................. 297
- Commercial Law (M) ......................................................... 228
- Communication Systems and Protocols (T) ......................... 298
- Competition in Networks (T) .............................................. 299
- Computational Economics (T) ............................................ 300
- Computational Finance (M) ............................................... 62
- Computational FinTech with Python and C++ (T) ............... 302
- Computational Risk and Asset Management (T) .................... 303
- Computer Contract Law (T) .............................................. 304
- Computer Integrated Planning of New Products (T) ............ 305
- Constitution and Properties of Protective Coatings (T) ........ 306
- Constitution and Properties of Wearresistant Materials (T) .... 308
- Construction and Maintenance of Guided Track Infrastruc- ture (T) .............................................................. 310
- Construction Equipment (T) .............................................. 311
- Consumer Behavior (T) ..................................................... 312
- Control Engineering II (M) ................................................. 211
- Control of Linear Multivariable Systems (T) ....................... 313
- Control Technology (T) ..................................................... 314
- Convex Analysis (T) .......................................................... 316
- Copyright (T) ................................................................. 317
- Corporate Compliance (T) ................................................. 318
- Corporate Financial Policy (T) .......................................... 319
- Country Manager Simulation (T) ......................................... 320
- Credit Risk (T) ............................................................... 321
- Cross-functional Management Accounting (M) ................... 105
- Current Issues in Innovation Management (T) ..................... 322
- Current Issues in the Insurance Industry (T) ....................... 323
- Current Topics on BioMEMS (T) ....................................... 324

### D

- Data Mining and Applications (T) ....................................... 325
- Data Protection Law (T) ..................................................... 327
- Data Science: Advanced CRM (M) .................................... 59
- Data Science: Data-Driven Information Systems (M) ......... 42
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Science: Data-Driven User Modeling (M)</td>
<td>97</td>
</tr>
<tr>
<td>Data Science: Evidence-based Marketing (M)</td>
<td>54</td>
</tr>
<tr>
<td>Database Systems and XML (T)</td>
<td>328</td>
</tr>
<tr>
<td>Derivatives (T)</td>
<td>330</td>
</tr>
<tr>
<td>Design Basics in Highway Engineering (T)</td>
<td>331</td>
</tr>
<tr>
<td>Design Thinking (T)</td>
<td>332</td>
</tr>
<tr>
<td>Design, Construction, Operation and Maintenance of Highways (M)</td>
<td>162</td>
</tr>
<tr>
<td>Designing Interactive Systems (M)</td>
<td>93</td>
</tr>
<tr>
<td>Developing Business Models for the Semantic Web (T)</td>
<td>333</td>
</tr>
<tr>
<td>Digital Service Design (T)</td>
<td>335</td>
</tr>
<tr>
<td>Digital Service Systems in Industry (M)</td>
<td>101</td>
</tr>
<tr>
<td>Digital Transformation of Organizations (T)</td>
<td>336</td>
</tr>
<tr>
<td>Disassembly Process Engineering (T)</td>
<td>337</td>
</tr>
<tr>
<td>Discrete-Event Simulation in Production and Logistics (T)</td>
<td>338</td>
</tr>
<tr>
<td>Disruptive FinTech Innovations (M)</td>
<td>110</td>
</tr>
<tr>
<td>Document Management and Groupware Systems (T)</td>
<td>339</td>
</tr>
<tr>
<td>Econometrics and Statistics I (M)</td>
<td>226</td>
</tr>
<tr>
<td>Econometrics and Statistics II (M)</td>
<td>227</td>
</tr>
<tr>
<td>Economic Efficiency of Guided Transport Systems (T)</td>
<td>340</td>
</tr>
<tr>
<td>Economic Integration in Europe (T)</td>
<td>341</td>
</tr>
<tr>
<td>Economic Policy II (M)</td>
<td>132</td>
</tr>
<tr>
<td>Economic Theory and its Application in Finance (M)</td>
<td>116</td>
</tr>
<tr>
<td>eEnergy: Markets, Services, Systems (T)</td>
<td>342</td>
</tr>
<tr>
<td>Efficient Energy Systems and Electric Mobility (T)</td>
<td>344</td>
</tr>
<tr>
<td>eFinance: Information Engineering and Management for Securities Trading (T)</td>
<td>345</td>
</tr>
<tr>
<td>Electives in Informatics (M)</td>
<td>220</td>
</tr>
<tr>
<td>Electrical Railway Traction Systems (T)</td>
<td>347</td>
</tr>
<tr>
<td>Electronic Markets (M)</td>
<td>76</td>
</tr>
<tr>
<td>Elements and Systems of Technical Logistics (T)</td>
<td>348</td>
</tr>
<tr>
<td>Elements of Technical Logistics and Project (T)</td>
<td>349</td>
</tr>
<tr>
<td>Emissions into the Environment (T)</td>
<td>350</td>
</tr>
<tr>
<td>Emphasis in Informatics (M)</td>
<td>222</td>
</tr>
<tr>
<td>Employment Law I (T)</td>
<td>351</td>
</tr>
<tr>
<td>Employment Law II (T)</td>
<td>352</td>
</tr>
<tr>
<td>Energy and Environment (T)</td>
<td>353</td>
</tr>
<tr>
<td>Energy and Process Technology I (M)</td>
<td>170</td>
</tr>
<tr>
<td>Energy and Process Technology I (T)</td>
<td>354</td>
</tr>
<tr>
<td>Energy and Process Technology II (M)</td>
<td>214</td>
</tr>
<tr>
<td>Energy and Process Technology II (T)</td>
<td>355</td>
</tr>
<tr>
<td>Energy Conversion and Increased Efficiency in Internal Combustion Engines (T)</td>
<td>356</td>
</tr>
<tr>
<td>Energy Economics and Energy Markets (M)</td>
<td>51</td>
</tr>
<tr>
<td>Energy Economics and Technology (M)</td>
<td>74</td>
</tr>
<tr>
<td>Energy Efficient Intralogistic Systems (T)</td>
<td>357</td>
</tr>
<tr>
<td>Energy Policy (T)</td>
<td>358</td>
</tr>
<tr>
<td>Energy Systems Analysis (T)</td>
<td>359</td>
</tr>
<tr>
<td>Energy Trade and Risk Management (T)</td>
<td>360</td>
</tr>
<tr>
<td>Engine Measurement Techniques (T)</td>
<td>362</td>
</tr>
<tr>
<td>Engineering FinTech Solutions (T)</td>
<td>363</td>
</tr>
<tr>
<td>Engineering Geophysics for external students (T)</td>
<td>364</td>
</tr>
<tr>
<td>Enterprise Architecture Management (T)</td>
<td>365</td>
</tr>
<tr>
<td>Entrepreneurial Leadership &amp; Innovation Management (T)</td>
<td>366</td>
</tr>
<tr>
<td>Entrepreneurship (T)</td>
<td>367</td>
</tr>
<tr>
<td>Entrepreneurship (EnTechnon) (M)</td>
<td>87</td>
</tr>
<tr>
<td>Entrepreneurship Research (T)</td>
<td>368</td>
</tr>
<tr>
<td>Environmental and Ressource Policy (T)</td>
<td>369</td>
</tr>
<tr>
<td>Environmental Aspects of Guided Transport Systems (T)</td>
<td>370</td>
</tr>
<tr>
<td>Environmental Communication (T)</td>
<td>371</td>
</tr>
<tr>
<td>Environmental Economics (M)</td>
<td>121</td>
</tr>
<tr>
<td>Environmental Economics and Sustainability (T)</td>
<td>372</td>
</tr>
<tr>
<td>Environmental Law (T)</td>
<td>373</td>
</tr>
<tr>
<td>Environmental Management (M)</td>
<td>152</td>
</tr>
<tr>
<td>Environmental Management (T)</td>
<td>195</td>
</tr>
<tr>
<td>European and International Law (T)</td>
<td>374</td>
</tr>
<tr>
<td>Examination Prerequisite Environmental Communication (T)</td>
<td>376</td>
</tr>
<tr>
<td>Exchanges (T)</td>
<td>377</td>
</tr>
<tr>
<td>Exercises in Civil Law (T)</td>
<td>378</td>
</tr>
<tr>
<td>Experimental Economics (M)</td>
<td>128</td>
</tr>
<tr>
<td>Experimental Economics (T)</td>
<td>381</td>
</tr>
<tr>
<td>Experimental Lab Class in Welding Technology, in Groups (T)</td>
<td>383</td>
</tr>
<tr>
<td>Extracurricular Module in Engineering (M)</td>
<td>163</td>
</tr>
<tr>
<td>Fabrication Processes in Microsystem Technology (T)</td>
<td>384</td>
</tr>
<tr>
<td>Facility Location and Strategic Supply Chain Management (T)</td>
<td>385</td>
</tr>
<tr>
<td>Failure of Structural Materials: Deformation and Fracture (T)</td>
<td>387</td>
</tr>
<tr>
<td>Failure of Structural Materials: Fatigue and Creep (T)</td>
<td>389</td>
</tr>
<tr>
<td>Field Training Water Quality (T)</td>
<td>391f.</td>
</tr>
<tr>
<td>Finance 1 (M)</td>
<td>46</td>
</tr>
<tr>
<td>Finance 2 (M)</td>
<td>81</td>
</tr>
<tr>
<td>Finance 3 (M)</td>
<td>40</td>
</tr>
<tr>
<td>Financial Analysis (T)</td>
<td>393</td>
</tr>
<tr>
<td>Financial Econometrics (T)</td>
<td>394</td>
</tr>
<tr>
<td>Financial Economics (M)</td>
<td>39</td>
</tr>
<tr>
<td>Financial Intermediation (T)</td>
<td>395</td>
</tr>
<tr>
<td>Financial Technology for Risk and Asset Management (M)</td>
<td>106</td>
</tr>
<tr>
<td>Fixed Income Securities (T)</td>
<td>396</td>
</tr>
<tr>
<td>Fluid Power Systems (T)</td>
<td>397</td>
</tr>
<tr>
<td>Foundry Technology (T)</td>
<td>398</td>
</tr>
<tr>
<td>Freight Transport (T)</td>
<td>399</td>
</tr>
<tr>
<td>Fuels and Lubricants for Combustion Engines (T)</td>
<td>400</td>
</tr>
<tr>
<td>Fundamentals for Design of Motor-Vehicle Bodies I (T)</td>
<td>401</td>
</tr>
<tr>
<td>Fundamentals for Design of Motor-Vehicle Bodies II (T)</td>
<td>403</td>
</tr>
<tr>
<td>Fundamentals in the Development of Commercial Vehicles I (T)</td>
<td>405</td>
</tr>
<tr>
<td>Fundamentals in the Development of Commercial Vehicles II (T)</td>
<td>407</td>
</tr>
<tr>
<td>Fundamentals of Automobile Development I (T)</td>
<td>409</td>
</tr>
<tr>
<td>Fundamentals of Automobile Development II (T)</td>
<td>410</td>
</tr>
<tr>
<td>Fundamentals of Catalytic Exhaust Gas Aftertreatment (T)</td>
<td>411</td>
</tr>
<tr>
<td>Fundamentals of Transportation (M)</td>
<td>179</td>
</tr>
<tr>
<td>Fundamentals of X-Ray Optics I (T)</td>
<td>413</td>
</tr>
<tr>
<td>Fundamentals of X-Ray Optics II (T)</td>
<td>414</td>
</tr>
</tbody>
</table>
Index

G

Gas Engines (T) ........................................ 415
Gas-Markets (T) ...................................... 416
Gear Cutting Technology (T) ....................... 418
Generation and transmission of renewable power (M) . 183
Global optimization I (T) .......................... 420
Global optimization I and II (T) .................... 421
Global optimization II (T) .......................... 422
Global Production and Logistics (M) ............... 201
Global Production and Logistics - Part 1: Global Production (T) ........................................... 423
Global Production and Logistics - Part 2: Global Logistics (T) ............................................. 425
Global Vehicle Evaluation within Virtual Road Test (T) 427
Governance, Risk & Compliance (M) .............. 229
Graph Theory and Advanced Location Models (T) ... 428
Growth and Agglomeration (M) ...................... 120

H

Handling Characteristics of Motor Vehicles (M) .... 212
Handling Characteristics of Motor Vehicles I (T) ... 429
Handling Characteristics of Motor Vehicles II (T) .. 431
Heat Economy (T) ..................................... 432
High Performance Powder Metallurgy Materials (T) .... 433
High-Voltage Technology (M) ....................... 164
High-Voltage Technology I (T) ........................ 434
High-Voltage Technology II (T) ..................... 435
High-Voltage Test Technique (T) .................... 436
Highway Engineering (M) ............................ 196
Homework “Project in Public Transportation” (T) .... 437
Homework “Public Transportation Operations” (T) .... 438
Homework “Track Guided Transport Systems / Engineering” (T) ........................................... 439

I

Incentives in Organizations (T) ...................... 440
Industrial Application of Material Handling Systems in Sorting and Distribution Systems (T) ........ 442
Industrial Application of Technological Logistics Instancing Crane Systems (T) ....................... 443
Industrial Production II (M) .......................... 49
Industrial Production III (M) ......................... 44
Industrial Services (T) .................................. 444
Informatics (M) ......................................... 134
Information Engineering (M) .......................... 64
Information Engineering (T) .......................... 446
Information Management for public Mobility Services (T) .................................................. 447
Information management in production (T) ........ 448
Information Service Engineering (T) .................. 449
Information Systems and Supply Chain Management (T) .................................................. 451
Information Technology and Business Information (T) .................................................. 452
Infrastructure Dimensioning and Running Dynamics Based Railway Alignment (T) ................... 453
Infrastructure Equipment of Railway Tracks (T) .... 454
Infrastructure Management (T) ...................... 455
Innovation and Growth (M) ........................... 114
Innovation Economics (M) ........................... 112
Innovation Management (M) .......................... 68
Innovation Management: Concepts, Strategies and Methods (T) ...................................... 456
Innovationtheory and -Policy (T) .................... 457
Insurance Management I (M) .......................... 85
Insurance Management II (M) ......................... 72
Insurance Marketing (T) .................................. 459
Insurance Production (T) .................................. 460
Insurance Risk Management (T) .................... 461
Integrated Production Planning (M) ................ 186
Integrated Production Planning (T) .................. 462
Integrative Strategies in Production and Development of High Performance Cars (T) ............ 464
Intellectual Property Law (M) ......................... 232
Intelligent CRM Architectures (T) ................... 466
Intelligent Risk and Investment Advisory (M) .... 61
Interactive Systems (T) .................................. 468
International Economic Policy (T) .................. 469
International Finance (T) .................................. 470
International Management in Engineering and Production (T) ........................................... 471
Internet Law (T) ........................................ 472
Introduction to Ceramics (T) ........................... 473
Introduction to Logistics (M) .......................... 171
Introduction to Microsystem Technology I (T) .... 474
Introduction to Microsystem Technology II (T) .... 475
Introduction to Stochastic Optimization (T) ........ 476
IoT platform for engineering (T) ....................... 477
IT-Based Road Design (T) .................................. 478
IT-Fundamentals of Logistics (T) .................... 479

K

Knowledge Discovery (T) .................................. 481

L

Laboratory Laser Materials Processing (T) ............. 482
Laboratory Work Water Chemistry (T) ................. 483
Large-scale Optimization (T) .......................... 484
Laser in Automotive Engineering (T) .................. 485
Laser Physics (T) ......................................... 487
Law Aspects of Guided Transport Systems (T) .... 488
Law of Contracts (T) ...................................... 489
Laws concerning Traffic and Roads (T) ................ 490
Lean Construction (T) ..................................... 491
Lean Management in Construction (M) ....... 215
Life Cycle Assessment (T) .................................. 492
Logistics - Organisation, Design and Control of Logistic Systems (T) .................................. 494
Logistics in Value Chain Networks (M) ............... 199
Long-distance and Air Traffic (T) ...................... 496

M

Machine Learning 1 - Basic Methods (T) .................. 497
Machine Learning 2 – Advanced Methods (T) ........ 498
Machine Learning in Finance (T) ....................... 500
<table>
<thead>
<tr>
<th>Module Master Thesis (M)</th>
<th>37</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelling, Measuring and Managing of Extreme Risks (T)</td>
<td>549</td>
</tr>
<tr>
<td>Modelling Strategic Decision Making (T)</td>
<td>546</td>
</tr>
<tr>
<td>Modeling and OR-Software: Advanced Topics (T)</td>
<td>543</td>
</tr>
<tr>
<td>Modeling Based Application Methods (T)</td>
<td>540</td>
</tr>
<tr>
<td>Modeling and Managing of Extreme Risks (T)</td>
<td>547</td>
</tr>
<tr>
<td>Module Master Thesis (M)</td>
<td>37</td>
</tr>
<tr>
<td>Mixed Integer Programming II (T)</td>
<td>537</td>
</tr>
<tr>
<td>Mixed Integer Programming I and II (T)</td>
<td>536</td>
</tr>
<tr>
<td>Mixed Integer Programming I (T)</td>
<td>535</td>
</tr>
<tr>
<td>Mobile Machines (M)</td>
<td>207</td>
</tr>
<tr>
<td>Mobile Machines (T)</td>
<td>538</td>
</tr>
<tr>
<td>Mobility Services and new Forms of Mobility (T)</td>
<td>539</td>
</tr>
<tr>
<td>Model Based Application Methods (T)</td>
<td>540</td>
</tr>
<tr>
<td>Modeling and Analyzing Consumer Behavior with R (T)</td>
<td>541</td>
</tr>
<tr>
<td>Modeling and OR-Software: Advanced Topics (T)</td>
<td>543</td>
</tr>
<tr>
<td>Modeling Mass Fluxes in River Basins (T)</td>
<td>544f.</td>
</tr>
<tr>
<td>Modeling Strategic Decision Making (T)</td>
<td>546</td>
</tr>
<tr>
<td>Modelling, Measuring and Managing of Extreme Risks (T)</td>
<td>547</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanotechnology (M)</td>
</tr>
<tr>
<td>Nanotechnology for Engineers and Natural Scientists (T)</td>
</tr>
<tr>
<td>Nanotechnology with Clusterbeams (T)</td>
</tr>
<tr>
<td>Nanotribology and -Mechanics (T)</td>
</tr>
<tr>
<td>Natural Hazards and Risk Management 1 (M)</td>
</tr>
<tr>
<td>Natural Hazards and Risk Management 2 (M)</td>
</tr>
<tr>
<td>Nature-Inspired Optimisation Methods (T)</td>
</tr>
<tr>
<td>Network Economics (M)</td>
</tr>
<tr>
<td>Non- and Semiparametrics (T)</td>
</tr>
<tr>
<td>Nonlinear Optimization I (T)</td>
</tr>
<tr>
<td>Nonlinear Optimization I und II (T)</td>
</tr>
<tr>
<td>Nonlinear Optimization II (T)</td>
</tr>
<tr>
<td>Novel Actuators and Sensors (T)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Marketing (T)</td>
</tr>
<tr>
<td>Open Innovation - Concepts, Methods and Best Practices (T)</td>
</tr>
<tr>
<td>Operation Methods for Earthmoving (T)</td>
</tr>
<tr>
<td>Operation Methods for Foundation and Marine Construction (T)</td>
</tr>
<tr>
<td>Operation Systems and Track Guided Infrastructure Capacity (T)</td>
</tr>
<tr>
<td>Operations Research in Health Care Management (T)</td>
</tr>
<tr>
<td>Operations Research in Supply Chain Management (M)</td>
</tr>
<tr>
<td>Operations Research in Supply Chain Management (T)</td>
</tr>
<tr>
<td>Operations Research in Supply Chain Management and Health Care Management (M)</td>
</tr>
<tr>
<td>Optical Transmitters and Receivers (T)</td>
</tr>
<tr>
<td>Optical Waveguides and Fibers (T)</td>
</tr>
<tr>
<td>Optimization in a Random Environment (T)</td>
</tr>
<tr>
<td>Optoelectronic Components (T)</td>
</tr>
<tr>
<td>Optoelectronics and Optical Communication (M)</td>
</tr>
<tr>
<td>OR-Oriented Modeling and Analysis of Real Problems (Project) (T)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;C Insurance Simulation Game (T)</td>
</tr>
<tr>
<td>Panel Data (T)</td>
</tr>
<tr>
<td>Parametric Optimization (T)</td>
</tr>
<tr>
<td>Patent Law (T)</td>
</tr>
<tr>
<td>Personalization and Services (T)</td>
</tr>
<tr>
<td>PH APL-ING-TL01 (T)</td>
</tr>
<tr>
<td>PH APL-ING-TL02 (T)</td>
</tr>
<tr>
<td>PH APL-ING-TL03 (T)</td>
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<tr>
<td>PH APL-ING-TL04 ub (T)</td>
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<tr>
<td>PH APL-ING-TL05 ub (T)</td>
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<tr>
<td>PH APL-ING-TL06 ub (T)</td>
</tr>
<tr>
<td>Photovoltaics (T)</td>
</tr>
<tr>
<td>Physical Basics of Laser Technology (T)</td>
</tr>
<tr>
<td>Physics for Engineers (T)</td>
</tr>
<tr>
<td>Planning and Management of Industrial Plants (T)</td>
</tr>
<tr>
<td>Course Title</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PLM for Product Development in Mechatronics (T)</td>
</tr>
<tr>
<td>PLM-CAD Workshop (T)</td>
</tr>
<tr>
<td>Polymer Engineering I (T)</td>
</tr>
<tr>
<td>Polymer Engineering II (T)</td>
</tr>
<tr>
<td>Polymers in MEMS A: Chemistry, Synthesis and Applications (T)</td>
</tr>
<tr>
<td>Polymers in MEMS B: Physics, Microstructuring and Applications (T)</td>
</tr>
<tr>
<td>Polymers in MEMS C: Biopolymers and Bioplastics (T)</td>
</tr>
<tr>
<td>Portfolio and Asset Liability Management (T)</td>
</tr>
<tr>
<td>Power Network (T)</td>
</tr>
<tr>
<td>Power Transmission and Power Network Control (T)</td>
</tr>
<tr>
<td>Practical Course Polymers in MEMS (T)</td>
</tr>
<tr>
<td>Practical Course Technical Ceramics (T)</td>
</tr>
<tr>
<td>Practical Seminar Digital Service Systems (T)</td>
</tr>
<tr>
<td>Practical Seminar Service Innovation (T)</td>
</tr>
<tr>
<td>Practical Seminar: Crowd Analytics (T)</td>
</tr>
<tr>
<td>Practical Seminar: Data-Driven Information Systems (T)</td>
</tr>
<tr>
<td>Predictive Mechanism and Market Design (T)</td>
</tr>
<tr>
<td>Price Management (T)</td>
</tr>
<tr>
<td>Price Negotiation and Sales Presentations (T)</td>
</tr>
<tr>
<td>Pricing (T)</td>
</tr>
<tr>
<td>Principles of Ceramic and Powder Metallurgy Processing (T)</td>
</tr>
<tr>
<td>Principles of Food Process Engineering (M)</td>
</tr>
<tr>
<td>Principles of Food Process Engineering (T)</td>
</tr>
<tr>
<td>Principles of Information Engineering and Management (T)</td>
</tr>
<tr>
<td>Principles of Insurance Management (T)</td>
</tr>
<tr>
<td>Private Business Law (M)</td>
</tr>
<tr>
<td>Problem Solving, Communication and Leadership (T)</td>
</tr>
<tr>
<td>Process Engineering (T)</td>
</tr>
<tr>
<td>Process Engineering in Construction (M)</td>
</tr>
<tr>
<td>Production and Logistics Controlling (T)</td>
</tr>
<tr>
<td>Production and Logistics Management (T)</td>
</tr>
<tr>
<td>Production Technology and Management in Automotive Industry (T)</td>
</tr>
<tr>
<td>Programming Internship: Solving Computational Risk and Asset Management Pro-</td>
</tr>
<tr>
<td>Project in Public Transportation (M)</td>
</tr>
<tr>
<td>Project Management (T)</td>
</tr>
<tr>
<td>Project Management (M)</td>
</tr>
<tr>
<td>Project Management in Construction (M)</td>
</tr>
<tr>
<td>Project Management in Construction and Real Estate Industry I (T)</td>
</tr>
<tr>
<td>Project Management in Construction and Real Estate Industry II (T)</td>
</tr>
<tr>
<td>project paper Lean Construction (T)</td>
</tr>
<tr>
<td>Project Studies (T)</td>
</tr>
<tr>
<td>Project Workshop: Automotive Engineering (T)</td>
</tr>
<tr>
<td>Project Seminar (T)</td>
</tr>
<tr>
<td>Public Business Law (M)</td>
</tr>
<tr>
<td>Public Business Law (M)</td>
</tr>
<tr>
<td>Public Media Law (T)</td>
</tr>
<tr>
<td>Public Revenues (T)</td>
</tr>
<tr>
<td>Public Transportation Operations (M)</td>
</tr>
<tr>
<td>Project Management (T)</td>
</tr>
<tr>
<td>Quality Control I (T)</td>
</tr>
<tr>
<td>Quality Control II (T)</td>
</tr>
<tr>
<td>Quality Management (T)</td>
</tr>
<tr>
<td>Quantitative Methods in Energy Economics (T)</td>
</tr>
<tr>
<td>Quantitative Risk Management (M)</td>
</tr>
<tr>
<td>Quantitative Risk Management (M)</td>
</tr>
<tr>
<td>Quantum Functional Devices and Semiconductor Technology (T)</td>
</tr>
<tr>
<td>Quantitative Valuation (M)</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability (M)</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability Part 1: Basics and Valuation (T)</td>
</tr>
<tr>
<td>Real Estate Economics and Sustainability Part 2: Reporting and Rating (T)</td>
</tr>
<tr>
<td>Recommender Systems (T)</td>
</tr>
<tr>
<td>Regulation Theory and Practice (T)</td>
</tr>
<tr>
<td>Regulatory Management and Grid Management - Economic Efficiency of Network</td>
</tr>
<tr>
<td>Replication Technologies in Micro System Technology (T)</td>
</tr>
<tr>
<td>Report Urban Water Infrastructure and Management (T)</td>
</tr>
<tr>
<td>Requirements Analysis and Requirements Management (T)</td>
</tr>
<tr>
<td>Requirements Analysis and Requirements Management (T)</td>
</tr>
<tr>
<td>Risk Communication (T)</td>
</tr>
<tr>
<td>Risk Management in Industrial Supply Networks (T)</td>
</tr>
<tr>
<td>River and Floodplain Ecology (T)</td>
</tr>
<tr>
<td>Roadmapping (T)</td>
</tr>
<tr>
<td>Safe mechatronic systems (T)</td>
</tr>
<tr>
<td>Safe structures for machines in material handling (T)</td>
</tr>
<tr>
<td>Safety Engineering (T)</td>
</tr>
<tr>
<td>Safety Engineering in Highway Engineering (T)</td>
</tr>
<tr>
<td>Safety, Computing and Law in Highway Engineering (M)</td>
</tr>
<tr>
<td>Sales Management (M)</td>
</tr>
<tr>
<td>Sales Management and Retailing (T)</td>
</tr>
<tr>
<td>Selected Applications of Technical Logistics (T)</td>
</tr>
<tr>
<td>Selected Applications of Technical Logistics and Project (T)</td>
</tr>
<tr>
<td>Selected Topics on Optics and Microoptics for Mechanical Engineers (T)</td>
</tr>
<tr>
<td>Semantic Web Technologies (T)</td>
</tr>
<tr>
<td>Semantic Web Technologies (T)</td>
</tr>
<tr>
<td>Seminar in Business Administration A (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Business Administration B (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Economic Policy (T)</td>
</tr>
<tr>
<td>Seminar in Economics A (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Economics B (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Engineering Science (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Informatics A (Master) (T)</td>
</tr>
<tr>
<td>Course Title</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Seminar in Informatics B (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Mathematics (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Operations Research A (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Operations Research B (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Statistics A (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Statistics B (Master) (T)</td>
</tr>
<tr>
<td>Seminar in Transportation (T)</td>
</tr>
<tr>
<td>Seminar Mobility Services (Master) (T)</td>
</tr>
<tr>
<td>Seminar Module (M)</td>
</tr>
<tr>
<td>Seminar Sensors (T)</td>
</tr>
<tr>
<td>Seminar: Legal Studies I (T)</td>
</tr>
<tr>
<td>Seminar: Legal Studies II (T)</td>
</tr>
<tr>
<td>Sensor Systems (T)</td>
</tr>
<tr>
<td>Sensor Technology I (M)</td>
</tr>
<tr>
<td>Sensor Technology II (M)</td>
</tr>
<tr>
<td>Sensors (T)</td>
</tr>
<tr>
<td>Sensors and Actuators Laboratory (T)</td>
</tr>
<tr>
<td>Service Analytics (M)</td>
</tr>
<tr>
<td>Service Analytics A (T)</td>
</tr>
<tr>
<td>Service Analytics B - Enterprise Data Reduction and Prediction (T)</td>
</tr>
<tr>
<td>Service Design Thinking (M)</td>
</tr>
<tr>
<td>Service Economics and Management (M)</td>
</tr>
<tr>
<td>Service Innovation (T)</td>
</tr>
<tr>
<td>Service Innovation, Design &amp; Engineering (M)</td>
</tr>
<tr>
<td>Service Management (M)</td>
</tr>
<tr>
<td>Service Operations (M)</td>
</tr>
<tr>
<td>Service Oriented Computing (T)</td>
</tr>
<tr>
<td>Services Marketing (M)</td>
</tr>
<tr>
<td>Services Marketing (T)</td>
</tr>
<tr>
<td>Simulation Game in Energy Economics (T)</td>
</tr>
<tr>
<td>Simulation I (T)</td>
</tr>
<tr>
<td>Simulation II (T)</td>
</tr>
<tr>
<td>Simulation of Coupled Systems (T)</td>
</tr>
<tr>
<td>Simulation of Stochastic Systems (T)</td>
</tr>
<tr>
<td>Site Management (T)</td>
</tr>
<tr>
<td>Social Choice Theory (T)</td>
</tr>
<tr>
<td>Social Network Analysis in CRM (T)</td>
</tr>
<tr>
<td>Sociology (M)</td>
</tr>
<tr>
<td>Software Quality Management (T)</td>
</tr>
<tr>
<td>Spatial Economics (T)</td>
</tr>
<tr>
<td>Special Sociology (T)</td>
</tr>
<tr>
<td>Special Topics in Highway Engineering and Environmental Impact Assessment (T)</td>
</tr>
<tr>
<td>Special Topics in Information Engineering &amp; Management (T)</td>
</tr>
<tr>
<td>Special Topics of Efficient Algorithms (T)</td>
</tr>
<tr>
<td>Special Topics of Enterprise Information Systems (T)</td>
</tr>
<tr>
<td>Special Topics of Knowledge Management (T)</td>
</tr>
<tr>
<td>Special Topics of Software- and Systemsengineering (T)</td>
</tr>
<tr>
<td>Specialization in Food Process Engineering (M)</td>
</tr>
<tr>
<td>Specialization in Food Process Engineering (T)</td>
</tr>
<tr>
<td>Specialization in Production Engineering (M)</td>
</tr>
<tr>
<td>Specific Aspects in Taxation (T)</td>
</tr>
<tr>
<td>Specific Topics in Materials Science (M)</td>
</tr>
<tr>
<td>Statistical Modeling of generalized regression models (T)</td>
</tr>
<tr>
<td>Stochastic Calculus and Finance (T)</td>
</tr>
<tr>
<td>Stochastic Modelling and Optimization (M)</td>
</tr>
<tr>
<td>Stochastic Optimization (M)</td>
</tr>
<tr>
<td>Strategic and Innovative Decision Making in Marketing (T)</td>
</tr>
<tr>
<td>Strategic Brand Management (T)</td>
</tr>
<tr>
<td>Strategic Corporate Management and Organization (M)</td>
</tr>
<tr>
<td>Strategic Decision Making and Organization (M)</td>
</tr>
<tr>
<td>Strategic Management of Information Technology (T)</td>
</tr>
<tr>
<td>Strategic Transport Planning (T)</td>
</tr>
<tr>
<td>Strategical Aspects of Energy Economy (T)</td>
</tr>
<tr>
<td>Strategy, Communication, and Data Analysis (M)</td>
</tr>
<tr>
<td>Structural and Phase Analysis (T)</td>
</tr>
<tr>
<td>Structural Ceramics (T)</td>
</tr>
<tr>
<td>Superhard Thin Film Materials (T)</td>
</tr>
<tr>
<td>Supplementary Claim Management (T)</td>
</tr>
<tr>
<td>Supply Chain Management (T)</td>
</tr>
<tr>
<td>Supply Chain Management in the Automotive Industry (T)</td>
</tr>
<tr>
<td>Supply Chain Management in the Process Industry (T)</td>
</tr>
<tr>
<td>Supply Chain Management with Advanced Planning Systems (T)</td>
</tr>
<tr>
<td>Systematic Materials Selection (T)</td>
</tr>
<tr>
<td>Tactical and Operational Supply Chain Management (T)</td>
</tr>
<tr>
<td>Tax Law I (T)</td>
</tr>
<tr>
<td>Tax Law II (T)</td>
</tr>
<tr>
<td>Team Work in the Area of Service Oriented Architectures (T)</td>
</tr>
<tr>
<td>Technical conditions met (T)</td>
</tr>
<tr>
<td>Technical Logistics (M)</td>
</tr>
<tr>
<td>Technological Change in Energy Economics (T)</td>
</tr>
<tr>
<td>Technologies for Innovation Management (T)</td>
</tr>
<tr>
<td>Technology Assessment (T)</td>
</tr>
<tr>
<td>Telecommunication and Internet Economics (T)</td>
</tr>
<tr>
<td>Telecommunications Law (T)</td>
</tr>
<tr>
<td>Tendering, Planning and Financing in Public Transport (T)</td>
</tr>
<tr>
<td>Theoretical Sociology (T)</td>
</tr>
<tr>
<td>Theory of Business Cycles (T)</td>
</tr>
<tr>
<td>Theory of Economic Growth (T)</td>
</tr>
<tr>
<td>Theory of Endogenous Growth (T)</td>
</tr>
<tr>
<td>Tires and Wheel Development for Passenger Cars (T)</td>
</tr>
<tr>
<td>Topics in Experimental Economics (T)</td>
</tr>
<tr>
<td>Track Guided Transport Systems - Operational Logistics &amp; Management (T)</td>
</tr>
<tr>
<td>Track Guided Transport Systems - Technical Design and Components (T)</td>
</tr>
<tr>
<td>Track Guided Transport Systems / Engineering (M)</td>
</tr>
<tr>
<td>Trademark and Unfair Competition Law (T)</td>
</tr>
<tr>
<td>Traffic Engineering (T)</td>
</tr>
<tr>
<td>Traffic Flow Simulation (T)</td>
</tr>
<tr>
<td>Traffic Infrastructure (T)</td>
</tr>
<tr>
<td>Traffic Management and Transport Telematics (T)</td>
</tr>
<tr>
<td>Transport Economics (T)</td>
</tr>
<tr>
<td>Transport infrastructure policy and regional development (M)</td>
</tr>
<tr>
<td>Transportation Data Analysis (T)</td>
</tr>
</tbody>
</table>
Transportation Modelling and Traffic Management (M) 149
Transportation Systems (T) ................................. 805
Tunnel Construction and Blasting Engineering (T) ...... 806
Turnkey Construction I - Processes and Methods (T) .. 807
Turnkey Construction II - Trades and Technology (T) . 808

U

Urban Water Infrastructure and Management (T) ...... 809

V

Valuation (T) .................................................. 810
Vehicle Comfort and Acoustics I (T) .................... 811
Vehicle Comfort and Acoustics II (T) .................... 813
Vehicle Development (M) .................................... 178
Vehicle Mechatronics I (T) ................................... 815
Vehicle Ride Comfort & Acoustics I (T) ................ 817
Vehicle Ride Comfort & Acoustics II (T) ............... 819
Virtual Engineering A (M) .................................... 173
Virtual Engineering B (M) .................................... 153
Virtual Engineering I (T) ..................................... 821
Virtual Engineering II (T) .................................... 822
Virtual Engineering Lab (T) .................................. 823
Virtual Reality Practical Course (T) ...................... 824
Virtual training factory 4.X (T) ............................. 825

W

Warehousing and Distribution Systems (T) .......... 826
Wastewater and Storm Water Treatment (T) ........ 828
Water Chemistry and Water Technology I (M) ....... 159
Water Chemistry and Water Technology I (T) ........ 829
Water Chemistry and Water Technology II (M) ..... 190
Water Chemistry and Water Technology II (T) ....... 830
Water Resource Management and Engineering Hydrology (T) ........................................ 831
Water Supply and Sanitation (M) ......................... 194
Water Supply and Sanitation (T) ......................... 832
Web Science (T) ............................................. 833
Welding Technology (T) .................................... 834
Wildcard - Introduction to Logistics (T) ............... 836
Wildcard Key Competences Seminar 1 (T) ............ 837
Wildcard Key Competences Seminar 2 (T) .......... 235
Wildcard Key Competences Seminar 3 (T) ............ 838
Wildcard Key Competences Seminar 4 (T) ............ 839
Wildcard Key Competences Seminar 5 (T) ............ 840
Wildcard Key Competences Seminar 6 (T) .......... 841
Wildcard Key Competences Seminar 7 (T) .......... 842
Wildcard Key Competences Seminar 8 (T) .......... 843
Workflow-Management (T) ................................ 844