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| <b>Mandatory Elective Module: Operations Research</b><br><b>Responsible: Helmes / Brandt</b>   |                  |   | <b>Study Points: 15</b>   |
| Goals :  |                  |   |   |
| <p>This module offers students the opportunity to specialize in the area of Operations Research. Courses can be chosen from advanced OR-courses (OR III – OR IV), special topic courses and seminars. Special topic courses are offered on a variety of business management specializations, e. g. Revenue Management, Operations Management and Operational Risk Management, Financial Engineering, Queueing and Inventory Theory, Logistic and Supply Chain Management, simulation studies, stochastic modelling and optimization algorithms, etc.</p> <p>Attention: The module will only be completed if at least one course from each category, i. e. advanced OR-courses, special topic courses and seminars (note, OR IV can be chosen as an advanced OR-course or as a seminar course, but not both) will have been successfully completed.</p> |                  |   |   |
| Prerequisites to participate in the module: none   |                  |   |   |
| Course   | Periods/<br>Week | SP; work load   | Topics  |
| Regular Lectures:  |                  |   |   |
| Lecture/<br>Tutorial<br><br>OR III   | 3                | 4,5;<br>Attendance (45 h)<br>Preparation (60 h)<br>Exam preparation (30 h)                    | Deterministic and stochastic dynamic programming; solution algorithms, business and economic applications   |
| Lecture/<br>Tutorial<br><br>OR IV  | 3                | 4,5;<br>Attendance (45 h)<br>Preparation (30 h)<br>Project work (60 h)                        | Lectures based on research articles, presentation of thesis and project work  |
| Special Lectures:  |                  |   |   |
| Every lecture marked as Special OR lecture in the university calendar  | 3                | 4,5;<br>Attendance (45 h)<br>Preparation (60 h)<br>Exam preparation (30 h)                    | There will be special lectures on OR topics every semester.   |
| Seminars:  |                  |   |   |
| Software in Operations Research  | 2                | 6;<br>Attendance (30 h)<br>Preparation (30 h)<br>Seminar paper and presentation (90 h + 30 h) | Introduction into the usage of, e. g. AMPL, OPL, AIMMS, NEOS, etc.; syntactic elements of model languages; linear, piecewise linear, quadratic and integer valued optimization problems |
| Software project   | 2                | 3;<br>Implementation, documentation und presentation (90 h)                                   | Developing software packages; long term projects  |
| Research Seminar   | 2                | 3;<br>Attendance (30 h)<br>Reports and presentation (60 h)                                    | Lectures on research projects   |

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| Module examinations      | Lecture/Tutorial OR III: Written exam (120 min)<br>Lecture/Tutorial OR IV: Written exam (120 min)<br>Seminar Software in OR: work reports (50 %), presentation (40 %), and exercises (10 %)<br>Lecture/Tutorial Excel in OR: Written exam (60 min) or oral exam (20 min)<br>Lecture/Tutorial OR Special: Written exam (120 min) or oral exam (20 min) |
| Duration of the module   | <input type="checkbox"/> 1 Semester <input checked="" type="checkbox"/> 2 Semesters   |
| Module can be started in | <input checked="" type="checkbox"/> Fall Semester <u>or</u> <input checked="" type="checkbox"/> Spring Semester   |