Hochschule München University of Applied Sciences

# Courses in English
## Course Description

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| **Department** | 09 Engineering and Management |
| **Course title** | **Scheduling problems and solutions** |
| **Hours per week (SWS)** | 4 |
| **Number of ECTS credits** | 3 |
| **Course objective** | Learn about scheduling problems of the type: who does what at which time where for which customer using which devices? These problems can be observed in every domain and help to significantly increase the quality and efficiency of the resulting solutions. Different real-life problems and their solutions will be demonstrated. |
| **Prerequisites** | None |
| **Recommended reading** | Peter Brucker: „Scheduling Algorithms“, 5. Edition, Springer Verlag;<br>Peter Brucker, Sigrid Knust: „Complex Scheduling“, 2. Edition, Springer Verlag<br>K. Deb: ,,Multi-Objective Optimization using Evolutionary Algorithms“<br>Carsten Franke and Joachim Lepping and Uwe Schwiegelshohn: „Greedy Scheduling with Custom-made Objectives“, Annals of Operations Research, Springer<br>Carsten Franke and Frank Hoffmann and Joachim Lepping and Uwe Schwiegelshohn: „Development of Scheduling Strategies with Genetic Fuzzy Systems“, Applied Soft Computing Journal, Elsevier<br>Y. Fu, M. Shahidehpour, Z. Li: „Security-constrained unit commitment with AC constraints“, IEEE Transactions on Power Systems, 2005, IEEE<br>Sven Oliver Krumke, Sleman Saliba, Tjark Vredeveld, Stephan Westphal: ,,Approximation algorithms for a vehicle routing problem“, Math. Methods Oper. Res., 2008<br>Va-Tang Chuang, Yi-Hung Chang, Jr-Fang Dang, Ren-Chyi You, Steven Min Chang: „Optimizing multi-station scheduling in consideration of equipment flexibility and loading balance in semiconductor wafer fabrication“, SEMI Advanced Semiconductor Manufacturing Conference, 2012<br>Benjamin Hiller, Sven O. Krumke, Sleman Saliba, Andreas Tuchscherer: „Randomized online algorithms for the dynamic multi-period routing problem“, MAPSP |
| **Teaching methods** | Lectures and seminars |
| **Assessment methods** | 90 min written exam |
| **Language of instruction** | English |
| **Name of lecturer** | Prof. Dr-Ing. Carsten Franke |
| **Email** | carsten.franke@hm.edu |
| **Link** | not yet available |
| **Course content** | - systematic classification of different scheduling problems and parallel introduction of a general notation for scheduling systems<br>- introduction of complexity of scheduling algorithms<br>- exploration of different scheduling strategies for fundamental scheduling problems<br>- learning of multi-objective optimization strategies (classical and evolutionary) for scheduling problems<br>- exploration of precise and heuristical solutions for practical scheduling problems in the areas of:<br>-- parallel machines and cloud-computing<br>-- unit commitment problem in electrical grids<br>-- scheduling in logistic<br>-- scheduling in production |
| **Remarks** | None |