

**Name of programme:** International Semester Information Technology / System Engineering

Title of Module	Problem Oriented Programming
Responsible person	Prof. Dr. Hartmut Weber
Teacher	Prof. Dr. Hartmut Weber, Dipl.-Math. Langstrof
Module Code	MT102
Type of Module	O obligatory module (Pflichtmodul), x elective module (Wahlpflichtmodul)
Level (BA / MA)	Bachelor
Language	English (German on demand)
Related Degree Programme/s	Technical Informatics
Department	IEM
Location	O Gießen, x Friedberg
Availability/frequency of module	O every semester, O annually in the Winter Semester, x annually in the Summer Semester,
Hours per Week / Workload	4 HpW, contact hours per week 180 H in total
Number of CrP/ECTS	6 ECTS/CrP
Forms of instruction	x lecture O seminar x supervised training x Laboratory Practical Course
Qualifications and Goals	The students are able to understand a given technical or scientific problem statement, to translate the problem statement into a suitable problem oriented software coding, to solve or respectively simulate the problem statement using the software coding and to interpret as well as to present the resulting problem solution.
Short Description of Contents	Learning of a high abstraction level programming language for solving engineering and scientific problems (MATLAB and appropriate toolboxes). Construction of graphical user interfaces to control and visualize the problem solutions. Modelling and simulation of dynamic systems. Application in exemplary problems from mechanics, electrical engineering, image processing, biology and economics.
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Prerequisites	Basic knowledge in physics (fundamentals in mechanics and DC/AC circuits). Basic knowledge in mathematics (fundamentals in matrix calculations and analysis). Basic knowledge in an imperative programming language (conditions, loops, functions, data types).
Assessment	O oral (O examination of xx minutes, O presentation), x written (x examination of xx minutes, O term paper), other: The supervised exercise tasks must be successfully processed before written exam. This will be confirmed by certificate.
Literature/Textbooks	Angermann, Beuschel, Rau, Wohlfahrt: Matlab, Simulink, Stateflow - Grundlagen, Toolboxes, Beispiele; Attia: Electronics and Circuit Analysis Using MATLAB; Pietruszka: MATLAB und Simulink in der Ingenieurpraxis - Modellbildung, Berechnung und Simulation van Loan, Fan: Insight through computing - a MATLAB introduction to computational science and engineering
Other	