inf209 - Control Theory

Module label: Control Theory
Module code: inf209
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Bachelor’s Programme Computing Science > Akzentsetzungsmodule
- Dual-Subject Bachelor's Programme Computing Science > Basismodule
- Master of Education Programme (Gymnasium) Computing Science > Mastermodule
- Master’s Programme Computing Science > Nicht Informatik

Contact person:
- Module responsibility
  - Sergei Fatikow
  - Andreas Hein
- Authorized examiners
  - Sergei Fatikow
  - Andreas Hein
  - Die im Modul Lehrenden

Entry requirements:
- Module Differential Equations
- Module Basics Electrical Engineering

Skills to be acquired in this module:
Instruction on theoretical and mathematical basics of control engineering

Professional competence:
The students:
- Describe the core principles of steering and control of technical systems
- Discuss the modelling core concepts of systems and their controllers
- Name methods to determine the quality of controlled systems
- Model technical systems with differential equations and their transfer functions
- Develop control structures, evaluate their stability and determine their optimal control parameters

Methodological competence:
The students:
- Are aware of the technical challenges and solve them by including the implementations of other disciplines and methods

Social competence:
The students:
- Present solutions for specific questions

Self-competence:
The students:
- Get used to the specific challenges of the development of controlled systems

Module contents:
Basics; analog transfer elements; linear time invariant (LTI-) systems; simulation and modeling; step response; frequency response; frequency response locus; differential equations and transfer function; control loop stability; types of controlled systems; types of linear controllers; linear control loops: reference and disturbance reaction of the controlled system; rules for control loop optimization; methods of analysis and synthesis, implementation; computerbased control MATLAB/Simulink

Reader’s advisory:
- Unbehauen, H.: Regelungstechnik I, Klassische Verfahren zur Analyse und Synthese linearer
kontinuierlicher Regelsysteme
- Lutz, H. und Wendt, W.: Taschenbuch der Regelungstechnik
- further reading will be announced at lecture

Links
Language of instruction: German
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Module level: ---
Module art: je nach Studiengang Pflicht oder Wahlpflicht

Lern-/Lehrform / Type of program
Vorkenntnisse / Previous knowledge

Examination
Final exam of module
Time of examination
At the end of the lecture period
Type of examination
Hands-on exercises and written or oral exam

Course type
Lecture
Frequency
Workload attendance
3.00
WiSe
42 h
1.00
WiSe
14 h

Total time of attendance for the module
56 h