

Single-loop and multi-loop controller design					AR-229
Rota	Duration	Semester	SWS	Credit Points	Workload
After Announcement	1 Semester	2 nd (Semester)	3 SWS	3	90 h
1	Modul Structure				
	Course (Abbreviation)	Type/ SWS	Presence	Self Study	Credit Points
	a) Single-loop and multi-loop controller design	Lecture/ 2 SWS	25 h	25 h	2
	b) Single-loop and multi-loop controller design	Tutorial/ 1 SWS	15 h	25 h	1
2	Language English				
3	Content				
	<ol style="list-style-type: none"> 1. Frequency domain single loop controller design <ol style="list-style-type: none"> a. Specification of controller performance in the time domain and in the frequency domain b. Loop shaping: Classical PID and Lead-Lag controller design revisited c. Design using frequency response approximation (FASTER) d. Limits of controller performance e. Internal Model Control 2. Frequency domain multivariable controller design <ol style="list-style-type: none"> a. I/O-system description, poles, zeros of MIMO systems b. Stability criteria c. Decoupling, sequential loop closure, approximate decoupling, directionality d. Multivariable frequency response approximation 3. Control structure selection 				
	Literature:				
	<ul style="list-style-type: none"> • Multivariable Feedback Control - Analysis and Design by Sigurd Skogestad and Ian Postlethwaite, 2nd edition, Wiley, 2005 • Modern Control Engineering by Katsuhiko Ogata, 4th edition, Prentice Hall 				
4	Competencies				
5	Examination Requirements				
6	Formality of Examination				
	<input checked="" type="checkbox"/> Module Finals		<input type="checkbox"/> Accumulated Grade		
7	Module Requirements (Prerequisites)				
8	Allocation to Curriculum:				
	Program: Automation & Robotics, Field of study: Process Automation				
9	Responsibility/ Lecturer				
	Prof. Dr.-Ing. Sebastian Engell and Prof. Dr. S. Lucia / Prof. Dr.-Ing. Sebastian Engell and Prof. Dr. S. Lucia				