

SINGLE -LOOP AND MULTI-LOOP CONTROLLER DESIGN					AR-229
Rota	Duration	Semester	SWS	Credit Points	Workload
annually WS	1 Semester	3rd (Semester)	--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/ SWS 2	25 h	25 h	2
	b) Single-loop and multi-loop controller design	Tutorial/ SWS 1	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"> 1.1. Specification of controller performance in the time domain and in the frequency domain 1.2. Loop shaping: Classical PID and Lead-Lag controller design revisited 1.3. Design using frequency response approximation (FASTER) 1.4. Limits of controller performance 1.5. Internal Model Control 2. Frequency domain multivariable controller design <ol style="list-style-type: none"> 2.1. I/O-system description, poles, zeros of MIMO systems 2.2. Stability criteria 2.3. Decoupling, sequential loop closure, approximate decoupling, directionality 2.4. Multivariable frequency response approximation 3. Control structure selection <p>Literature:</p> <ol style="list-style-type: none"> 1) Multivariable Feedback Control - Analysis and Design by Sigurd Skogestad and Ian Postlethwaite, 2nd edition, Wiley, 2005 2) Modern Control Engineering by Katsuhiko Ogata, 4th edition, Prentice Hall 				
4	Competencies				
5	Examination Requirements				
6	Formality of Examination <input 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				