

Module: Digital Control Systems

Level	Bachelor	Short Name	DCS
Responsible Lecturers	Korff, Alexander, Prof. Dr.-Ing.		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Elektrotechnik - Kommunikationssysteme, Bachelor		
Compulsory/elective	Compulsory	ECTS Credit Points	5
Semester of Studies	4	Semester Hours per Week	4
Length (semesters)	1	Workload (hours)	150
Frequency	SuSe	Presence Hours	60
Teaching Language	English	Self-Study Hours	90

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Written Exam	Exam Language	English
Exam Length (minutes)	120	Exam Grading System	One-third Grades
Learning Outcomes	Students should be able to: <ul style="list-style-type: none"> • Analyze and simulate the dynamic behavior of control systems. • know the behavior of standard transfer elements and apply them in the context of controlled system analysis • perform basic methods for controller design • use Matlab/Simulink for simulation, analysis and design of control loops • know the special features of digital control systems and be able to design them in principle 		
Participation Prerequisites	Signale und Systeme, Prozedurale Programmierung, Physik, Mathe I + II		

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	✘ Use of gender-neutral language (THL standard) ✘ Target group specific adjustment of didactic methods ✘ Making subject diversity visible (female researchers, cultures etc.)		
Applicability			
Remarks			

Module Course: Digital Control Systems (Lecture)

(of Module: Digital Control Systems)

Course Type	Lecture	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	4
Participation Limit		Semester Hours per Week	3
Group Size		Workload (hours)	120
Teaching Language	English	Presence Hours	45
Study Achievements ("Studienleistung", SL)		Self-Study Hours	75
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	Grundbegriffe der Regelungstechnik, Modellierung und Analyse dynamischer Systeme, Basisübertragungselemente, Standard-PID- Regler, Stabilitätskriterien, Auslegung von PID- Reglern, Kaskadenregelungen
Literature	[1] Serge Zacher, Manfred Reuter: Regelungstechnik für Ingenieure, Springer Vieweg
Remarks	

Module Course: Digital Control Systems (Practical Training)

(of Module: Digital Control Systems)

Course Type	Practical Training	Form of Learning	Presence
Mandatory Attendance	no	ECTS Credit Points	1
Participation Limit		Semester Hours per Week	1
Group Size	12	Workload (hours)	30
Teaching Language	English	Presence Hours	15
Study Achievements ("Studienleistung", SL)		Self-Study Hours	15
SL Length (minutes)		SL Grading System	

The following section is filled only if there is a course-specific exam.

Exam Type		Exam Language	
Exam Length (minutes)		Exam Grading System	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	Messung von Sprungantworten und Bodediagrammen, Identifikation der Regelstrecke, Auslegung von einfachem Drehzahlregler, Positionsregler, Präsentation der Ergebnisse
Literature	<p>[1] https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted</p> <p>[2] https://matlabacademy.mathworks.com/details/simulink-onramp/simulink</p> <p>[3] https://matlabacademy.mathworks.com/details/simulink-fundamentals/slbe</p> <p>[4] https://matlabacademy.mathworks.com/details/control-design-onramp-with-simulink/controls</p>
Remarks	