TECHNISCHE HOCHSCHULE LÜBECK

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	Allgemeine Elektrotechnik, 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: • 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	[1] https://matlabacademy.mathworks.com/details/matlab-onramp/gettingstarted [2] https://matlabacademy.mathworks.com/details/simulink-onramp/simulink [3] https://matlabacademy.mathworks.com/details/simulink-fundamentals/slbe [4] https://matlabacademy.mathworks.com/details/control-design-onramp-with-simulink/controls
Remarks	