TECHNISCHE HOCHSCHULE LÜBECK

Module: Digital Control Systems

Level	Bachelor	**Short Name**	CS II
Responsible Lecturers	Bayerlein, Jörg, Prof. Dr.		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Electrical Engineering - Communication Systems, Bachelor		
Compulsory/elective	Compulsory	**ECTS Credit Points**	5
Semester of Studies	6	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	SuSe	**Presence Hours**	57
Teaching Language	English	**Self-Study Hours**	93

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

Exam Type	Written Exam	**Exam Language**	English
Exam Length (minutes)	90	**Exam Grading System**	Pass
Learning Outcomes	The students should learn to convert a classical PIDT1 into a digital algorithm with rectangular approach. They should be able to work with Z-Transform to Design controllers and filters. They should be able to apply PC-based identification algorithms like step response with Least square optimization, Least square offline and online methods. They should be able to apply some special controllers like model based controllers		
Participation Prerequisites	Control System Basics		

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	

TECHNISCHE HOCHSCHULE LÜBECK

Module Course: Digital Control Systems (lecture)

(of Module: Digital Control Systems)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	yes	**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	See above.		
Participation Prerequisites	CS I		

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

Contents	Basics of digital PID control, basics of z-transform, some identification methods, some sophisticated controllers like model based controllers
Literature	
Remarks	

Module Course: Digital Control Systems (Practical Training)

(of Module: Digital Control Systems)

Course Type	Practical Training	**Form of Learning**	Presence
Mandatory Attendance	yes	**ECTS Credit Points**	1
Participation Limit		**Semester Hours per Week**	1
Group Size		**Workload (hours)**	30
Teaching Language		**Presence Hours**	12
Study Achievements ("Studienleistung", SL)	Practical Training	**Self-Study Hours**	18
SL Length (minutes)		**SL Grading System**	Participation

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	The students should be able to design, implement on PC and test some sophisticated loops (position control, inverted pendulum, adaptive controllers)
Participation Prerequisites	CS I

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

Contents	Position control system, inverted pendulum, Adaptive controller
Literature	
Remarks	