TECHNISCHE HOCHSCHULE LÜBECK

Module: Computer Aided Design

Level	Bachelor	**Short Name**	CAD
Responsible Lecturers	Schmidt, Gunnar, Prof. Dr.		
Department, Facility	Electrical Engineering and Computer Science		
Course of Studies	Elektrotechnik - Energiesysteme und Automation, Bachelor		
Compulsory/elective	Compulsory	**ECTS Credit Points**	5
Semester of Studies	6	**Semester Hours per Week**	5
Length (semesters)	1	**Workload (hours)**	150
Frequency	SuSe	**Presence Hours**	61
Teaching Language	English	**Self-Study Hours**	89

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

Exam Type	Portfolio Exam	**Exam Language**	English
Exam Length (minutes)		**Exam Grading System**	One-third Grades

Learning Outcomes

- The students are familiar with the basic development process for electrical components and their mapping into integrated computer aided development systems. From the requirements analysis, sub-functions can be defined and implemented by suitable basic circuits, subsequently combined to form a complete circuit.
- The students can enter electrical circuits into a CAD system and are aware of the structure of net lists describing electrical circuits.
- The students are familiar with the various simulation options in PSpice and can apply them for circuit design, for function verification or for measure circuit parameters. They know the component library structure in PSpice and can add missing components.
- The students know the basic transistor and operational amplifier circuits and their properties and parameters. They can measure these parameters in the simulation and derive them theoretically from the circuit.
- For different applications they can select the appropriate basic circuit and calculate the relevant component parameters.
- The students know different options of bias point selection and derivation of for different applications. They understand example circuits, can design, simulate and build them.
- The students can bring their circuit designs and practical implementations into operation in a structured manner and thus systematically detect and eliminate design errors or defective components.
- The students can verify their own circuit designs in simulation and practical implementation. Deviations can be quantified and classified into acceptable values and actual errors.

	• The students can document the relevant lecture and laboratory tasks in a suitable form and thus represent their individual learning progress. They evaluate their individual learning progress in relation to the defined learning objectives.
Participation Prerequisites	Elektrical Components, Analog Electronics

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: Computer Aided Design (Lecture)

(of Module: Computer Aided Design)

Course Type	Lecture	**Form of Learning**	Presence
Mandatory Attendance	no	**ECTS Credit Points**	3
Participation Limit		**Semester Hours per Week**	3
Group Size		**Workload (hours)**	90
Teaching Language	English	**Presence Hours**	45
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	45
SL Length (minutes)		**SL Grading System**	One-third Grades

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	1. Introduction 2. PSpice Basic Simulations 3. Transistor circuits 4. ClassAB Audio Power Amplifier 5. Analog Behavior Model (ABM) Simulations 6. Power supply with Boost Converter 7. Operational amplifiers 8. Digital simulations
Literature	Skript
Remarks	

Module Course: Computer Aided Design (Practical Training)

(of Module: Computer Aided Design)

Course Type	Practical Training	**Form of Learning**	Presence
Mandatory Attendance	yes	**ECTS Credit Points**	2
Participation Limit		**Semester Hours per Week**	2
Group Size	12	**Workload (hours)**	60
Teaching Language	English	**Presence Hours**	16
Study Achievements ("Studienleistung", SL)	Practical Training	**Self-Study Hours**	44
SL Length (minutes)		**SL Grading System**	Pass

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	Lab 1: Design 5W Audio Amplifier Lab 2: Design Switched Power Supply (Boost Converter) Lab 3: Redesign and Integration of Task 1 and Task
Literature	Skript
Remarks	