TECHNISCHE HOCHSCHULE DEGGENDORF

# Module Guide
# Applied Computer Sciences

Faculty Computer Science
Examination regulations 07.12.2020
Date: Tuesday 16.02.2021 15:16

# 1 Theoretical Computer Science

| | |
|---|---|
| Module code | 1 |
| Module coordination | Prof. Dr. Peter Faber |
| Course number and name | Theoretical Computer Science |
| Lecturers | Prof. Dr. Peter Faber<br>Prof. Dr. Peter Jüttner |
| Semester | 1 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 6 |
| ECTS | 8 |
| Workload | Time of attendance: 90 hours<br>self-study: 180 hours<br>Total: 270 hours |
| Type of Examination | written ex. 90 min. |
| Duration of Examination | 90 min. |
| Language of Instruction | English |
| | |

## Module Objective

The goal of this course is that students are able to understand and to apply formal theories and methods in the area of semantics, computability and theory of complexity.

Technical Competence:

- Application of formal calculation of the semantics of recursive functions
- Application of different induction methods to prove properties of programs
- Application of operational and axiomatic semantics to prove properties of programs
- Application of different models of computability

- Knowledge of the calculation of the complexity of different classes of problem and application of resulting consequences for programming of software.

Methodical Competences

- Application of mathematical proof concepts

# Theoretical Computer Science

## Objectives

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Technical Competence:

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- Application of different induction methods to prove properties of programs
- Application of operational and axiomatic semantics to prove properties of programs
- Application of different models of computability
- Knowledge of the calculation of the complexity of different classes of problem and application of resulting consequences for programming of software.

Methodical Competences

- Application of mathematical proof concepts

## Learning Content

## Type of Examination

part of module exam

## Recommended Literature

- John Longley, Lessons in „Formal Programming Language Semantics“, University of Edinburgh, 2003
- F.L. Bauer, H. Wössner: Algorithmische Sprache und Programmentwicklung, Springer Verlag 1984 (availble also in English)
- Rudolf Berghammer: Semantik von Programmiersprachen, Logos Verlag, 2001

- Juraj Hromkovic: Theoretische Informatik, Springer Verlag
- Uwe Schöning: Theoretische Informatik - kurz gefasst. Spektrum, 2008
- Hopcroft, Motwani, Ullman: Introduction to Automata Theory, Languages, and Computation, Addison-Wesley, 2001
- Hopcroft, Motwani, Ullman: Einführung in die Automatentheorie, Formale Sprachen und Komplexitätstheorie, Pearson, 2002.

# 11 FPGA Programmierung

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|---|---|
| Module code | 11 |
| Module coordination | Prof. Dr. Martin Schramm |
| Course number and name | FPGA Programmierung |
| Lecturers | Prof. Dr. A Admin<br>Prof. Dr. Martin Schramm |
| Semester | 1 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 4 |
| ECTS | 5 |
| Workload | Time of attendance: 60 hours<br>self-study: 90 hours<br>Total: 150 hours |
| Type of Examination | written ex. 90 min. |
| Duration of Examination | 90 min. |
| Language of Instruction | English |
| | |

## Module Objective

## FPGA Programmierung

### Type of Examination

part of module exam

# 12 AWP

| | |
|---|---|
| Module code | 12 |
| Module coordination | Prof. Dr. Peter Jüttner |
| Course number and name | AWP I<br>AWP II |
| Lecturer | Dozenten/innen für AWP und Sprachen, vhb |
| Semester | 1, 2 |
| Duration of the module | 2 semester |
| Module frequency | annually |
| Course type | compulsory elective course |
| Level | postgraduate |
| Semester periods per week (SWS) | 4 |
| ECTS | 4 |
| Workload | Time of attendance: 60 hours<br>self-study: 90 hours<br>Total: 150 hours |
| Weight | |
| Language of Instruction | German |
| | |

## Module Objective

## Entrance Requirements

## Learning Content

German for non-German students. Germans can choose a random language that is offered by the language centre.

## Remarks

Duration of the module examination

- German exams (4 ECTS): 90 minutes

- all other language exams (2 ECTS): 60 minutes
Course language is the respectice foreign language.

## AWP I

### Type of Examination

written ex. 60 min.

## AWP II

### Type of Examination

written ex. 60 min.

# 13 Mastermodul

| | |
|---|---|
| Module code | 13 |
| Module coordination | Prof. Dr. Peter Jüttner |
| Course number and name | Master's Thesis<br>Master's Colloquium |
| Semester | 3 |
| Duration of the module | 1 semester |
| Module frequency | each semester |
| Course type | required course |
| Semester periods per week (SWS) | 0 |
| ECTS | 23 |
| Workload | Time of attendance: 0 hours<br>self-study: 760 hours<br>Total: 760 hours |
| Type of Examination | master thesis |
| Language of Instruction | German |
| | |

## Module Objective

## Master's Thesis

### Type of Examination

student research project

# Master's Colloquium

## Type of Examination

oral examination

# 2 Practical Computer Science

| | |
|---|---|
| Module code | 2 |
| Module coordination | Prof. Dr. Peter Jüttner |
| Course number and name | Practial Computer Science |
| Lecturers | Prof. Dr. Peter Faber<br>Prof. Dr. Peter Jüttner |
| Semester | 1 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 6 |
| ECTS | 8 |
| Workload | Time of attendance: 90 hours<br>self-study: 180 hours<br>Total: 270 hours |
| Type of Examination | written ex. 90 min. |
| Duration of Examination | 90 min. |
| Language of Instruction | English |
| | |

## Module Objective

## Practial Computer Science

### Type of Examination

part of module exam

# 3 Selected Topics of Embedded Software Development I

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|---|---|
| Module code | 3 |
| Module coordination | Prof. Dr. Andreas Grzemba |
| Course number and name | Selected Topics of Embedded Software Development I |
| Lecturers | Prof. Dr. Gökçe Aydos<br>Prof. Dr. Andreas Grzemba<br>Ismail Günay |
| Semester | 1 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 4 |
| ECTS | 5 |
| Workload | Time of attendance: 60 hours<br>self-study: 120 hours<br>Total: 180 hours |
| Type of Examination | written student research project |
| Language of Instruction | English |
| | |

## Module Objective

## Selected Topics of Embedded Software Development I

### Type of Examination

part of module exam

# 4 Selected Topics of Embedded Software Development II

| | |
|---|---|
| Module code | 4 |
| Module coordination | Prof. Dr. Martin Schramm |
| Course number and name | Selected Topics of Embedded Software Development II |
| Semester | 3 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 4 |
| ECTS | 5 |
| Workload | Time of attendance: 60 hours<br>self-study: 90 hours<br>Total: 150 hours |
| Type of Examination | written ex. 90 min. |
| Duration of Examination | 90 min. |
| Language of Instruction | German |
| | |

## Module Objective

## Selected Topics of Embedded Software Development II

### Type of Examination

written ex. 90 min.

# 5 Special Mathematical Methods

| | |
|---|---|
| Module code | 5 |
| Module coordination | Prof. Dr. Gökçe Aydos |
| Course number and name | Special Mathematical Methods |
| Semester | 2 |
| Duration of the module | 1 semester |
| Module frequency | annually |
| Course type | required course |
| Semester periods per week (SWS) | 4 |
| ECTS | 5 |
| Workload | Time of attendance: 60 hours<br>self-study: 90 hours<br>Total: 150 hours |
| Type of Examination | written ex. 90 min. |
| Duration of Examination | 90 min. |
| Language of Instruction | English |
| | |

## Module Objective

## Special Mathematical Methods

### Type of Examination

written ex. 90 min.

# 6-10 Elective Courses

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|---|---|
| Module code | 6-10 |
| Module coordination | Prof. Dr. Peter Jüttner |
| Course number and name | |
| Semester | 1, 2 |
| Duration of the module | 2 semester |
| Module frequency | annually |
| Course type | compulsory course |
| Semester periods per week (SWS) | 4 |
| ECTS | 5 |
| Workload | Time of attendance: 60 hours<br>self-study: 120 hours<br>Total: 180 hours |
| Language of Instruction | German |
| | |

## Module Objective

## Type of Examination

Examination form of the chose module