

Prüfungsordnung des Fachbereichs 2: Informatik und Ingenieurwissenschaften – Computer Science and Engineering der Fachhochschule Frankfurt am Main - University of Applied Sciences für den Master-Studiengang „High Integrity Systems (HIS)“ vom 13.12.2006, zuletzt geändert am 24.10.2012

Hier: Änderung vom 06.02.2013

Aufgrund des § 44 Abs. 1 Nr. 1 des Hessischen Hochschulgesetzes (HHG) vom 14. Dezember 2009 (GVBl. I S. 666), zuletzt geändert durch Gesetz vom 26. Juni 2012 (GVBl. S. 227), hat der Fachbereichsrat des Fachbereichs 2: Informatik und Ingenieurwissenschaften – Computer Science and Engineering der Fachhochschule Frankfurt am Main – University of Applied Sciences am 06.02.2013 die nachstehende Änderung der Prüfungsordnung für den Master-Studiengang High Integrity Systems beschlossen.

Die Änderung der Prüfungsordnung entspricht den Allgemeinen Bestimmungen für Prüfungsordnungen mit den Abschlüssen Bachelor und Master an der Fachhochschule Frankfurt am Main – University of Applied Sciences (AB Bachelor/Master) vom 10. November 2004 (Staatsanzeiger für das Land Hessen 2005 S. 519), zuletzt geändert am 11. Juli 2012 (veröffentlicht am 25.09.2012 auf der Internetseite in den amtlichen Mitteilungen der Fachhochschule Frankfurt am Main – University of Applied Sciences) und ergänzt sie. Die Änderung der Prüfungsordnung wurde durch das Präsidium am 13. Januar 2014 gemäß § 37 Abs. 5 HHG genehmigt.

Die Genehmigung ist befristet für die Dauer der Akkreditierung bis zum 25.07.2013.

Artikel I: Änderung

1.

§4 wird wie folgt geändert:

Die Absätze 1 und 2 erhalten folgende neue Fassung:

„(1) Der Studiengang umfasst 18 Module. 12 Module sind Pflichtmodule und 6 Module sind Wahlpflichtmodule.

(2)Die Wahlpflichtmodule werden aus den drei Wahlpflichtbereichen Elective Subjects I (Module 8.1 und 8.2), Elective Subjects II (Module 10.1 und 10.2), Elective Subjects III (Module 12.1 und 12.2), Elective Subjects IV (Module 13.1 und 13.2), Elective Subjects V (Module 14.1, 14.2 und 14.3) und Elective Subjects VI (Module 16.1, 16.2 und 16.3) ausgewählt. Dabei ist aus jedem der sechs Wahlpflichtbereiche ein Modul auszuwählen. Das Angebot in den Wahlpflichtmodulen wird in jedem Semester per Fachbereichsrats-Beschluss festgelegt und fachbereichsweit per Aushang veröffentlicht.“

2.

§ 5 wird wie folgt geändert:

a. In Abs. 2 wird Satz 2 „Auf Antrag des Studierenden können Modulprüfungen nach Beschluss des Prüfungsausschusses in deutscher Sprache durchgeführt werden.“ ersatzlos gestrichen.

b.In Abs. 3 Satz 2 wird der in Klammern gehaltene Verweis auf „Anlage 1“ geändert in „Anlage 3“

c. Absatz 4 erhält folgende neue Fassung:

„ Das Modul 17 : HIS Project umfasst 10 ECTS-Punkte (Credits). Die Dauer beträgt 8 Wochen.

3. § 7 wird wie folgt geändert:

a. In Absatz 1 Satz wird die Angabe „ 6 Monate“ durch die Angabe „5 Monate“ ersetzt.

b. Abs. 7 erhält folgende neue Fassung:

„ Die Master-Arbeit ist im Rahmen eines Kolloquiums vorzustellen. Voraussetzung für das Kolloquium ist die mit mindestens „ausreichend“ bewertete Master-Arbeit. Das Kolloquium findet innerhalb von 4 Wochen nach Bestehen der Master-Arbeit statt. Das Kolloquium wird vor einer Prüfungskommission abgelegt, die aus den beiden Prüfenden der Master-Arbeit besteht. Die Dauer des Kolloquiums beträgt mindestens 30 Minuten und höchstens 45 Minuten.“

4.

Die Anlage 2 Modulübersicht wird wie folgt neu gefasst:

| Sem | No | Modules | Units | Type | Form | Weekly hours | CP | Work-load |
|------------------------|----------------------|--|-----------------------|------|------|--------------|-----------|------------|
| 1 | 1 | Safety Critical Computer Systems For students starting in the Winter term | Lectures Exercises | PL | O | 4 | 5 | 150 |
| | 7 | Mathematics Update For students starting in the Summer term | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 2 | Advanced Formal Modeling | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 3 | Introductory Data Analysis | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 4 | Advanced Real-Time Systems | Group Project | PL | P | 4 | 5 | 150 |
| | 5 | Implementation of DBMS | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 6 | Pattern Oriented Software Architecture | Lectures Exercises | PL | O | 4 | 5 | 150 |
| Sum 1. Semester | | | | | | 24 | 30 | 900 |
| 2 | 1 | Safety Critical Computer Systems For students starting in the Summer term | Lectures Exercises | PL | O | 4 | 5 | 150 |
| | 7 | Mathematics Update For students starting in the Winter term | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 8 | Elective Subjects I | | | | | | |
| | 8.1 | Advanced Distributed Systems | Lectures Exercises | PL | W | 4 | 5 | 150 |
| | 8.2 | Advanced Testing Methods | Lectures Exercises | PL | W | 4 | 5 | 150 |
| 9 | Advanced IT-Security | Lectures Exercises | PL | O | 4 | 5 | 150 | |

| | | | | | | | | |
|------------------------|------|------------------------------|---------------|----|-----------|-----------|------------|-----|
| | 10 | Elective Subjects II | | | | | | |
| | 10.1 | Human Machine Interaction | Group Project | PL | P | 4 | 5 | 150 |
| | 10.2 | Smart Sensor Network Systems | Group Project | PL | P | 4 | 5 | 150 |
| | 11 | Data Mining | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | VL | B | | | |
| | 12 | Elective Subjects III | | | | | | |
| | 12.1 | System Theory and Modeling | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | | | | | |
| | 12.2 | Transaction Management | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | | | | | |
| Sum 2. Semester | | | | | 22 | 30 | 900 | |

| | | | | | | | | |
|------------------------|---------------------------------|--|-----------|----|-----------|-----------|------------|-----|
| 3 | 13 | Elective Subjects IV: | | | | | | |
| | 13.1 | Multivariate Data Analysis | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | VL | B | | | |
| | 13.2 | Simulation Methods | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | VL | B | | | |
| | 14 | Elective Subjects V | | | | | | |
| | 14.1 | Standards and Certification | Seminar | PL | O | 2 | 5 | 150 |
| | | Current Topics in High Integrity | | | | | | |
| | 14.2 | Systems | Seminar | PL | O | 2 | 5 | 150 |
| | | | | | | | | |
| | 14.3 | Internet of Things | Seminar | PL | O | 2 | 5 | 150 |
| | | | | | | | | |
| | 15 | Formal Specification and Verification | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | | | | | |
| | 16 | Elective Subjects VI | | | | | | |
| | 16.1 | Selected Subjects in Current Web Engineering | Lectures | PL | W | 4 | 5 | 150 |
| | | | Exercises | | | | | |
| 16.2 | Mobile Systems and Applications | Lectures | PL | W | 4 | 5 | 150 | |
| | | Exercises | | | | | | |
| 16.3 | Cloud Computing | Lectures | PL | W | 4 | 5 | 150 | |
| | | Exercises | | | | | | |
| 17 | HIS Project | Group Project | PL | P | 4 | 10 | 300 | |
| Sum 3. Semester | | | | | 18 | 30 | 900 | |

| | | | | | | | | |
|----------|------------------------|---------------|----------------|----|---|--|-----------|------------|
| 4 | 18 | Master Thesis | Thesis Project | PL | T | | 30 | 900 |
| | Sum 4. Semester | | | | | | 30 | 900 |

5.

Die Anlage 3 Modulbeschreibungen wird wie folgt geändert:

a. Die Vorlage für die Modulbeschreibungen wird wie folgt geändert:

| | |
|--|--|
| Module title | |
| Module number | |
| Study programme | |
| Applicability of the module to other study programmes | |
| Duration of the module | |
| Status of the module | |
| Recommended semester during the study programme | |
| Credit points (Cp) of the module | |
| Prerequisites for module participation | |
| Prerequisites for module examination | |
| Module examination | |
| Intended learning outcomes /acquired competences of the module | |
| Contents of the module | |
| Teaching methods of the module | |
| Total workload | |
| Language of the module | |
| Frequency of the module | |

b. Aufgrund der Änderung der Vorlage für die Modulbeschreibung erhalten die Modulbeschreibungen für die Module 2, 3, 5 und 6 folgende neue Fassung:

Modulbeschreibung zum Modul 2 Advanced Formal Modeling

| | |
|-----------------------------|--|
| Module title | Advanced Formal Modeling (M. Sc.) |
| Module number | 2 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module | Usable in other Computer Science Master programs |

| | |
|--|---|
| to other study programmes | |
| Duration of the module | 1 Semester |
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 1st /2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | Successful participation in the unit exercises |
| Module examination | Written examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Understanding the mathematical background and theoretical foundations of formal methods in the software engineering processes, which are relevant for safety critical systems. • Assessing the need for zero-defect software in safety critical systems. • Ability to distinguish formal specification methods. • Ability to carry out correctness proofs for simple code fragments. • Studying advanced formal methods. • Understanding the limitation of advanced formal methods. <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> • Scientific working style |
| Contents of the module | Advanced Formal Modeling - Lectures Advanced Formal Modeling - Exercises |
| Teaching methods of the module | Lectures and Exercises |
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Every Winter term |

Modulbeschreibung zum Modul 3 Introductory Data Analysis

| | |
|---|--------------------------------------|
| Module title | Introductory Data Analysis |
| Module number | 3 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | |
| Duration of the module | 1 semester |

| | |
|--|--|
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | 50% Regular attendance at exercise groups, (unit Introductory Data Analysis – Exercises) |
| Module examination | solutions to 40% of weekly exercises in unit Introductory Data Analysis - Exercises |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Confident assessment of the usage of the various methods of univariate and bivariate statistics in the application context. • Knowledge and understanding of different probability concepts (distributions, statistical models, testing procedures and principles) • Capacity to apply methods to selected real world situations • Capacity to use the computer to solve problems in real world situations • Capacity to understand and judge results of statistical analysis • Awareness of dangers of misuse and misinterpretation • Capacity to communicate using statistical language, i.e. explain procedures, results of an analysis and a critique of the results <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> • Scientific work style |
| Contents of the module | Advanced Formal Modeling - Lectures Advanced Formal Modeling - Exercises |
| Teaching methods of the module | Lectures and Exercises |
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Every Winter term |

Modulbeschreibung zum Modul 5 Implementation of DBMS

| | |
|---|---|
| Module title | Implementation of DBMS |
| Module number | 5 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science master curricula |
| Duration of the module | 1 |

| | |
|--|---|
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <p>Understand why databases form the backbone of every modern information system, and why a robust database management system (DBMS) is crucial for these systems.</p> <ul style="list-style-type: none"> Decide which architectures and implementation issues are relevant for robust DBMS. Comprehend prerequisites for building and extending a DBMS as well as for building the DBMS part of a larger application in a robust fashion. Assess the role of available parameters of commercial DBMS and thus, be able to tune these parameters in a way that results in a robust and best performing system. <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> Working in teams Communication in international teams |
| Contents of the module | <ul style="list-style-type: none"> Implementation of DBMS - Lectures Implementation of DBMS - Exercises |
| Teaching methods of the module | <p>Interactive lectures</p> <p>Teamwork in lab exercises</p> |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual |

Modulbeschreibung zum Modul 6 Pattern Oriented Software Architecture

| | |
|---|---|
| Module title | Pattern Oriented Software Architecture |
| Module number | 6 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science master curricula |
| Duration of the module | 1 |

| | |
|--|---|
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | Oral examination of at least 15 and maximum 45 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this course, the student is able to: • understand the motives of the pattern community. • distinguish between different types of patterns. • apply patterns in the design of SCS. • assess new developments of pattern catalogs and languages. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | Pattern Oriented Software Architecture - Lectures Pattern Oriented Software Architecture - Exercises |
| Teaching methods of the module | Interactive lectures Teamwork in lab exercises |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual |

c. Im Modul 1 „Safety Critical Computer Systems“ wird die Angabe in der Zeile „Semester“ wie folgt neu gefasst: „1st /2nd semester Offered each semester for 1st semester students“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 1 Safety Critical Computer Systems

| | |
|---|--|
| Module title | Safety Critical Computer Systems |
| Module number | 1 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Usable in the M.Sc. program Basys – Intelligente Systeme |
| Duration of the module | 1 |
| Status of the module | Mandatory module |

| | |
|--|--|
| Recommended semester during the study programme | 1st /2nd semester Offered each semester for 1st semester students |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | Oral examination of at least 15 and maximum 45 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this course, the student is able to: • distinguish between reliability and safety, • critically read accident reports, • perform a hazard analysis on a computer-based system, • write requirements for a safety-critical system and trace safety constraints to design, • work with human factors experts in the design of safe human-computer interaction, • apply the principles of safe design to both systems and software, • criticize and evaluate a system design for safety, and design a process for building a safety-critical system, • distinguish between the role of practitioners and managers. <p>Non specialist competencies (25% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Presentation skills • Team leading skills • Scientific literature research and handling • Time and project management skills |
| Contents of the module | Safety Critical Computer Systems – Lectures Safety Critical Computer Systems - Exercises |
| Teaching methods of the module | Lectures: Interactive teaching Exercises: Teamwork in small development groups |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Each semester |

d. Im Modul 4 „Real-Time Systems“ werden folgende Zeilen neu gefasst:

4. Module: Real-Time Systems: „Advanced Real-Time Systems“

Duration: „Project processing time 8 weeks“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 1 Safety Critical Computer Systems

| | |
|---------------|----------------------------|
| Module title | Advanced Real-Time Systems |
| Module number | 4 |

| | |
|--|---|
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science master curricula especially master program BaSys – Intelligente Systeme |
| Duration of the module | Project processing time 8 weeks |
| Status of the module | Mandatory |
| Recommended semester during the study programme | 1st /2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | The project should be worked out in a team of students (no more than four) with a 2-weekly written report of each participant describing essential aspects of the process from the point of view of each participant. |
| Module examination | Delivery of a written paper describing the theoretical concept of a real-time project in combination with a working software demonstrating the theory of the paper. The format of the paper has to be in accordance with a paper template of a typical scientific conference |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Extending the basic knowledge of real-time systems by reading a typical real-time research-paper • Transferring the knowledge into a theoretical model solving a concrete problem • Transferring the theoretical model into a working software • Validating the software <p>Non specialist competencies (25% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Presentation skills • Team leading skills • Scientific literature research and handling • Writing a paper • Time and project management skills • Project documentation |
| Contents of the module | Advanced Real-Time Systems - Project |
| Teaching methods of the module | After an introduction the student teams will work in a project setting. They have to use official textbooks and/ or scientific papers to back up their knowledge. The professor can be interviewed on demand. |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Winter term |

e) Nach dem Modul 6 „Pattern Oriented Software Architecture“ wird als Modul 7 folgendes neues Modul eingefügt:

Modulbeschreibung zum Modul 7 Mathematics Update

| | |
|--|---|
| Module title | Mathematics Update |
| Module number | 7 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | In other Computer Science master curricula |
| Duration of the module | 1 |
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 2 Offered for 2nd semester students |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this module the student is able to • analyze mathematical problems in a software project's list of requirements • to familiarize with new mathematical fields • assess the suitability and usability of mathematical software tools <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | Mathematics Update - Lectures Mathematics Update - Exercises |
| Teaching methods of the module | Interactive lectures Exercises with teamwork in small groups |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Summer semester for students starting in Winter, Winter semester for students starting in Summer |

f. Modul 7.1 „Distributed Systems“ wird zu Modul 8.1. Außerdem werden folgende Zeilen in diesem Modul neu gefasst:

7.1 Module: Distributed Systems“: „Advanced Distributed Systems“

Contents: „Advanced Distributed Systems – Lectures

Advanced Distributed Systems - Exercises“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 8.1 Advanced Distributed Systems

| | |
|--|--|
| Module title | Advanced Distributed Systems |
| Module number | 8.1 |
| Study programme | M.Sc. Program High-Integrity Systems |
| Applicability of the module to other study programmes | Usable in other Computer Science Master programs |
| Duration of the module | 1 |
| Status of the module | Elective Subject |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Understanding the advantages and problems of distributed systems. • Knowledge of different distributed architectures and algorithms. • Ability to analyze distributed systems, in particular with respect to robustness. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | <ul style="list-style-type: none"> • Advanced Distributed Systems - Lectures • Advanced Distributed Systems - Exercises |
| Teaching methods of the module | Lectures: Interactive group lecturing Exercises: Teamwork in small groups |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

g. Modul 7.2 „Data Mining“ wird verschoben und ist jetzt Modul 11.
Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 11 Advanced Distributed Systems

| | |
|---|--------------------------------------|
| Module title | Data Mining Methods |
| Module number | 11 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | yes |

| | |
|--|--|
| Duration of the module | 1 |
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 2 |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | 50% Regular attendance at exercise groups, (unit Data Mining Methods – Exercises) solutions to 40% of weekly exercises in unit Data Mining Methods - Exercises short written exposé as stated in unit Data Mining Methods - Exercises |
| Module examination | Written (computer) examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Awareness of different data types, data scales, data use as endogenous and exogenous • Skills in data recovery and data pre-processing • Theoretical understanding of statistical methods for information extraction • Capacity to use the computer to solve problems in real world data mining problems • Capacity to understand and judge results of statistical analysis in the context of data mining • Awareness of dangers of misuse and misinterpretation • Capacity to communicate using statistical language, i.e. explain procedures, results of an analysis and a critique of the results <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | Lectures using multimedia presentation techniques Exercises with a PC and statistical programming language in Computer pool to solve problems |
| Teaching methods of the module | Lectures using multimedia presentation techniques |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

h. Modul 8 „Advanced IT-Security“ wird zu Modul 9
Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 9 Advanced IT-Security

| | |
|-----------------------------|--|
| Module title | Advanced IT-Security |
| Module number | 9 |
| Study programme | M.Sc. Program High-Integrity Systems |
| Applicability of the module | Usable in other Computer Science Master programs |

| | |
|--|--|
| to other study programmes | |
| Duration of the module | 1 |
| Status of the module | Mandatory |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Oral examination of at least 15 and maximum 45 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <ul style="list-style-type: none"> to identify, analyze, and perhaps solve network-related security problems in computer systems. to understand security problems in the combination of the Internet with Intranets. to comprehend the need to protect all architectural levels. to get an understanding of how to coordinate hardware and software to provide data security against internal and external attacks. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> Team work Communication in international teams |
| Contents of the module | <ul style="list-style-type: none"> Advanced IT-Security - Lectures Advanced IT-Security - Exercises |
| Teaching methods of the module | <p>Lectures: Interactive group lecturing</p> <p>Exercises: Teamwork in small groups</p> |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

i. Modul 9 „Advanced Testing Methods“ wird zu Modul 8.2. Außerdem wird folgende Zeile in diesem Modul neu gefasst:

Status: „ Elective Subject“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 8.2 Advanced Testing Methods

| | |
|-----------------------------|--|
| Module title | Advanced Testing Methods |
| Module number | 8.2 |
| Study programme | M.Sc. Program High-Integrity Systems |
| Applicability of the module | Usable in other Computer Science Master programs |

| | |
|--|---|
| to other study programmes | |
| Duration of the module | 1 |
| Status of the module | Elective Subject |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <ul style="list-style-type: none"> • assess different testing methodologies, • master various powerful testing procedures, • differentiate between the testing of procedural and object oriented software, • estimate the importance of safety criteria for test case design, • recognize the limits of testing capabilities, • use gained experience to select valuable automated tests, • recognize tests not to be automated. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • This module facilitates communication structures used in business like Wikis and Discussion boards to show challenges working in global teams. |
| Contents of the module | <ul style="list-style-type: none"> • Unit Advanced Testing Methods - Lectures • Unit Advanced Testing Methods - Exercises |
| Teaching methods of the module | Lectures: Interactive group lecturing Exercises: Teamwork in small groups |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

j. Im Modul 10.1 „Human-Machine Interaction“ werden folgende Zeilen neu gefasst:
Duration: „Project processing time 8 weeks“
Status: „Elective module“
semester: „1st/2nd semester“
Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 10.1 Human-Machine Interaction

| | |
|---------------|---------------------------|
| Module title | Human-Machine Interaction |
| Module number | 10.1 |

| | |
|--|--|
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science master curricula especially master program BaSys – Intelligente Systeme |
| Duration of the module | Project processing time 8 weeks |
| Status of the module | Elective module |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | The project should be worked out in a team of students (no more than four) with a 2-weekly written report of each participant describing essential aspects of the process from the point of view of each participant. |
| Module examination | Delivery of a written paper describing the theoretical concept of a HMI-project in combination with a working demonstrator showing the working of the theory. The format of the paper has to be in accordance with a paper template of a typical scientific conference. The project should include at least one realized empirical usability test with the demonstrator. |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Overall goal is to gain basic knowledge about HMI as part of a systems engineering process, psychological conditions of a user, how to describe the behavior of user, how to derive requirements for an interface, and how to test the usability of an interface • Transferring the gained knowledge into a theoretical model solving a concrete problem • Transferring the theoretical model into a working demonstrator • Validating the demonstrator with the aid of usability tests <p>Non specialist competencies (25% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Presentation skills • Team leading skills • Documentation • Writing a scientific paper |
| Contents of the module | Human Machine Interaction - Project |
| Teaching methods of the module | After an introduction the student teams work in a project. They have to use official textbooks and/ or scientific papers to back up their knowledge. The professor can be interviewed on demand. |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

k. Im Modul 10.2 „Smart Sensor Network Systems“ werden folgende Zeilen neu gefasst:
Duration: „Project processing time 8 weeks“

Status: „Elective module“
semester: „1st/2nd semester“
Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 10.2 Smart Sensor Network Systems

| | |
|--|---|
| Module title | Smart Sensor Network Systems |
| Module number | 10.2 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science master curricula especially master program BaSys – Intelligente Systeme |
| Duration of the module | Project processing time 8 weeks |
| Status of the module | Elective module |
| Recommended semester during the study programme | 1st/2nd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | The project should be worked out in a team of students (no more than four) with a 2-weekly written report of each participant describing essential aspects of the process from the point of view of each participant. |
| Module examination | Oral examination of at least 15 minutes and maximum 30 minutes duration, based on a written report and an oral presentation of project results. |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this course, the student is able to: • understand the interface between computer science and the physical environment, • assess the challenges of the measuring process and the possible errors, • set up and program a Wireless Sensor Network and interface it with a standard network and/or the Internet, • participate in the solution of measuring tasks by cooperation with specialists of other disciplines. <p>Non specialist competencies (25% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Presentation skills • Team leading skills • Documentation • Writing a scientific paper |
| Contents of the module | Smart Sensor Network Systems - Project |
| Teaching methods of the module | Project |
| Total workload | 150 |
| Language of the module | English |

| | |
|-------------------------|---------------------|
| Frequency of the module | Annual, Summer term |
|-------------------------|---------------------|

I. Modul 11 „System Theory and Modeling“ wird verschoben und ist jetzt Modul 12.1 Es wird ersetzt durch das bisherige Module 7.2, das jetzt Modul 11 ist. Außerdem wird folgende Zeile in diesem Modul neu gefasst:

Status: „ Elective Subject“

Die Modulbeschreibungen erhalten folgende neue Fassungen:

Modulbeschreibung zum Modul 12.1 System Theory and Modeling

| | |
|--|--|
| Module title | System Theory and Modeling |
| Module number | 12.1 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other M.Sc. Programs in computer science |
| Duration of the module | 1 semester |
| Status of the module | Elective subject |
| Recommended semester during the study programme | 2nd /1st semester |
| Credit points (Cp) of the module | 5 CP |
| Prerequisites for module participation | none |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <ul style="list-style-type: none"> • understand the foundations of systems theory, • comprehend the importance of HW/SW system modeling, • assess different modeling techniques, • apply system modeling techniques to real world application prototype examples. <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Scientific literature research and handling |
| Contents of the module | System Theory and Modeling – Lectures System Theory and Modeling - Exercises |
| Teaching methods of the module | Interactive lectures using multimedia presentation techniques Exercises: Teamwork |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

Modulbeschreibung zum Modul 11 Data Mining Methods

| | |
|--|--|
| Module title | Data Mining Methods |
| Module number | 11 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | yes |
| Duration of the module | 1 |
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 2 |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | 50% Regular attendance at exercise groups, (unit Data Mining Methods – Exercises) solutions to 40% of weekly exercises in unit Data Mining Methods - Exercises short written exposé as stated in unit Data Mining Methods - Exercises |
| Module examination | Written (computer) examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Awareness of different data types, data scales, data use as endogenous and exogenous • Skills in data recovery and data pre-processing • Theoretical understanding of statistical methods for information extraction • Capacity to use the computer to solve problems in real world data mining problems • Capacity to understand and judge results of statistical analysis in the context of data mining • Awareness of dangers of misuse and misinterpretation • Capacity to communicate using statistical language, i.e. explain procedures, results of an analysis and a critique of the results <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | Data Mining Methods - Lectures Data Mining Methods - Exercises |
| Teaching methods of the module | Lectures using multimedia presentation techniques Exercises with a PC and statistical programming language in Computer pool to solve problems |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

m. Modul 12 „Transaction Management“ wird zu Modul 12.2. Außerdem wird folgende Zeile in diesem Modul neu gefasst:
Status: „ Elective Subject“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 12.2 Transaction Management

| | |
|--|---|
| Module title | Transaction Management |
| Module number | 12.2 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other M.Sc. Programs in computer science |
| Duration of the module | 1 semester |
| Status of the module | Elective subject |
| Recommended semester during the study programme | 2nd /1st semester |
| Credit points (Cp) of the module | 5 CP |
| Prerequisites for module participation | none |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Understanding the concept of a transaction. • Understanding how the deployment of transaction systems can increase the robustness of a system without adding additional complexity to the application development. • Knowledge of algorithms to handle problems resulting from concurrent access to data and errors resulting from system failures. <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Scientific literature research and handling |
| Contents of the module | Transaction Management – Lectures Transaction Management - Exercises |
| Teaching methods of the module | Interactive lectures Exercises: Teamwork in R&D-groups |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual, Summer term |

n. Das Modul 13 „Multivariate Data Analysis“ erhält die neue Nummerierung 13.1, die folgende Zeile wird neu gefasst:

Status: „Elective subject“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 13.1 Multivariate Data Analysis

| | |
|--------------|----------------------------|
| Module title | Multivariate Data Analysis |
|--------------|----------------------------|

| | |
|--|---|
| Module number | 13.1 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other M.Sc. Programs in computer science |
| Duration of the module | 1 semester |
| Status of the module | Elective subject |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 CP |
| Prerequisites for module participation | successful participation in courses Introductory Data Analysis - Exercises successful participation in courses Data Mining Methods - Exercises |
| Prerequisites for module examination | 50% Regular attendance at exercise groups, (unit Multivariate Data Analysis – Exercises) solutions to 40% of weekly exercises in unit Multivariate Data Analysis - Exercises short written exposé as stated in unit Multivariate Data Analysis - Exercises |
| Module examination | Written (computer) examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Understanding of structure of data from automated processes • Understanding of Data pre-processing methods (data compression, data alignment, data transformations etc.) • Understanding of collinearity problem and ways to deal with it • Capacity to apply technologies to real world situations • Capacity to analyse a data analysis project, determine pre-processing steps, try out different statistical technologies • Interpret results in the context of an application and a given problem setting • Draw conclusions and communicate results and procedures of a data analysis project <p>Non specialist competencies (15% of total workload):</p> <ul style="list-style-type: none"> • Cultural and social aspects of project work in international R&D teams • Presentation skills • Communicate with a customer to understand a problem setting • Scientific literature research and handling |
| Contents of the module | Multivariate Data Analysis – Lectures Multivariate Data Analysis - Exercises |
| Teaching methods of the module | Lectures using multimedia presentation techniques Group work |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Biannual |

o. Im Modul 14.1 „Standards and Certification“ wird folgende Zeile neu gefasst:

Module frequency: „Alternating with modules 14.2, 14.3“
 Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 14.1 Standards and Certification

| | |
|--|--|
| Module title | Standards and Certification |
| Module number | 14.1 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other M.Sc. Programs in computer science |
| Duration of the module | 1 |
| Status of the module | Elective Subject |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | <ul style="list-style-type: none"> • Paper written according to international scientific journal standards and oral presentation (30 minutes) according to international scientific conference standards. • The grade is calculated by the arithmetic mean of the marks for the written report and oral presentation |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this course, the student is able to: • assess the growing pressure to standardize the development of high-integrity systems, • understand the growing importance of software safety, • survey the body of standards, • distinguish between standards of different application fields, • understand the history of engineering for safety, • achieve the ability for certification work, • understand the roles of management and staff in certification work. <p>Training for non-specialist competencies (25% of the total workload): Students learn</p> <ul style="list-style-type: none"> • to search for, read, summarize and cite scientific literature on a large scale; • to read and interpret national and international standards; • to write a report as a scientific paper; • to give a scientific talk. <p>Standards and Certification - Seminar</p> |
| Contents of the module | <ul style="list-style-type: none"> • Standards and Certification - Seminar |
| Teaching methods of the module | Seminar |
| Total workload | 150 |
| Language of the module | English |

| | |
|-------------------------|-------------------------------------|
| Frequency of the module | Alternating with modules 14.2, 14.3 |
|-------------------------|-------------------------------------|

p. Im Modul 14.2 „Current Topics in High Integrity Systems“ wird folgende Zeile neu gefasst:

Module frequency: „Alternating with modules 14.1, 14.3“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 14.2 Current Topics in High Integrity Systems

| | |
|--|--|
| Module title | Current Topics in High Integrity Systems |
| Module number | 14.2 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | |
| Duration of the module | 1 |
| Status of the module | Elective Subject |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | <p>Paper written according to international scientific journal standards and oral presentation (30 minutes) according to international scientific conference standards.</p> <p>The grade is calculated by the arithmetic mean of the marks for the written report and oral presentation</p> |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Upon completion of this course, the student is able to: • recognize important developments in the field of High Integrity Systems, • incorporate new methods into the software and systems development process • criticize new technology with respect to their usability in critical systems development. <p>Training for non-specialist competencies (25% of the total workload): Students learn</p> <ul style="list-style-type: none"> • to search for, read, summarize and cite scientific literature on a large scale; • to read and interpret national and international publications; • to write a report as a scientific paper; • to give a scientific talk. • Standards and Certification - Seminar |
| Contents of the module | <ul style="list-style-type: none"> • Current Topics in High Integrity Systems - Seminar |

| | |
|--------------------------------|-------------------------------------|
| Teaching methods of the module | Seminar |
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Alternating with modules 14.1, 14.3 |

q. Nach dem Modul 14.2 „Current Topics in High Integrity Systems“ wird als Modul 14.3 folgendes neues Wahlpflichtmodul eingefügt:

Modulbeschreibung zum Modul 14.3 Internet of Things

| | |
|--|--|
| Module title | Internet of Things |
| Module number | 14.3 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | |
| Duration of the module | 1 |
| Status of the module | Elective Subject |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | none |
| Module examination | <p>Paper written according to international scientific journal standards (6 weeks) and oral presentation (min. 25, max. 30 minutes) according to international scientific conference standards.</p> <p>The grade is calculated by the arithmetic mean of the marks for the written report and oral presentation</p> |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <ul style="list-style-type: none"> • understand the basic technologies for the Internet of Things, • asses emerging technologies concerning their suitability, • get acquainted quickly with new technologies, and • develop new application fields. <p>Training for non-specialist competencies (25% of the total workload): Students learn</p> <ul style="list-style-type: none"> • to search for, read, summarize and cite scientific literature on a large scale; • to read and interpret national and international standards; • to write a report as a scientific paper; • to give a scientific talk. |
| Contents of the module | Internet of Things - Seminar |
| Teaching methods of the module | Seminar |

| | |
|-------------------------|--|
| Total workload | 150 |
| Language of the module | English |
| Frequency of the module | Annual after Fachbereichsrats decision |

r. Das Modul 10 „ Formal Specification and Verification“ wird ins dritte Semester verschoben und ist jetzt Modul 15. Es wird ersetzt durch die bisherigen Module 15.1 und 15.2

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 15 Formal Specification and Verification

| | |
|--|--|
| Module title | Formal Specification and Verification |
| Module number | 15 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | Usable in other Computer Science Master programs |
| Duration of the module | 1 Semester |
| Status of the module | Mandatory module |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration |
| Intended learning outcomes /acquired competences of the module | <ul style="list-style-type: none"> • Understanding the principles of formal specification and verification. • Understanding the theory (models and logics) used in model checking. • Reasoning about safety, liveness and fairness properties in concurrent systems. • Specifying safety and liveness properties of concurrent systems using temporal logic and/or computational tree logic. • Verifying that a concurrent system satisfies certain safety and liveness properties using model checking algorithms. • Understanding the limitations of model checking. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | Formal Specification and Verification - Lectures Formal Specification and Verification - Exercises |
| Teaching methods of the module | Lectures and Exercises |

| | |
|-------------------------|------------------------|
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Summer and Winter term |

s. Das Modul 16 „Simulation Methods“ wird ins zweite Semester verschoben und ist jetzt Modul 13.2. Das vormalige Modul 16 wird ersetzt durch die folgenden Wahlpflichtmodul:

Modulbeschreibung zum Modul 16.1 Selected Subjects in Current Web Engineering

| | |
|--|--|
| Module title | Selected Subjects in Current Web Engineering |
| Module number | 16.1 |
| Study programme | M.Sc. Program High-Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science and engineering master curricula |
| Duration of the module | 1 Semester |
| Status of the module | Elective module |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Web architectures play an important and ever increasing role in organizing IT on a large scale. Web applications and algorithms have an important impact on society and how information is processed and consumed.</p> <p>Upon completion of this course, the students</p> <ul style="list-style-type: none"> • have a basic understanding of the fundamental principles of Web Engineering, such as Web-protocols and architectures, relevant algorithms, data semantics and (Web-) UI and how these relate to each other • are able to plan and architect information systems based on those principles • have a deep understanding of at least one selected subject from Web-protocols and architecture, relevant algorithms, data semantics and (Web-) UI (depending on the actual lecture and the student's interest) <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | <p>Selected Subjects in Current Web Engineering - Lectures</p> <p>Selected Subjects in Current Web Engineering - Exercises</p> |
| Teaching methods of the module | Lectures and Exercises |

| | |
|-------------------------|---|
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Bi-annual after Fachbereichsrats decision |

Modulbeschreibung zum Modul 16.2 Mobile Systems and Applications

| | |
|--|--|
| Module title | Mobile Systems and Applications |
| Module number | 16.2 |
| Study programme | M.Sc. Program High-Integrity Systems |
| Applicability of the module to other study programmes | Applicable in other computer science and engineering master curricula |
| Duration of the module | 1 Semester |
| Status of the module | Elective module |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the students</p> <ul style="list-style-type: none"> • understand the role and specific challenges of mobile computing • understand the foundations of mobile computing including theoretical concepts, technologies and tools • are able to apply their skills and choose technologies accordingly • are able to develop and deploy mobile applications <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | <p>Mobile Systems and Applications - Lectures</p> <p>Mobile Systems and Applications - Exercises</p> |
| Teaching methods of the module | Lectures and Exercises |
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Annual after Fachbereichsrats decision |

Modulbeschreibung zum Modul 16.3 Cloud Computing

| | |
|-----------------|--------------------------------------|
| Module title | Cloud Computing |
| Module number | 16.3 |
| Study programme | M.Sc. Program High-Integrity Systems |

| | |
|--|---|
| Applicability of the module to other study programmes | Applicable in other computer science and engineering master curricula |
| Duration of the module | 1 Semester |
| Status of the module | Elective module |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 5 |
| Prerequisites for module participation | None |
| Prerequisites for module examination | None |
| Module examination | Written examination of 90 minutes duration at the end of the semester |
| Intended learning outcomes /acquired competences of the module | <p>Cloud Computing provides scalable IT resources "on demand" using technologies such as virtualization. Access to these resources is abstracted via APIs and frameworks - often based on Web-Services. It is expected that Cloud Computing has a major impact on IT infrastructure of enterprises and business models.</p> <p>Upon completion of this course, the students</p> <ul style="list-style-type: none"> • understand the concepts and technologies fundamental for Cloud Computing • understand the economical and operational impact of Cloud Computing for providing IT-resources within the enterprise • is able to apply a structured, scientific process to evaluate architecture alternatives for Cloud Computing • are able to architect and implement Cloud Computing solutions. <p>Non specialist competencies (15% of the total workload):</p> <ul style="list-style-type: none"> • Team work • Communication in international teams |
| Contents of the module | <p>Cloud Computing - Lectures</p> <p>Cloud Computing - Exercises</p> |
| Teaching methods of the module | Lectures and Exercises |
| Total workload | 150 h |
| Language of the module | English |
| Frequency of the module | Annual after Fachbereichsrats decision |

t. Im Modul 17 „HIS Project“ wird folgende Zeile neu gefasst:

Duration: „Project processing time 8 weeks“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 17 High Integrity Systems Project

| | |
|---|--------------------------------------|
| Module title | High Integrity Systems Project |
| Module number | 17 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | |

| | |
|--|--|
| Duration of the module | Project processing time 8 weeks |
| Status of the module | Mandatory |
| Recommended semester during the study programme | 3rd semester |
| Credit points (Cp) of the module | 10 |
| Prerequisites for module participation | none |
| Prerequisites for module examination | The project should be worked out in a team of students (no more than four) with a 2-weekly written report of each participant describing essential aspects of the process from the point of view of each participant. |
| Module examination | Written report in the form of a scientific paper and an oral presentation of project results in the form of a scientific conference talk according to the rules of a scientific society, i.e. IEEE. |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of this course, the student is able to:</p> <ul style="list-style-type: none"> • develop a high-integrity software application with real-world requirements, • gain experience in all fields of software and systems engineering and certification of high-integrity software, • and assess the problems of applying scientific knowledge in a real world R&D – situation. <p>Training for non-specialist competencies (25% of the total workload): Students learn</p> <ul style="list-style-type: none"> • to explore and to adapt to a R&D environment; • to organize a research team; • to use modern tools for project organization; • to make industrial presentations; • work in a group environment with distributed responsibilities; • to write a report as a scientific paper. |
| Contents of the module | High Integrity Systems - Project |
| Teaching methods of the module | Project |
| Total workload | 300 |
| Language of the module | English |
| Frequency of the module | Each semester |

p) Im Modul 18 „HIS Project“ wird die Zeile "Duration" neu gefasst:
„5 months“

Die Modulbeschreibung erhält folgende neue Fassung:

Modulbeschreibung zum Modul 18 High Integrity Systems Master Thesis

| | |
|---|--------------------------------------|
| Module title | High Integrity Systems Master Thesis |
| Module number | 18 |
| Study programme | M.Sc. Program High Integrity Systems |
| Applicability of the module to other study programmes | |
| Duration of the module | 5 months |

| | |
|--|---|
| Status of the module | Mandatory |
| Recommended semester during the study programme | 4th semester |
| Credit points (Cp) of the module | 30 |
| Prerequisites for module participation | All modules of the first 3 semesters with examinations passed |
| Prerequisites for module examination | Successful completion of Master's Thesis |
| Module examination | Master's colloquium of at least 30 and maximum 60 minutes duration |
| Intended learning outcomes /acquired competences of the module | <p>Upon completion of the master thesis, the student is able to:</p> <ul style="list-style-type: none"> • develop completely an extensive high-integrity software application with real-world requirements, • work in a larger group environment with distributed responsibilities, • gain experience in all fields of software engineering and certification of high-integrity software, • and assess the problems of applying scientific knowledge in a real world R&D – situation. <p>Training for non-specialist competencies (25% of the total workload): Students</p> <ul style="list-style-type: none"> • practice scientific project management;. • use modern tools for project organization; • write the thesis as a comprehensive scientific report; • defend the thesis in a scientific colloquium. |
| Contents of the module | Master Thesis |
| Teaching methods of the module | Research and Development project |
| Total workload | 900 |
| Language of the module | English |
| Frequency of the module | Each semester |

Artikel II: Inkrafttreten

Die Änderung tritt am 01.09.2012 zum Wintersemester 2012/13 in Kraft und wird in einem zentralen Verzeichnis auf der Internetseite der Fachhochschule Frankfurt am Main –University of Applied Sciences veröffentlicht.

Frankfurt am Main, den _____

Prof. Achim Morkramer
Dekan des Fachbereichs Fb 2:
Informatik und Ingenieurwissenschaften – Computer Science and Engineering
Fachhochschule Frankfurt am Main - University of Applied Sciences