Subdivided Module Catalogue
for the Subject

Human-Computer Systems
as a Bachelor’s with 1 major
with the degree "Bachelor of Science"
(180 ECTS credits)

Examination regulations version: 2016
Responsible: Faculty of Human Sciences
Responsible: Institute of Human Computer Media
Course of Studies - Contents and Objectives

The Bachelor of Human-Computer Systems is an interdisciplinary course of studies that teaches field-related competencies as well as competencies in computer science and psychology. The program imparts substantial knowledge on the following subjects:

- Programming and programming techniques;
- Software design and analysis;
- Psychological and physiological characteristics of users;
- Foundations of Usability, User Experience and Human Factors;
- User interface design of interactive systems;
- Interaction techniques and paradigms;
- Statistical methods.

Graduates acquire the following methodological competencies:

- Analytic thinking and planning and the ability to abstract;
- Algorithmic thinking and design;
- Mastery of methods and methodologies for the analysis, design and evaluation of human-computer systems;
- Substantial skills in designing experiments, data collection, and interpretation.

Graduates can apply their knowledge and their skills in their occupational or professional context and can develop and advance solutions to problems and arguments in their field of work. They can collect, assess and interpret relevant information, in particular on their degree programme, and are able to draw scientifically-founded conclusions. They can formulate specialised positions and solutions to problems, can present these verbally or in written form, and can defend these through argument. They can discuss information, ideas, problems and solutions with specialists and non-specialists and can take on responsibility in a team.
Abbreviations used

Course types: \( E \) = field trip, \( K \) = colloquium, \( O \) = conversatorium, \( P \) = placement/lab course, \( R \) = project, \( S \) = seminar, \( T \) = tutorial, \( Ü \) = exercise, \( V \) = lecture

Term: \( SS \) = summer semester, \( WS \) = winter semester

Methods of grading: \( \text{NUM} = \) numerical grade, \( \text{B}/\text{NB} = \) (not) successfully completed

Regulations: \( \text{(L)ASPO} = \) general academic and examination regulations (for teaching-degree programmes), \( \text{FSB} = \) subject-specific provisions, \( \text{SFB} = \) list of modules

Other: \( A = \) thesis, \( LV = \) course(s), \( PL = \) assessment(s), \( TN = \) participants, \( VL = \) prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

\( \text{ASPO2015} \)

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

\( 4\text{-Apr-2016 (2016-54)} \)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.
The subject is divided into

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<td>10-MCS-ICGV-152-m01</td>
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<td>06-MCS-IDA-152-m01</td>
<td>Inclusive Design &amp; Accessibility</td>
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<td>06-MCS-AT-152-m01</td>
<td>Current Trends of Human-Computer Systems</td>
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<td>06-MCS-IgL-152-m01</td>
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<td>One of the following modules must be taken: MCS-Projekt Psychologie (MCS Project Psychology), MCS-Projekt Informatik (MCS Project Computer Science), MCS-Projekt Interdisziplinär (MCS Project Interdisciplinary).</td>
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**Module Catalogue for the Subject**

**Human-Computer Systems**

**Bachelor's with 1 major, 180 ECTS credits**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<td>MCS Project Interdisciplinary</td>
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**Key Skills Area (20 ECTS credits)**

**General Key Skills (5 ECTS credits)**

In addition to the modules listed below, students may also take modules offered by JMU as part of the pool of general transferable skills (ASQ).

**General Key Skills (subject-specific)**

<table>
<thead>
<tr>
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<td>06-MCS-ASQ-152-m01</td>
<td>Work experience as a research and teaching assistant</td>
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**Subject-specific Key Skills (15 ECTS credits)**

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<tr>
<td>06-MCS-Exhib-152-m01</td>
<td>Exhibition MCS Thesis</td>
<td>5</td>
<td>B/NB</td>
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<td>06-MCS-BPrakt-152-m01</td>
<td>Practice/Job-oriented Internship</td>
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**Thesis (12 ECTS credits)**

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<th>Credits</th>
<th>Type</th>
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<td>Bachelor's Thesis</td>
<td>12</td>
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</table>
Module title  |  Abbreviation  
---|---
Statistics 1  |  06-PSY-STAT-1-152-m01

<table>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tr>
<td>holder of the Professorship of Psychological Research Methods</td>
<td>Institute of Psychology</td>
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<th>ECTS</th>
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<tr>
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<thead>
<tr>
<th>Duration</th>
<th>Module level</th>
<th>Other prerequisites</th>
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</thead>
<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</tbody>
</table>

**Contents**

The module teaches the basics of descriptive and inferential statistics (descriptive statistics, graphs, regression and correlation analysis, probability theory, Bayesian, distributions, binomial test). The principles of statistical analysis of data will be discussed in a lesson on the basis of examples. The practical application of the methods is trained in tutorials with the help of calculating exercises.

**Intended learning outcomes**

Students acquire knowledge of various inferential procedures and their foundations as well as the ability to select adequate statistical methods for testing empirical questions, perform these correctly, display the results reasonably and interpret them correctly.

**Courses** (type, number of weekly contact hours, language — if other than German)

S (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 120 minutes)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>06-PSY-STAT-2-152-m01</td>
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<thead>
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<tr>
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<td>Institute of Psychology</td>
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<tr>
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<th>Module level</th>
<th>Other prerequisites</th>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

**Contents**

The module provides advanced knowledge of inferential statistics (sampling techniques, estimation principles, confidence intervals, theory of null hypothesis testing, parametric and non-parametric methods for uni- and bivariate records, equivalence tests, contingency table analysis, analysis of variance). The principles of statistical analysis of data will be discussed in a lesson on the basis of examples. The practical application of the methods is trained in tutorials with the help of calculating exercises.

**Intended learning outcomes**

Students possess knowledge of various inferential procedures and their foundations as well as the ability to select adequate statistical methods for testing empirical questions, perform these correctly, display the results reasonably and interpret them correctly.

**Courses** (type, number of weekly contact hours, language — if other than German)

S (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 120 minutes)
Language of assessment: German and/or English
creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO 1** (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Foundations of Human-Computer-Systems and Cognitive Psychology | 06-MCS-GL-AP-152-m01

<table>
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<tr>
<td>chairperson of examination committee of the Bachelor’s degree programme Mensch-Computer-Systeme (Human-Computer Systems)</td>
<td>Institute of Human Computer Media</td>
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<td>undergraduate</td>
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Contents

Human-Computer Interaction is concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. This course gives an introduction into the principle biological, physiological, and psychological constraints as defined by the human user and relates these constraints to the conceptual and technical solutions of today’s computer systems and existing as well as prospective interaction metaphors between humans and computers.

The course covers topics about human perception and cognition, memory and attention, the design of interactive systems, prominent evaluation methods, the principles of computer systems, typical input processing techniques, interface technology, and examples of typical interaction metaphors, from text-based input to graphical desktops to multimodal interfaces. Accompanying lab-work will introduce students to typical tasks involved in this field, i.e., prominent evaluation methods and prototyping of interfaces.

Intended learning outcomes

After the course, the students will have a broad understanding of the underlying principles of human users and computer systems. They will understand the constraints and capabilities of current user interfaces and they will learn about the necessary steps applied in user-centered design and development approaches.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + V (3) + Ü (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

Allocation of places

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Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Selected Areas of Psychology | 06-MCS-SGP-152-m01

Module coordinator | Module offered by
holder of the Chair of Psychological Ergonomics | Institute of Human Computer Media

<table>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

**Contents**

This module will acquaint students with the fundamental principles of the following branches of psychology: emotional and motivational psychology, social psychology, personality and differential psychology as well as organisational psychology.

**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die in diesem Modul erworbenen Kenntnisse aus wesentlichen Teilgebieten der Psychologie bilden die Grundlage für die Studierenden, theoriegeleitet User Interfaces zu analysieren, zu entwerfen und zu bewerten hinsichtlich emotionaler und motivationaler Aspekte (User Experience), hinsichtlich der individuellen Anpassung von Nutzungschnittstellen (Personalisierung) sowie hinsichtlich der Unterstützung von Kommunikation und Kooperation mit anderen Menschen (Computer Supported Cooperative Work).

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 90 minutes)
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module Catalogue for the Subject

**Human-Computer Systems**

**Bachelor’s with 1 major, 180 ECTS credits**

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**Module title**  
Programming Course Interface Development

**Abbreviation**  
10-MCS-SPSE-152-m01

**Module coordinator**  
holder of the Chair of Computer Science IX

**Module offered by**  
Institute of Computer Science

**ECTS**  
10

**Method of grading**  
numerical grade

**Only after succ. compl. of module(s)**  
--

**Duration**  
1 semester

**Module level**  
undergraduate

**Other prerequisites**  
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**Contents**

The development of software typically is a complex process that requires the collaboration of a group of people carrying out many different roles. The activities required for this process include requirements engineering, software architecture design, programming, testing and integration. These activities can be organised by following one of many software development methodologies, like waterfall, iteration, V-shaped, spiral or Extreme programming. This course involves the development of a non-trivial application by a group of 4-5 students. The application’s graphical user interface is of central importance. Along the way, presentations, exercises and discussions support the student groups in increasing their teamwork efficiency, familiarising themselves with required technologies and activities as well as organising the overall project. The technologies utilised are regularly adapted to current well-established approaches, e. g. git, HTML, CSS, JavaScript, Java, the Play framework, SQL, JDBC or JUnit.

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**Intended learning outcomes**

At the end of the course, the participants will have a fundamental understanding of a collaborative software development process. This includes in particular best practices for effectively working as a team, such as evaluation methods, communication of expectations and dealing with problems. In addition to these soft skills, the course “Softwarepraktikum Schnittstellenentwurf” (“Programming Course Interface Development”) will teach students how to gather, analyse, specify and validate software requirements and to independently familiarise themselves with new software technologies and frameworks. In addition, students will enhance their basic programming skills (which are a prerequisite for participation in this course) during the project’s implementation phase.

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**Courses**  
(type, number of weekly contact hours, language — if other than German)

Ú (4)

**Method of assessment**  
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

presentation of project results (approx. 20 minutes)

Language of assessment: German and/or English

creditable for bonus

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**Allocation of places**  
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**Additional information**  
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**Referred to in LPO I**  
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Software Quality | 10-MCS-SQ-152-m01

Module coordinator | Module offered by
holding of the Chair of Computer Science IX | Institute of Computer Science

<table>
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<th>ECTS</th>
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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

Contents

How do we develop high quality software? How do we write good code? This module will teach students how to recognise and write high quality software code.
The module will focus on developing the skills to meet critical software quality requirements such as reliability, testability, accuracy, security, portability and maintainability as well as efficiency in time and space. Programming guidelines as well as code examples will illustrate concepts, techniques and tools that lead to professional code quality and ensure high software quality production. Different programming languages will be used to highlight typical examples and key concepts.

Intended learning outcomes

At the end of the course, the students will have gained a solid background knowledge on the theory and the methods for producing high quality code. They will also have gained a broad understanding of testing techniques and software requirements specifications.

Courses (type, number of weekly contact hours, language — if other than German)

V (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
Language of assessment: German and/or English creditable for bonus

Allocation of places

--

Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

--
Module title | Abbreviation
---|---
Usability and Software Ergonomimics | 06-MCS-Usab-152-m01

Module coordinator | Module offered by
holder of the Chair of Psychological Ergonomics | Institute of Human Computer Media

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<tbody>
<tr>
<td>1 semester</td>
<td>undergraduate</td>
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</table>

Contents

This module will acquaint students with analytical as well as empirical methods for the evaluation of the usability and user experience of interactive devices and will provide them with an opportunity to apply these. Having been introduced to these methods during the lecture, students will apply selected methods to examples during the exercise. In addition, students will independently evaluate two interactive devices in small teams; they will plan, conduct and analyse a usability evaluation, will critically compare different methods and will deliver a presentation on the results of their work.

Intended learning outcomes

German intended learning outcomes available but not translated yet.


Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (4)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

project report (approx. 12 pages)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

3 places. The indicated number of places will be allocated to students of the subject Digital Humanities (Master of Arts with 120 ECTS credits). Places will be allocated primarily according to the number of subject semesters; among applicants with the same number of subject semesters, places will be allocated by lot.

Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
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**Module coordinator**

holder of the Chair of Psychological Ergonomics

**Module offered by**

Institute of Human Computer Media

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**Duration**

1 semester  undergraduate

**Other prerequisites**

--

**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 90 minutes)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

--

**Additional information**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
### Module title

Experience as a tester or subject in experiments

### Abbreviation

06-MCS-Meth-2-152-m01

### Module coordinator

holder of the Chair of Psychological Ergonomics

### Module offered by

Institute of Human Computer Media

### ECTS

1

### Method of grading

1 (not) successfully completed

### Only after succ. compl. of module(s)

--

### Duration

1 semester

### Module level

undergraduate

### Other prerequisites

--

## Contents

Trials and controlled experiments are central methods for empirical evaluations. Typically, students learn how to design and execute well-defined experiments as the controlling instances. In this module students have to switch sides and take part in such trials and experiments not as the controller, but as subjects.

### Intended learning outcomes

After the course, the participants will have a good understanding of how test subjects perceive empirical trials. They will become more sensitive on does and don’ts of such tests as seen from the subjects’ point of view.

### Courses

(type, number of weekly contact hours, language — if other than German)

P (0)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Acting as a participant in experiments (30 hours)

### Allocation of places

--

### Additional information

--

### Referred to in LPO I (examination regulations for teaching-degree programmes)

--
### Interactive Computer Graphics

**Module title**
Interactive Computer Graphics

**Abbreviation**
10-MCS-ICGV-152-m01

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**Duration**
1 semester

**Module level**
undergraduate

**Module coordinator**
holder of the Chair of Computer Science IX

**Module offered by**
Institute of Computer Science

**Contents**
Computer graphics studies methods for digitally synthesizing and manipulating visual content. This course specifically concentrates on interactive graphics with an additional focus on 3D graphics as a requirement for many contemporary as well as for novel human-computer interfaces and computer games. The course will cover topics about light and images, lighting models, data representations, mathematical formulations of movements, projection as well as texturing methods. Theoretical aspects of the steps involved in ray-tracing and the raster pipeline will be complemented by algorithmical approaches for interactive image syntheses using computer systems. Accompanying software solutions will utilize modern graphics packages and languages like OpenGL, GLSL and/or DirectX.

**Intended learning outcomes**
After the course, the students will have a broad understanding of the underlying theoretical models of computer graphics. They will be able to implement a prominent variety of these models, to build their own interactive graphics applications, and to choose the right software tool for this task.

**Courses**
(type, number of weekly contact hours, language — if other than German)

V (2)

**Method of assessment**
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes)
Language of assessment: German and/or English creditable for bonus

**Allocation of places**
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**Additional information**
--

**Referred to in LPO I**
(examination regulations for teaching-degree programmes)

--
## Interactive Computer Graphics Exercise

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</table>

### Contents

Computer graphics studies methods for digitally synthesising and manipulating visual content. This course concentrates on interactive graphics with an additional focus on 3D graphics as a requirement for many contemporary as well as for novel human-computer interfaces and computer games.

### Intended learning outcomes

At the end of the course, the students will have a broad understanding of the underlying theoretical models of computer graphics. They will be able to implement a prominent variety of these models, to build their own interactive graphics applications and to choose the right software tool for this task.

### Courses (type, number of weekly contact hours, language — if other than German)

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### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

- Presentation of project results (approx. 20 minutes)
- Language of assessment: German and/or English
- Creditable for bonus

### Allocation of places

--

### Additional information

--

### Referred to in LPO I (examination regulations for teaching-degree programmes)

--
Module title | Abbreviation
---|---
Methods for User-Centered Design | 06-MCS-MBG-152-m01

Module coordinator | Module offered by
holder of the Chair of Psychological Ergonomics | Institute of Human Computer Media

ECTS | Method of grading | Only after succ. compl. of module(s)
10 | numerical grade | --

Duration | Module level | Other prerequisites
1 semester | unknown | --

Contents
This module will acquaint students with methods of ergonomic product design and will provide them with an opportunity to apply these. Having been introduced to these methods during the lecture, students will apply selected methods to examples during the exercise. In addition, students will develop a product concept and will carry out the initial stages of an ergonomic design process from context-of-use and requirements analysis through the development of design solutions to a tested (paper) prototype.

Intended learning outcomes
German intended learning outcomes available but not translated yet.


Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (4)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
project report (approx. 12 pages)
Language of assessment: German and/or English
creditable for bonus

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
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<td>Institute of Human Computer Media</td>
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<td>1 semester</td>
<td>undergraduate</td>
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Nach der Teilnahme an diesem Modul beherrschen die Teilnehmer spezielle Kenntnisse und Methoden für die Bewertung und Gestaltung von barrierefreien Benutzungsschnittstellen. Sie unterscheiden die Methoden nach Einsatzgebiet und können eine geeignete Methode für die Bewertung auswählen. Die Studierenden können Benutzungsschnittstellen bezüglich der barrierefreien evaluieren, kritisieren und verändern.

**Courses (type, number of weekly contact hours, language — if other than German)**

S (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages). Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
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<td>chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)</td>
<td>Institute of Human Computer Media</td>
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**Contents**

Sound research requires an in-depth reflection of prior approaches and the related work typically published in the scientific media (conference proceedings, journals, books, etc.). This course is an introduction into typical scientific research work with a specific focus on topics from the field of human-computer interaction (HCI).

During the course, students will have to work on one specific topic. They will have to find relevant publications, read the publications and analyze them given some defined research questions and/or categories of the current state-of-the-art. They have to summarize and present their findings to a larger audience.

**Intended learning outcomes**

After the course, the participants will have a basic understanding of an important aspect of typical research work. They will have learned how to read scientific publications, how to extract relevant information, and how to summarize their findings.

**Courses (type, number of weekly contact hours, language — if other than German)**

S (2)

**Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)**

presentation (approx. 20 minutes) with handout (approx. 5 pages)

Language of assessment: German and/or English
creditable for bonus

**Allocation of places**

--

**Additional information**

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**Referred to in LPO 1 (examination regulations for teaching-degree programmes)**

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## Contents

German contents available but not translated yet.


## Intended learning outcomes

German intended learning outcomes available but not translated yet.

Nach der Teilnahme an diesem Modul verstehen die Studierenden die Prinzipien ausgewählter Usability Methoden und Domänen und sind in der Lage selbst Benutzungsschnittstellen zu gestalten sowie Studien durchzuführen, um Fragestellungen aus dem Bereich der Mensch-System Interaktion zu untersuchen. Des weiteren können sie die Vor- und Nachteile verschiedener Methoden abschätzen und empirische Studien sowie Gestaltungslösungen beurteilen und kritisch hinterfragen.

## Courses (type, number of weekly contact hours, language — if other than German)

S (2)

## Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages). Language of assessment: German and/or English creditable for bonus

## Allocation of places

--

## Additional information

--

## Referred to in LPO I (examination regulations for teaching-degree programmes)

--
Module title
Specialization MCS 1

Abbreviation
06-MCS-V1-152-m01

Module coordinator
Chairperson of examination committee of the Bachelor’s degree programme Mensch-Computer-Systeme (Human-Computer Systems)

Module offered by
Institute of Human Computer Media

ECTS
5

Method of grading
Numerical grade --

Only after succ. compl. of module(s)

Duration
1 semester

Module level
Undergraduate

Other prerequisites
--

Contents

German contents available but not translated yet.


Intended learning outcomes

German intended learning outcomes available but not translated yet.


Courses (type, number of weekly contact hours, language — if other than German)
S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages).

Language of assessment: German and/or English creditable for bonus

Allocation of places
--

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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### Module Catalogue for the Subject
Human-Computer Systems
Bachelor's with 1 major, 180 ECTS credits

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<td>chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)</td>
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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.


### Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (1)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages).

Language of assessment: German and/or English creditable for bonus

### Allocation of places

--

### Additional information

--

### Referred to in LPO I (examination regulations for teaching-degree programmes)

--
### Module title
Interactive Systems 1

### Abbreviation
10-MCS-IS1-152-m01

### Module coordinator
holder of the Chair of Computer Science IX

### Module offered by
Institute of Computer Science

### ECTS
5

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

### Contents
This module discusses requirements, concepts and practical solutions in the area of interactive systems. A special focus is on systems concentrating on human-computer interaction. Typical examples include graphical user interfaces, web-based solutions or even systems from augmented and virtual reality. The course concentrates on systems in which users and computers form a closed input-output loop and requirements of reactivity and real-time performance are decisive.

### Intended learning outcomes
At the end of the course, students will have a thorough knowledge of the requirements of interactivity. They will be able to identify and analyse technical capabilities and properties of today's computer systems with respect to interactivity as well as to derive the necessary actions. Students will have learned to choose appropriate solutions and tools for various development tasks in this area. Having been equipped with a theoretical foundation, students will be able to develop alternative solutions for future systems.

### Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages).

Language of assessment: German and/or English

### Creditable for bonus

### Allocation of places
--

### Additional information
--

### Referred to in LPO I
(examination regulations for teaching-degree programmes)
--
### Module title
Interactive Systems 2

### Abbreviation
10-MCS-IS2-152-m01

### Module coordinator
holder of the Chair of Computer Science IX

### Module offered by
Institute of Computer Science

### ECTS
5

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
undergraduate

### Other prerequisites
--

## Contents
This module discusses specific requirements, concepts and solutions in the area of interactive systems in more detail. A special focus is on systems concentrating on human-computer interaction. Typical examples include graphical user interfaces, web-based solutions or even systems from augmented and virtual reality. The course concentrates on systems in which users and computers form a closed input-output loop and requirements of reactivity and real-time performance are decisive.

## Intended learning outcomes
At the end of the course, students will have an advanced knowledge of the requirements of interactivity. They will be able to identify and analyse technical capabilities and properties of today's computer systems with respect to interactivity as well as to derive the necessary actions. Students will have learned to choose appropriate solutions and tools for various development tasks in a broad range of applications. Having been equipped with a theoretical foundation, students will be able to develop alternative solutions for future systems.

## Courses (type, number of weekly contact hours, language — if other than German)

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## Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages). Language of assessment: German and/or English creditable for bonus

## Allocation of places
--

## Additional information
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## Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title
Interactive Systems 3

Abbreviation
10-MCS-IS3-152-m01

Module coordinator
holder of the Chair of Computer Science IX

Module offered by
Institute of Computer Science

ECTS
5

Method of grading
numerical grade

Only after succ. compl. of module(s)

Duration
1 semester

Module level
undergraduate

Other prerequisites
--

Contents
This module discusses practical requirements, concepts and solutions in the area of interactive systems in more detail. A special focus is on systems concentrating on human-computer interaction. Typical examples include graphical user interfaces, web-based solutions or even systems from augmented and virtual reality. The course concentrates on systems in which users and computers form a closed input-output loop and requirements of reactivity and real-time performance are decisive.

Intended learning outcomes
At the end of the course, students will have an advanced knowledge of the requirements of interactivity. They will be able to identify and analyse technical capabilities and properties of today's computer systems with respect to interactivity as well as to derive the necessary actions. Students will have learned to choose appropriate solutions and tools for various development tasks in a broad range of applications. Practical applications will allow students to implement alternative solutions for future interactive systems, building on the theoretical foundation they have been equipped with.

Courses (type, number of weekly contact hours, language — if other than German)
R (0)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages). Language of assessment: German and/or English creditable for bonus

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<td>undergraduate</td>
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**Contents**

Practical experience is a necessary skill for application-oriented aspects of various sciences. This is specifically true for human-computer interaction (HCI) which incorporates engineering as well as empirical work skills. This course assigns a well-defined project or task to (teams of) students which they have to solve largely on their own. The topic will be in the area of human-computer interaction with a strong focus on the engineering, aka computer science, part of HCI.

**Intended learning outcomes**

At the end of the course, the participants will have gained a good understanding of how to solve a coherent problem, using typical HCI skills. They will have learned how to collaborate with colleagues and to define, distribute and execute individual work packages.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 60 minutes) or b) oral examination of one candidate each (approx. 20 minutes) or c) term paper (approx. 20 pages) or d) portfolio (approx. 20 pages)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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</table>

**Contents**

Selected topics in computer science.

**Intended learning outcomes**

The students are able to understand the solutions to complex problems in computer science and to transfer them to related questions.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages).

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Contents**

The module provides deeper knowledge of central topics, theories and findings of instructional psychology and its relation to digital media. The lecture gives an overview of current approaches in research about learning and instruction, above all in instructional design.

**Intended learning outcomes**

Students will acquire expertise and practical skills that will be useful for both their academic and their professional lives. This includes a more in-depth knowledge of theories, methods and findings of instructional psychology as well as a basic knowledge of the application of instructional psychology. The skills acquired in this course will also be useful in many ways for their future careers.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 110 minutes)

Language of assessment: German and/or English

creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module Catalogue for the Subject
Human-Computer Systems
Bachelor's with 1 major, 180 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
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<td>Specialisation Usability</td>
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### Contents

German contents available but not translated yet.


### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Nach der Teilnahme an diesem Modul verstehen die Studierenden die Prinzipien ausgewählter Usability Methoden und Domänen und sind in der Lage selbst Benutzungsschnittstellen zu gestalten sowie Studien durchzuführen, um Fragestellungen aus dem Bereich der Mensch-System Interaktion zu untersuchen. Des weiteren können sie die Vor- und Nachteile verschiedener Methoden abschätzen und empirische Studien sowie Gestaltungslösungen beurteilen und kritisch hinterfragen.

### Courses (type, number of weekly contact hours, language — if other than German)

S (2)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Unless otherwise specified, the following methods can be chosen from for assessment in the specialisations Human-Computer Systems: a) written examination (approx. 90 minutes), b) presentation (approx. 20 minutes) and handout (approx. 5 pages), c) presentation of project results (approx. 30 minutes), d) presentation (approx. 45 minutes), e) oral examination of one candidate each (approx. 30 minutes) or f) term paper (approx. 10 pages). Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

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## Module Catalogue for the Subject
**Human-Computer Systems**
**Bachelor's with 1 major, 180 ECTS credits**

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<td>Specialisation User Experience</td>
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### Contents

German contents available but not translated yet.

In diesem Modul werden vertieft Inhalte, Methoden und Anwendungen der User Experience Forschung gelehrt, also der Gestaltung von Mensch-Computer-Systemen hinsichtlich eines guten Erlebens der Benutzer. Anwendungsbeispiele kommen dabei aus dem öffentlichen und privaten Raum, beinhalten z.B. Kundenzufriedenheit, Persuasive Interfaces, Ästhetische Gestaltung und Service Design.

#### Intended learning outcomes

German intended learning outcomes available but not translated yet.

Nach der Teilnahme an diesem Modul verstehen die Studierenden die Prinzipien ausgewählter User Experience Methoden und Domänen und sind in der Lage selbst Benutzeroberflächen zu gestalten sowie Studien durchzuführen, um entsprechende Fragestellungen aus dem Bereich der Mensch-System Interaktion zu untersuchen. Des weiteren können sie die Vor- und Nachteile verschiedener Methoden abschätzen und empirische Studien sowie Gestaltungslösungen beurteilen und kritisch hinterfragen.

### Courses

(type, number of weekly contact hours, language — if other than German)

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#### Method of assessment

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### Allocation of places

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### Additional information

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(examination regulations for teaching-degree programmes)

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**Intended learning outcomes**

German intended learning outcomes available but not translated yet.


| Courses (type, number of weekly contact hours, language — if other than German) |
| S (2) |

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Module title | Abbreviation
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MCS Project Psychology | 06-MCS-Proj-Psy-152-m01

| Module coordinator | Module offered by |
---|---
chairperson of examination committee of the Master’s degree programme Human-Computer Interaction | Institute of Human Computer Media |

| ECTS | Method of grading | Only after succ. compl. of module(s) |
---|---|---
12 | numerical grade | -- |

| Duration | Module level | Other prerequisites |
---|---|---
1 semester | undergraduate | -- |

Contents

Practical experience is a necessary skill for application-oriented aspects of various sciences. This is specifically true for Human-Computer Interaction (HCI) which incorporates engineering as well as empirical work skills. This course assigns a well-defined project or task to (teams of) students which they have to solve largely on their own. The topic will be in the area of Human-Computer Interaction with an evenly distributed focus on the engineering, aka computer science, as well as on the empirical or psychological part of HCI.

Intended learning outcomes

After the course, the participants will have a good understanding of how to solve a coherent problem using typical HCI-skills. They will have learned how to collaborate with colleagues and to define, distribute, and execute individual work packages.

Courses (type, number of weekly contact hours, language — if other than German)

Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

report (approx. 10 pages)
Language of assessment: German and/or English creditable for bonus

Allocation of places

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Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

--
# Module Catalogue for the Subject

**Human-Computer Systems**

**Bachelor’s with 1 major, 180 ECTS credits**

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### Contents

The development of software typically is a complex process that requires the collaboration of a group of people carrying out many different roles. The activities required for this process include requirements engineering, software architecture design, programming, testing and integration. These activities can be organised by following one of many software development methodologies, like waterfall, iteration, V-shaped, spiral or Extreme programming. This course involves the development of a non-trivial application by a group of 4-5 students. The application’s graphical user interface is of central importance. Along the way, presentations, exercises and discussions support the student groups in increasing their teamwork efficiency, familiarising themselves with required technologies and activities as well as organising the overall project. The technologies utilised are regularly adapted to current well-established approaches, e.g. git, HTML, CSS, JavaScript, Java, the Play framework, SQL, JDBC or JUnit.

### Intended learning outcomes

At the end of the course, the participants will have a fundamental understanding of a collaborative software development process. This includes in particular best practices for effectively working as a team, such as evaluation methods, communication of expectations and dealing with problems. In addition to these soft skills, the course “Softwarepraktikum Schnittstellenentwurf” (“Programming Course Interface Development”) will teach students how to gather, analyse, specify and validate software requirements and to independently familiarise themselves with new software technologies and frameworks. In addition, students will enhance their basic programming skills (which are a prerequisite for participation in this course) during the project’s implementation phase.

### Courses (type, number of weekly contact hours, language — if other than German)

| Ü (2) |

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

- report (approx. 10 pages)
- Language of assessment: German and/or English
- creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
MCS Project Interdisciplinary | 06-MCS-Proj-Int-152-m01

Module coordinator | Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction | Institute of Human Computer Media

ECTS | Method of grading | Only after succ. compl. of module(s)
---|---|---
12 | numerical grade | --

Duration | Module level | Other prerequisites
---|---|---
1 semester | undergraduate | --

Contents
Practical experience is a necessary skill for application-oriented aspects of various sciences. This is specifically true for Human-Computer Interaction (HCI) which incorporates engineering as well as empirical work skills. This course assigns a well-defined project or task to (teams of) students which they have to solve largely on their own. The topic will be in the area of Human-Computer Interaction with an evenly distributed focus on the engineering, aka computer science, as well as on the empirical or psychological part of HCI.

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Courses (type, number of weekly contact hours, language — if other than German)
Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
report (approx. 10 pages)
Language of assessment: German and/or English creditable for bonus

Allocation of places
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Additional information
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<tbody>
<tr>
<td>Work experience as a research and teaching assistant</td>
<td>06-MCS-ASQ-152-m01</td>
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<table>
<thead>
<tr>
<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>chairperson of examination committee of the Master's degree programme Human-Computer Interaction</td>
<td>Institute of Human Computer Media</td>
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<tbody>
<tr>
<td>1 semester</td>
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</table>

### Contents

The students have to individually work as tutors (research and/or teaching assistants) in the scope of the bachelor program Mensch-Computer Systeme (MCS) and/or the master program Human-Computer Interaction (HCI). The tasks will be individually defined from the range of individual tasks typically associated with academic work in the field.

### Intended learning outcomes

Competencies will span two areas. Working as a teaching assistant, participants will learn how to teach others about HCI topics. They will gain a better understanding on the problems students may face during learning. Working as a research assistant, participants will gain first-hand as well practical experience on the methodology of scientific work.

### Courses

(type, number of weekly contact hours, language — if other than German)

P (0)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Experience report (approx. 2 pages)

### Allocation of places

--

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title | Exhibition MCS Thesis
---|---
Abbreviation | 06-MCS-Exhib-152-m01

Module coordinator | chairperson of examination committee of the Master’s degree programme Human-Computer Interaction
Module offered by | Institute of Human Computer Media

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Duration | 1 semester | Module level | undergraduate | Other prerequisites | -- |

Contents
Presentation and communication are important skills for application-oriented and practical aspects of various sciences. This is specifically true for Human-Computer Interaction (HCI). This course requires the participants to present the results of an associated thesis to a larger audience in an exhibition-like setup.

Intended learning outcomes
The participants will learn how to present their own work to a larger audience, how to plan, design and set-up the different parts of an own exhibition booth, and how to react individually to questions from the audience.

Courses (type, number of weekly contact hours, language — if other than German)
S (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
presentation of results of Bachelor’s thesis (approx. 15 minutes)
Language of assessment: German and/or English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Practice/Job-oriented Internship</td>
<td>06-MCS-BPrakt-152-m01</td>
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**Contents**

German contents available but not translated yet.


**Intended learning outcomes**

German intended learning outcomes available but not translated yet.

Die Studierenden lernen, in den Praktika theoretische und praktische Aspekte des Studiums auf neue Aufgabenstellungen anzuwenden. Sie knüpfen erste Kontakte zur Berufswelt und schaffen damit eine Grundlage für ihre spätere Berufswahl sowie für die Ausrichtung des Masterstudiums.

**Courses (type, number of weekly contact hours, language — if other than German)**

P (0)

**Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)**

report on practical course (approx. 2 pages)

**Allocation of places**

--

**Additional information**

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**Referred to in LPO I (examination regulations for teaching-degree programmes)**

--
Module title | Abbreviation
---|---
Bachelor's Thesis | 06-MCS-Thesis-152-m01

Module coordinator | Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction | Institute of Human Computer Media

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Contents
The students have to individually work on an assigned well-defined problem in the field of Human-Computer Interaction and document their results using good scientific standards.

Intended learning outcomes
Participants will learn how to apply scientific methods from the HCI field. They will learn a structured approach starting from a definition and motivation of research questions and the discussion and summery of related work from scientific publications and prior approaches. Following this they will learn how to develop own concepts and methods to tackle the questions and how to implement them and potentially to evaluate the results.

Courses (type, number of weekly contact hours, language — if other than German)
No courses assigned to module

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)
Bachelor's thesis (approx. 30 pages)  
Language of assessment: German or English

Allocation of places
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Additional information
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<td>Introduction to Programming (MCS)</td>
<td>10-MCS-EinP-161-m01</td>
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<tr>
<td>holder of the Chair of Computer Science II</td>
<td>Institute of Computer Science</td>
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**Contents**

Data types, control structures, foundations of procedural programming, selected topics of C, introduction to object orientation in Java, selected topics of C++, further Java concepts, digression: scripting languages.

**Intended learning outcomes**

The students possess a fundamental knowledge about programming languages (in particular Java, C and C++) and are able to independently develop average to high level Java programs.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
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<td>Foundations Algorithms and Data Structures (MCS)</td>
<td>10-MCS-GADS-161-m01</td>
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**Contents**

Design and analysis of algorithms, recursion vs. iteration, sort and search methods, data structures, abstract data types, lists, trees, graphs, basic graph algorithms, programming in Java.

**Intended learning outcomes**

The students master to independently design algorithms, to describe them precisely and to analyze them. The students know the basic paradigms of the design of algorithms and are able to apply them to practical programs. The students are able to estimate the run time behaviour of algorithms and to prove their correctness.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (4) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

Written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title: Software Technology (MCS)

Abbreviation: 10-MCS-ST-161-m01

Module coordinator: Dean of Studies Informatik (Computer Science)

Module offered by: Institute of Computer Science

ECTS: 10

Method of grading: numerical grade

Duration: 1 semester

Module level: undergraduate

Other prerequisites: --

Contents:
Object-oriented software development with UML, development of graphical user interfaces, basics of databases and object-relational mapping, basics of web programming (HTML, XML), software development processes, unified process, agile software development, project management, quality assurance.

Intended learning outcomes:
The students possess basic and theoretical and practical knowledge to design and develop software systems.

Courses (type, number of weekly contact hours, language — if other than German):
V (4) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus):
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes):
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### Module Catalogue for the Subject
**Human-Computer Systems**

**Bachelor's with 1 major, 180 ECTS credits**

<table>
<thead>
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<th>Module title</th>
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<td>Introductory Programming Course (MCS)</td>
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**Contents**

The programming language used is Java. In the practical course, small to middle-sized Java programs are to be implemented independently.

**Intended learning outcomes**

The students are able to independently develop and implement small to middle sized Java programs.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

practical examination (programming exercises, approx. 240 hours) and written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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