Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

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: 2015
Responsible: Faculty of Human Sciences
Responsible: Institute of Human Computer Media

Learning Outcomes

German contents and learning outcome available but not translated yet.

Berufsziele

Der Bachelorstudiengang Mensch-Computer-Systeme bildet den ersten Teil der Human- Computer Interaction (HCI) Ausbildung an der Universität Würzburg. Aufgrund der bestandenen Bachelorprüfung wird der akademische Grad eines „Bachelor of Science" („B.Sc.") verliehen, der einen ersten berufsqualifizierenden Abschluss darstellt. Mit dem Bachelorabschluss besitzen Studierende die grundlegende Qualifikation für Tätigkeiten in Institutionen und in der Privatwirtschaft. Absolventen und Absolventinnen sind durch ihre interdisziplinäre Ausbildung vielseitig einsetzbar und haben sehr gute Berufschancen, beispielsweise

- in der Industrie und der Logistik
- in der Automobil-Branche
- im Öffentlichem Dienst/Behörden
- im Bereich E-Commerce
- in der Medizin und Pflege
- als User Experience Designer, Usability Engineer oder User Experience Consultant im IT-Bereich

Der Bachelorstudiengang legt aber auch die Grundlagen für den Masterstudiengang, der dann wiederum den Grundstein für eine wissenschaftliche und qualifiziert praktische Tätigkeit legt. Im Pflichtbereich des Bachelorstudiengangs erlangen Studierende Wissen über grundlegende Inhalte und wissenschaftliche Konzepte der verschiedenen Teilgebiete der HCI und erwerben fundierte methodische Kenntnisse, wobei technische Expertise gleichfalls eine wichtige Rolle spielt. Dieses Wissen wird durch anwendungsnahe Angebote ergänzt. Im Wahlpflichtbereich haben Studierende die Möglichkeit, je nach ihren persönlichen Interessen Module auszuwählen und zu vertiefen.

Qualifikationsziele

Das Studium der Mensch-Computer-Systeme ist interdisziplinär ausgerichtet und vermittelt neben fachspezifischen Kompetenzen auch Kompetenzen aus der Informatik und der Psychologie. Nach erfolgreichem Abschluss des Studiums verfügen die Studierenden über folgende Kompetenzen:

1. Allgemeine Kompetenzen
   - Kritische Reflexion und Einordnung von wissenschaftlichen Erkenntnissen.
   - Schriftliche und mündliche Präsentation erworbener Kenntnisse.
   - Durchführung eigener wissenschaftlicher & angewandter Projekte.
   - Verfassen wissenschaftlicher Texte nach fachlichen Standards.
   - Teamarbeit
2. Methodische Kompetenzen
   - Analytisches Vorgehen und Abstraktionsvermögen.
   - Algorithmisches Denken und Konstruieren.
   - Verständnis und Strukturierung komplexer Zusammenhange.
   - Analyse-, Design- und Evaluationsmethoden für Mensch-Computer-Systeme.
   - Versuchsplanung, Datenerhebung und Datenauswertung.
3. Inhaltliche Kompetenzen
   - Programmierung und programmiertechnische Verfahren.
   - Softwareentwurf und Softwareanalyse.
   - Schnittstellengestaltung interaktiver Systeme.
   - Interaktionstechniken und -paradigmen.
   - Statistische Verfahren.
   - Physiologische und psychologische Benutzereigenschaften.
   - Technische Grundlagen informatischer Systeme.

- Grundlagen zu Usability, User Experience und Human Factors.

Wissenschaftliche Befähigung

- Die Absolvent:innen verfügen über kritisches Verständnis in verschiedenen Teilgebieten der Mensch- Computer-Systeme inklusive Grundlagen der Psychologie und Informatik das den Stand der Fachliteratur sowie einige vertiefte Wissensbestände auf dem aktuellen Stand der Forschung einschließt.
- Die Absolvent:innen besitzen forschungsmethodisches Wissen und die Fähigkeit, wissenschaftliche Erkenntnisse und ausgewählte Literatur zu vergleichen und einzuordnen und an Beispielen zu vertiefen.
- Die Absolvent:innen sind in der Lage exemplarisch/ unter Anleitung, wissenschaftliche Untersuchungen zu planen, durchzuführen und zu bewerten.
- Die Absolvent:innen können die erworbenen methodischen Fähigkeiten einsetzen, um die Ergebnisse empirischer Untersuchungen auszuwerten, zu interpretieren und Schlussfolgerungen daraus zu ziehen.
- Die Absolvent:innen sind in der Lage, sich mit Hilfe von internationaler Fachliteratur in neue Gebiete einzuarbeiten und selbstständig Literatur für bislang neue Fragestellungen zu recherchieren, zu interpretieren und zu bewerten.
- Die Absolvent:innen sind befähigt, sich in neue Themengebiete der Mensch-Computer- Systeme und Fragestellungen durch die Recherche aktueller Forschungsergebnisse einzuarbeiten. Sie können diese Themen- und Fragestellungen unter verschiedenen Zielsetzungen bearbeiten, darstellen und analysieren.
- Die Absolvent:innen sind in der Lage, Probleme und deren Lösungen zielgruppengerecht und (teilweise auch in englischer oder sonstiger Fremdsprache) aufzubereiten und darzustellen (teilweise auch medienunterstützt) und können ihr Wissen und Verstehen auf Tätigkeit und Beruf anwenden sowie Problemlösungen in ihrem Fachgebiet erarbeiten oder weiterentwickeln.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolvent:innen begründen das eigene berufliche Handeln mit theoretischem und methodischem Wissen.
- Die Absolvent:innen können die eigenen Fähigkeiten einschätzen, zudem reflektieren sie autonom sachbezogene Gestaltungs- und Entscheidungsfreiheiten und nutzen diese unter Anleitung, in dem sie ihre Erkenntnisse einem Fachpublikum oder einem Praxispublikum gegenüber darstellen und theoriegeleitet argumentieren.

Persönlichkeitsentwicklung

- Die Absolvent:innen kennen die Regeln guter wissenschaftlicher Praxis und reflektieren ihr berufliches Handeln in Bezug auf diese.
- Die Absolvent:innen sind in der Lage, konstruktiv und zielorientiert in einem Team zusammenzuarbeiten, unterschiedliche und abweichende Ansichten produktiv zur Zielerreichung zu nutzen und auftretende Konflikte zu lösen (Teamfähigkeit).

Befähigung zum gesellschaftlichen Engagement

- Die Absolvent:innen können gesellschaftliche Diskussionen auf der Basis selbst recherchierter objektiver Daten bewerten und angemessen diskutieren.
- Die Absolvent:innen können auf der Basis des erworbenen Wissens im gesellschaftlichen Diskurs begründet Position beziehen.
- Die Absolvent:innen haben die Bereitschaft und Fähigkeit entwickelt, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.

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: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **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:

ASPO2015

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

09-Sep-2015 (2015-145)

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

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Courses (126 ECTS credits)				
06-MCS-GL-AP-152-m01	Foundations of Human-Computer-Systems and Cognitive Psychology	8	NUM	11
10-I-EinP-152-m01	Introduction to Programming	5	NUM	38
06-PSY-STAT-1-152-m01	Statistics 1	6	NUM	34
10-I-ADS-152-m01	Algorithms and data structures	10	NUM	36
06-PSY-STAT-2-152-m01	Statistics 2	6	NUM	35
10-I-ST-152-m01	Software Technology	10	NUM	40
10-I-PP-152-m01	Practical Course in Programming	10	B/NB	39
06-MCS-SGP-152-m01	Selected Areas of Psychology	5	NUM	22
10-MCS-SPSE-152-m01	Programming Course Interface Development	10	NUM	53
10-MCS-SQ-152-m01	Software Quality	5	NUM	54
06-MCS-Usab-152-m01	Usability and Software Ergonomics	10	NUM	24
06-MCS-Meth-1-152-m01	Research Methods	5	NUM	18
06-MCS-Meth-2-152-m01	Experience as a tester or subject in experiments	1	B/NB	19
10-MCS-ICGV-152-m01	Interactive Computer Graphics	5	NUM	44
10-MCS-ICGT-152-m01	Interactive Computer Graphics Exercise	5	NUM	43
06-MCS-MBG-152-m01	Methods for User-Centered Design	10	NUM	16
06-MCS-IDA-152-m01	Inclusive Design & Accessibility	5	NUM	13
06-MCS-AT-152-m01	Current Trends of Human-Computer Systems	5	NUM	8
06-MCS-IGL-152-m01	Interaction Guidelines	5	NUM	14
Compulsory Electives (22 ECTS credits) 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).				
06-MCS-V1-152-m01	Specialization MCS 1	5	NUM	25
06-MCS-V2-152-m01	Specialization MCS 2	5	NUM	27
10-MCS-IS1-152-m01	Interactive Systems 1	5	NUM	45
10-MCS-IS2-152-m01	Interactive Systems 2	5	NUM	47
10-MCS-IS3-152-m01	Interactive Systems 3	5	NUM	49
10-MCS-Med-152-m01	Media Informatics for MCS	5	NUM	51
10-MCS-AKI-152-m01	Selected topics of Computer Science	5	NUM	42
06-MCS-Inst-152-m01	Instructional Psychology for MCS	5	NUM	15
06-MCS-VUsab-152-m01	Specialisation Usability	5	NUM	31
06-MCS-VUsEx-152-m01	Specialisation User Experience	5	NUM	32
06-MCS-VHuFa-152-m01	Specialisation Human Factors	5	NUM	29
06-MCS-MedPsy-152-m01	Media Psychology for MCS	5	NUM	17
06-MCS-Proj-Psy-152-m01	MCS Project Psychology	12	NUM	21
10-MCS-Proj-Info-152-m01	MCS Project Computer Science	12	NUM	52
06-MCS-Proj-Int-152-m01	MCS Project Interdisciplinary	12	NUM	20
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)				
06-MCS-ASQ-152-m01	Work experience as a research and teaching assistant	5	B/NB	7
Subject-specific Key Skills (15 ECTS credits)				
06-MCS-Exhib-152-m01	Exhibition MCS Thesis	5	B/NB	10
06-MCS-BPrakt-152-m01	Practice/Job-oriented Internship	10	B/NB	9
Thesis (12 ECTS credits)				
06-MCS-Thesis-152-m01	Bachelor's Thesis	12	NUM	23

Module title	Abbreviation
Work experience as a research and teaching assistant	06-MCS-ASQ-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)
5	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

The students work as tutors (research and/or teaching assistants) in the context of the Bachelor's program Human-Computer Systems (HCI) and/or the Master's program Human-Computer Interaction (HCI, German: Mensch-Computer-Interaktion). The work tasks are determined individually and include typical activities from the academic work environment.

Intended learning outcomes

After participating in this module, students will be able to moderate learning processes, lead discussions and conduct results-oriented conversations with students. They are able to recognize progress and stagnation of individual project groups or project participants and provide assistance or offer problem-solving strategies. Competencies are taught in two areas. In the course of working as a teacher, participants will learn to teach others in topics related to the field of HCI. They will gain a better understanding of the problems students encounter in learning. While working as a research assistant, participants will gain hands-on experience with the methods 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

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title	Abbreviation
Current Trends of Human-Computer Systems	06-MCS-AT-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)	Institute of Human Computer Media

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

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

The module provides an introduction to typical scientific research work with a focus on human-computer systems topics. Content includes the use of scientific media (conference proceedings, journals, books, etc.) and the presentation of scientific content. Students search for and analyze scientific publications in relation to a specific research question. Analysis involves identifying relevant content, synthesizing it into coherent arguments, and critiquing it. Students present the results of their analysis to other participants with an oral presentation.

Intended learning outcomes

After participating in the module courses, students will be able to understand relevant information from scientific texts and identify and interpret the important key points. They will be able to summarize these and compare and evaluate them with other results and present the overall results to a specialized audience.

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

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Master's degree (1 major) Media Communication (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)
Master's degree (1 major) Media Entertainment (2022)
Master's degree (1 major) Psychology of digital media (2022)

Module title			Abbreviation
Practice/Job-oriented Internship			06-MCS-BPrakt-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)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides insights into the professional activities of experts for user experience, user interface development, usability and/or human factors in institutions related to the subject and/or in the private sector. Students apply the knowledge acquired during their studies in practice and deepen it.

Intended learning outcomes

After participating in the module courses, students are able to apply subject content and methods of the field of study in new and practical tasks. Students will be able to develop problem-solving proposals in work environments new to them and communicate in teams. They make their first contacts with the professional world, create a basis for their later career choice and improve their employability.

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 work placement (approx. 2 pages)

Allocation of places

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Additional information

Additional information on module duration: no less than 10 weeks.

Workload

300 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Exhibition MCS Thesis			06-MCS-Exhib-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)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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 a and 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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

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

Module coordinator	Module offered by
chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)	Institute of Human Computer Media

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

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

The module provides a comprehensive insight into the contents and methods of human-computer interaction. The entire cycle consisting of design, implementation and evaluation of interactive computer systems is considered. Input/output processing techniques and important and typical interaction metaphors, from text-based input to graphical desktop applications to multimodal interfaces, are introduced and prominent evaluation methods are explained. The module provides insights into basic functioning of modern computer systems as well as basic human capabilities and limitations in cognition (perception, cognition, memory, attention, decision making) and physical ergonomics (anthropometry, biomechanics). Accompanying practical tasks in the exercise teach students typical methods of needs analysis, prototype development and evaluation.

Intended learning outcomes

After participating in the module courses, students have acquired basic professional skills. They remember specific methods and procedures. They are able to identify relevant use-cases and recognize possible issues and tasks and compare different solution options. They are able to solve first prototypical tasks, organize the solution process, implement the individual steps of the solution process, interpret and compare the results.

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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Workload

240 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Inclusive Design & Accessibility			06-MCS-IDA-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, fundamentals of accessibility and inclusive design from a human-computer interaction perspective are covered and practiced. Central topics are design for important target groups (e.g. people with visual impairments, elderly people, people with dementia), methods for estimating exclusion, basic technologies for increasing accessibility, principles of universal design and approaches of inclusive design. The content will be taught interactively and applied in a small accompanying project.

Intended learning outcomes

After participating in the module events, students are able to characterize user groups with diverse abilities and limitations. The students are able to independently compile, summarize and evaluate relevant excerpts from the specialist literature. In the project they generate user-oriented design solutions. They develop their communicative competencies and their own values in relation to their fellow human beings with special needs.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Interaction Guidelines			06-MCS-IGL-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Usability guidelines often sound logical, but their implementation is often more difficult than expected. In this module, students learn basic guidelines for the design of e.g. texts, graphics and forms as well as special guidelines from different application domains e.g. web, natural user interfaces and language interaction and apply them prototypically.

Intended learning outcomes

After participating in this module, students will be able to explain basic rules of good user interface design using examples, recognize typical usage problems, and apply rules to avoid them.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: only in summer semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Instructional Psychology for MCS			06-MCS-Inst-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Instructional Psychology and New Media		Institute of Human Computer Media	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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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Workload

150 h

Teaching cycle

Teaching cycle: depending on the offer

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)

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	undergraduate	--	

Contents

This module is about teaching methods of requirements analysis and the design of user interfaces of interactive products. The methods are introduced in the lecture part of the course. Selected methods are tested by the students on examples in the exercise part of the course. In a team, they develop a product concept and carry out the first phases of a user-centered design process from context of use and requirements analysis to the design of design solutions and a tested low-fidelity prototype

Intended learning outcomes

After participating in the module courses, students are able to apply selected methods for context of use and requirements analysis as well as for the design of human-technology interaction. They will be able to contrast the methods and assess the usefulness of individual methods for specific goals and apply the methods to the design of an interactive system. Project work promotes independent planning, communication and cooperation in groups as well as the ability to resolve conflicts.

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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Workload

300 h

Teaching cycle

Teaching cycle: only in summer semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Media Psychology for MCS			06-MCS-MedPsy-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Media Psychology		Institute of Human Computer Media	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Media psychology deals with human experiences and behaviour while interacting with media. Media psychology develops theories and tests these in empirical studies. This introductory module aims to equip students with fundamental knowledge about the subject of media psychology (e. g. traditional media and mass media) as well as its theories, findings, and methods. The module focuses on the introduction to a) the subject itself, theories, and findings of media psychology b) research fields and current problems in media psychology c) methods in media psychology.

Intended learning outcomes

Students should be familiar with central concepts and methods of media psychology. They should have a basic knowledge of the subject-specific questions and should understand the relevance and importance of a psychological perspective as well as the relevance of questions in the field of the social sciences. Thus, a basis is provided for academic work as well as for acquiring practically relevant (vocationally oriented) media skills.

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)

a) written examination (approx. 50 minutes) or
b) oral examination of one candidate each (approx. 20 minutes)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: depending on the offer

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Research Methods			06-MCS-Meth-1-152-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides basic knowledge about methods of gaining knowledge in human-computer systems. These include scientific theoretical basics, identification of questions, formulation of hypotheses, securing suitable measurement methods, selection of research paradigms and data collection methods, as well as evaluation and interpretation of research results. In the exercise, the above points are practiced practically by means of tasks such as smaller experiments, data evaluation and the preparation of a research report.

Intended learning outcomes

After participating in the module courses, students are able to investigate empirical questions in human-computer systems using the appropriate scientific methods. The students are able to reproduce basic terms and methods, formulate and comprehend questions, and decide on and apply suitable survey and evaluation methods. The students are able to critically examine the methods of others and their own work and have knowledge of the structure and writing of scientific reports.

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

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Experience as a tester or subject in experiments			06-MCS-Meth-2-152-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)**	
1	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Empirical studies and controlled experiments are the central methods of scientific procedure. Typically, students learn to design and execute experiments from the perspective of the person conducting the experiment. In this module, students switch sides and participate in experiments, not as leaders, but as subjects.
Detailed information on the distribution of subject hours among the various work areas of the Institute Human-Computer Media can be found on the degree program's website.

Intended learning outcomes

After participating in the module courses, students will be able to recognize how subjects perceive empirical studies. They can deduce which positive and negative aspects an empirical study can have from the perspective of a test subject.

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

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Additional information

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Workload

30 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

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

Hands-on experience is a necessary skill for application-oriented aspects of human-computer interaction (HCI). In this course, groups of students work on a well-specified project or work task, which they are expected to solve mainly independently. The topic is drawn from the interdisciplinary psychological-informational aspects of human-computer interaction and may include design, evaluation, and research aspects.

Intended learning outcomes

After participating in the module courses, students will be able to apply their methodological and content knowledge with an interdisciplinary informatics and psychology focus. They are able to work in a team according to structured processes and develop their methodological competence, communicative competence, cooperation skills and ability to deal with conflicts.

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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Workload

360 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
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

Hands-on experience is a necessary skill for application-oriented aspects of human-computer interaction (HCI). In this course, groups of students work on a well-specified project or work task, which they are expected to solve mainly independently. The topic comes from the psychological aspects of human-computer interaction and may include design, evaluation, and research aspects.

Intended learning outcomes

After participating in the module events, students can apply their methodological and content knowledge with a psychological focus. They are able to work in a team according to structured processes and develop their methodological competence, communicative competence, cooperation skills and ability to deal with conflicts.

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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Workload

360 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

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	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In the lecture, the module for human-computer systems studies teaches fundamentals of psychology in the sub-aspects: Emotional and Motivational Psychology, Social Psychology, Personality and Differential Psychology, and Organizational Psychology. In the exercise, examples are given of how this knowledge can be applied or researched in human-computer interaction.

Intended learning outcomes

After participating in the module courses, the students are able to reproduce the basics of the sub-aspects of psychology and to delineate the individual sub-aspects. Furthermore, the students are able to recognize and evaluate the relevance of the sub-aspects in a human-computer system. The exercise enables the students to present and discuss the contents.

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

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Workload

150 h

Teaching cycle

Teaching cycle: only in summer semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

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	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
12	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Students work independently on an assigned problem from the research area of human-computer interaction (HCI) and document their results according to scientific standards.

Intended learning outcomes

After participation in the module, participants are able to independently apply scientific methods of human-computer interaction to a thematically defined problem. They recognize and interpret subject-specific questions of the problem. They compare, interpret and evaluate analogous problems and remember the necessary methods to answer them. They organize and implement a structured processing and solution process. They document and illustrate their solution process and interpret 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

Time to complete: 12 weeks.

Workload

360 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Usability and Software Ergonomics			06-MCS-Usab-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	undergraduate	--	

Contents

This module is about teaching and applying analytical and empirical evaluation methods for usability and user experience of interactive products. The methods are introduced in the lecture part of the course. Selected methods are tested by the students on examples in the exercise part of the course. Furthermore, the students evaluate two interactive products independently in small groups. The task consists of planning, conducting, evaluating and presenting the results of a usability study and includes a critical comparison of methods.

Intended learning outcomes

After participating in the module courses, students will be able to apply analytical and empirical methods for evaluating interactive products, present them in writing and critically evaluate them. They will be able to plan, conduct and evaluate evaluation studies. From the analysis of the results, they develop suggestions for the revision of interactive products. Through project work in small groups, their general problem-solving ability, communicative competence, cooperation skills and self-competence to develop their own willingness to perform.

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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Workload

300 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Master's degree (1 major) Digital Humanities (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title	Abbreviation
Specialization MCS 1	06-MCS-V1-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)	Institute of Human Computer Media

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

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

In this module, the contents of the degree courses are deepened and references to neighboring sciences are made, which expand and deepen the skills already acquired, e.g. media communication, business informatics, interaction design, sociology of technology, psychology, computer science, museology, digital humanities, geography, etc.

Intended learning outcomes

After participating in this module, students will be able to name and explain typical problems and methods in their own subject as well as in related fields of science and application. They develop methodological competence, communicative competence, cooperation skills and the ability to deal with conflicts in interdisciplinary cooperation.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module studies (Bachelor) Human-Computer Systems (2019)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title	Abbreviation
Specialization MCS 2	06-MCS-V2-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Bachelor's degree programme Mensch-Computer-Systeme (Human-Computer Systems)	Institute of Human Computer Media

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

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

In this module, the contents of the degree courses are deepened and references to neighboring sciences are made, which expand and deepen the skills already acquired, e.g. media communication, business informatics, interaction design, sociology of technology, psychology, computer science, museology, digital humanities, geography, etc.

Intended learning outcomes

After participating in this module, students will be able to name and explain typical problems and methods in their own subject as well as in related fields of science and application. They develop methodological competence, communicative competence, cooperation skills and the ability to deal with conflicts in interdisciplinary cooperation.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module studies (Bachelor) Human-Computer Systems (2019)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Specialisation Human Factors			06-MCS-VHuFa-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students are introduced to safety-critical and complex work areas in which human factors play a major role (e.g. aviation, acute medicine, traffic). For this purpose, (1) a work area with its specific requirements for the design of the human-machine interface is introduced, (2) current problems and research topics in this area are discussed and (3) possibilities and limits are discussed on applying HCI knowledge and research to solving problems in this domain. Excursions to safety-critical work places are also planned as part of the seminar.

Intended learning outcomes

After participating in this module, students will be able to assess how human-machine interfaces must be designed in context through insight and contacts in safety-critical socio-technical work areas. Furthermore, students will be able to analyze these interfaces from a safety-critical point of view and taking into account work area-specific features, and to incorporate these results into designs of new interfaces. The excursions offer an insight into fields in which internships or project and thesis work are relevant and also represent a potential professional field.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)

Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Specialisation Usability			06-MCS-VUsab-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, the content, methods and applications of usability research are taught in depth, i.e. the design of human-computer systems along the criteria of effectiveness, efficiency and satisfaction during use. Examples of application come from industrial use, public and private space.

Intended learning outcomes

After participating in this module, students will be able to name the principles of selected usability methods and domains and will be able to design user interfaces themselves as well as conduct studies to investigate issues in the field of human-system interaction. Furthermore, they are able to explain the advantages and disadvantages of different usability methods, analyze and evaluate empirical studies as well as design solutions.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Specialisation User Experience			06-MCS-VUsEx-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module provides in-depth content, methods and applications of user experience research, i.e. the design of human-computer systems with regard to a good user experience. Examples of application come from the public and private spheres and include, for example, customer satisfaction, persuasive interfaces, aesthetic design and service design.

Intended learning outcomes

After participating in this module, students will be able to name the principles of selected user experience methods and domains and will be able to design user interfaces themselves as well as conduct studies to investigate corresponding questions from the field of human-system interaction. Furthermore, they will be able to explain the advantages and disadvantages of different user experience methods, analyze and evaluate empirical studies as well as design solutions.

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Master's degree (1 major) Media Communication (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Master's degree (1 major) Media Communication (2016)

Master's degree (1 major) Media Communication (2018)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Master's degree (1 major) Media Communication (2019)
Bachelor's degree (1 major) Human-Computer Systems (2022)
Master's degree (1 major) Media Entertainment (2022)
Master's degree (1 major) Psychology of digital media (2022)

Module title			Abbreviation
Statistics 1			06-PSY-STAT-1-152-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Psychological Research Methods		Institute of Psychology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
6	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The course gives an introduction to univariate and bivariate descriptive statistics and probability theory (descriptive statistics, graphic representations of data, probability theory, Bayes, distributions, binomial test, linear, nonlinear and multiple regression, correlation) as well as statistical methods of evaluation research. The application of computer-based data collection and -analysis is trained in exercises and explicitly tested in the exam.

Intended learning outcomes

Students acquire knowledge of various procedures of descriptive statistics and probability theory and their foundations as well as the ability to select adequate statistical methods for testing empirical questions, perform the procedures correctly with using computer-based data analysis, 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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Workload

180 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Psychology (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Media Communication (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Statistics 2			06-PSY-STAT-2-152-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Psychological Research Methods		Institute of Psychology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
6	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides advanced knowledge of inferential statistics (sampling, estimation principles, confidence intervals, theory of Null hypothesis testing, parametric and nonparametric methods for univariate and bivariate data sets, tests of equivalence, contingency table analysis, analysis of variance). After the principles of statistical data analysis are discussed, computational procedures using computer-based data analysis are trained with examples and tested in the final exam.

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 e.g. from evaluation research, 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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Workload

180 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Psychology (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Media Communication (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Algorithms and data structures			10-I-ADS-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Informatik (Computer Science)		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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

Students are proficient in independently designing, precisely describing and analyzing algorithms. The students know the basic paradigms for the design of algorithms and can implement them in practical programs. Students are able to estimate the runtime behavior of algorithms and prove the correctness of algorithms.

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).
creditable for bonus

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

Teaching cycle: only in winter semester

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

§ 49 I Nr. 1 a)
§ 69 I Nr. 1 a)

Module appears in

Bachelor's degree (1 major) Computer Science (2015)
Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Economathematics (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
Bachelor's degree (1 major) Aerospace Computer Science (2015)
First state examination for the teaching degree Realschule Computer Science (2015)
First state examination for the teaching degree Gymnasium Computer Science (2015)
Bachelor's degree (1 major) Aerospace Computer Science (2017)
Bachelor's degree (1 major) Computer Science (2017)
Bachelor's degree (1 major) Computer Science (2019)

Bachelor's degree (1 major) Aerospace Computer Science (2020)
Bachelor's degree (1 major) Computer Science and Sustainability (2021)
Bachelor's degree (1 major) Mathematics (2023)

Module title			Abbreviation
Introduction to Programming			10-I-EinP-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science II		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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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Workload

150 h

Teaching cycle

Teaching cycle: only in winter semester

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

§ 49 I Nr. 1 b)
§ 69 I Nr. 1 b)

Module appears in

Bachelor's degree (1 major) Computer Science (2015)
Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Business Information Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
Bachelor's degree (1 major) Aerospace Computer Science (2015)
First state examination for the teaching degree Realschule Computer Science (2015)
First state examination for the teaching degree Gymnasium Computer Science (2015)
Bachelor's degree (1 major) Business Information Systems (2016)
Bachelor's degree (1 major) Business Information Systems (2019)

Module title			Abbreviation
Practical Course in Programming			10-I-PP-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Informatik (Computer Science)		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
	undergraduate	--	

Contents

The programming language Java. Independent creation of small to middle-sized, high-quality Java programs.

Intended learning outcomes

The students are able to independently develop small to middle-sized, high-quality 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)

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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Workload

300 h

Teaching cycle

Teaching cycle: every semester

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

§ 49 I Nr. 1 c)
§ 69 I Nr. 1 d)

Module appears in

Bachelor's degree (1 major) Computer Science (2015)
Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
Bachelor's degree (1 major) Aerospace Computer Science (2015)
First state examination for the teaching degree Realschule Computer Science (2015)
First state examination for the teaching degree Gymnasium Computer Science (2015)
Master's degree (1 major) Functional Materials (2016)
Bachelor's degree (1 major) Computer Science (2017)
Master's degree (1 major) Functional Materials (2022)
Master's degree (1 major) Functional Materials (2025)

Module title			Abbreviation
Software Technology			10-I-ST-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Informatik (Computer Science)		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

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

Intended learning outcomes

The students possess a fundamental theoretical and practical knowledge on the design and development of 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).
creditable for bonus

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

Teaching cycle: only in summer semester

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

§ 49 I Nr. 1 b)
§ 69 I Nr. 1 b)

Module appears in

Bachelor's degree (1 major) Computer Science (2015)
Bachelor's degree (1 major) Mathematics (2015)
Bachelor's degree (1 major) Economathematics (2015)
Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Computational Mathematics (2015)
Bachelor's degree (1 major) Aerospace Computer Science (2015)
First state examination for the teaching degree Realschule Computer Science (2015)
First state examination for the teaching degree Gymnasium Computer Science (2015)
Bachelor's degree (1 major) Business Information Systems (2016)
Bachelor's degree (1 major) Aerospace Computer Science (2017)
Bachelor's degree (1 major) Economathematics (2017)

Bachelor's degree (1 major) Computer Science (2017)
Bachelor's degree (1 major) Computer Science (2019)
Bachelor's degree (1 major) Business Information Systems (2019)
Module studies (Bachelor) Orientierungsstudien (2020)
Bachelor's degree (1 major) Business Information Systems (2020)
Bachelor's degree (1 major) Aerospace Computer Science (2020)
Bachelor's degree (1 major) Computer Science and Sustainability (2021)
Bachelor's degree (1 major) Business Information Systems (2021)
Bachelor's degree (1 major) Economathematics (2021)
Bachelor's degree (1 major) Economathematics (2022)
Bachelor's degree (1 major) Mathematics (2023)
Bachelor's degree (1 major) Business Information Systems (2023)
Bachelor's degree (1 major) Economathematics (2023)
Bachelor's degree (1 major) Business Information Systems (2024)
Bachelor's degree (1 major) Economathematics (2024)
Bachelor's degree (1 major) Digital Business & Data Science (2024)

Module title			Abbreviation
Selected topics of Computer Science			10-MCS-AKI-152-m01
Module coordinator		**Module offered by**	
Dean of Studies Informatik (Computer Science)		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Interactive Computer Graphics Exercise			10-MCS-ICGT-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides fundamental knowledge of the development process of a rendering framework for digital synthesis and manipulation of visual content in the context of interactive 3D computer graphics. This includes light-matter interaction, illumination models, image formats, data representation, mathematical formulations of motion and projections, and texturing techniques. The required activities are performed independently in groups of 3 students. Accompanying exercises, software assignments, and discussions assist students in using typical graphics software packages and languages such as WebGL, OpenGL, GLSL, and/or DirectX, as well as organizing the project as a whole.

Intended learning outcomes

After participating in the module courses, students will be able to independently develop key components for digital synthesis and manipulation of visual content in the context of interactive 3D computer graphics. Students will have a sound understanding of the operation of modern software packages for digital synthesis and manipulation of visual content.

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

Ü (1) + T (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 of project results (approx. 20 minutes)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: only in summer semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Interactive Computer Graphics			10-MCS-ICGV-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module teaches basic methods for digital synthesis and manipulation of visual content in the context of interactive 3D computer graphics. This includes principles of modeling light-matter interaction, illumination models, image formats, data representations, the mathematical formulations of motion and projections, and texturing techniques. Theoretical aspects of the ray-tracing and raster pipeline substeps and their extension by algorithmic approaches to interactive image synthesis using computer systems will be taught. The WebGL pipeline will be used to practically illustrate the concepts of modern renderers. Typical application areas for interactive 3D computer graphics are contemporary and novel graphical human-computer interfaces, for example in the areas of virtual and augmented reality, the visualization of complex data in scientific and industrial applications, or the economically growing segment of computer games.

Intended learning outcomes

After participating in the module courses, students know basic concepts of digital synthesis and manipulation of visual content. They can recall, summarize and explain principle methods and implement them.

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

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Workload

150 h

Teaching cycle

Teaching cycle: only in summer semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Interactive Systems 1			10-MCS-IS1-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module teaches basic requirements, concepts and practical solutions in the field of interactive systems. A special focus is on systems for the realization of human-computer interaction, in which user and computer form a common system in a closed input-output loop and requirements of different degrees of reactivity up to real-time are crucial. Possible examples include classical graphical interfaces, web-based solutions, and virtual and augmented reality systems.

Intended learning outcomes

After participating in the module courses, students are able to identify basic capabilities and properties of today's computer systems with regard to their interactivity and to derive technical measures for their realization. Students will be able to select and evaluate suitable solution approaches and tools for tasks in the field of interactive systems development. Furthermore, students are able to develop alternative approaches for future interactive 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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Interactive Systems 2			10-MCS-IS2-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module teaches basic requirements, concepts and practical solutions in the field of interactive systems. A special focus is on systems for the realization of human-computer interaction, in which user and computer form a common system in a closed input-output loop and requirements of different degrees of reactivity up to real-time are crucial. Possible examples include classical graphical interfaces, web-based solutions, and virtual and augmented reality systems.

Intended learning outcomes

After participating in the module courses, students are able to identify basic capabilities and properties of today's computer systems with regard to their interactivity and to derive technical measures for their realization. Students will be able to select and evaluate suitable solution approaches and tools for tasks in the field of interactive systems development. Furthermore, students are able to develop alternative approaches for future interactive systems.

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)

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

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Interactive Systems 3			10-MCS-IS3-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module teaches basic requirements, concepts and practical solutions in the field of interactive systems. A special focus is on systems for the realization of human-computer interaction, in which user and computer form a common system in a closed input-output loop and requirements of different degrees of reactivity up to real-time are crucial. Possible examples include classical graphical interfaces, web-based solutions, and virtual and augmented reality systems.

Intended learning outcomes

After participating in the module courses, students are able to identify basic capabilities and properties of today's computer systems with regard to their interactivity and to derive technical measures for their realization. Students will be able to select and evaluate suitable solution approaches and tools for tasks in the field of interactive systems development. Furthermore, students are able to develop alternative approaches for future interactive systems.

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

R (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) or
b) presentation (approx. 20 minutes) and handout (approx. 5 pages) or
c) presentation of project results (approx. 30 minutes) or
d) presentation (approx. 45 minutes) or
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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Workload

150 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Media Informatics for MCS			10-MCS-Med-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	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 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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Workload

150 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
MCS Project Computer Science			10-MCS-Proj-Info-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
12	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides basic knowledge of the collaborative development process of software. This includes both the creation and execution of requirements analyses, the design of the software architecture, its implementation and evaluation. The necessary activities are carried out independently in groups of 8-10 students. Presentations and discussions help the student groups improve their teamwork skills, become familiar with the required technologies and activities, and organize the project as a whole.

Intended learning outcomes

After participating in the module courses, students are able to develop software collaboratively. They can elicit, specify, analyze, and validate software requirements. Students are able to independently familiarize themselves with new software technologies and frameworks and use them to develop software. In addition to these technical and methodological competencies, students will be able to apply best practices for effective teamwork, such as evaluation methods, communicating expectations, and dealing with problems.

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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Workload

360 h

Teaching cycle

Teaching cycle: every semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)

Module title			Abbreviation
Programming Course Interface Development			10-MCS-SPSE-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module provides basic knowledge about the collaborative development process of software with a focus on graphical user interfaces. This includes the creation and execution of requirements analyses, the design of the software architecture, its implementation and the testing of the developed software. The necessary activities are carried out independently in groups of 4-5 students. Presentations, exercises and discussions help the student groups to improve their teamwork skills, to become familiar with the required technologies and activities, and to organize the project as a whole. The technologies used are regularly adapted and currently include Git, HTML, CSS, JavaScript, Java, the Play framework, SQL, JDBC and JUnit.

Intended learning outcomes

After participating in the module courses, students are able to develop software collaboratively. They can elicit, specify, analyze, and validate software requirements. Students are able to independently familiarize themselves with new software technologies and frameworks and use them to develop graphical user interfaces. In addition to these technical and methodological skills, students will be able to apply best practices for effective teamwork, such as evaluation methods, communicating expectations, and dealing with problems.

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

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)

presentation of project results (approx. 20 minutes)
Language of assessment: German and/or English
creditable for bonus

Allocation of places

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Additional information

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Workload

300 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)

Module title			Abbreviation
Software Quality			10-MCS-SQ-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Institute of Computer Science	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module teaches techniques and practices for creating high-quality software. Specifically, principles of typical software requirements such as reliability, testability, accuracy, security, reusability, maintainability, and efficiency in terms of runtime behavior and resource consumption are presented and discussed. Programming guidelines and source code examples are used to teach concepts, techniques and tools for creating professional quality code and high quality software products.

Intended learning outcomes

After participating in the module courses, students will be able to recall, summarize, explain, and implement theory and methods for creating high-quality software products. Students will be able to compare, describe, and develop 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

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Additional information

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Workload

150 h

Teaching cycle

Teaching cycle: only in winter semester

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

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Module appears in

Bachelor's degree (1 major) Human-Computer Systems (2015)
Bachelor's degree (1 major) Human-Computer Systems (2016)
Bachelor's degree (1 major) Human-Computer Systems (2018)
Bachelor's degree (1 major) Human-Computer Systems (2022)