Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue

for the Subject

Human-Computer-Interaction

as a Master's with 1 major

with the degree "Master of Science"

(120 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

Im viersemestrigen Masterstudiengang (akademischer Grad: „Master of Science, M.Sc.“) werden die im Bachelorstudiengang erworbenen grundlegenden Fähigkeiten und Kenntnisse der Human-Computer Interaction vertieft und erweitert. Die Studierenden erlangen die Fähigkeit, eigenständig nach wissenschaftlichen Methoden zu arbeiten und werden auf die Berufspraxis vorbereitet. Das Studium versieht die Studierenden mit einer Berufsfeldqualifikation für ein breites Spektrum an Handlungsfeldern in Organisationen, Institutionen und in der Privatwirtschaft. Die Berufsfelder beziehen sich unter anderem auf

- die Lehre an Schulen, Hochschulen und Universitäten
- die Forschung in universitären und außeruniversitären Forschungseinrichtungen
- Tätigkeiten in der Weiterbildung
- die Industrie und der Logistik
- die Automobil-Branche
- den Öffentlichem Dienst/Behörden
- den Bereich E-Commerce
- die Medizin und Pflege
- als User Experience Designer, Usability Engineer, User Experience Consultant oder Human Factors Spezialist im IT-Bereich (auch leitende Funktionen).

Nach unserer bisherigen Erfahrung sind die Einstellungsaussichten von Absolvent:innen der Human-Computer Interaction sehr gut.

Qualifikationsziele

Das Studienfach Human-Computer Interaction wird von der Fakultät für Humanwissenschaften der JMU als forschungsorientierter Studiengang mit dem Abschluss „Master of Science“ (M.Sc.) im Rahmen eines konsekutiven Bachelor- und Master- Studienmodells angeboten. Der Grad des Master of Science stellt einen weiteren berufsqualifizierenden sowie forschungsorientierten Abschluss dar. 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 und angewandter Projekte.
   - Verfassen wissenschaftlicher Texte nach fachlichen Standards.
   - Projektmanagement und Teamarbeit.
   - Ethik und professionelles Selbstverständnis.
2. Vertiefte Methodische Kompetenzen
   - Analytisches Vorgehen und Abstraktionsvermögen.
   - Algorithmisches Denken und Konstruieren.
   - Verständnis und Strukturierung komplexer Zusammenhänge.
   - Einbettung interaktiver Produkte in organisationale und gesellschaftliche Kontexte.
   - Erweiterte Kenntnisse in Statistik und Versuchsplanung.
3. Inhaltliche Kompetenzen
   - Programmierung und programmiertechnische Verfahren.
   - Softwareentwurf und Softwareanalyse.
   - Schnittstellengestaltung interaktiver Systeme.
   - Fortgeschrittene Interaktionstechniken und -paradigmen.
   - Fortgeschrittene statistische Verfahren.
   - Vertiefungen in Usabilty Management, Human Factors und User Experience Design.

- Technische Grundlagen informatischer Systeme.
- Herstellen interdisziplinärer Bezüge zu weiteren Anwendungsfeldern.

Wissenschaftliche Befähigung

- Die Absolvent:innen verfügen über ein breites, detailliertes und kritisches Verständnis der zentralen Theorien und Prinzipien, das den Stand der Fachliteratur sowie vertiefendes Wissen zum aktuellen Stand der Forschung einschließt.
- Die Absolvent:innen verfügen über vertiefte Kenntnisse der forschungsmethodischen und theoretischen Bereiche der Human-Computer Interaction und können auf dieses fundierte Wissen zur Erlangung neuer Erkenntnisse zurückgreifen.
- Die Absolvent:innen besitzen ein differenziertes Methodeninventar, um empirische Fragestellungen strukturieren, analysieren und durchführen zu können.
- Die Absolvent:innen verfügen über einen erweiterten Überblick über Bereiche der Human-Computer Interaction und sind in der Lage, Besonderheiten, Grenzen, Terminologien und Lehrmeinungen (wissenschafts-)theoretisch zu definieren und zu interpretieren.
- Die Absolvent:innen kennen die Gebiete der Psychologie, HCI und Informatik sowie interdisziplinäre Zusammenhänge und entwickeln auf der Grundlage des Wissens und Verstehens eigenständige anwendungs- und forschungsorientierte Ideen.
- Die Absolvent:innen und Absolventen verfügen über Kenntnisse des aktuellen Forschungsstandes in mindestens einem Schwerpunktbereich der Human-Computer Interaction und wenden diese Fähigkeiten und Kenntnisse an, indem sie innerhalb dieses Schwerpunkts selbstständig Projekte mitentwickeln. Sie können ihr Wissen und Verstehen sowie ihre Fähigkeiten zur Problemlösung auch in neuen und unvertrauten Situationen anwenden, die in einem breiteren oder multidisziplinären Zusammenhang mit der Human-Computer Interaction stehen.
- Die Absolvent:innen sind in der Lage, mit Fachvertretern auf dem aktuellen Stand der Forschung Fragestellungen zu diskutieren.
- Die Absolvent:innen sind in der Lage, sich anhand von Primärliteratur, insbesondere in englischer Sprache, in den aktuellen Forschungsstand eines Schwerpunktgebiets einzuarbeiten, diesen zu reflektieren und daraus eigenständige Frage- und Problemstellungen abzuleiten.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolvent:innen schätzen die eigenen Fähigkeiten ein, nutzen sachbezogene Gestaltungs- und Entscheidungsfreiheiten autonom und entwickeln diese unter Anleitung weiter, in dem sie unter Anwendung der wissenschaftlichen Arbeitsweise und unter Beachtung der Regeln guter wissenschaftlicher Praxis Fragestellungen aus der HCI und die Ergebnisse ihrer Arbeit öffentlich vertreten.
- Die Absolvent:innen begründen das eigene berufliche Handeln mit theoretischem und methodischem Wissen und reflektieren es hinsichtlich alternativer Entwürfe.
- Die Absolvent:innen verfügen über ein breites Wissen über ihr Studienfach hinaus. Sie haben grundlegendes Wissen in nicht originären Disziplinen, die aber relevant für HCI und Berufspraxis sind oder Tätigkeitsfelder für die Absolvent:innen bieten.

Persönlichkeitsentwicklung

- Die Absolvent:innen kommunizieren und kooperieren mit anderen Fachvertreterinnen und Fachvertretern, um eine Aufgabenstellung verantwortungsvoll zu lösen und binden Beteiligte unter Berücksichtigung der jeweiligen Gruppensituation zielorientiert in Aufgabenstellungen ein.
- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und reflektieren ihr berufliches Handeln in Bezug auf diese.
- Die Absolvent:innen verfügen über die Fähigkeit, eigenverantwortlich und selbstständig zu arbeiten. Auch in einem internationalen Umfeld sind sie in der Lage, neue Themen selbstständig zu erschließen und Kontakte zu knüpfen.

Befähigung zum gesellschaftlichen Engagement

- Die Absolvent:innen können gesellschaftlich relevante Fragestellungen und Entwicklungen der HCI kritisch reflektieren und deren Auswirkungen auf die Wirtschaft, Gesellschaft, Kultur und Politik erfassen und entwickeln ihr berufliches Handeln weiter.
- Die Absolvent:innen können ihr Wissen bezüglich wirtschaftlicher, (bildungs-)politischer, gesellschaftlicher, naturwissenschaftlicher, kultureller etc. Fragestellungen erweitern und 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)):

13-Jul-2015 (2015-23)

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 (70 ECTS credits)				
10-HCI-RIS-152-m01	Realtime Interactive Systems	5	NUM	39
10-HCI-3DUI-152-m01	3D User Interfaces	5	NUM	27
10-HCI-ML-152-m01	Machine Learning	5	NUM	35
10-HCI-MMI-152-m01	Multimodal Interfaces	5	NUM	37
06-HCI-THCI-152-m01	HCI Theories	5	NUM	20
06-HCI-METH-152-m01	Advanced methods of data analysis	5	NUM	15
06-HCI-SIO-152-m01	Software in organisations	5	NUM	19
06-HCI-MTG-152-m01	Human-Technology-Society	5	NUM	16
06-HCI-Proj-152-m01	HCI Project	10	NUM	17
06-HCI-Sem-152-m01	HCI Seminar	5	NUM	18
06-HCI-Exhib-152-m01	Exhibition HCI-Project	5	NUM	10
06-HCI-BPrakt-152-m01	Scientific Internship	10	B/NB	8
Compulsory Electives (20 ECTS credits)				
06-HCI-ID1-152-m01	Interdisciplinary Relations 1	5	NUM	12
06-HCI-ID2-152-m01	Interdisciplinary Relations 2	5	NUM	13
06-HCI-VHCI-1-152-m01	Specialisation HCI 1	5	NUM	24
06-HCI-VHCI-2-152-m01	Specialisation HCI 2	5	NUM	25
10-HCI-AIS1-152-m01	Advanced Interactive Systems	5	NUM	28
10-HCI-AIS2-152-m01	Advanced Interactive Systems 2	5	NUM	29
06-HCI-UM-152-m01	Advanced Usability	5	NUM	22
06-HCI-HF-152-m01	Advanced Human Factors	5	NUM	11
06-HCI-UX-152-m01	Advanced User Experience	5	NUM	23
10-HCI-Info1-152-m01	Computer Sciences I - Concepts	5	NUM	31
10-HCI-Info2-152-m01	Computer Science II - Theory	5	NUM	32
10-HCI-Info3-152-m01	Computer Sciences III - Application	5	NUM	33
10-HCI-Info4-152-m01	Computer Sciences IV - Praxis	5	NUM	34
10-HCI-AK-152-m01	Selected Topics of Computer Science	5	NUM	30
06-HCI-DTT-152-m01	Psychological Diagnostics and Test Theory	5	NUM	9
06-HCI-Instpsy-152-m01	Advanced Studies in Instructional Psychology	5	NUM	14
06-MK-ME2-152-m01	Methods 2	5	NUM	26
06-HCI-Tut-152-m01	Work experience as a research and teaching assistant	5	B/NB	21
Thesis (30 ECTS credits)				
06-HCI-Abschl-152-m01	HCI Master's Thesis	30	NUM	7

Module title	Abbreviation
HCI Master's Thesis	06-HCI-Abschl-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

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

Intended learning outcomes

After participation in this module, students possess the skills to apply scientific methods of human-computer interaction in a structured and independent manner to a clearly defined problem. They are able to analyze the problem and work on it in a planned and structured process. They are able to summarize, compare and evaluate the relevant state of research. They generate their own questions and plan and implement approaches to answer these questions. They are able to review their findings and evaluate them in comparison of alternative methods. They deepen their self-management skills.

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)

written thesis (approx. 50 to 90 pages)
Language of assessment: German and/or English

Allocation of places

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Additional information

Time to complete: 6 months.

Workload

900 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

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Scientific Internship			06-HCI-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	graduate	--	

Contents

The scientific internship provides insights into research activities in the fields of HCI, user experience, usability or human factors in scientific research institutions. The concrete contents come from the broad spectrum of topics in HCI and are subject to the individual internship agreements.

Intended learning outcomes

After participation in this module, students possess the skills to apply scientific methods of human-computer interaction in a structured way to specific tasks of scientifically oriented institutions. They expand their communication, cooperation and conflict skills in collaboration with the teams of the internship institutions. They develop and deepen their self-management skills. They establish contacts with the world of research, thus creating a scientific basis for their later professional activity.

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)
Language of assessment: German and/or English

Allocation of places

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Additional information

Additional information on module duration: 8 weeks.

Workload

300 h

Teaching cycle

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)

Module title	Abbreviation
Psychological Diagnostics and Test Theory	06-HCI-DTT-152-m01

Module coordinator	Module offered by
holder of the Chair of Psychology V - Differential Psychology, Personality Psychology, and Psychological Diagnostics	

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Psychological diagnostics is understood as a practice-related professional testing, measuring, acting and decision-making that is based on strict methodological criteria. The main focus is on classical test theory and probabilistic test theory, test construction, item characteristics and quality criteria. In addition, the diagnostic methods, procedures and approaches for capturing individual differences through observation, questioning, tests, questionnaires and their presentation in findings reports and assessments as well as classification systems their characteristics, classification errors and sources of error, the indication and the diagnostic process are presented. In addition, an introduction to the technical mastery of selected psychodiagnostic procedures is given and the approaches to scientifically guided professional action and decision-making are treated.

Intended learning outcomes

Knowledge of classical and probabilistic approaches to test and questionnaire design as well as terms and methods for evaluating tests and questionnaires. Knowledge about the planning and development of tests, item analyzes, factor analyzes, quality criteria. Introduction to standardized survey methods for differential psychology, personality research and psychological diagnostics.

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. 120 minutes)
Modules offered will vary according to resources of research group Differentielle Psychologie, Persönlichkeitspsychologie und Psychologische Diagnostik (Differential Psychology, Personality Psychology and Psychological Diagnosis) at the Institute of Psychology

Allocation of places

max. 5 places.
Should the number of applications exceed the number of available places, places will be allocated 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

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

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Exhibition HCI-Project			06-HCI-Exhib-152-m01
Module coordinator			**Module offered by**
chairperson of examination committee of the Master's degree programme Human-Computer Interaction			Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

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 project to a larger audience in a and exhibition-like setup.

Intended learning outcomes

After participating in this module, participants will be able to present their own work to a larger audience, plan, design and implement the various components of a trade show booth and respond professionally to individual questions from the audience.

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

S (0.5)

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. 10 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Advanced Human Factors			06-HCI-HF-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics		Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

In this module, the knowledge and methods of human factors research are taught in depth, i.e. the design of safety-critical systems. For example, this module can include a seminar on the use and application of eye tracking in human-system interaction. The seminar would cover the basics of eye tracking and possibilities of its application. Students might also carry out small research projects in which they apply what they have learnt.

Intended learning outcomes

After participating in this module, the students understand the principles of selected human factors methods and domains and are able to carry out studies themselves in order to address research questions from the area of human-system interaction. Furthermore, they can assess the advantages and disadvantages of various methods, can assess and critically evaluate empirical studies.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title	Abbreviation
Interdisciplinary Relations 1	06-HCI-ID1-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

In this module, references are made to neighboring sciences that expand and deepen the competencies acquired so far in the course of study, e.g. media communication, business informatics, interaction design, sociology of technology, psychology, computer science, museology, digital humanities, geography, and others.

Intended learning outcomes

After participating in this module, students will recognize and understand problems and methods in the related fields of science and application. They develop knowledge, skills and abilities related to communication, cooperation and conflict resolution in interdisciplinary teams.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title	Abbreviation
Interdisciplinary Relations 2	06-HCI-ID2-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

In this module, references are made to neighboring sciences that expand and deepen the competencies acquired so far in the course of study, e.g. media communication, business informatics, interaction design, sociology of technology, psychology, computer science, museology, digital humanities, geography, and others.

Intended learning outcomes

After participating in this module, students will recognize and understand problems and methods in the related fields of science and application. They develop knowledge, skills and abilities related to communication, cooperation and conflict resolution in interdisciplinary teams.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Advanced Studies in Instructional Psychology			06-HCI-Instpsy-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	graduate	--	

Contents

The module provides advanced knowledge of central theories and findings of instructional psychology and its relation to digital media. The course provides an overview of research on learning and instruction as well as instructional design.

Intended learning outcomes

Students acquire both expertise and practical skills that can be used for further steps in professional life. This includes advanced knowledge of theories, methods and findings of instructional media as well as basic knowledge concerning the application of instructional psychology when designing and evaluating technology-based learning environments.

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)

a) written examination (approx. 60 minutes) or
b) oral examination of one candidate each (approx. 30 minutes) or
c) presentation (15 to 45 minutes) and written elaboration (10 to 15 pages) or
d) term paper (15 to 20 pages) or
e) portfolio (maximum 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

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)

Module title			Abbreviation
Advanced methods of data analysis			06-HCI-METH-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics			
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This course covers advanced methods of statistics such as single-factor and multifactor analysis of variance with repeated measures, regression analysis, and exploratory and confirmatory factor analysis. The individual lectures each include a knowledge base according to the current state of research by the lecturers. Students actively structure this knowledge themselves. In addition, e-learning materials with numerous application examples in various statistical programs are provided.

Intended learning outcomes

After participating in the module courses, students have knowledge of advanced methods of statistics. They will be able to interpret the results in scientific texts. The students are able to compare the methods regarding advantages and disadvantages in order to select the most suitable method for a specific problem. Furthermore, they are able to apply the basic steps of the application of these methods.

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. 75 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

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)

Module title			Abbreviation
Human-Technology-Society			06-HCI-MTG-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics		Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The content of this module deals with currently controversial topics at the interface between technology and society, e.g. Should we use robots in elderly care? Is the internet making the world more democratic? Should the state be allowed to monitor our data traffic? Many of the questions that arise cannot be answered simply with a yes or no. This module introduces the topic area of technology and society by looking at current problems in the sociology of technology and ethics and allows students to develop their own responses to these controversies. Students debate current social issues related to technology use. In the process, pros and cons are brought into sharp focus and current opinion patterns are questioned.

Intended learning outcomes

After participating in the module courses, students are able to describe, analyze and contrast current social theories and topics related to human-technology. In a debate, they show that they can summarize their own and others' points of view, argue for or against them, and assess their implications. Students develop their self-competence by developing their ethical awareness and individual professional values. Participation in a debate develops their general communicative competencies in terms of expressiveness, conversational skills and persuasiveness.

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)

a) presentation (approx. 30 minutes) with handout (approx. 2 pages) or
b) term paper (approx. 15 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

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)

Module title			Abbreviation
HCI Project			06-HCI-Proj-152-m01
Module coordinator		**Module offered by**	
chairperson of examination committee of the Master's degree programme Human-Computer Interaction		Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Practical experience is a necessary skill for scientific research. This applies in particular to human-computer interaction (HCI), which requires technical, psychological and empirical skills. In this module, students work on a specified research project or task that they have to solve mostly independently. The topic is derived from research on human-computer interaction and combines technical and empirical or psychological aspects.

Intended learning outcomes

After participating in the module courses, students are able to apply their methodological and content knowledge with an interdisciplinary informatics and/or psychology focus. They can work according to self-created structured processes and develop their methodological competence, communicative competence and cooperation skills.

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

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)

report (approx. 15 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
HCI Seminar			06-HCI-Sem-152-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Psychology of Intelligent Interactive Systems			
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Sound research requires an in-depth reflection of prior approaches and the related work typically published in the scientific media (conference proceedings, journals, books, etc.). This course is an advanced course about typical scientific research work with a specific focus on topics from the field of human-computer interaction (HCI). During the course, students will have to work on one specific topic as a preparation for their master thesis. They will have to find relevant publications, read the publications and analyze them given some defined research questions and/or categories of the current state-of-the-art. They have to summarize and present their findings to a larger audience.

Intended learning outcomes

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

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

S (2)

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

talk (approx. 30 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Software in organisations			06-HCI-SIO-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	graduate	--	

Contents

The productivity paradox suggests that an increase in investment in information technology leads to hardly any noticeable increase in the overall level of productivity of a business. This is not true, however, if the focus is on investment in humans. When introducing standard software in organisations, there are numerous aspects to be considered. This module will focus on three areas: usability management during the introduction of software, the planning and running of user training courses, and organisational change management. Using the example of the introduction of enterprise resource planning (ERP) systems such as SAP software, this module will discuss procedures and success factors.

Intended learning outcomes

After participating in this module, the students can name the steps involved in introducing software in organizations. They can summarise procedures involved in usability management, planning and conducting user training courses and organizational change management. Furthermore, they are able to prepare and plan the necessary steps of the process or they can check, adapt and, if necessary, improve existing processes.

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)

a) presentation (approx. 30 minutes) with handout (approx. 2 pages) or
b) term paper (approx. 15 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

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)

Module title			Abbreviation
HCI Theories			06-HCI-THCI-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics		Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Human-Computer Interaction lies at the intersection of the social sciences and computer science and seeks to understand how people use devices and systems and how to make those devices and systems more useful and usable. Theories in cognitive science about perception, motor skills, memory, etc., informed theory and model development in the early years. In the following years, developments in cognitive science, internationalization, and rapid technological development had led to both specialization and new theoretical approaches in HCI. In this seminar, classical and especially new theoretical approaches and methods in HCI will be considered, trying to find a common framework despite all specialization and fragmentation.

Intended learning outcomes

After participating in this module, students have an extensive knowledge of theoretical approaches and methods in HCI and can distinguish from which traditions certain theoretical approaches and methods have emerged. This knowledge enables an assessment of the appropriateness of a theory or method for a specific problem and thus also enables a theoretically based and conscious decision for or against a theory or method.

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)

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

150 h

Teaching cycle

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)

Module title	Abbreviation
Work experience as a research and teaching assistant	06-HCI-Tut-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

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)

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

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Advanced Usability			06-HCI-UM-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics		Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Advanced User Experience			06-HCI-UX-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Psychological Ergonomics		Chair of Psychological Ergonomics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

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 and analyze and evaluate empirical studies and 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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title	Abbreviation
Specialisation HCI 1	06-HCI-VHCI-1-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Module studies (Master) Human-Computer-Interaction (2019)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title	Abbreviation
Specialisation HCI 2	06-HCI-VHCI-2-152-m01

Module coordinator	Module offered by
chairperson of examination committee of the Master's degree programme Human-Computer Interaction	Chair of Computer Science IX (Human-Computer Interaction) Chair of Psychological Ergonomics

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Methods 2			06-MK-ME2-152-m01
Module coordinator		**Module offered by**	
all four core Professorships of the degree programme Medienkommunikation (Media Communication)		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	graduate	--	

Contents

This module discusses advanced techniques of data collection. Students should obtain an overview of different data collection techniques that are used in media communication research. Based on the knowledge of common data collection techniques (e. g. written surveys), this module covers, for example, innovative techniques such as eye tracking or physiological measures.

Intended learning outcomes

Students should acquire a profound knowledge of the data collection techniques discussed and should deepen their methodological skills. In addition, students should become acquainted with innovative data collection techniques.

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)

a) written examination (approx. 60 minutes) or
b) oral examination of one candidate each (approx. 30 minutes) or
c) presentation (15 to 45 minutes) and written elaboration (10 to 15 pages) or
d) term paper (15 to 20 pages) or
e) portfolio (maximum 20 pages) or
f) completion of exercises on a regular basis (approx. 60 hours)
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

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

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Module appears in

Master's degree (1 major) Media Communication (2015)
Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Media Communication (2016)
Master's degree (1 major) Media Communication (2018)
Master's degree (1 major) Media Communication (2019)

Module title			Abbreviation
3D User Interfaces			10-HCI-3DUI-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides knowledge about the possibilities and specifics of 3D user interfaces in the areas of augmented reality, large screens, mobile devices, robotics and computer games. The lecture introduces high-quality 3D interaction techniques and discusses their advantages and disadvantages in specific application areas. Furthermore, design guidelines as well as the theory needed for their implementation will be taught. In the exercise, students work in groups of 2-3 participants to develop appropriate 3D interaction techniques for a virtual reality application. Presentations, exercises and discussions help the student groups to familiarize themselves with the required technologies and activities and to organize the project as a whole.

Intended learning outcomes

After participating in the module courses, students are able to develop 3D user interfaces independently. They know high-quality 3D interaction techniques and can explain important design guidelines. Students can apply available tools for typically occurring tasks and know their advantages and disadvantages. Furthermore, you can independently familiarize yourself with complex technical systems as well as independently develop problem-solving proposals, communicate these in a team and integrate them into a common prototype.

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

V (2) + Ü (2)
Module taught in: German and/or English

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. 30 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: every year, summer semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) eXtended Artificial Intelligence (xtAI) (2020)

Module title			Abbreviation
Advanced Interactive Systems			10-HCI-AIS1-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module teaches in-depth 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 will be able to recall, classify and summarize basic capabilities and features of interactive computer systems. They will be able to explain and compare them. They remember subject-specific methods for implementing interactive systems, can plan their application, implement the resulting development processes and interpret the results.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Advanced Interactive Systems 2			10-HCI-AIS2-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module teaches in-depth 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 will have deepened their expertise in the field of interactive systems. They are able to recall, classify and summarize capabilities and features of interactive computer systems. They can explain and compare them. They remember comprehensive subject-specific methods for implementing interactive systems, can plan their application, implement the resulting development processes and interpret the results.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Selected Topics of Computer Science			10-HCI-AK-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Selected topics in computer science.

Intended learning outcomes

After participating in the module courses, students are able to understand and comprehend the solutions to complex problems in computer science. They are able to transfer the solution approaches to related problems, implement and evaluate 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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: if announced

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Computer Sciences I - Concepts			10-HCI-Info1-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides a shell module. Students may receive credit for a target module from Computer Science on the following topic: Concepts of Computer Science.

Intended learning outcomes

According to the specification of the imported module.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Computer Science II - Theory			10-HCI-Info2-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides a shell module. Students may receive credit for a target module from Computer Science on the following topic: Theoretical Foundations of Computer Science.

Intended learning outcomes

According to the specification of the imported module.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Computer Sciences III - Application			10-HCI-Info3-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides a shell module. Students may receive credit for a target module from Computer Science on the following topic: Fundamentals of Computer Science Applications.

Intended learning outcomes

According to the specification of the imported module.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Computer Sciences IV - Praxis			10-HCI-Info4-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides a shell module. Students may receive credit for a target computer science module on the following topic: Practical Applications of Computer Science.

Intended learning outcomes

According to the specification of the imported module.

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)

a) written examination (approx. 75 minutes) or
b) presentation (approx. 20 minutes) with handout (approx. 2 pages) or
c) presentation of project results (approx. 20 minutes) or
d) term paper (approx. 10 pages) or
e) a total of approx. 5 hours of completing exercises or
f) oral examination (approx. 25 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: every semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) Human-Computer-Interaction (2021)

Module title			Abbreviation
Machine Learning			10-HCI-ML-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lecture module provides a broad introduction to machine learning, data mining, gesture processing, and statistical pattern recognition. Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, kernels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning). (iii) Machine learning best practices (data preparation, bias/variance theory, hyperparameter search). To this end, numerous case studies and applications will be presented from gesture-based and multimodal interfaces, text and speech recognition (web search, anti-spam), intelligent robots (perception, control), machine vision, medical informatics, data mining, and other areas. In the exercise, students independently develop a machine learning algorithm from scratch in groups of 2-3 participants. They train and optimize their algorithm to recognize body gestures used to control a given application. Presentations, exercises and discussions help the student groups to familiarize themselves with the required technologies and activities and to organize the project as a whole.

Intended learning outcomes

After participating in the module courses, students are able to recognize basic application scenarios for machine learning methods. They remember subject-specific approaches and can apply them to different problems. They can summarize, compare and explain different approaches and evaluate their performance. They can apply available tools to typically occurring tasks and know their advantages and disadvantages. Furthermore, you can independently familiarize yourself with complex technical systems as well as independently develop problem-solving proposals, communicate these in a team and integrate them in a prototype.

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

V (2) + Ü (2)
Module taught in: German and/or English

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. 30 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: every year, winter semester

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

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Module appears in

Master's degree (1 major) Human-Computer-Interaction (2015)

Master's degree (1 major) Human-Computer-Interaction (2018)

Module title			Abbreviation
Multimodal Interfaces			10-HCI-MMI-152-m01
Module coordinator		**Module offered by**	
holder of the Chair of Computer Science IX		Chair of Computer Science IX (Human-Computer Interaction)	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Multimodal interactions make use of different modalities to interact with computers or machines. The field includes both analysis and synthesis of multimodal utterances. This course focuses on analysis, i.e., processing input from, for example, speech, gestures, touch, gaze direction, or even biosensors. The goal here is to determine the intent of the interactor from multiple channels and signals in order to perform desired (inter-) actions. In this course, students will learn about examples of multimodal interfaces, their advantages, the underlying terminology and theoretical background. In addition, students will learn the steps necessary for processing both unimodal and multimodal input. As core content, building on this, the fusion of multimodal signals is taught using the example of synergistic speech-gesture interfaces as well as its integration into an interactive real-time system. This includes on the one hand typical aspects of multimodal dependencies, e.g. temporal and semantic entanglements, and on the other hand prominent approaches to perform multimodal fusion on decision level. In the accompanying exercise, the theoretical contents are deepened by a practical examination of the development of a synergistic speech-gesture interface for a virtual environment.

Intended learning outcomes

After participating in the module courses, students are able to recognize basic application scenarios for multimodal interfaces. They remember subject-specific approaches and can apply them to adequate problems. They can summarize, compare and explain different approaches. They can apply available tools to typically occurring tasks and know their advantages and disadvantages. Furthermore, you can independently familiarize yourself with complex technical systems as well as independently develop problem-solving proposals, communicate these in a team and integrate them in a prototype.

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

V (2) + Ü (2)
Module taught in: German and/or English

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. 90 minutes) or
b) presentation of project results (approx. 30 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: every year, summer semester

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

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Module appears in
Master's degree (1 major) Human-Computer-Interaction (2015)
Master's degree (1 major) Human-Computer-Interaction (2018)
Master's degree (1 major) eXtended Artificial Intelligence (xtAI) (2020)

Module title			Abbreviation
Realtime Interactive Systems			10-HCI-RIS-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	graduate	--	

Contents

The module teaches requirements, concepts and practical solutions for interactive human-computer systems of extended reality (virtual reality, mixed reality, augmented reality), perceptual computing, computer games and cyber-physical systems. Due to their common characteristics, these systems have recently often been referred to as real-time interactive systems.
In the lecture, theoretical models are introduced, requirements of the application domain are derived, and current and novel conceptual and practical solutions are presented. First, conceptual principles for characterizing real-time interactive systems are presented. Then, conceptual models of the mission-critical aspects of time, latencies, processes, and events necessary to describe the behavior of a system are introduced. This is followed by a presentation of the application state, its distribution and coherence requirements, and the consequences of these requirements on decoupling and software quality in general. Then, potential solutions for data redundancy, distribution, synchronization, and interoperability are addressed. Furthermore, concepts underlying virtual reality such as immersion and presence are discussed, as well as various methods for measuring them. Finally, avatars and the concept of embodiment will be discussed. The exercise will provide an insight into practical research work and experiments of the chair as well as a first practical insight into software technologies and frameworks for the creation of interactive real-time systems, e.g. Unity3d and/or Unreal Engine.

Intended learning outcomes

After participating in the module courses, students are able to recognize basic application scenarios for Interactive Systems. They remember subject-specific approaches and can apply them to adequate problems. They know theoretical models and they can summarize, compare and explain different approaches and evaluate their performance. They can apply available tools to typically occurring tasks and know their advantages and disadvantages. Furthermore, you can independently familiarize yourself with complex technical systems as well as independently develop problem-solving proposals, communicate these in a team and integrate them in a prototype.

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

V (2) + Ü (2)
Module taught in: German and/or English

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

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

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Module appears in
Master's degree (1 major) Human-Computer-Interaction (2015)