Handbook of Modules for the Degree Programme

Usability Engineering, M.Sc.

Faculty of Communication and Environment

Version 1.1

05.03.2015

Dokumentenhistorie

Version	Bemerkung
1.0	Version für die Akkreditierung
1.1	Überschrift geändert (Degree Programm)

Index

Curriculum of the Master Degree Programme Usability Engineering, M.Sc.

Code No (Kennnummer)	Module	SW (SWS)	Type (Veranstaltungsart) L (V)	SL (SL)	S (S)	Ex (Ü)	PT (Pra)	Pro (Pro)	V/N	TE (Prü)	CP (CP)	WS1	SS2	WS3
UE_1.01	Human Factors Design Menschliche Faktoren im Design	5							75					
	Human Factors in System-Design Menschliche Faktoren im System-Design		2			1				P	3	3		
	Project in Design for Human Factors Projekt im Design für Menschliche Faktoren						2				2	2		
UE_1.02	Psychology Psychologie	5							75					
	Psychology of Perception and Psychology of Learning Wahrnehmungs- und Kognitionspsychologie		2							P	2	2		
	Human Information Processing and Occupational Psychology Menschliche Informationsverarbeitung und Arbeitspsychologie		2								2	2		
	Practice in Observation and Survey Methods Praxis in Beobachtung und Umfragemethoden						1				1	1		
UE_1.03	Analysis Methods Analysemethoden	5							75					
	Analysis and Evaluation Methods Analyse- und Evaluationsmethoden		2			1				P	3	3		
	Case Studies and Practice of Analysis and Evaluation Methods Fallbeispiele und Praktische Anwendung von Analyse- und				2						2	2		
UE_1.04	Visualisation Visualisierung	5												
	Design Concept Development Konzeptuelle Designentwicklung		2						75	P	2	2		
	Interface Design Visualisation Benutzungsschnittstellendesign						1				1	1		
	Case Studies of Visualisation Projects Fallbeispiele von Visualisierungsprojekten				2						2	2		
UE_1.05	Strategic Usability Engineering Strategisches Usability Engineering	5							75					
	Usability- and Software-Engineering Integration Integration von Usability- und Software-Engineering		1		1					P	2	2		
	Standards and Legal Aspects, Accessibility and Universal Design Standards, Rechtliche Aspekte, Accessability und Universelles		1								1	1		
	Practice in Process Design Praxis in der Prozessgestaltung						2				2	2		
UE_1.06	Applied Research Project A Angewandes Projekt A	5							75	P				
	Applied Research Project A Angewandes Projekt A						5				5	5		
UE_2.01	Usability Consulting Usability Beratung	5							75					
	Project Acquisition, Planning Management and Documentation Projektakquise, Management- und Dokumentationsplanung		2			1				P	3		3	
	Practice in Training and Coaching Praxis in Training und Schulung						2				2		2	
UE_2.02	Advanced Human Interface Design Erweitertes Mensch Maschine Schnittstellendesign	5							75					
	Industrial Interfaces Industrielle Benutzungsschnittstellen				1		1			P	2		2	
	Natural User Interfaces Natürliche Interaktionsschnittstellen				1		1				2		2	
	Digital and Social Media Digitale und Soziale Medien				1						1		1	
UE_2.03	Innovation Management Innovationsmanagement	5							75					
	User-Centred Innovation and Design Management Nutzerzentriertes Innovations- und Design-Management		2							P	2		2	
	Digital Culture and New Markets Digitale Kulturen und Neue Märkte		2								1		2	
	Case Studies of Innovation Management Fallbeispiele des Innovationsmanagements						1				2		1	
UE_2.04	Intercultural Management and Intercultural Competence Interkulturelles Management und Interkulturelle Kompetenz	5							75					
	Intercultural Management and Intercultural Competence Interkulturelles Management und Interkulturelle Kompetenz		2			1				P	3		3	
	Localisation and Internationalisation Lokalisierung und Internationalisierung						1				1		1	
	Case Studies of Localisation of Information Technology Products Fallbeispiele der Lokalisierung von Informationstechnologischen				1						1		1	
UE_2.05	Scientific and Technical Communication Wissenschaftliche und Technische Kommunikation	5							75					
	Creative and Technical Writing Kreatives und Technisches Schreiben		2			1				P	3		3	
	Experimental Design, Analysis and Documentation Experimentelles Design, Analyse und Dokumentation		1			1					2		2	
UE_2.06	Applied Research Project B Angewandes Projekt B	5							75	P				
	Applied Research Project B Angewandes Projekt B						5				5		5	
	Semester hours per week (total)	60									60	30	30	30

UE_3.01 Master Thesis (27 CP) & Colloquium (3 CP)

60 SW 30 SW
60 CP 30 CP
90 CP

Allocation	SW	total	total	90	30	30	30
	CP	total	total	90	30	30	30

Code No (Kennnummer)	Elective Courses Wahlpflichtkurse	SW	CP	TE

List of abbreviations	
SW	Semester hours per week (Semesterwochenstuden)
L	Lecture (Vorlesungs)
SL	Seminaristic lecture (Seminaristische Lehrveranstaltung)
S	Seminar (Seminar)
Ex	Exercise (Übung)
PT	Practical training (Praktikum)
Pro	Project (Projekt)
TE	Type of examination (Prüfungsform)
CP	Credit Points
WS	Winter semester (Wintersemester)
SS	Summer semester (Sommersemester)
E	Examination (Prüfung)
C	Certificate (Testat)

* As elective courses, a maximum of 6 CH/ 6 CP can be chosen with the consent of the examination committee from any study course at the Rhine-Waal University of Applied Sciences

UE_1.01 Human Factors Design

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.01	150 h	5 CP	1st semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Excersise: 15 h / 1 SWS Practical Training: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students are able to understand the importance and relevance of human capabilites in the process of system design. General principles of human-centred design were taught as the basis for an explicit understanding of users, their tasks and their environment and the corresponding conceptualization of designs focused on users needs and requirements. These principles enable students to evaluate the proposed solution in a human-centred and interative way. The exercises have trained students to perform a complete project life cycle, from context of use and requirements analysis to project definition, conceptualization, evaluation and phase-out.

Content

Properties of human capabilities

Usability, user experience and user centred-design

Human-centred design according to DIN/EN ISO 9241-110

Interviews, user profiles, personas and use cases

Conceptualization and prototyping

Evaluation

Teaching methods

Tuition in seminars, lectures and (partially self-organized) practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points Passed examination
Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Cooper, Alan, Robert Reimann, and David Cronin. About Face 3: The Essentials of Interaction Design. 3rd ed. Wiley, 2007. Beyer, Karen Holtzblatt Hugh. Contextual Design: Defining Customer-Centered Systems. Morgan Kaufmann, 1997. Benyon, David. Designing Interactive Systems. 10th ed. Addison Wesley, 2010. Garrett, Jesse James. The Elements of User Experience: User-Centered Design for the Web and Beyond. 2nd ed. New Riders Press, 2010. Stanton, Neville A., Paul M. Salmon, and Guy H. Walker. Human Factors Methods: A Practical Guide for Engineering And Design. Ed. Neville A. Stanton, Paul M. Salmon, and Guy H. Walker. Ashgate Publishing, 2005. Dix, Alan, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. Human-Computer Interaction. 3rd ed. Prentice Hall, 2003. Rogers, Yvonne, Jenny Preece, and Helen Sharp. Interaction Design: Beyond Human - Computer Interaction. 3rd ed. Wiley, 2011. Pruitt, Tamara Adlin John. The Persona Lifecycle: Keeping People in Mind Throughout Product Design. Morgan Kaufmann, 2006. Courage, Kathy Baxter Catherine. Understanding Your Users: A Practical Guide to User Requirements Methods, Tools, and Techniques. Morgan Kaufmann, 2005. Mayhew, Deborah J. The Usability Engineering Lifecycle: A Practitioner's Handbook for User Interface Design. Morgan Kaufmann, 1999. Buxton, Bill. Sketching User Experiences: Getting the Design Right and the Right Design. Morgan Kaufmann, 2007. Cockburn, Alistair. Writing Effective Use Cases. Addison-Wesley Professional, 2000.

UE_1.02 Psychology

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.02	150 h	5 CP	1st semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 60 h / 4 semester hours per week (SWS) Practical training: 15 h / 1 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students are able to understand the principles of human perception, psychology of learning and processing of information and know how to apply their skills and knowledge to usability engineering (e.g. in a usability lab). With regard to human perceptions students have acquired knowledge of approaches to study perception, vision, object and face recognition, visual attention, perception of motion, depth and size, the auditory system, speech perception, cutaneous senses and chemical senses. Students have gained profound knowledge of theories of learning and memory. Students are able to apply these theories in the field of usability engineering. The knowledge of basic concepts in problem solving, expertise, judgment, decision making, inductive and deductive reasoning enables students to understand human information processing.

Content

Principles of human perception, learning psychology and information processing.

Psychology of perception: basics in psychophysics, physiological techniques (EEG, MEG, fMRT, PET, transcranial magnetic stimulation, EOG, eye tracking).

Psychology of learning i.e. classical conditioning, operant conditioning, implicit learning, social learning theory and memory (short term memory, long term memory, working memory, forgetting and consolidation).

Human Information processing and occupational psychology.

Practice in observation and survey methods.

Teaching methods

Tuition in seminars, lectures and practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points Passed examination
Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module N.N.
Additional information B. Goldstein, Sensation and Perception (with Virtual Lab Manual CD-Rom). International Edition 8th edition. Cengage Learning Emea, 2010. M. W. Eysenck, M. T. & Keane. Cognitive Psychology. A Student´s Handbook. 6th edition. Taylor & Francis, 2010. A. Baddeley, M. W. Eysenck, M. Anderson. Memory. Taylor & Francis, 2009.

UE_1.03 Analysis and Evaluation Methods

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.03	150 h	5 CP	1st semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Exersise: 15 h / 1 SWS Seminar: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

The students have gained extensive theoretical knowledge about several analysis and evaluation methods and are trained to apply them in practice. They know which method to choose, depending on where in the user centered design process they are being perfomed most sufficiently, which research goals are being addressed and which resources need to be available.

Furthermore students have learned and practiced fundamental qualitative research methods, like interviewing techniques and qualitative content analysis.

Within several case studies, students have learned to apply those methods in various professional contexts.

Content

Introduction to qualitative and quantitative research methods

Focus groups

Day in the life studies

Diary studies

Card sorting

Heuristic evaluation

Formative usability testing

Summative usability testing

Advanced research methods (Eye tracking, valence method, user experience testing, etc.)

Teaching methods

Lectures, seminars and self study

Entry requirements None
Types of assessment Oral examination/Written report and oral presentation
Requirements for the award of credit points Passed examination/Report and presentation
Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information J. C. Dumas, J.C. Redish. A Practical Guide to Usability-Testing. Portland: Intellect Books, 1999. J. Rubin. Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests. New York: John Wiley and Sons, 1994. R. A. Krueger, M. A. Casey. Focus groups - A practical guide for applied research. Thousand Oaks: Sage Publications, 2000. M. Kuniavsky. Observing The user experience - A parctitioner's guide to user research. Morgan Kaufmann Publishers, 2003. B. Shneiderman, C. Plaisant. Designing the User Interface, 2005. A. Duchowski. Eye Tracking Methodology - Theory and Practice. Second Edition, Springer, 2007. Kuniavsky. Observing the user experience – A practitioner's guide to user research, 2003. Brandt et al. Lowering the Burden for Diary Studies Under Mobile Conditions, 2007. Tomitsch et al. Using Diaries for Evaluatiog Interactive Products: The Relevance of Form and Context, 2006. J. Nielsen, R. L. Mack. Usability Inspection Methods. John Wiley & Sons, New York, 1994.

UE_1.04 Visualisation

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.04	150 h	5 CP	1st semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Seminars: 30 h / 2 SWS Practical Training: 15 h / 1 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have gained knowledge of design principles and design elements for visual interface design. They understand the relationships between forms, shapes and colours, and the ways in which humans understand and perceive these relationships. The students have learned how to use this general knowledge in order to create interfaces for interactive systems. They have developed the ability to create usable interfaces which create high user experiences, i.e. in the way it is perceived, learned, and used. Students have learned how to use visual communication skills in conjunction with interactive communication skills as part of user interaction design.

Content

Design principles and design elements

Communication of objectives, methods and concepts for the typical development phases

Visual interface design

Sketching and prototyping

Teaching methods

Lectures and seminars with accompanying practical trainings

Entry requirements

None

Types of assessment

Portfolio and project

Requirements for the award of credit points

Passed examination

Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module N.N.
Additional information Alan Cooper, Robert Reimann, David Cronin. About Face 3: The Essentials of Interaction Design. 3rd ed. Wiley, 2007. Crawford, Chris. The Art of Interactive Design. Sunsoft Press, 2003. Kevin Mullet, Darell Sano. Designing Visual Interfaces. Sunsoft Press, 1995. Jenny Preece, Yvonne Rogers, Helen Sharp. Interaction Design. Wiley & Sons, 2007.

UE_1.05 Strategic Usability Engineering

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.05	150 h	5 CP	1st semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 15 h / 1 semester hour per week (SWS) Seminar: 15 h / 1 SWS Excersise: 15 h / 1 SWS Practical Training: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students are qualified to link the different perspectives and principles of both software engineering and usability engineering and have learned to utilize this knowledge in practice. Students have advanced their knowledge in process models and development lifecycles and have also gained extensive knowledge of international standards for both disciplines. They can apply their knowledge of general guidelines for the development of human-centred products and the process of their design in practice. This code of practice will enable the students to assess and analyse preexisting processes, define and specify human-centred design processes and to select the appropriate usabilty methods for use in practice in the field of software engineering. In addition to this accessibility and universal design as well as the legal aspects of this topic have been discussed in detail.

Content

Software engineering, process models, processes and requirements engineering

Usability engineering, user centred design models, usability requirements

Standards in software engineering and usability engineering: ISO/IEC 12207, ISO/IEC 15288, ISO/TS 18152, ISO 9241-110, IOS 9241-210, ISO/TR 16982

Legal aspects, accessibility and universal design

Standards in accessibility: ISO 9241-20, ISO 9241-171

Teaching methods

Tuition in seminars, lectures and practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment Written/Oral examination
Requirements for the award of credit points Passed examination
Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Cooper, Alan, Robert Reimann, and David Cronin. About Face 3: The Essentials of Interaction Design. 3rd ed. Wiley, 2007. Dix, Alan, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. Human-Computer Interaction. 3rd ed. Prentice Hall, 2003. Mayhew, Deborah J. The Usability Engineering Lifecycle: A Practitioner's Handbook for User Interface Design. Morgan Kaufmann, 1999. ISO 9241-110:2006. Ergonomics of human-system interaction - Part 110: Dialogue principles. ISO 9241-210:2010. Ergonomics of human-system interaction - Part 210: Human-centred design for interactive systems. ISO/TR 16982:2002. Ergonomics of human-system interaction - Usability methods supporting human-centred design. ISO/IEC 15288:2008. Systems and software engineering - System life cycle processes. ISO/TS 18152:2010. Ergonomics of human-system interaction - Specification for the process assessment of human-system issues. ISO/IEC 12207:2008. Systems and software engineering - Software life cycle processes. ISO 9241-20:2008. Ergonomics of human-system interaction - Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services. ISO 9241-171:2008. Ergonomics of human-system interaction - Part 171: Guidance on software accessibility.

UE_1.06 Applied Research Project A

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_1.06	150 h	5 CP	1st semester	Winter semester / Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Practical Training: 75h / 5 semester hours per week (SWS)	Depending on individual needs	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have learned to apply the knowledge they have gained in other courses to their project work. They know how to do research and how to gather information by using different sources like literature, Internet or experts. They are able to write a convincing project report and to communicate project results in a professional way.

Due to this project experience students have improved their soft skills and their ability to work in a team.

Content

Students have to plan, realize, document and present their own projects by applying the knowledge they have gained in accompanying courses. The projects students choose should be related to current research projects of the faculty or can be realised by doing industrial internships.

Research project A focuses on analytical methods used in Usability Engineering.

Teaching methods

At the beginning of the semester the different projects are presented and teams are built. Project kickoffs and regular meetings will be initated by the professors in charge who will also support the projects and will be available in case of problems and questions.

Entry requirements

None

Types of assessment

Documentation, report, presentation and prototype

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Literature depending on project

UE_2.01 Usability Consulting

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.01	150 h	5 CP	2nd semester	Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Excersise: 15 h / 1 SWS Practical Training: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Usability is growing to become an integral quality aspect of software development, but it is not only an attribute of the generated product; it is also a fundamental attribute for the development process itself. Students have explored theory and practice of negotiating, with an emphasis on the improvement of processes as well as opportunities for marketing. Students are able to plan and perform project acquisition, manage human-centred design activities and to set up documentation processes in various organisational contexts. Students know techniques to estimate and control project costs, to set up schedules and to measure performance and success focusing on usability engineering.

Content

Project acquisition, -management and -documentation

Managing human-centred design activities and processes

Cost justifying usability

Assessment approaches on the capability of companies to produce usable products (CMMI, ISO/TS 18152)

Teaching methods

Tuition in seminars, lectures and practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points

Passed examination

Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Institute., Project Management. A Guide to the Project Management Body of Knowledge. Project Management Institute, 2004. Davis, Barbee. 97 Things Every Project Manager Should Know: Collective Wisdom from the Experts. O'Reilly Media, 2009. Gray, Dave, Sunni Brown, and James Macanufo. Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers. O'Reilly Media, 2010. Berkun, Scott. Making Things Happen: Mastering Project Management. O'Reilly Media, 2008. Reynolds, Garr. Presentation Zen: Simple Ideas on Presentation Design and Delivery. New Riders Press, 2008. ISO/TS 18152:2010. Ergonomics of human-system interaction - Specification for the process assessment of human-system issues.

UE_2.02 Advanced Human Interface Design

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.02	150 h	5 CP	2nd semester	Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Seminar: 45 h / 3 semester hours per week (SWS) Practical Training: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have been introduced to the latest user interfaces and user-interface research based on journal and conference articles. Students have gained practical experiences in state-of-the-art user interface design and technlogy. They developed capabilities to work with paradigms, methods and tools used for the construction of complex multi-modal interfaces between humans and artefacts. This knowledge has been applied to different domains or contexts of use, i.e. industrial interfaces, mobile devices, embodied interaction and natural user interface design, digital and social media.

Content

State-of-the-art multi-modal interface design technologies: games, industry and research

Special markets with special needs: social media, mobile devices/applications

Special interfaces for special use cases: natural interfaces and embodied interaction

High-level prototyping (processing and physical computing)

Teaching methods

Seminars and practical trainings

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points

Passed examination

Use of module (in other study programs)

Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Wigdor, Dennis Wixon Daniel. Brave NUI World: Designing Natural User Interfaces for Touch and Gesture. Morgan Kaufmann, 2011. Saffer, Dan. Designing for Interaction: Creating Innovative Applications and Devices. 2nd ed. New Riders Press, 2009. Saffer, Dan. Designing Gestural Interfaces: Touchscreens and Interactive Devices. O'Reilly Media, 2008. Kortum, Philip. HCI Beyond the GUI: Design for Haptic, Speech, Olfactory, and Other Nontraditional Interfaces. Morgan Kaufmann, 2008. Igoe, Tom. Making Things Talk: Practical Methods for Connecting Physical Objects. Make, 2007. Igoe, Tom, and Dan O'sullivan. Physical Computing: Sensing and Controlling the Physical World with Computers. Premier Press, 2004. Noble, Joshua. Programming Interactivity: Unlock the Power of Arduino, Processing, and OpenFrameworks. O'Reilly Media, 2009. Wollan, Robert, Nick Smith, and Catherine Zhou. The Social Media Management Handbook: Everything You Need to Know to Get Social Media Working in Your Business. John Wiley & Sons, 2011. Bradley, Anthony J, and Mark P. Mcdonald. The Social Organization: How to Use Social Media to Tap the Collective Genius of Your Customers and Employees. Harvard Business School Press, 2011.

UE_2.03 Innovation Management

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.03	150 h	5 CP	2nd semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 60 h / 4 semester hours per week (SWS) Practical Training: 15 h / 1 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have learned about the various approaches to innovation focusing on customer-driven and user-driven methodology. They are able to identify opportunities and to transform these opportunities into requirements and concepts for future products that aim to achieve an optimum balance between usability and desirability from all stakeholders' perspectives. The students have gained knowledge of various concepts of design, including design activities such as analysis and synthesis. They understand design thinking as a human-centred process of innovation. The students can apply techniques from design thinking and synthesis, are able to balance different design alternatives and can communicate the design rationales appropriately. Students are familiar with the strategy, process and implementation of design thinking and design management. They have gained knowledge of the breadth of principles, methods and practices that shape design management across the different design disciplines.

Content

Strategic management and design management

Design thinking and creativity methods

Open innovation and user-centred innovation

Innovative business models for new markets and digital culture

Teaching methods

Tuition in seminars, lectures and practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points

Passed examination

Use of module (in other study programs)

Weight towards final grade

6%

Person in charge of module

N.N.

Additional information

Osterwalder, Alexander, and Yves Pigneur. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley & Sons, 2010.

Brown, Tim. Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation. HarperBusiness, 2009.

Verganti, Roberto. Design Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean. Harvard Business Press, 2009.

Greene, Jay. Design Is How It Works: How the Smartest Companies Turn Products into Icons. Portfolio Hardcover, 2010.

Ambrose, Paul Harris Gavin. Design Thinking: Fragestellung, Recherche, Ideenfindung, Prototyping, Auswahl, Ausführung, Feedback. Stiebner Verlag Gmbh, 2010.

Gray, Dave, Sunni Brown, and James Macanufo. Gamestorming: A Playbook for Innovators, Rulebreakers, and Changemakers. O'Reilly Media, 2010.

Institute., Project Management. A Guide to the Project Management Body of Knowledge. Project Management Institute, 2004.

Cooper, Rachel, Sabine Junginger, and Thomas Lockwood. The Handbook of Design Management. Ed. Rachel Cooper, Sabine Junginger, and Thomas Lockwood. Berg Publishers, 2011.

Tidd, Joseph. Managing innovation. 4th ed. Hoboken, NJ: Wiley, 2009.

Hippel, Eric Von. The Sources of Innovation. OUP USA, 1995.

Schilling, Melissa A. Strategic management of technological innovation. 3rd ed. New York: McGraw-Hill/Irwin, 2010.

Merholz, Peter, Todd Wilkens, Brandon Schauer, and David Verba. Subject To Change: Creating Great Products & Services for an Uncertain World. O'Reilly Media, 2008.

Kelley, Tom. The Ten Faces of Innovation: Strategies for Heightening Creativity. Profile Books Ltd, 2008.

Johnson, Steven. Where Good Ideas Come From: The Natural History of Innovation. Riverhead Trade, 2011.

UE_2.04 Intercultural Management and Intercultural Competence

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.04	150 h	5 CP	2nd semester	Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Excersise: 15 h / 1 SWS Seminar: 15 h / 1 SWS Practical Training: 15 h / 1 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

The students have gained a good understanding of the basic concepts in the field of cross-cultural differences in business settings. They know the main cultural dimensions developed by different scholars and are familiar with strong and weak points of these approaches. The students are able to conduct a cross-cultural analysis of a case study or a business situation, evaluating potential threats and risks arising from a culture clash. These analytical skills form the basis of their core competences in issues related to intercultural management.

Content

Definition of culture. The Iceberg Model of Culture

Sources of cultural diversity

Culture as mental programming

G. Hofstede's cultural dimensions

Power distance (G. Hofstede). Ascribed vs. achieved status (F. Trompenaars)

Individualism and collectivism as a cultural dimension. Views of Globe study project on this dimension

Masculinity vs. femininity. Critique of this dimension by other scholars

Uncertainty avoidance and its importance for crisis management

Attitide to time (approaches by R. Lewis and F. Trompenaars)

Culture shock. Stages of a culture shock. Cultural stereotypes

The role of culture in organizations

Decision making across cultures

Negotiating in cross-cultural settings

Communication patterns and socialising in intercultural management
Teaching methods The course is held in the form of a seminar: lectures are accompanied by various practical activities, discussions and exercises.
Entry requirements None
Types of assessment Written examination
Requirements for the award of credit points Passed examination
Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module N.N.
Additional information Michael Kublin. International negotiating: a primer for American business professionals. New York: The Haworth Press, Inc., 1995. Craig Storti. Cross-cultural dialogues. 74 brief encounters with cultural difference. Boston: Intercultural Press, Inc., 1994. Richard D. Lewis. When cultures collide: managing successfully across cultures. London: Nicholas Brealey Publishing, 2001. Jeremy Comfort, Peter Franklin. The mindful manager: how to work effectively across cultures. London: Kogan Page, 2011. Robert J. House, Paul L. Hanges, Mansour Javidan, Peter W. Dorfmann, Vipin Gupta. Culture, leadership, and organizations: The GLOBE study of 62 societies. London: Sage Publications, 2004. H. Spencer-Oatey, P. Franklin. Intercultural Interaction: A Multidisciplinary Approach to Intercultural Communication. Basingstoke: Palgrave Macmillan, 2009. Geert H. Hofstede, Gert J. Hofstede. Cultures and Organizations: Software of the Mind. New York: McGraw-Hill, 2005.

UE_2.05 Scientific and Technical Communication

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.05	150 h	5 CP	2nd semester	Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 45 h / 3 semester hours per week (SWS) Excersise: 30 h / 2 SWS	75 h / 5 SWS	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have learned to communicate technical information in an easily understandable language. They have internalized the fundamentals of effective scientific writing. They have deepened their knowledge of how to write and revise (technical) reports and manuals and have practiced their skills by completing different hands-on assignments. Students have learned to plan and edit documentation materials and to estimate the effort needed to include illustrations, photographs, charts and diagrams. In addition to the ability to communicate technical knowledge students have learned how to plan and conduct experimental designs (e.g. usability tests, eye-tracking studies etc) and how to analyse and document the findings in adequate ways.

Content

Writing style

Creative and technical writing

Illustrations, charts and diagrams

Presentation techniques

Editing and publishing

Experimental design, analysis and documentation

Teaching methods

Tuition in seminars, workshops, lectures and practical trainings. Students work individually and in teams.

Entry requirements

None

Types of assessment

Written/Oral examination

Requirements for the award of credit points Passed examination
Use of module (in other study programs)
Weight towards final grade
Person in charge of module N.N.
Additional information Albers, Michael J., and Mary Beth Mazur. Content and Complexity: The Role of Content in Information Design. Ed. Michael J. Albers, and Mary Beth Mazur. Routledge, 2003. Alley, Michael. The Craft of Scientific Writing. 3rd ed. Springer, 1998. Katz, Michael Jay. From Research to Manuscript: A Guide to Scientific Writing. 2nd ed. Springer, 2009. Miller, Frederic P., Agnes F. Vandome, and John McBrewster. Illustration: Information Drawing, Painting, Photograph, Art, Technical illustration. Ed. Frederic P. Miller, Agnes F. Vandome, and John McBrewster. Alphascript Publishing, 2010. Hofmann, Angelika H. Scientific Writing and Communication: Papers, Proposals, and Presentations. OUP USA, 2010. Anderson, Paul V. Technical Communication: A Reader-centered Approach. 4th ed. Heinle & Heinle Publishing, 1998. Raman, Meenakshi, and Sangeeta Sharma. Technical Communication: Prinicples and Practice, 2e. 2nd ed. OUP India, 2012. Surhone, Lambert M., Miriam T. Timpledon, and Susan F. Marseken. Technical Illustration: Technical Drawing, Diagram, Line Drawing, Exploded View Drawing, Cutaway Drawing, Clip-Art, Parallel Projection, Perspective Projection. Ed. Lambert M. Surhone, Miriam T. Timpledon, and Susan F. Marseken. Betascript Publishing, 2010. Agarwal, B. L. Theory & Analysis of Experimental Designs. CBS Publishers & Distributors Private Limited, 2010. Cargill, Margaret, and Patrick O'connor. Writing Scientific Research Articles: Strategy and Steps. Wiley-Blackwell, 2009.

UE_2.06 Applied Research Project B

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_2.06	150 h	5 CP	2nd semester	Winter semester / Summer semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Practical Training: 75h / 5 semester hours per week (SWS)	Depending on individual needs	75 h	20 students

Learning outcomes / Competences and qualifications profile

Students have learned to apply the knowledge they have gained in other courses to their project work. They know how to do research and how to gather information by using different sources like literature, Internet or experts. They are able to write a convincing project report and to communicate project results in a professional way.

Due to this project experience students have improved their soft skills and their ability to work in a team.

Content

Students have to plan, realize, document and present their own projects by applying the knowledge they have gained in accompanying courses. The projects students choose should be related to current research projects of the faculty or can be realised by doing industrial internships.

Research Project B focuses on conceptual methods and approaches used in Usability Engineering.

Teaching methods

At the beginning of the semester the different projects are presented and teams are built. Project kickoffs and regular meetings will be initated by the professors in charge who will also support the projects and will be available in case of problems and questions.

Entry requirements

None

Types of assessment

Documentation, report, presentation and prototype

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)
Weight towards final grade 6%
Person in charge of module Prof. Dr. Karsten Nebe
Additional information Literature depending on project

UE_3.01 Master Thesis and Colloquium

Code	Workload	Credits	Level of module	Frequency of offer	Duration
UE_3.01	810 h	30 CP	3rd semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Master Thesis: 27 CP Colloqium: 3 CP	Depending on individual needs		

Learning outcomes / Competences and qualifications profile

Students have worked on a reseach topic of their interest in the scientific field of Usability Engineering. They have conducted intensive studies on literature and developed their research question. Students have developed appropriate methodological strategies concerning that question. They have conducted the approach focussing on specific details of the question,have analysed the results and transferred their findings to the broader perspective of the field. They have reflected their work and findings critically and have come up with some further research questions. Student have proven that they are able to analyze a complex field of work, find specific new reseach questions and have been able to answer them.

During the colloquium students have presented their work and have proven their expertise in the field of work. They have been able to defend the topic and to reflect on its impact on real-life problems in a professional way.

Content

Researching and evaluating literature

Developing a research question and deriving hypotheses

Operationalizing constructs

Analyzing methodological strengths and weaknesses of different research approaches

Developing research designs

Conducting the studies

Evaluating the results

Writing the thesis

Presenting and defending the findings

Teaching methods

Individual supervision and support

Entry requirements 60 credits points achieved in other courses of the curriculum
Types of assessment Written Master thesis and oral disputation
Requirements for the award of credit points Passed Master thesis and disputation as well as successful completion of all other modules of the curriculum
Use of module (in other study programs)
Weight towards final grade 33%
Person in charge of module All professors of the faculty
Additional information