Handbook of Modules
for the Degree Program

Design and Interaction, M.A.

Faculty of Communication and Environment

Version 1.4
2021-02-23

Document History

Version	Date	Resp.	Note
1.4	2021-02-23	MPI	Correction module name: *Design and Interaction Seminar 1* to *Design and Interaction Project 1* (p.3 and 5)
1.3	2020-12-18	MPI	Update Curriculum (p. 4) Requirements AQUAS report (2020-07-01) Formatting
1.2	2019-06-19	MPI	Correction credit points (Design and Interaction Projects)

Index

List of abbreviations:
TU: Teaching time (45 min)
h: Hour (60 min)

Curriculum

of the Master Degree Program Design and Interaction, M.A.

Version 2020-06-12

Curriculum M.A. Design and Interaction

Code No	Module	SW	Typ						TE	CP	Sum CP	SS1	WS2	SS3
			L	SL	S	Ex	PT	Pro						
M-DI_1.00	**Computer Science Foundations**	3		3					--	0	**0**	3		
M-DI_1.01	**Design and Interaction Project 1 ***	6		6					E	10	**10**	6		
M-DI_1.02	**Workshop Orientation**	4		4					C	5	**5**	4		
M-DI_1.03	**Advanced Design**	4		2		2			E	5	**5**	4		
M-DI_1.04	**Human-Computer Interaction**	4	2			2			E	5	**5**	4		
M-DI_1.05	**Creative Computing**	4	2			2			E	5	**5**	4		
M-DI_2.01	**Design and Interaction Project 2 ***	6		6					E	10	**10**		6	
M-DI_2.02	**Workshop Thesis Development**	4		4					C	5	**5**		4	
M-DI_2.03	**Digital Culture and Ethics**	4	2			2			E	5	**5**		4	
M-DI_2.04	**Electives ******	4	2			2			E	5	**5**		4	
M-DI_2.05	**Electives ******	4	2			2			E	5	**5**		4	
M-DI_3.01	**Thesis**	-							E	24	**24**			-
M-DI_3.02	**Colloquium**	-							E	6	**6**			-
	total semester hours per week	**44**								**CP**	**90**	**22**	**22**	**0**

SWS **44**

				SS1	WS2	SS3
Allocation	SW	44		22	22	0
	CP	90		30	30	30

Weight towards final grade	%	Sum of all CPs	
Courses	67%	60	
Master Thesis	29%	24	
Colloquium	4%	6	

M-DI_2.04/ M-DI_2.05	**Electives ********		
Code No	Module	SWS	CP
UE_1.01	**Human Factors Design**	4	5
UE_1.02	**Psychology**	4	5
UE_1.04	**Visualisation**	4	5
M-IE_1.03	**Scientific and Technical Communication**	4	5
M-IE_2.03	**Intercultural Management and Intercultural Competence**	4	5
M-IE_2.04	**Innovation Management**	4	5
varies	**Other courses from the Master** *Information Engineering and Computer Science, with exceptions ******	4	5
varies	**other courses from other Masters *********	var.	5

List of abbreviations	
SW	Semester hours per week (Semesterwochenstunden)
L	Lecture (Vorlesung)
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)

* Subjects for the project work of the Design and Interaction Project 1 and 2 will vary from semester to semester
** Offer depending on a sufficient number of attendees and on feasibility of time tables
*** With exception of the courses Applied Research Project A and Applied Research Project B
**** With consent of the Examination Board, other courses from other Master programmes of this university can be selected.

M-DI_Curriculum Studienverlaufplan Ressourcen 2020-06-12.xlsx

M-DI_1.01 Design and Interaction Project 1

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_1.01	300 h	10 CP	1st semester	Summer Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 90 TU / 6 semester hours per week (SWS)	90 TU / 6 SWS	232,5 h	20–30 students

Learning outcomes / Competences and qualifications profile

Students acquire the ability to develop an innovative project idea and manage a design project in the area of design and interactive applications. Students understand innovation concepts and exemplary system development methodologies stemming from computer science and from design, know their differences and overlaps, and are capable of choosing appropriate approaches for a task.

They put into practice the competences and knowledge gained in the other modules, e.g. by applying methods learned in Human-Computer Interaction, to create and prototype a design concept and evaluate it. Students master the challenge of utilizing technology and design for the creation of a product or service that is new and useful, or that enables novel and meaningful experiences to users. They are capable of devising, presenting, and demonstrating an innovative, unique concept in the area of interactive digital applications or services, and to cooperate and discuss with specialists from different disciplines.

Key competences: creative and critical thinking, cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility

Content

- Presentation and discussion of research and technology topics, representative projects and interactive applications in the area of study.
- Introduction to research and process methods including repetition of methods from Human-Centered Design as well as project management methods
- Overview and introduction to innovation concepts and methods and guided application to the projects. Choice and application of appropriate development methodologies to individual projects.
- Discussion of evaluation criteria for interactive applications as well as social and ethical implications and benefits and risks.
- Idea Development and refinement

- Agreement on projects and main research questions
- Development concepts and iterative design of conceptual prototypes

Teaching methods

In focus is the independent project work of the students. Practical work on assignment provides a framework for the students in the design process and concept development. Workshops building on methodologies taught e.g. in the Human-Computer Interaction course guide students in idea development, idea refinement and concept prototyping.
In addition, lecturers provide input on innovation and project management through short lectures and give feedback on the designs of the students.

Entry requirements

None

Types of assessment

Assignments, final report, presentation and concept prototype.

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)

–

Weight towards final grade

9.2%

Person in charge of module

Prof. Dr. Alina Huldtgren

Additional information (recommended readings)

- Webb, Nicholas J. The Digital Innovation Playbook: Creating a Transformative Customer Experience. John Wiley & Sons, 2011.
- HBR's 10 Must Reads on Innovation. Harvard Business Review Press, 2013.
- Design Thinking Research: Building Innovators (Understanding Innovation). Hasso Plattner, Christoph Meinel, Larry Leifer (Eds). Springer 2015.
- Robert K. Wysocki. Effective Project Management: Traditional, Agile, Extreme. John Wiley & Sons 2014.
- Russ Unger, Carolyn Chandler. A Project Guide to UX Design: For User Experience Designers in the Field or in the Making. New Riders 2012.
- Further literature depending on project

M-DI_1.02 Workshop Orientation

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_1.02	150 h	5 CP	1st semester	Summer Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 60 TU / 4 semester hours per week (SWS)	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

In the module Workshop Orientation, the students monitor and reflect their individual level in the context of the program and grasp the spectrum of the study contents. Students gain a solid and broad overview of contemporary developments in the areas related to design and interaction. Furthermore, they acquire a firm knowledge of new challenges and opportunities of various domains related to it. They understand the varying research and development challenges that are currently being pursued, within academia and industry, and have an overview of achievements, expectations and goals that belong to different areas of their field of study. Students acquire the competence to research, review, reflect upon, and present, in a scientifically appropriate manner. They are skilled to present and discuss their ideas and opinions.

Key competences: creative and critical thinking, cultural awareness and expression, relating to and engaging with others, participating and contributing

Content

The module offers orientation in form of intensive preparatory workshops, excursions and lectures. In the course students acquire the understanding and insights they need for their studies. These workshop classes provide time and space to determine the individual strengths, ambitions and understanding as well as an opportunity to reflect and explore. The workshops are intended as a creative playground that is characterized by curiosity, little fear of failure, get to know each other, intercultural exchange and an attitude of playfulness.

Teaching methods

Lectures and workshops with focus on guests from industry and academia; excursions;

Entry requirements

None

Types of assessment

Term paper

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs) –
Weight towards final grade 4.6%
Person in charge of module Prof. Michael Pichler
Additional information (recommended readings) – Manovich, Lev. Software Takes Command. Bloomsbury Academic, 2013. – Maeda, John. Laws of Simplicity. The Mit Press, 2010. – Maeda, John. How to Speak Machine: Laws of Design for a Computational Age. Portfolio Penguin, 2019. – Pfeffer, FLorian. To Do: Die neue Rolle der Gestaltung in einer veränderten Welt: Strategien, Werkzeuge, Geschäftsmodelle. Hermann Schmidt, 2014. – Norman, Donald A. Design of Everyday Things. Revised and expanded edition. Perseus Books, 2013. – Norman, Donald A. Living With Complexity. The Mit Press, 2010. Further specific literature is recommended by each guest lecturer.

M-DI_1.03 Advanced Design

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_1.03	150 h	5 CP	1st semester	Summer Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 60 TU / 4 semester hours per week (SWS)	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

The students have an overview of the different approaches used in practice and know the basic theoretical perspectives in the defined areas (see content). They are familiar with pioneering practical examples and are acquainted with current discussions in the field.

They are able to analyse practical examples and to understand the underlying principles. They are capable of critically examining established methods and preferences. They have an understanding of the challenges and opportunities accompanying current technological, societal and creative processes of development.

They have the theoretical basis for the development of their individual projects.

Key competences: creative and critical thinking, cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility

Content

The module is organized in five sub-areas, which are exploring the expansion of the concept of design and an attempt to understand design from a more integrative and holistic perspective with the focuses on technologically supported forms of interaction and future communication scenarios.

Beyond Branding
What do we really know about the relationship between brand success and design? The students will be familiarized with the current state of scientific research and learn to question traditional ideas. The digitalization of all areas of life affects brand and identity design in many ways. Economic and social parameters are changing, but so are design requirements (from grids to fluid systems, from representation to interaction). The students will be familiarized with the essential developments and discuss innovative concepts.

Text
Based on the basic principles of knowledge communication and editorial design, students will be familiarized with innovative examples from the field of communication design in interactive media. Different forms of digital publishing will be analyzed and discussed. Furthermore, Typography is an integral part of almost any digital media formats. The history of the past decades of typographical design will be analyzed while emphasizing the specific connections to typographical conventions, technical innovations, standards and digital typographical practice. Contemporary best-practice examples will be discussed regarding their communicative and aesthetic potentials and the underlying technologies. Students will deepen their knowledge of contemporary technologies in the field of typography and practice their implementation and use in practical examples.

Visual Programming
Participants know about the advanced principles of a process focused and rule-based design approach. They are capable of defining flexible grid-based layouts as well as developing variable design systems. Participants are able to adapt and reflect the potential of complex visual programs both in theory and practice.

Research through Design / Design through Research
Research in the context of design is often treated as a necessary evil, rather than being understood as a crucial part of the creative process itself. However, given the unprecedented availability of information, navigating the information landscape has become increasingly challenging – especially when research is extended to include the visual parameter. In order to find orientation, it is necessary to reflect on existing research methods as well as to explore and develop new ones that go beyond the search bar. Against this background, the module aims to present the necessary framework for developing a research literacy through various means such as understanding the meaning of language (synonyms, metaphors and sequencing of terms); circumventing research constraints (availability, accessibility); appreciating the possibilities of open source tools and creative commons; exploiting archives and databases; looking at social media platforms as research hubs; and exploring experimental and playful aspects of research.

Designing for Futures
Participants look beyond design as a problem-solving discipline. They understand how to use design for critical and speculative purposes to pose questions how things could be. Furthermore, students will deepen their knowledge in the field of experimental design and the creative process as a source of innovation.

Teaching methods
Lectures and Exercises

Entry requirements
None

Types of assessment
Graded exercises and report

Requirements for the award of credit points

Passed examination

Use of module (in other study programs)

–

Weight towards final grade

4.6%

Person in charge of module

Prof. Christoph Zielke

Additional information (recommended readings)

- Snijders, W. (2018): Eat your Greens, Leicestershire: Matador
- Sharp, B. (2010): How Brands grow, Oxford University Press
- Spies M. (2015): Branded Interactions: Creating the Digital Experience, London: Thames & Hudson
- Haralambous, Yannis: Fonts and Encodings, O'Reilly Media Inc.; Sebastopol, CA; 2007
- Ho, Kevin (2016): Organizing the World of Fonts with AI; IDEO; https://medium.com/ ideo-stories/organizing-the-world-of-fonts-with-ai-7d9e49ff2b25 (visited 5/2018)
- Prototypo: Create your own fonts with a few clicks; https://www.prototypo.io, (visited 5/2018)
- Schulz, Florian (2017): The Anatomy of a Thousand Typefaces. https://medium.com/@getflourish/the-anatomy-of-a-thousand-typefaces-f7b9088eed1 (visited 5/2018)
- Gerstner, Karl. Designing Programmes. Programme as Typeface, Typography, Picture, Method. Zürich: Lars Müller Publishers, 2018
- Grünberger, Christoph. Analog algorithm: source-related grid systems. Zürich: Lars Müller Publishers, 2019
- Dunne A. and Raby F. 2013. Speculative Everything: Design, Fiction, and Social Dreaming. Cambridge MA: The MIT Press.
- Schuler, Gerlinde, 2009. The World as Flatland – Report 1: Designing Universal Knowledge.Baden: Lars Müller Publishers.
- Reinfurt, David (2019): A *New* Program for Graphic Design, Los Angeles: Inventory Press; New York: D.A.P. / Distributed Art Publishers
- Manovich, Lev. Software Takes Command. Bloomsbury Academic, 2013.
- Maeda, John. Laws of Simplicity. The Mit Press, 2010.
- Maeda, John. How to Speak Machine: Laws of Design for a Computational Age. Portfolio Penguin, 2019.
- Pfeffer, FLorian. To Do: Die neue Rolle der Gestaltung in einer veränderten Welt: Strategien, Werkzeuge, Geschäftsmodelle. Hermann Schmidt, 2014.
- Norman, Donald A. Design of Everyday Things. Revised and expanded edition. Perseus Books, 2013.
- Norman, Donald A. Living With Complexity. The Mit Press, 2010.

M-DI_1.04 Human-Computer Interaction

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_1.04	150 h	5 CP	1st semester	Summer Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 TU / 2 semester hours per week (SWS) Practical training: 30 TU / 2 SWS	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

Students will gain a comprehensive introduction into the research field of human-computer interaction including the historic development and paradigm shifts over time. They will master the theory necessary to understand interactions between humans and machines and the methods to analyze, design and evaluate user interfaces ranging from traditional GUIs to novel interactive technologies such as tangible UIs or virtual reality.

They acquire the competence to design interactive systems systematically, i.e. they will be able to research user contexts and needs, define requirements and apply core interaction design principles to real-world problems following an iterative process and employing human-centered and user experience design methods. They will understand how their design decisions affect users and be able to evaluate their designs regarding usability and user experiences as well as ethical and social aspects. They will be able to choose either quantitative or qualitative evaluation methods (incl. experiments, survey, interviews, usability studies) based on the research question. Furthermore, they will have basic knowledge in advanced interactive technologies and be able to discuss their implications on society critically.

Key competences: cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development

Content

- Theories and Methods of Human-centered system design, HCI Paradigms
- Core concepts such as usability, UX, context of use
- Methods in HCI:
  - HCI research methods (qualitative/quantitative, i.e. lab studies, ethnography, field studies)
  - Evaluation techniques for interactive systems

- Human Capabilities:
  - Fundamentals in Human Information Processing: Perception, Cognition, Motorics
- User Interface Design / Interaction Design
  - Communication between man and machine: e.g. speech, GUIs, forms
  - Presentation, research and analysis of state-of-the-art advanced UIs: NUIs, Tangibles, Gesture-based Systems, VR …
- Ethical, legal, societal implications (ELSI) of interactive technology design (e.g. Frameworks like value sensitive design)

Teaching methods

Lectures and exercises

Entry requirements

None

Types of assessment

Assignments and/or written examinations

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)

–

Weight towards final grade

4.6%

Person in charge of module

Prof. Dr. Alina Huldtgren

Additional information (recommended readings)

- Johnson, J. (2013). Designing with the mind in mind: simple guide to understanding user interface design guidelines. Elsevier.
- Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann.
- Hassenzahl, M. (2010). Experience design: Technology for all the right reasons. Synthesis lectures on human-centered informatics, 3(1), 1-95.
- Kuniavsky, M. (2003). Observing the user experience: a practitioner's guide to user research. Elsevier.
- 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. New Riders Press, 2009.
- Kortum, Philip. HCI Beyond the GUI: Design for Haptic, Speech, Olfactory, and Other Nontraditional Interfaces. Morgan Kaufmann, 2008.
- Andy Pratt, Jason Nunes. Interactive Design: An Introduction to the Theory and Application of User-centered Design. Rockport Publishers, 2012.
- Guy Boy. Orchestrating Human-Centered Desig. Springer, 2013.

M-DI_1.05 Creative Computing

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_1.05	150 h	5 CP	2nd semester	Winter Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 TU / 2 semester hours per week (SWS) Practical training: 30 TU / 2 (SWS)	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

Students have learned methods and principles of software frameworks for the procedural creation and design of Digital Media. They have improved their procedural literacy by employing algorithms, coding, or visual programming. Students have understood that this literacy can be applied to all facets of digital media such as video data, animation, 3D worlds, sound, and computer vision. They have explored the tools and methods and their usage for communication, design, and creativity. They have gained insight into the potential benefits of procedural approaches for the design of media systems, became acquainted with innovative procedural design techniques, and understood the wide range of fields this can be applied to. Students are trained to foresee, devise and implement creative procedural systems.

Key competences: cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility, endurance

Content

- Principles of procedural frameworks
- Creation and presentation of concepts for procedural Digital Media for different domains
- Hands-on experiences with exemplary tools for procedural design, application of these tools in demo projects that exemplify wider concepts
- Peer-supported introduction to programming and of design principles of procedural media
- Theories and methods of creative coding, agile development, and participatory design applied to Digital Media projects
- Research and analysis of state-of-the-art in procedural design approaches
- Potential applications to different markets and needs, and limitations

Teaching methods

Seminars and practical trainings

Entry requirements None
Types of assessment Project presentation and report
Requirements for the award of credit points Passed assessment
Use of module (in other study programs) –
Weight towards final grade 4.6%
Person in charge of module Prof. Dr-Ing. Ido Iurgel
Additional information (recommended readings) – Casey Reas, Ben Fry. Processing: A Programming Handbook for Visual Designers and Artists. The MIT Press 2007. – Colin Ware, Information Visualization: Perception for Design (Interactive Technologies), Morgan Kaufmann 2012 – Jörg Müller, Florian Alt, Daniel Michelis (Eds.): Pervasive Advertising. Human–Computer Interaction Series. Springer 2011. – Richard Colson: The Fundamentals of Digital Art. Ava Publishing, 2007. – Robert Klanten, S. Ehmann, Lukas Feireiss: A Touch of Code: Interactive Installations and Experiences. Die Gestalten 2011. – V. J. Manzo, Max/MSP/Jitter for Music: A Practical Guide to Developing Interactive Music Systems for – Education and More, Oxford University Press 2011

M-DI_2.01 Design and Interaction Project 2

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_2.01	300 h	10 CP	2nd semester	Winter Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic Lecture: 90 TU / 6 semester hours per week (SWS)	90 TU / 6 SWS	232,5 h	20–30 students

Learning outcomes / Competences and qualifications profile

Students are able to find independent, unique and competent solutions to complex tasks in the field of design and interaction. They are able to develop their own topic independently and combine it with the necessary background research. They have learned to question established strategies and to look for innovative ideas. They are skilled in approaching tasks by applying various design concepts.

They realize the technical implications of their design-decisions, have experienced the restrictions within specific media and are capable of finding technically appropriate solutions. They master the challenge of utilizing technology and design for the creation of a product or service that is new and useful, or that enables novel experiences to users. Students can organize complex projects and carry them out within a set period of time. They have acquired the skills to communicate their concepts clearly and have gained experience in presenting and documenting their work and ideas.

Key competences: creative and critical thinking, cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility

Content

- The main difference to the first project course is that now more emphasis is placed on the quality of the realization. The result should exceed a purely conceptual level. The content in detail:
- Presentation and discussion of exemplary projects and systems, and of possible topics.
- Definition of a project's research question and goals.
- Development of concepts, presentation, documentation. Development of a digital media demonstrator / prototype (the degree of realization depends on the respective task).
- Choice of appropriate methods (cf. Project Seminar I).
- Introduction, reinforcement, and review of examples of scientific research and writing in Digital Media.

– Reading and discussion of case studies of digital media published research stemming from design and computer science cultures. – Comparison of research cultures in design and computer science, partly also based on the previous knowledge of the students and previous experiences.
Teaching methods At the beginning of the semester the topics of the project are worked out. Lectures, discussions, reading and writing assignments on case studies of publications on selected research topics. Project kick-offs and regular meetings are initiated by the professors in charge, who also guide the project and are available in case of problems and questions. Close accompaniment of the project´s development by professors both from computer science and from design.
Entry requirements None
Types of assessment Assignments, report, presentation and digital media demonstrator / prototype
Requirements for the award of credit points Passed assessment
Use of module in other study programs) –
Weight towards final grade 9.2 %
Person in charge of module Prof. Christoph Zielke
Additional information (recommended readings) Further literature depending on projects, cf. also Project Seminar I and M-DI_1.03.

M-DI_2.02 Workshop Thesis Development

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_2..02	150 h	5 CP	2nd semester	Winter Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 60 TU / 4 semester hours per week (SWS)	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

Students know about epistemology and have an overview over different schools of thought regarding the creation of (scientific) knowledge (e.g. rationalism, empiricism, constructivism). They are capable of situating their own research within the field of design and interactive technology to appropriate schools of thought.

Students are able of defining a research topic of scientific and societal relevance and develop research questions for the topic that are appropriate in scope for the duration of the master project. They can plan their thesis work for the given timeframe and structure the work according to background research, prototype design/ development, and evaluation study and are able to compare and select appropriate qualitative and quantitative research and design methods to the respective steps. Furthermore, they have acquired the ability to research scientific sources as well as structure and write scientific texts, using scientific argumentation and scientific citation standards.

They are able to reflect critically on the contribution and limitations of their own work to the body of knowledge in the chosen field and give recommendations for further development.

Key competences: creative and critical thinking, cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility

Content

- Epistemology, Research paradigms
- Qualitative and quantitative research and evaluation methods
- Selection of topics, Formulation of research questions
- Project Planning
- Desk Research
- Scientific argumentation: from research questions to research findings
- Scientific writing
- International citation standards
- Design oriented research trends in the 21st century

Teaching methods Seminaristic lecture, appropriate to the thesis topics of the candidates, with frequent student presentation and peer-discussion of individual methods and approaches.
Entry requirements None
Types of assessment Attendance cerificate
Requirements for the award of credit points Passed assessment
Use of module (in other study programs) –
Weight towards final grade 4.6%
Person in charge of module Prof. Dr. Alina Huldtgren
Additional information (recommended readings) – Smith, P. G. (2003). Theory and reality: an introduction to the philosophy of science. – Alex Rosenberg. Philosophy of Science: A Contemporary Introduction (Routledge Contemporary Introductions to Philosophy), 2011. – Robson, C., & McCartan, K. (2016). Real world research. John Wiley & Sons. – Lazar, J., Feng, J. H., & Hochheiser, H. (2017). Research methods in human-computer interaction. Morgan Kaufmann. – Hart, C. (2005). Doing your masters dissertation. Sage. – Martin, B., Hanington, B.. (2012) Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions. Rockport. – Blackwell, J., Martin, J. (2001) A Scientific Approach to Scientific Writing.

M-DI_2.03 Digital Culture and Ethics

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_2.03	150 h	5 CP	2nd semester	Winter Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 TU / 2 semester hours per week (SWS) Exercise: 30 TU / 2 (SWS)	60 TU / 4 SWS	105 h	20–30 students

Learning outcomes / Competences and qualifications profile

Lecture:
Students have gained and consolidated their capabilities to critically reflect and discuss contemporary development in digital media. They can evaluate the relevance and effects of digitalization on modern society and are familiar with the complex of ethical problems and social as well as economical implications and consequences of the process. Students can determine and evaluate the relevant factors for successful acts of medial communication. They have conceived different perspectives and approaches of narration and storytelling in technical media and are capable of evaluating them within the projects cultural, technological and social contexts. Students have deepened their media literacy, they can reflect and evaluate the effects of digital artifacts and services in a social and economical context.

Exercise:
Students can analyze and interpret single digital-media-works regarding the aspects discussed in the lectures. They have internalized the terms and definitions of the relevant discourses for further application, have improved their media literacy and are aware of social and ethical implications of the use of digital technologies.

Key competences: cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development

Content

The course briefly summarizes the history of digital media and presents different approaches of media and communication theory. Different approaches to a concept of digital culture are discussed along with its evolution and every-day-relevance. Theoretical approaches on digital culture and media are discussed and contextualized in contemporary services and technologies. Through reflecting contemporary and historical discourse the course gives contour to the ethical and social challenges raised by media development. Classical and digital media are analyzed regarding their communication outcomes and narration patterns

used.

Teaching methods
Lectures, presentations, analysis of digital-media-works, text work

Entry requirements
None

Types of assessment
Graded examination

Requirements for the award of credit points
Passed examination

Use of module (in other study programs)
–

Weight towards final grade
4.6%

Person in charge of module
Prof. Jörg Petri

Additional information (recommended readings)

- Bolter, Jay David; Grusin, Richard (1999). Remediation: Understanding New Media. Cambridge; Mass. MIT Press,
- Couldry, Nick. (2012). Media, society, world: social theory and digital media practice. Cambridge; Malden, MA: Polity.
- Galloway, Alexander (2004). Protocol: How Control exists after decentralization. Cambridge; Mass. MIT Press
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M-DI_2.04 Electives

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_2.04	150	5 CP	2nd semester	Winter Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Various	60 TU / 4 SWS	105 h	Various

Learning outcomes / Competences and qualifications profile

Students are given the opportunity to choose courses from our master's degree program Usability Engineering (obligatory offering) or other study programs of our university (in agreement with the Examinations Board and the head of the respective study program).

M-DI_2.04.1 Human Factors Design
M-DI_2.04.2 Psychology
M-DI_2.04.3 Visualization
M-IE_1.03 Scientific and Technical Communication
M-IE_2.03 Intercultural Management and Intercultural Competence
M-IE_2.04 Innovation Management

Electives taken from the master's degree program Usability Engineering:

M-DI_2.04.1 Human Factors Design
Students are able to understand the importance and relevance of human capabilites in the process of system design. General principles of human-centered 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-centered 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.

M-DI_2.04.2 Psychology
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.

M-DI_2.04.3 Visualisation
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.

M-IE_1.03 Scientific and Technical Communication
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 document and present research in information engineering and computer science (especially complex systems) in adequate ways to a diverse audience.

M-IE_2.03 Intercultural Management and Intercultural Competence
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. 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.

M-IE_2.04 Innovation Management
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 all functional and non-functional requirements from all stakeholders' perspectives. 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. 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.

Electives taken from other study programs
Students have acquired basic knowledge from other study programs and are able to use it as

a specific focus for their projects. The have acquired interdisciplinary competencies have broadened their view and are able to devise innovative solutions. A full description of respective learning outcomes can be found within the particular module description.

Content

Human Factors Design
- Properties of human capabilities
- Usability
- User experience and user centered-design
- Interviews
- User profiles, personas and use cases
- Conceptualization and prototyping
- Evaluation

Psychology
- 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

Visualisation
- Design principles and design elements
- Communication of objectives
- Methods and concepts for the typical development phases
- Visual interface design
- Sketching and prototyping

Scientific and Technical Communication
- Writing style
- Creative and technical writing
- Illustrations, charts and diagrams
- Presentation techniques
- Editing and publishing
- Experimental design, analysis and documentation

Intercultural Management and Intercultural Competence
- 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
- Attitude 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 socializing in intercultural management

Innovation Management
- Strategic management and design management
- Design thinking and creativity methods
- Open innovation and user-centered innovation
- Innovative business models for new markets and digital culture

Electives taken from other study programs:
Students are also given the opportunity to choose courses and contents from different study programs according to their career aspirations.

Teaching methods
Various

Entry requirements
–

Types of assessment
Graded examination

Requirements for the award of credit points
Passed examination

Use of module (in other study programs)
–

Weight towards final grade
4.6%

Person in charge of module
Prof. Dr Ido Iurgel

Additional information
The head of the study program must consent to courses from other study programs, that must fit to the learning goals of the Master and of the student.

M-DI_3.01 Thesis

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DI_3.01	720 h	24 CP	3rd semester	Summer Semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
	Depending on individual needs	720 h	

Learning outcomes / Competences and qualifications profile

Students are capable to solve a complex assignment independently and to apply the knowledge and skills acquired in the program. They are able to demonstrate command of the field of the study program theoretically as well as practically. Students demonstrate their ability for research-oriented work on a design, theoretical or applied research topic. They have conducted intensive studies on source material and developed their research question. Students have developed appropriate methodological and design strategies concerning that question. They have conducted the approach focusing on specific details of the question, have analyzed the results and transferred their findings to the broader perspective of the field. The thesis may be a piece of theoretical, artistic or applied research, a work of design, computing or a combination of these. The thesis always includes a design or other production component and a written component, the student must specify the emphasis to be given to the different components in the evaluation. However, the thesis is always evaluated as a whole, with all the components of the thesis included in the evaluation.

Generally, the written component of the thesis should be approx. 50.000–70.000 characters in length, though the specific requirement is set by the respective examiner. The thesis can be supplemented with other media as well, provided they are appropriate and helpful tools for documenting the work in accordance with the assigned task.

Key competences: creative and critical thinking, cultural awareness and expression, handling and articulating constructive criticism, relating to and engaging with others, participating and contributing, managing self and self-development, adaptability and flexibility, endurance

Content

- Definition of the topic and relevance for the field of study
- Command of the topic and use of sources
- Choice of methods and techniques
- Analysing strengths and weaknesses of different research approaches
- Ability for analytical and research-oriented work

– Ability to derive hypotheses and concepts – Quality of the idea and design vision – Quality and execution of the production component (practical part) – Quality of the written component (theoretical part) – Description and analysis of the working process – Analysis and evaluation of the results – Understanding of the broader context of the work
Teaching methods Individual supervision and support
Entry requirements 50 credits points achieved in other courses of the curriculum
Types of assessment Master thesis (production component and written component)
Requirements for the award of credit points Passed Master thesis as well as successful completion of all other modules of the curriculum
Use of module (in other study programs) –
Weight towards final grade 30%
Person in charge of module All professors of the study program
Additional information –

M-DI_3.02 Colloquium

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_3.02	N.A.	6 CP	3rd semester	Winter semester	N.A.

Courses	Teaching time	Self-study	Planned group size
	Depending on individual needs	N.A.	–

Learning outcomes / Competences and qualifications profile

The presentation of the thesis components. During the colloquium students have presented their work and have demonstrated their expertise in the field of work. They have been able to defend the topic and to reflect on its impact in a professional way.

Key competences: cultural awareness and expression, handling and articulating constructive criticism

Content

– Presenting the thesis components
– Defending the findings as well as justifying the candidate's views

Teaching methods

Individual supervision and support

Entry requirements

50 credits points achieved in other courses of the curriculum

Types of assessment

Oral disputation

Requirements for the award of credit points

Passed disputation as well as successful completion of all other modules of the curriculum

Use of module (in other study programs)

–

Weight towards final grade

5%

Person in charge of module

All professors of the study program

Additional information

–