Handbook of Modules
for the Degree Programme

Digital Media, M.A.

Faculty of Communication and Environment

Version 3.2

31.01.2018

Dokumentenhistorie

Version	Datum	Verantw.	Bemerkung
0.1	2013-12-17	TH	Initialversion
0.2	2013-12-17	TH	Curriculum ausgetauscht
0.3	2013-12-17	TH	„Weight towards final grade“ korrigiert
0.4	2014-01-09	TH	Curriculum aktualisiert Folgende Module eingefügt: • M-DM_2.04.1 Human Factors Design • M-DM_2.04.2 Psychology • M-DM_2.04.3 Visualisation
1.0	2014-01-13	TH	Version zur Veröffentlichung
1.1	2014-09-24	TH	Bearbeitungszeit Masterarbeit laut PO angepasst
2.0	2015-03-06	TH/II	Inhaltliche Änderung folgender Module: • M-DM_1.01 Digital Media Project Seminar I • M-DM_1.02 Interactive Systems • M-DM_1.03 Design, Technology and Innovation • M-DM_2.01 Digital Media Project Seminar II Brückenkurse eingefügt: • M-DM_BC_1 Bridge Course for Computer Scientists • M-DM_BC_2 Bridge Course for Designers
3.1	2017-05-08	II	Brückenkurse • Obligatorisch, nicht mehr fakultativ • Erhöhung der SWS, Workload auf 150h / 4SWS • Umbenennung in „Crossover Knowledge for Designers“, „…for Computer Scientists“ • Änderung der Prüfungsform, Lehrform Project Seminar I • Änderung der CP, des Workload Anpassung der tabellarischen Übersicht des Curriculums Änderung bzw. Korrektur der Felder „Weight towards final grade“ Aktualisierung der Modulverantwortlichen
3.2	2017-06-08	II	Umbenennung der ehemaligen Brückenkurse

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Curriculum of the Master Degree Programme Digital Media, M.A.

Code No	Module	SW	Typ						TE	CP	Sum CP	SS1	WS2	SS3
			L	SL	S	Ex	PT	Pro						
M-DM_1.01	**Digital Media Project Seminar 1 ***	6			2		4		E	15	**10**	6		
M-DM_1.02	**Interactive Systems**	4			2		2		E	5	**5**	4		
M-DM_1.03	**Design, Technology and Innovation**	4		4					E	5	**5**	4		
M-DM_1.04	**Creative Strategies**	4		4					E	5	**5**	4		
	Crossover Knowledge Modules **	4	2				2		E	5	**5**	4		
M-DM_2.01	**Digital Media Project Seminar 2 ***	6			2		4		E	15	**15**		6	
M-DM_2.02	**Procedural Design**	4	2				2		E	5	**5**		4	
M-DM_2.03	**Digital Culture**	4	2			2			E	5	**5**		4	
M-DM_2.04	**Electives *****	4	2		1		1		E	5	**5**		4	
M-DM_3.01	**Advanced Research and Scientific Writing**	4		4					C	3	**3**			4
M-DM_3.02	**Thesis**	0							E	24	**24**			0
M-DM_3.03	**Colloquium**	0							E	3	**3**			0
	total semester hours per week	**44**								**CP**	**90**	**22**	**18**	**4**

SWS **44**

	Crossover Knowledge Modules **		
	Module	SWS	CP
M-DM_1.05.1	**Crossover Knowledge for Computer Scientists ****	4	5
M-DM_1.05.2	**Crossover Knowledge for Designers ****	4	5

				SS1	WS2	SS3
Allocation	SW	44		22	18	4
	CP	90		30	30	30

M-DM_2.04	**Electives *****		
Code No	Module	SWS	CP
M-DM_2.04.1	**Human Factors Design**	4	5
M-DM_2.04.2	**Psychology**	4	5
M-DM_2.04.3	**Visualisation**	4	5
varies	**other course *****	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 Digital Media Project Seminar I and II will vary from semester to semester

** Students will attend one of the Crossover Knowledge Modules, so that they will acquire complementary competencies to their previous qualifying degree. To ensure this, the head of the degree programme will assign students to one of the modules, depending on their previous background.

*** Offer depending on a sufficient number of attendees. With consent of the Examination Board, other courses from other Master programmes of this university can be elected.n.

M-DM_1.01 Digital Media 1

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.01	300 h	10 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Practical training: 60 h / 4 SWS	90 h / 6 SWS	210 h	20-30 students

Learning outcomes / Competences and qualifications profile

Students acquire the competence to pursue and accomplish innovation in Digital Media, and to evaluate and orient their work on process models. They put into practice competencies and knowledge acquired at the other modules of the semester. They learn to devise, present, and demonstrate an innovative, unique Digital Media system, and to cooperate and discuss with specialists from different disciplines. 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 experiences to users. Students understand innovation concepts and exemplary system development methodologies stemming from computer science and from design, learn their differences and overlaps, and are capable of choosing appropriate approaches for a task.

Content

Introduction to the structure and goals of the Master; introduction to resources, labs, processes, as well as to scientific assistants and other relevant persons.

Mutual introduction of lecturers and students, including presentation of background disciplines and individual expectations, previous experiences and specializations of students.

Discussion of societal implications of digital media, ethical aspects, risks and opportunities.

Introduction to specific research and process methods of digital media. Overview and comparison of development methodologies from computer science and design, based partly on M-DM_1.04 and M-DM_1.02 and on domain specific previous knowledge of the students (e.g. agile development, waterfall, spiral and RAD, design thinking, user centered design).

Overview and introduction to innovation concepts and methods and guided application to the projects. Choice and application of appropriate development methodologies to individual projects.

Presentation and discussion of exemplary projects and systems, and of possible topics.

Definition and agreement upon the main questions and on the goals of a project. Students are encouraged to develop own topics and to work in small interdisciplinary groups.

Development of concepts, presentation, documentation, and development of a Digital Media demonstrator.

Teaching methods

Lectures and exercises on innovation and development methodologies. At the beginning of the semester the topics of the project are worked out and teams are built. 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.

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)

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Weight towards final grade

11,5 %

Person in charge of module

Prof. Dr.-Ing. Ido Iurgel

Additional information

Fagerberg, Jan, David C. Mowery, and Richard R. Nelson, eds. The Oxford handbook of innovation. Oxford Handbooks Online, 2006.

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.

The Johns Hopkins Guide to Digital Media. Marie-Laure Ryan, Lori Emerson, Benjamin J. Robertson (Eds.). Johns Hopkins University Press 2014.

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.

Alex Rosenberg. Philosophy of Science: A Contemporary Introduction (Routledge Contemporary Introductions to Philosophy), 2011.

Further literature depending on project

M-DM_1.02 Interactive Systems

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.02	150 h	5 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Practical training: 30 h / 2 SWS	60 h / 4 SWS	90 h	20-30 students

Learning outcomes / Competences and qualifications profile

Students know the wide spectrum of interaction technologies, their technological principles, usage fields, and their strengths and shortcomings. They learn to employ exemplary frameworks and tools to create interactive digital media systems. They acquire the competence to design interactive systems systematically, based on the needs of users and the context of use, following an iterative approach to system design, in particular Human-Centered Design and User Experience Design. They know the varieties of usability methods such as personas, eye tracking, or questionnaires, and are capable of choosing the appropriate measure for a task and to embed it into the development process

Content

Theories and methods of Human-Centred Design, User Experience, Human Factors, and the position of the theories within the wider field of related theories (e.g. Design Thinking, Participatory Design).

Presentation, research and analysis of state-of-the-art multi-modal interface design technologies, including technical working principles, variations, strengths and weaknesses.

Potential topics for exemplary exercises include: serious gaming/computer games, augmented and mixed reality, natural and embodied interaction (e.g. touch, gesture and haptic interfaces), social media.

Teaching methods

Lectures and exercises

Entry requirements

None

Types of assessment

Assignments, written or oral examinations

Requirements for the award of credit points

Passed assessment

Use of module (in other study programs)

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Weight towards final grade

5,8 %

Person in charge of module

Prof. Dr. Ido Iurgel

Additional information

Recommended Reading:

Wigdor, Dennis Wixon Daniel. Brave NUI World: Designing Natural User Interfaces for Touch and Gesture. Morgan Kaufmann, 2011.

Juul, Jesper. A Casual Revolution: Reinventing Video Games and Their Players. The MIT Press, 2009.

Kankaanranta, Marja Helena, and Pekka Neittaanmäki. Design and Use of Serious Games. Ed. Marja Helena Kankaanranta, and Pekka Neittaanmäki. Springer, 2008.

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, and Dan O'sullivan. Physical Computing. Premier Press, 2004.

Kuniavsky, Mike. Smart Things: Ubiquitous Computing User Experience Design. Morgan Kaufmann, 2010.

Russ Unger, Carolyn Chandler. A Project Guide to UX Design: For User Experience Designers in the Field or in the Making. New Riders, 2012.

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.

Handbook of Digital Human Modeling: Research for Applied Ergonomics and Human Factors Engineering (Human Factors and Ergonomics). Vincent G. Duffy (Eds.). Lawrence Erlbaum, 2008.

M-DM_1.03 Design, Technology and Innovation

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.03	150 h	5 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 60 h / 4 semester hours per week (SWS)	60 h / 4 SWS	90 h	20-30 students

Learning outcomes / Competences and qualifications profile

Students acquire a firm knowledge of new challenges, latest trends and innovations, and opportunities of various domains related to design, media and technology. They gain a solid and broad overview of contemporary developments in these areas. 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 state-of-the-art. Students acquire the competence to research, review, reflect upon, and present, in a scientifically appropriate manner, the technological and conceptual state-of-the-art of a chosen domain of digital media research. They are trained in writing an academic state-of-the-art report, and know how to employ the different knowledge sources.

Content

Review of criteria and requirements of scientific writing, introduction and reflection upon different writing styles in design and computer science.

Excursion to museums and to outstanding digital media companies.

Presentation and discussion of current typical, innovative, and extraordinary examples of digital media systems. Guest lectures by recognized experts of areas as diverse as for example human-robot interaction, serious games, digital publishing, digital media for learning, design thinking in practice, installations in space; exemplary insights into the diversity and richness of digital media research and development.

Presentation of future themes and megatrends (e.g. connectivity, mobility, sustainability, demographic change, care and cure etc.), and reflection upon these trends in the context of digital media technologies and developments.

Students write a detailed state-of-the-art report, based on the presentation of an expert and on independent research, reflect upon opportunities, challenges and risks, and establish links between different areas of the expert presentations.

Teaching methods

Lectures with focus on guest speakers from industry and academia presenting their work; excursions.

Entry requirements

None

Types of assessment Report on state-of-the-art of a specific topic
Requirements for the award of credit points Passed assessment
Use of module (in other study programs) --
Weight towards final grade 5,8 %
Person in charge of module Prof. Michael Pichler
Additional information Recommended Reading: Angelika Hofmann. Scientific Writing and Communication: Papers, Proposals, and Presentations. Oxford University Press, 2013. Angela Boland, Gemma Cherry, Rumona Dickson. Doing a Systematic Review: A Student's Guide. Sage Pubn Inc, 2013. Johnson, Steven R. Interface Culture: How New Technology Transforms the Way We Create and Communicate. Basic Books. 1997. Manovich, Lev. Software Takes Command. Bloomsbury Academic, 2013. 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-DM_1.04 Creative Strategies

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.04	150 h	5 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 60 h / 4 semester hours per week (SWS)	60 h / 4 SWS	90 h	20-30 Students

Learning outcomes / Competences and qualifications profile

Students have been introduced to various theories in the field of creativity, innovation and human factors in design. They are able to critically reflect different approaches. They are aware that knowing and addressing physical, cognitive, cultural and emotional human factors is essential in media design.

Students are skilled in generating ideas for services and products, working individually and in transdisciplinary teams.

They are confident in their own creative ability and skilled in identifying creative challenges of the real world.

Students are able to define a problem, analyze the context, choose appropriate research methods and outline objectives. They are skilled to present and discuss their projects.

Content

Theory

How can ideas for products and services be developed and creative teamwork be organized? What current and future challenges must be considered in the creative process?

This course gives students comprehensive knowledge about different approaches and theories in this topic area. Ideas and concepts like Service Design, Design-driven Innovation, User Experience, Human-Centered Design and Participatory Design will be critically reflected and discussed.

Practise

The workshops are an opportunity for students to practice methods for design research and concept development. They are intended as a creative playground that is characterized by curiosity, little fear of failure and an attitude of playfulness. All students are expected to participate in the making, discussion, and critical analysis of work.

The aim is to develop ideas for products and services that could be further explored in the project moduls. We will look for the most creative, ambitious and realistic possibilities.

Teaching methods

Lectures in the first sessions are followed by student working groups in which ideas and concepts are presented and discussed. The workshops contain different exercises to encourage creative development.

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

5,8%

Person in charge of module

Prof. Christoph Zielke

Additional information

Brown T. (2009): Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, New York: Harper Business

Hara, K. (2007): Designing Design, Zürich: Lars Müller Publishers

Joost, G. (2011): Design Thinking? Präsentation auf der x mess. http://vimeo.com/32959645

Klemp, K. / Ueki-Polet, K. (2011): Less and More, The Design Ethos of Dieter Rams, Berlin: Gestalten

Lockwood T. (2009): Design Thinking: Integrating Innovation, Customer Experience, and Brand Value, New York: Allworth Press

Norman, D. A. (2002): The Design of Everyday Things, New York: Basic Books

Stickdorn M. / Schneider J. (2012): This is Service Design Thinking: Basics, Tools, Cases, Hoboken: Wiley

Von Borries, F. / Grätz, I. / Schulze S. (2011): Apple Design, Berlin: Hatje Cantz

Wigdor, Dennis Wixon Daniel. Brave NUI World: Designing Natural User Interfaces for Touch and Gesture. Morgan Kaufmann, 2011.

Zilver Innovation (2011): Design the new business. http://vimeo.com/31678404

M-DM_1.05.1 Design for Computer Scientists

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.05.1	150 h	5 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Practical Training: 30 h / 2 SWS	60 h / 4 SWS	90 h	10-15 students

Learning outcomes / Competences and qualifications profile

Students have gained an overview of the history of communication design and have been introduced to theoretical concepts fundamental to designing. They have discussed the development of forms and styles in the broad context of cultural and social trends and have explored renowned designers´ works and influential concepts. The students are sensitized for different approaches to design; they have developed an understanding of the tension between task, media and individual creative outlook. They know different contemporary design methods and can evaluate their use for specific design tasks.

Content

Lectures on the methods and strategies in communication design:

• Communication design: basic principles and assessment criteria

Fundamental parameters of communication design (hierarchy of information, grids, …) and assessment criteria that depend on the individual person's approach (creativity, consistency, …).

• History of Communication Design

Overview of the most important movements: »Constructivism«, »Ulmer Schule«, »Emigre, David Carson and Postmodernism«, …

• Branding and Identity

• Editorial Design (Online and Offline)

• Information Design

Teaching methods

Lectures, Practical Training

Entry requirements

None. Choice of elective must be complementary to previous academic background, and requires approval by Head of Degree Programme.

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 5,8%
Person in charge of module Prof. Michael Pichler
Additional information Hara, K. (2007): Designing Design, Lars Müller Publishers Klemp, K. / Ueki-Polet, K. (2011): Less and More, The Design Ethos of Dieter Rams, Gestalten Verlag Aicher, O. (2013): The world as design, Ernst & Sohn Lupton, E. (2011): Graphic Design Thinking: Beyond Brainstorming Lupton, E. (2008): Graphic Design: The New Basics, Princeton Architectural Press Millman, D. (2013): Brand Thinking and other noble Pursuits, Allworth Press Gomez-Palacio, B. / Vit, A. (2011): Graphic Design, Referenced: A Visual Guide to the Language, Applications, and History of Graphic Design, Rockport Publishers Norman, D. A. (2002): The Design of Everyday Things, New York: Basic Books

M-DM_1.05.2 Computer Science for Designers

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_1.05.2	150 h	5 CP	1st semester	Summer semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Practical Training: 30 h / 2 SWS	60 h / 4 SWS	90 h	10-15 students

Learning outcomes / Competences and qualifications profile

Students with a background in design are introduced to basic concepts, tools and methods of Computer Science (CS). They improve their understanding of the concrete work of the computer scientist, and know the basic concepts and vocabulary of CS for Digital Media. They thus acquire the competence to communicate and pursue projects together with computer scientists. They are able to understand and better estimate challenges and appearing problems of Digital Media projects, and improve their orientation within the field of CS. This course will qualify the students to employ a common language for cooperation in interdisciplinary work, and will impart basic skills and understanding of CS.

Content

Programming languages: Different paradigms, history or programming languages; Programming languages vs. HTML/CSS. Focus on procedural languages, practical exercises.

Basic concepts of programming: Compiler, interpreter, IDE, frameworks, libraries, source control.

Basic concepts of computer science such as algorithms, data structures, data bases, client-server systems, cloud computing; hardware aspects: CPU, graphic card, sound card.

Overview of disciplines of CS and their specific challenges, in the context of Digital Media, such as computer graphics, AI, Ambient Intelligence, Embedded Systems, HCI.

Basic concepts of CS-principles for Digital Media, such as 2D / 3D, pixels, digitalization, aliasing, filter, model, mesh, texture, rendering, frames, interpolation, etc.

Meaning of Digital Media terms in CS such as augmented, mixed, virtual reality, CAVE, HMD, types of sensors; data acquisition, motion capture, etc.

Academic/publication culture in CS.

Teaching methods

Lectures, Practical Training

Entry requirements

None. Choice of elective must be complementary to previous academic background, and requires approval by

Head of Degree Programme.
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 5,8%
Person in charge of module Prof. Ido Iurgel
Additional information Recommended References: Glenn Brookshear, Dennis Brylow. Computer Science: An Overview (12th Edition). Prentice Hall, 2014. Casey Reas, Ben Fry. Processing: A Programming Handbook for Visual Designers and Artists. MIT Press, 2014. Shandar Junaid, Yue-Ling Wong. Digital Media Primer (2nd Edition). Prentice Hall, 2012. Computing Handbook: Two-Volume Set. Allen Tucker, Teofilo Gonzalez, Heikki Topi (Eds.). Crc Pr Inc, 2014.

M-DM_2.01 Digital Media Project Seminar II

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_2.01	450 h	15 CP	2nd semester	Winter semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Seminaristic lecture: 30 h / 2 semester hours per week (SWS) Practical training: 60 h / 4 SWS	90 h / 6 SWS	360 h	20-30 students

Learning outcomes / Competences and qualifications profile

Following Project Seminar I, students deepen their capacities to devise, present, and demonstrate an innovative, unique Digital Media system, and to cooperate and discuss with specialists from different disciplines. 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 experiences to users. They apply lessons learnt and employ knowledge from accomplished courses of the previous semester and from accompanying modules. Project Seminar II adds to Project Seminar I a specific focus on scientific discourse, research and writing. Whereas Project Seminar I had a focus on the process, students now improve their competence to research, review, and evaluate the state of the art related to a specific, chosen research and innovation question, and are able to embed their work into current research. They understand the different scientific cultures in design and computer science, and learn to present and discuss their work following scientific criteria, orally and in written form.

Content

Presentation and discussion of exemplary projects and systems, and of possible topics.

Definition of a project´s question and goals. Students are encouraged to develop own topics and to work in small interdisciplinary groups.

Development of concepts, presentation, documentation, and development of a Digital Media demonstrator.

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 and teams are built. 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
Requirements for the award of credit points Passed assessment
Use of module (in other study programs) --
Weight towards final grade 16,25 %
Person in charge of module Prof. Dr.-Ing. Ido Iurgel
Additional information Further literature depending on projects, cf. also Project Seminar I and DM_1.03.

M-DM_2.02 Procedural Design

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_2.02	150 h	5 CP	2nd semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Practical training: 30 h / 2 (SWS)	60 h / 4 SWS	90 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.

Content

- Principles of procedural frameworks, e.g. Max MSP/ Jitter, Pure Data, Processing, game engines
- 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 5,8%
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-DM_2.03 Digital Culture

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_2.03	150 h	5 CP	2nd semester	Winter semester	1 semester

Courses	Teaching time	Self-study	Planned group size
Lecture: 30 h / 2 semester hours per week (SWS) Exercise: 30 h / 2 (SWS)	60 h / 4 SWS	90 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 for their own projects. Students have deepened their media literacy and are can reflect and evaluate the effects of their work 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 and have improved their media literacy.

Content

The course summarizes the history of digital media and presents approaches of media and communication theory. Through reflecting contemporary and historical discourse it 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)

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Weight towards final grade

5,8%

Person in charge of module

Prof. Jörg Petri

Additional information

Recommended readings:

Booker, Christopher. (2004). The seven basic plots : why we tell stories. London ; New York: Continuum.

Couldry, Nick. (2012). Media, society, world : social theory and digital media practice. Cambridge ; Malden, MA: Polity.

Gottschall, Jonathan, & Wilson, David Sloan. (2005). The literary animal : evolution and the nature of narrative. Evanston, Ill.: Northwestern University Press.

Jenkins, Henry, Ford, Sam, & Green, Joshua. (2013). Spreadable media : creating value and meaning in a networked culture. New York ; London: New York University Press.

Jenkins, Henry. (2006). Convergence culture : where old and new media collide. New York: New York University Press.

McLuhan, Marshall, & Gordon, W. Terrence. (2003). Understanding media : the extensions of man (Critical ed.). Corte Madera, CA: Gingko Press.

McLuhan, Marshall, Fiore, Quentin, & Agel, Jerome. (1996). The medium is the massage : an inventory of effects. San Francisco, CA: HardWired.

Murray, Janet Horowitz. (1998). Hamlet on the holodeck : the future of narrative in cyberspace. Cambridge, Mass.: MIT Press.

Perron, Bernard, & Wolf, Mark J. P. (2009). The video game theory reader 2. New York: Routledge.

Ryan, Marie-Laure. (2004). Narrative across media : the languages of storytelling. Lincoln: University of Nebraska Press.

M-DM_2.04 Electives

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_2.04	150	5 CP	2nd semester	Winter semester	1 Semester

Courses	Teaching time	Self-study	Planned group size
Various	60 h / 4 SWS	90 h	Various

Learning outcomes / Competences and qualifications profile

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

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

M-DM_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-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.

M-DM_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-DM_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.

Electives taken from other study programmes

Students have acquired basic knowledge from other study programmes 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

Electives taken from the master`s degree programme Usability Engineering:

Human Factors Design

- Properties of human capabilities
- Usability
- User experience and user centred-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   Electives taken from other study programmes: Students are also given the opportunity to choose courses and contents from different study programmes 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 5,8%
Person in charge of module Prof. Dr Ido Iurgel
Additional information

M-DM_3.01 Advanced Research and Scientific Writing

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_3.01	90 h	3 CP	3rd semester	Summer semester	1 semester

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

Learning outcomes / Competences and qualifications profile

Students know how to apply appropriate research and design methods to specific challenges. They have acquired the ability to structure and write scientific texts. Students have a thorough knowledge of both classical and innovative, design oriented research techniques. They are able to compare and evaluate methods stemming from the design tradition and from the computing field, and have learned how to situate their own approach within these different traditions.

Content

- Philosophy of science
- Scientific argumentation: from research questions to research findings
- Scientific writing
- International citation standards
- Qualitative and quantitative evaluation methods
- Design oriented research trends in the 21st century

Teaching methods

Seminarsitic 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)

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Weight towards final grade

Person in charge of module

N.N.

Additional information

Recommended readings:

Anthony M. Graziano, Michael L. Raulin. Research Methods. Pearson 2012

Bella Martin, Bruce Hanington. Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions. Rockport 2012.

John Blackwell, Jan Martin: A Scientific Approach to Scientific Writing. Springer 2011.

Justin Zobel . Writing for Computer Science: The Art of effective Communication. Springer 2009.

Robert K. Yin. Case Study Research: Design and Methods, Sage 2013.

M-DM_3.02 und 2.03 Master Thesis and Colloquium

Code	Workload	Credits	Level of module	Frequency of offer	Duration
M-DM_3.02 M-DM_3.03	720 h	Master Thesis: 24 CP Colloqium: 3 CP	3rd semester	Winter semester	20 weeks

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

Learning outcomes / Competences and qualifications profile

Students are capable of working on complex problems and innovative solutions in the field of digital media theoretically as well as practically. They have conducted intensive studies on literature and developed their research question and practical approach. Students have developed appropriate methodological and design strategies concerning that question. They have conducted the approach focusing 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, have come up with some further research questions and application scenarios. Students have proven that they are able to analyse a complex field of work, find specific new research and development questions and have been able to approach and solve them through design and theory.

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 and development question, deriving hypotheses and design concepts
- Analyzing methodological strengths and weaknesses of different research approaches
- Developing of a digital media artifact
- Analyzing and evaluating the results
- Writing the thesis
- Presenting and defending the findings

Teaching methods

Individual supervision and support

Entry requirements 50 credits points achieved in other courses of the curriculum
Types of assessment Master thesis, digital media artifact 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 35 %
Person in charge of module All professors of the study programme
Additional information --