ISNM
International School of New Media
at the University of Lübeck

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:: Module Handbook ::

:: Master of Science (M.Sc.) in Digital Media ::

Course of Study

<table>
<tr><th>Semester 1</th><th>Semester 2</th><th>Semester 3</th><th>Semester 4</th></tr>
<tr><td rowspan="2">Common Ground
26 CP</td><td>Specialization Area I
„Media Development Processes“
12 CP</td><td rowspan="2">Electives
„Digital Media Applications“
16 CP</td><td rowspan="3">Master Thesis
30 CP</td></tr>
<tr><td>Specialization Area II
„E-Business“ or
„Work-Design“
12 CP</td></tr>
<tr><td>Key Competences
4 CP</td><td>Key Competences
6 CP</td><td>Study Abroad
12 CP
Key Competences 2 CP</td></tr>
</table>

1. Semester – Common Ground

Four mandatory modules must be completed to establish a foundation or “common ground” in Digital Media for further studies. Additional key competences are acquired in the mandatory module “Research Methodology”.

- Common ground modules
  - Media Technology (8 CP)
  - Information Systems (6 CP)
  - Interaction Design (8 CP)
  - Media and Society (4 CP)

- Key competences module
  - Research Methodology (4 CP)

30 CP will be acquired in the first semester.

2. Semester - Specialization

In the second semester, students deepen their knowledge in two specialization areas of Digital Media, each consisting of three mandatory modules. Besides the mandatory specialization area “Media Development Processes”, one of the two specialization areas “E-Business” and “Work Design” can be selected. Additional key competences are acquired in the mandatory module “Intercultural Project Management”.

- Mandatory specialization area: Media Development Processes (12 CP)
  - Computer Graphics (4 CP)
  - Ubiquitous Computing (4 CP)
  - Web and Multimedia Design (4 CP)

- Specialization area*: E-Business (12 CP)
  - E-Business in Networked Economies (4 CP)
  - Market Communication in E-Commerce (4 CP)

- IT-Security and Intellectual Property (4 CP)

- Specialization area*: Work Design (12 CP)
  - Organizational Psychology (4 CP)
  - Collaborative Work (4 CP)
  - Learning and Qualification (4 CP)

- Key competences module
  - Intercultural Project Management (6 CP in semester 2; continued with 2 CP in semester 3)

* One of the two specialization areas “E-Business” or “Work-Design” must be selected.

30 CP will be acquired in the second semester.

3. Semester – Electives and Study Abroad

In the third semester, students freely select among the modules of the electives course catalogue “Digital Media Applications”, for a mandatory total of 16 CP. Further, a three month study abroad or, alternatively, a research-oriented or industry internship related to the field of Digital Media must be completed. Key competences are acquired in the mandatory module “Intercultural Project Management” (continued from the second semester).

- Complete a free choice of modules from electives catalog “Digital Media Applications” (at least 16 CP):
  - Digital Film and Video Production (4 CP)
  - Digital Music Production (4 CP)
  - Artificial Intelligence (4 CP)
  - Game Design (4 CP)
  - E-Culture (4 CP)
  - Digital Libraries (4 CP)
  - Media Streaming (4 CP)
  - Selected Topics in Digital Media (4 CP)

- Study Abroad (12 CP)

- Key competences module
  - Intercultural Project Management (2 CP; cont’d from semester 2)

At least 30 CP must be acquired in the third semester.

4. Semester – Master Thesis

- Master Thesis (30 CP)

30 CP will be acquired in the fourth semester.

Grading and Examination Modalities:
In all semesters, grades are assigned to modules, not to individual courses. Module grades are based on a written or oral final module examination without any external resources. Written module exams last 60 – 180 minutes, and oral module exams 15 – 40 minutes. For further details, please refer to the ISNM MSc Digital Media Examination Regulations.

1. Module “Media Technology”

Duration: 1 semester	**Offered:** regularly	**Study semester:** 1st semester	**Credit points:** 8

Module group: Common Ground

Mode: mandatory

Workload:

- In class: 80 hours (lecture; lab work, seminar)
- Self study: 160 hours (oral exam and preparation, lab work preparation, seminar talk preparation, report editing, read materials)
- Total: 240 hours

Courses:

- Multimedia Systems (48 class hours / semester)
- Information Theory & Data Compression (32 class hours / semester)

Qualification objectives:

- Gaining fundamental knowledge of media technology principles
- Understanding the principles of digital media processing and transmission
- Learning architectures and mechanisms of digital multimedia systems
- Understanding the principles of information theory
- Learning principles and standards for audio, image, and video compression
- Understanding principles of computer networks

Course contents:

- Introduction to media technology and computer technology
- Introduction to I/O-devices
- Introduction to digital media formats and color theory
- Introduction to information theory
- Overview of audio, image, and video compression algorithms and standards
- Introduction to digital multimedia applications

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation and written report, exercises.

Module coordinator: Prof. Dr.-Ing. A. Schrader

2. Module "Information Systems"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 1st semester	**Credit points:** 6

Module group: Common Ground | **Mode:** mandatory

Workload:
- In class: 72 hours (lecture; exercises, programming course)
- Self study: 108 hours (oral exam and preparation, web programming assignments, read materials)
- Total: 180 hours

Courses:
- Information Systems and the World Wide Web (48 class hours / semester)
- Web Programming (24 class hours / semester)

Qualification objectives:
- Understand what information and database systems are and how they support the world wide web
- Understand the information modeling process and learn how data models serve as specifications of information systems
- Understand the core concepts and principles of relational databases
- Understand the process of creating interactive web sites
- Understand different architectures of web-based information systems
- Understand the core principles of XML-based web services
- Understand concepts and methods of web programming

Course contents:
- Introduction to concepts, components, and architecture of Internet-based information systems
- Introduction to information modeling
- Introduction to relational databases
- Concepts of web programming
- Introduction to XML and the semantic web
- Web Programming, e.g. using HTML, PHP, and SQL

Examination modalities:
Oral or written module exam. Prerequisites: web programming exercises.

Module coordinator: Prof. Dr.-Ing. A. Schrader

3. Module “Interaction Design”

Duration: 1 semester	**Offered:** regularly	**Study semester:** 1st semester	**Credit points:** 8

Module group: Common Ground | **Mode:** mandatory

Workload:
- In class: 92 hours (lecture, seminar)
- Self study: 148 hours (preparation of seminar talk, composition of report, read materials, smaller home assignments)
- Total: 240 hours

Courses:
- Visual Communication (60 class hours / semester)
- Human Computer Interaction (32 class hours / semester)

Qualification objectives:
- Learn about basic principles and techniques of visual design
- Understand the design process for both print and screen design
- Learn about the difference between personal preferences and designing for a target audience
- Understand the cognitive and technological aspects of Human-Computer Interaction and how this relates to different interaction styles
- Develop an understanding of how new paradigms of computing extend current desktop interfaces

Course contents:
- Introduction to visual communication (incl. typography and color theory)
- Role of storytelling and animation in interface design
- Cognitive and technological aspects of Human Computer Interaction (HCI)
- Advanced user interfaces and computing paradigms, e.g. virtual & augmented reality, ubiquitous computing, etc.
- Social aspects of HCI (groupware, CSCW)
- Affective user interfaces

Examination modalities:
Oral or written module exam. Prerequisites: seminar talk plus written report; exercises.

Module coordinator: Prof. Dr.-Ing. A. Schrader

4. Module "Media and Society"

Duration: 1 semester	**Offered:** Regularly	**Study semester:** 1st semester	**Credit points:** 4

Module group: Common Ground | **Mode:** mandatory

Workload:
- In class: 48 hours (lecture)
- Self study: 72 hours (read materials, prepare seminar presentation and exams)
- Total: 120 hours

Courses:
- Media and Society (48 class hours / semester)

Qualification objectives:
- Understand the role of new media in society
- Understand core concepts and critical issues in new media studies
- Understand the (r)evolution from technical reproduction to the digital generation
- Develop critical thinking toward new media developments
- Learn to analyze new media developments and their social and political implications

Course contents:
- History of media: old and new media
- Key theories and concepts in new media studies, e.g. on identity (gender, age, ethnicity, class, nation), archives & memory, aethetics & culture
- Media and globalization, ICT4D and sustainability, the Digital Divide
- Network philosophy
- Media art(s) and culture
- Media law

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation, small projects, small written reports.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

5. Module "Computer Graphics"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4

Module group: Media Development Processes

Mode: mandatory

Workload:

- In class: 48 hours (lecture, exercises)
- Self study: 72 hours (read materials; home assignments; completion of term project or preparation for oral exams)
- Total: 120 hours

Courses:

- Computer Graphics (32 class hours / semester)
- Computer Graphics Exercises (16 class hours / semester)

Qualification objectives:

- Understand how 3D worlds can be defined in a computer and how they are rendered to images
- Understand the core principles and methods of computer animation
- Develop an understanding of current and future interface technology building on 3D computer graphics such as virtual and augmented reality

Course contents:

- 3D Modeling using surfaces and solids
- Local and global rendering methods
- Animation methods – from key framing to cognitive animation
- Introduction to virtual reality
- Virtual humans

Examination modalities:
Oral module exam. Prerequisites: usually based on a student project, involving the creation of a nontrivial 3D model, e.g. in the domains of cultural heritage, media art, or another topic related to current research in the Virtual Reality & Ubiquitous Computing Lab. In addition, students are expected to complete several smaller modeling and animation tasks.

Module coordinator: Prof. Dr.-Ing. A. Schrader

6. Module "Ubiquitous Computing"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4

Module group: Media Development Processes

Mode: mandatory

Workload:

- In class: 40 hours (lecture; seminar, project presentation)
- Self study: 80 hours (project work, seminar talk preparation, report editing, read materials)
- Total: 120 hours

Courses:

- Ubiquitous Computing (40 class hours / semester)

Qualification objectives:

- Understand historic and current trends in computing – from mainframes over personal to ubiquitous computing
- Understand the principles and differences of mobile, pervasive, and ubiquitous computing
- Understand the social implications of ubiquitous computing
- Ability to define and design context aware services

Course contents:

- Overview of computer technology developments (wearable computer, sensor networks, smart dust)
- Taxonomy of mobile, pervasive, and ubiquitous computing
- Presentation of ambient intelligence applications
- Introduction to ubiquitous computing infrastructures
- Overview of location-tracking technologies

Examination modalities:

Oral or written module exam. Prerequisites: usually based on a student project involving the creation of a context-aware service based on location tracking and mobile computing infrastructure. Usually the work is embedded within activities and infrastructure of the Virtual Reality & Ubiquitous Computing Lab. In addition, students have to present a seminar presentation on newest research results in the area of ubiquitous computing.

Module coordinator: Prof. Dr.-Ing. A. Schrader

7. Module "Web and Multimedia Design"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: Digital Media Applications		**Mode:** mandatory	

Workload:
- In class: 48 hours (lecture, exercises, case study discussions)
- Self study: 72 hours (smaller assignments, project work, preparation of report, read materials)
- Total: 120 hours

Courses:
- Web and Multimedia Design (48 class hours / semester)

Qualification objectives:
- Understand the user-centered design process in the context of web design
- Understand methods and tools of web design
- Ability to apply design process concepts to the production of web-based and other digital media
- Learn how to give constructive feedback, improve design results in synergetic team work and evaluate the results through objective criteria

Course contents:
- Introduction to usability design tools
- User scenarios and use cases
- Process flow
- Visual design concepts and web page templates
- Functional Specification
- Adaptive and adaptable interfaces
- Adaptation to output media
- Prototyping
- Focus group testing
- Designing for different media (e.g. DVD, interactive television, information kiosks)
- Barrier free access to media (e.g. barrier free web)

Examination modalities:
Oral or written module exam. Prerequisites: project work including project report.

Module coordinator: Prof. Dr.-Ing. A. Schrader

8. Module "E-Business in Networked Economies"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: E-Business		**Mode:** mandatory elective (i.e. mandatory in specialization area E-Business)	

Workload:

- In class: 48 hours (lecture, seminar)
- Self study: 72 hours (read materials, preparation of seminar presentation and report)
- Total: 120 hours

Courses:

- Theories and models of virtual enterprises (24 class hours / semester)
- Effective Management in E-Business (24 class hours / semester)

Qualification objectives:

- Introduction to effective management
- Overview of regional, national and networked economies
- Understand technologies for virtual enterprises
- Application to economical and technical cluster and network analyses

Course contents:

- Principles, tasks, and tools of effective management
- Models for technology, information and innovation management (incl. enterprise resource planning)
- Value chains, supply chains, and relationship management
- Economies of scale, economies of scope
- Network effects and theories of markets
- Business life cycle models, due diligence, and business planning
- Application to benchmarking, network and cluster analyses
- Technical options assessment

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation plus written report.

Module coordinator: Prof. Dr. rer.nat. habil. J. Hasebrook

9. Module "Market Communication in E-Commerce"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: E-Business		**Mode:** mandatory elective (i.e. mandatory in specialization area E-Business)	

Workload:

- In class: 48 hours (lecture, seminar)
- Self study: 72 hours (read materials, preparation of seminar presentation and report)
- Total: 120 hours

Courses:

- E-Commerce: Models & Theories (class hours / semester)
- Online Marketing & Search Engine Optimization (class hours / semester)

Qualification objectives:

- Understanding theories and models in marketing, sales & branding
- Overview of business models in e-commerce
- Basic technologies in e-commerce & online marketing
- Application to international & intercultural marketing in the Internet

Course contents:

- Economical standard models of a company (e.g. Porter's value chain, five forces)
- Business analysis (critical success factors, generic strategies / strategy grids)
- Development of e-commerce (life cycle models, cost models, market analysis)
- Business applications (role of marketing, sales & advertisement, branding & band equity)
- Electronic marketing (modes & technologies of e-marketing, mobile marketing, cross-media applications, measurement & optimization of online marketing)
- Electronic market places (market research, community building, customer life cycle, prizing models)

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation plus written report.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

10. Module "IT-Security and Intellectual Property"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: E-Business		**Mode:** mandatory elective (i.e. mandatory in specialization area E-Business)	

Workload:

- In class: 40 hours (lecture, seminar)
- Self study: 80 hours (read materials, preparation of seminar presentation and report)
- Total: 120 hours

Courses:

- IT-Security (40 class hours / semester)

Qualification objectives:

- Understanding technical and legal frameworks for intellectual properties
- Understanding core principles and technologies in IT security
- Understanding technical and economical risk and impact analyses
- Application of intellectual property rights (IPR) and digital rights management (DRM) to business cases

Course contents:

- Legal framework and international comparison for privacy, security, and IPR
- Technologies for security and IPR protection (incl. cryptography, watermarking)
- Risk analyses and risk management
- Impact analyses and recovery planning
- Application of IPR protection and DRM to business cases

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation plus written report.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

11. Module "Organizational Psychology"

Duration: 1 semester	**Offered:** Regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: Work Design		**Mode:** mandatory elective (i.e. mandatory in specialization area Work Design)	

Workload:

- In class: 48 hours (lecture, seminar)
- Self study (a): 45 hours (read materials, prepare seminar presentation)
- Self study (b): 27 hours (prepare final exam)
- Total: 120 hours

Courses:

- Organizational Psychology (48 class hours / semester)

Qualification objectives:

- Overview of history, philosophy and values of work
- Discuss meaning of work in different cultures
- Understand models of corporate cultures
- Understand models and technologies for human capital formation and human resource management
- Application of digital media to human resource and competence management

Course contents:

- Economical, cultural, and technological history of work
- Philosophical models of work, production, and action
- Models of organizational and work psychology
- Learning organization and organizational learning
- Models of leadership, empowerment, creativity, and innovation
- Human Resource Management (HRM) and Development (HRD)
- Intellectual capital measurement and management
- Technological models of knowledge and competence management
- Social network theories

Examination modalities:
Written module exam. Prerequisites: scientific group work / presentation (e.g. concept for regional knowledge management).

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

12. Module "Collaborative Work"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: Work Design		**Mode:** mandatory elective (i.e. mandatory in specialization area Work Design)	

Workload:

- In class: 36 hours (lecture, seminar)
- Self study (a): 50 hours (read materials, prepare seminar presentation)
- Self study (b): 34 hours (prepare final exam)
- Total: 120 hours

Courses:

- Collaborative Work (36 class hours / semester)

Qualification objectives:

- Overview of models for cooperation, coordination, and collaboration
- Understand models of team work and team building
- Discuss special issues of multi- and inter-cultural team work
- Understand impact of computers on work flows and team work

Course contents:

- Modes, modalities, and models of collaboration (incl. aspects of communication theories)
- Overview technologies for cooperation (CSCW, CWDS, DSS)
- Technical applications for CSCW (video conferencing, SWOF, collaborative work environments)
- Theories and technologies for cooperation, coordination, and collaboration
- Social models for group decision making (e.g. risky shift, group think)
- Models and technologies for work process and business engineering
- Models and findings on diversity at the work place
- Cultural factors and intercultural teams (e.g. Hall, Laurent, Hofstede, Trompenar)
- Social and economical impact of international collaboration technologies

Examination modalities:
Written module exam. Prerequisites: scientific group work / presentation (e.g. prototype implementation of groupware).

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

13. Module "Learning and Qualification"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 2nd semester	**Credit points:** 4
Module group: Work Design		**Mode:** mandatory elective (i.e. mandatory in specialization area Work Design)	

Workload:
- In class: 48 hours (lecture, seminar)
- Self study: 72 hours (read materials, preparation of seminar presentation and report)
- Total: 120 hours

Courses:
- Learning and Qualification (48 class hours / semester)

Qualification objectives:
- Overview of global trends in learning systems and technologies
- Understand models and theories of learning and memory
- Discuss applications of theories to media-based learning
- Apply flexible distance and collaborative learning schemes
- Understand and compare learning styles and international and intercultural differences in learning styles

Course contents:
- International trends, technologies and markets in e-learning
- Global educational markets, brain drain vs. brain gain ("war for talent")
- Memory systems: short / long term, working memory, mental models
- Theories of learning: behavioral, cognitive and social learning theories
- Overview of psychological models of sensation and perception (optical and auditory pathway, evolution of brain structures)
- Cultural and technological theories of vision and visual media
- History and psychology of learning machines
- Paradigms of computer-supported learning
- Aptitude-Treatment-Interaction (ATI) and Intelligent Tutoring Systems (ITS)
- Adaptable and adaptive multimedia for learning
- Models and technologies for collaborative and intercultural learning styles
- Technologies and theories of self-learning systems (incl. application to interactive learning environments)

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation plus written report.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

14. Module "Digital Film and Video Production"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 3rd semester	**Credit points:** 4
Module group: Media Development Processes		**Mode:** optional	

Workload:

- In class: 40 hours (lecture; lab introduction)
- Self study: 80 hours (film shooting, cutting, editing, post-processing, presentation)
- Total: 120 hours

Courses:

- Digital Film and Video Production (40 class hours / semester)

Qualification objectives:

- Understand basic principles of film production
- Learn to use video and film production equipment
- Practice video cutting and sound editing

Course contents:

- Overview of film history
- Introduction to camera handling and film shooting
- Introduction to digital film editing
- Introduction to post processing techniques and special effects
- Discussion of new and expanded cinema concepts

Examination modalities:
Oral or written module exam. Prerequisites: in a workshop setting students have to create an own video product including camera work, film cutting, sound editing and post processing. The theme of the workshop is usually inter-disciplinary, combined with other courses at the ISNM.

Module coordinator: Prof. Dr.-Ing. A. Schrader

15. Module “Digital Music Production”

Duration: 1 semester	**Offered:** regularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications | **Mode:** optional

Workload:
- In class: 40 hours (lecture; lab introduction)
- Self study: 80 hours (sound material preparation, composition, recording, mixing, post-processing, presentation)
- Total: 120 hours

Courses:
- Digital Music Production (40 class hours / semester)

Qualification objectives:
- Understand the principles of music production
- Get an overview of music production technologies
- Understand how to use a digital studio environment

Course contents:
- Overview of music history
- Introduction to music notation mechanisms and composition principles
- Introduction to digital studio environments
- Introduction to sequencer and synthesizer

Examination modalities:
Oral or written module exam. Prerequisites: in a workshop setting students have to create an own music product using microphones, real and virtual instruments and digital studio equipment including sequencer and synthesizer in a professional studio environment of the Media Docks.

Module coordinator: Prof. Dr.-Ing. A. Schrader

16. Module "Artificial Intelligence"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications	**Mode:** optional

Workload:

- In class: 40 hours (lecture, seminar)
- Self study: 80 hours (read materials, preparation of seminar presentation and written report)
- Total: 120 hours

Courses:

- Artificial Intelligence (40 class hours / semester)

Qualification objectives:

- Understand concepts and methods of Artificial Intelligence (AI)
- Understand how AI can enhance digital media
- Learn to apply AI methods to digital media

Course contents:

- Intelligent agents and agent architectures
- Search and problem solving
- Knowledge representation and ontologies
- Image analysis and computer vision
- Machine Learning
- Intelligent mulltimedia

Examination modalities:
Oral or written module exam. Prerequisites: seminar talk, lab sessions and assignments.

Module coordinator: Prof. Dr.-Ing. A. Schrader

17. Module "Game Design"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications

Mode: optional

Workload:

- In class: 40 hours (lecture; in-class project discussion and progress reports)
- Self study: 80 hours (game development project; read materials)
- Total: 120 hours

Courses:

- Game Design (40 class hours / semester)

Qualification objectives:

- To provide students with a thorough understanding of the history and types of digital and non-digital games
- Understand core principles of the game development process
- Understand core principles of online and physical interaction and communication in multi-player games
- Learn about new paradigms and challenges in game design, mainly in mobile and pervasive gaming

Course contents:

- Game theory, homo ludens
- History and genres of digital games
- Game development process, design documents
- Digital Storytelling, narrative structures
- New trends in game design: mobile, pervasive, tangible, and augmented reality games

Examination modalities:

Oral or written module exam. Prerequisites: project work (practical game development) with project report. The student project usually involves the development of a digital game including design, specification, implementation, and testing.

Module coordinators: Prof. Dr.-Ing. A. Schrader

18. Module "E-Culture"

Duration: 1 semester	**Offered:** regularly	**Study semester:** 3rd semester	**Credit points:** 4
Module group: Digital Media Applications		**Mode:** optional	

Workload:

- In class: 40 hours (lecture, seminar)
- Self study: 80 hours (read materials, preparation of seminar presentation and written report)
- Total: 120 hours

Courses:

- E-Culture (40 class hours / semester)

Qualification objectives:

- Understand use and impact of digital media in culture
- Understand and apply new media technologies for marketing and learning how to access and distribute cultural goods and services

Course contents:

- Factors, models and theories of culture
- The hermeneutic drive in culture: models of understanding
- Brief history and philosophy of cultural developments (Benjamin, Arendt, Derrida)
- The tree of knowledge and collective intelligence (Lévy)
- The "e" in culture: Assessment of technical options in culture
- Application of digital media in culture:
  - E-Learning in museums and memorials
  - Digital archives for artwork
  - Virtual galleries and art networks
  - Technology, tourism, and economics in culture
- Assessing future developments in e-culture

Examination modalities:
Oral or written module exam. Prerequisites: seminar talk plus written report.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

19. Module “Digital Libraries”

Duration: 1 semester	**Offered:** irregularly	**Study semester:** 3rd semester	**Credit points:** 4
Module group: Digital Media Applications		**Mode:** optional	

Workload:
- In class: 40 hours (lecture; seminar, project presentation)
- Self study: 80 hours (project work, seminar talk preparation, report editing, read materials)
- Total: 120 hours

Courses:
- Digital Libraries (40 class hours / semester)

Qualification objectives:
- Understand the technical and social aspects of libraries
- Understand the main principles of digital library creation and management
- Learn how to combine traditional physical libraries with new media technology

Course contents:
- Overview of library and archive history
- Definition of digital, virtual, electronic, and hybrid libraries
- Introduction to new technology trends for digital libraries
- Introduction to ontologies

Examination modalities:
Oral or written module exam. Prerequisites: usually, in a student project new library services will be designed and implemented using equipment of the Virtual Reality & Ubiquitous Computing Lab. In addition, students have to provide a seminar presentation and report.

Module coordinator: Prof. Dr.-Ing. A. Schrader

20. Module “Media Streaming”

Duration: 1 semester	**Offered:** irregularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications

Mode: optional

Workload:

- In class: 40 hours (lecture; seminar)
- Self study: 80 hours (oral examination preparation, seminar talk preparation, report editing, read materials)
- Total: 120 hours

Courses:

- Media Streaming (40 class hours / semester)

Qualification objectives:

- Understand underlying principles of real-time multimedia distribution
- Understand the technologies for media streaming in the Internet
- Learn how to realize a media streaming infrastructure

Course contents:

- Introduction to streaming technologies
- Overview of streaming applications and standards
- Introduction of media adaptation and filtering strategies
- Introduction to Content Delivery Networks (CDN) and Quality-of-Service (QoS) Architectures

Examination modalities:
Oral module examination. Prerequisites: seminar presentation and report.

Module coordinator: Prof. Dr.-Ing. A. Schrader

21. Module "Selected Topics in Digital Media"*

Duration: 1 semester	**Offered:** irregularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications

Mode: optional

Workload:

- In class: 40 hours (lecture; seminar or project presentation)
- Self study: 80 hours (project work, seminar talk preparation, report editing, read materials)
- Total: 120 hours

Courses:

- Selected Topics in Digital Media (40 class hours / semester)

Qualification objectives:

- Getting insight into newest trends and developments in digital media
- Overview of current research activities

Course contents:

The content of this lecture is dynamic and depends on the developments of technology and research in all areas of the ISNM curriculum. Possible topics are:

- Interactive digital television
- New networking trends (sensor networks, grid computing, smart dust, etc.)
- New hardware trends (electronic paper, optical computing, etc.)
- Trends in intelligent systems
- Multimodal communication
- Ambient intelligence
- Cryptography and electronic payment
- Etc.

Examination modalities:

Oral or written module exam. Prerequisites: typically, the participants have to perform a seminar presentation and report. Alternatively, project work and project report.

Module coordinator: Prof. Dr.-Ing. A. Schrader

*__Note__: Examples of two possible courses in "Selected Topics in Digital Media" are outlined below.

21. Module "Selected Topics in Digital Media" – Example: "iTV"

Duration: 1 semester	**Offered:** irregularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications

Mode: optional

Workload:

- In class: 40 hours (lecture and project presentation)
- Self study: 80 hours (project work, read materials)
- Total: 120 hours

Courses:

- Selected Topics in Digital Media – iTV (40 class hours / semester)

Qualification objectives:

- Introduction into core concepts of current/future television standards
- Overview of interaction mechanisms in broadcast media
- Analysis of convergence trends between broadcast and Internet media

Course contents:

- History and Development of Television Technology
- Digital Television
- DVB-T/S/C/H – Digital Video Broadcasting for Antennas, Satellites, Cables and Handheld Computers
- DMB/DAB – Streaming Standards
- MHP – Multimedia Home Platform
- Personalization
- Interaction Mechanisms and Feedback Channels
- CDN – Content Distribution Networks
- Adaptive Multimedia Streaming - Filtering/Scaling/Adaptation, QoS
- IPTV – Internet Television

Examination modalities:
Oral module examination. Prerequisite: project work in form of a design of an interactive museum television program (in cooperation with a Lübeck museum).

Module coordinator: Prof. Dr.-Ing. A. Schrader

21. Module "Selected Topics in Digital Media" - Example: "Social Computing & Web 2.0"

Duration: 1 semester	**Offered:** irregularly	**Study semester:** 3rd semester	**Credit points:** 4

Module group: Digital Media Applications

Mode: optional

Workload:

- In class: 40 hours (lecture; seminar or project presentation)
- Self study: 80 hours (seminar talk preparation, report editing, read materials)
- Total: 120 hours

Courses:

- Social Computing & Web 2.0 (40 class hours / semester)

Qualification objectives:

- Understand basic principles of the "Social Web"
- Overview of current tools for the "Social Web"
- Analysis of major development trends in the "Social Web"

Course contents:

Since the first Web 2.0 Conference in 2004 the term "Web 2.0" has been widely adopted by a lot of blog posts, wiki pages and forum discussions. In 1994, the World Wide Web Consortium started its work defined several standards, including those now building the Web 2.0, such as XHTML, CSS, Script Languages and RDF & RSS. Web 2.0 tools proliferated quickly throughout the web: First wikis started in 1995, 1999 was the start of now famous blogging service Blogger, RSS for content syndication was introduced in 2000, the year 2001 was the starting date of wikipedia, the photo sharing portal flickr started in 2002, and social bookmarking services like del.icio.us in 2003. In 2004, Web 2.0 terms, such as "long tail", "tag clouds", or "social bookmarking" became buzzword through a new series of conferences for web developers. As for the social nature of community-based tagging and bookmarking tools, the Web 2.0 is also referred to as the "Social Web". Focus topics of the course will be:

- Small World Effect and Web Development
- Web 2.0 Time Line
- Social Web Sites (Blogs, Wikis, Sharing Portals)
- Social Web Tools (Tags, Tag Clouds, RSS Feeds)
- Technical Development Trends (Ajax, RIA, Semantic Search Platforms)
- Cultural Aspects of the "Social Web" (Social Inclusion, Participation)
- Design Aspects of the "Social Web" (Case Studies, Design Guides)

Examination modalities:

Oral module exam. Prerequisites: seminar presentation and report based on project or research work.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

22. Module "Research Methodology"

Duration: 1 semester	**Offered:** Regularly	**Study semester:** 1st semester	**Credit points:** 4
Module group: Key Competences		**Mode:** mandatory	

Workload:
- In class: 40 hours (lecture)
- Self study: 80 hours (read materials, prepare statistical exercises; prepare individual proposal for academic study or thesis)
- Total: 120 hours

Courses:
- Research Methodology (40 class hours / semester)

Qualification objectives:
- Overview of historical development of scientific methods
- Introduction to statistical hypothesis testing
- Application of scientific writing standards (author guidelines, quotes, references)
- Understanding qualitative and quantitative research methods applied to selected problems in technology, humanities, and economics

Course contents:
- Foundations of scientific reasoning (induction, deduction, Greek philosophy)
- Emergence of natural science (scholastics, Occam's razor, Newton's principles, Leibniz' and Decartes' formal languages, Goedel's critique)
- Modern theories of science (For and against method: K.Popper, P.Feyerabend, T.Kuhn, "Science War")
- Research Planning and hypotheses testing (experiment, quasi-experiment, field study, H0/H1, alpha-/beta-error, power)
- Descriptive and inference statistics (scales, distributions, centrality, dispersion, t-test)
- Qualitative methods („hermeneutic drive", content analysis, action research)
- Application of research methods to individual proposals (academic study / thesis)

Examination modalities:
Written module exam. Prerequisites: individual scientific proposal (study / thesis).

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook

23. Module "Intercultural Project Management"

Duration: 1 semester	**Offered:** regularly	**Study semesters:** 2nd – 3rd semester	**Credit points:** 8

Module group: Key Competences

Mode: mandatory

Workload:

- In class: 88 hours (lecture, seminar, discussion of project work)
- Self study: 152 hours (read materials, prepare seminar talk and report, smaller assignments, project work)
- Total: 240 hours

Courses:

- Cross- and Intercultural Project Management (32 class hours / 2nd semester)
- Intercultural Studies and the New Media (32 class hours / 2nd semester)
- Self-Engineering (24 class hours / 3rd semester)

Qualification objectives:

- Understand core concepts and critical issues of cross and intercultural project management
- Ability to understand and apply international project management standards
- Ability to apply relevant aspects of intercultural studies to team work and management
- Understand core concepts and critical issues in intercultural studies in relation to the new media
- Develop personal qualities and abilities in self-management and team work

Course contents:

- Structures of project management
- Working in and with cross/ intercultural teams
- International project management standards of the project management institute (PMI): use and benefits
- Life cycle and management models
- Computer tools in project management and their effective use
- Intercultural aspects of media, particularly new media
- History and interdisciplinary concerns of intercultural studies, involving cultural anthropology, social psychology, communication studies
- Development of personal capabilities necessary for effectiveness in the 21st century
- System engineering applied to self management; stress management

Examination modalities:
Oral or written module exam. Prerequisites: seminar presentation plus written report or practical project work. Alternatively, a group work or study can be turned in (individual contributions of each team member must be clearly identified). Regular and active class participation.

Module coordinator: Prof. Dr. rer. nat. habil. J. Hasebrook