Curriculum for the Bachelor's Program in

Medialogy
(Medialogi)

September 2010

The Faculties of Engineering and Science
Aalborg University
2010

Preface:

Pursuant to Act 985 of October 21, 2009 on Universities (the University Act) with subsequent changes, the following curriculum for the Bachelor's program in Medialogy is established. The program also follows the Framework Provisions and the Examination Policies and Procedures for the Faculties of Engineering and Science.

Uffe Kjærulff

Head of School of Information and Communication Technology (SICT)

Aalborg University, August 2010

Rolf Nordahl

Chairman
Studyboard of Mediatechnology

Aalborg University, August 2010

Table of Contents

Chapter 1: Legal Basis of the Curriculum, etc.

1.1 Basis in ministerial orders

The Bachelor's program in Medialogy is organized in accordance with the Ministry of Science, Technology and Innovation's Ministerial Order no. 814 of June 29, 2010 on Bachelor's and Master's Programs at Universities (the Ministerial Order of the Study Programs) and Ministerial Order no. 857 of July 1, 2010 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 181 of February 23, 2010 (the Admission Order) and Ministerial Order no. 250 of March 15, 2007 (the Grading Scale Order) with subsequent changes.

1.2 Faculty affiliation

The Bachelor's program falls under the Faculties of Engineering and Science, Aalborg University.

1.3 Study Board affiliation

The Bachelor's program falls under the Study Board for Media Technology at School of Information and Communication Technology.

Chapter 2: Admission, Degree Designation, Program Duration and Competence Profile

2.1 Admission

Admission to the Bachelor's program in Medialogy requires an upper secondary education.

The program's specific entry requirements are:

- English B *or* an acceptable IELTS test score
- Mathematics B or better (or equivalent level or better from foreign upper secondary institutions)

cf. the Admission Order.

The University can stipulate requirements concerning conducting additional exams prior to the start of study.

The study board may limit admission or cancel the education if the number of admitted students is too low. The study board may cancel the education prior to the start of the study in specific locations where Aalborg University and the Study Board for Media Technology offer the Medialogy education (including, but not limited to, the locations in Aalborg, Esbjerg and Copenhagen).

2.2 Degree designation in Danish and English

The Bachelor's program entitles the graduate to the designation:

- Teknisk-naturvidenskabelig Bacheloruddannelse (BSc) i Medialogi. The English designation is: Bachelor of Science (BSc) in Medialogy.

2.3 The program's specification in ECTS credits

The Bachelor's program is a 3-year, research-based, full-time study program. The program is set to 180 ECTS credits.

2.4 Competence profile on the diploma

The following will appear on the diploma:

- A graduate of the Bachelor's program has competences acquired through an educational program that has taken place in a research environment.
- A graduate of the Bachelor's program has fundamental knowledge of and insight into his/her subject's methods and scientific foundation. These properties qualify the graduate of the Bachelor's program for further education in a relevant Master's program as well as for employment on the basis of the educational program.

2.5 Competence profile of the program

Students who complete the Bachelor's program in Medialogy will obtain the following qualifications:

Knowledge	• Must have an understanding of the basic function of the human senses and their interaction in the perception of the surroundings in general and media in particular • Must have an understanding of the duality between computer based recording and analysis of digital signals (images, audio, tactile information etc.), respectively computer based generation / synthesis and presentation of the corresponding signals • Must have an understanding of the interactive process between humans, computers and machines • Must have understanding of the structures of narrative forms and dissemination in relation to media and media technology characteristics • Must have understanding of the interplay between form and content through the use of new media technical instruments, and hence a basis to develop their own creativity in this field of tension • Must have understanding of media history and basis for including cultural, ethnographical, social and sociological perspectives in problem solving • Must have insight into correlations between theories and methods and between their foundation and validity areas • Must have an understanding of professional and organizational as well as cultural and economic aspects

Skills	• Must be able to design interactive systems, considering the intermediation and user relationships as well as technological opportunities
	
	• Must be able to analyze, synthesize and evaluate techniques and methods for development of media systems including animation technology, virtual reality technology and computer games on both new and widely used platforms
	
	• Must be able to perform synthesis and evaluation of media systems
	
	• Must independently be able to perform and also academically and logically consistently be able to argue within the discipline, including explaining correlations between identified problems and formulated solution strategies
	
	• Must within the partially known disciplines and practical problems be able to:
	  ○ simplify and operationalize issues in order to make these available to the professional, technical and/or scientific analysis
	  ○ assess the quality of the generated analyses and suggested solutions both professionally and in relation to the context
	  ○ through dialogue identify, analyze and find solutions for technical and/or scientific or cooperative issues and which reflect the professional and cultural context
	
	• Must in his or her own and adjacent professional fields be able to demonstrate innovative problem solving by either technical or scientific character through innovative use of knowledge

Competences	• Must be able to join professionally in professional and interdisciplinary teams • Must be able to identify own as well as group-related learning needs • Must independently be able to acquire knowledge and connect new knowledge with existing knowledge and critically assess both applied information and self-learning • Must be able to clear and well-structured disseminate relevant information, taking into account the target audience and show an alert and attentive attitude to other participants • Must be able to define and respect their own and possibly also other participants' function compared to the whole - that is both to lead and to be guided • Must be able to contribute to the joint development of knowledge and experience formation

Chapter 3: Content and Organization of the Program

The program is structured in modules and organized as a problem-based study. A module is a program element or a group of program elements, which aims to give students a set of professional skills within a fixed time frame specified in ECTS credits, and concluding with one or more examinations within specific exam periods. The examinations are defined in the curriculum.

The program is based on a combination of academic, problem-oriented and interdisciplinary approaches and organized based on the following work and evaluation methods that combine skills and reflection:

- lectures
- classroom instruction
- project work
- workshops
- exercises (individually and in groups)
- project work and exercises in labs
- teacher feedback
- reflection
- portfolio work

The BSc education in Medialogy is taught in English. All activities, including the above stated, are carried out in English. All exercise work and deliverables, project-work (as well as any documentation in connection to these) delivered by the student must be written in English and all exams are carried out in English. In accordance with the current Framework Provisions, The Study Board for Media Technology may choose to exempt from this rule in extra-ordinary cases, which in principle requires a well-documented application from the student and/or teacher.

Overview of the program:

All modules are assessed through individual grading according to the 7-point scale *or* Pass/Fail. All modules are assessed by external examination (external grading) or internal examination (internal grading or assessment by the supervisor only).

Semester 1: Designing from Both Sides of the Screen					
Semester	Module	ECTS	Assessment	Exam	Type
1st	Creative Play - Applied Technology	5	Pass/Fail	Internal	Mandatory
1st	Designing from Both Sides of the Screen	10	7-point scale	Internal	Mandatory
1st	Problem based learning in Science, Technology and Society	5	Pass/Fail	Internal	Mandatory
1st	Animation and Graphic Design	5	7-point scale	Internal	Mandatory
1st	Introduction to Programming	5	7-point scale	Internal	Mandatory
Semester 2: Interaction Design – Human Computer Confluence					
Semester	Module	ECTS	Assessment	Exam	Type
2nd	Interaction Design - Human Computer Confluence	15	7-point scale	External	Mandatory

2nd	Mathematics for Multimedia Applications	5	7-point scale	Internal	Mandatory
2nd	Physical Interface Design	5	7-point scale	Internal	Mandatory
2nd	Interaction Design	5	Pass/Fail	Internal	Mandatory
Semester 3: Human Senses – Digital Perception					
Semester	Module	ECTS	Assessment	Exam	Type
3rd	Visual Computing	10	7-point scale	Internal	Mandatory
3rd	A/V Production	5	7-point scale	Internal	Mandatory
3rd	Image Processing	5	Pass/Fail	Internal	Mandatory
3rd	Perception	5	Pass/Fail	Internal	Mandatory
3rd	Procedural Programming	5	7-point scale	Internal	Mandatory
Semester 4: Sonic Interactions: Design and Evaluation					
Semester	Module	ECTS	Assessment	Exam	Type
4th	Sonic Interactions: Design and Evaluation	15	7-point scale	Internal	Mandatory
4th	Sound and Music Computing	5	7-point scale	Internal	Mandatory
4th	Design and Analysis of Experiments	5	Pass/Fail	Internal	Mandatory
4th	Object Oriented Software Engineering	5	7-point scale	Internal	Mandatory
Semester 5: Audio-Visual Experiments					
Semester	Module	ECTS	Assessment	Exam	Type
5th	Audio-Visual Experiments – Pre-Rendered Experiences	15	7-point scale	External	Elective
5th	Audio-Visual Experiments – Interactive Experiences	15	7-point scale	External	Elective
5th	Computer Graphics Programming	5	7-point scale	Internal	Mandatory
5th	Computer Graphics Rendering	5	7-point scale	Internal	Mandatory
5th	Screen Media	5	7-point scale	Internal	Mandatory
Semester 6: Interactive Systems Design					
Semester	Module	ECTS	Assessment	Exam	Type
6th	Interactive Systems Design	20	7-point scale	External	Mandatory
6th	Real-time Interfaces and Interactions	5	7-point scale	Internal	Mandatory
6th	Media Sociology and Psychology	5	Pass/Fail	Internal	Mandatory
	Total	180			

On the 5th semester students must choose 1 of 2 elective project-modules (15 ECTS).

Most courses introduce theories of science, scientific methods and scientific theories, which are specific to the topic of the specific courses and the overall education. The Medialogy curriculum

includes theories of science, and scientific theories and methods in courses (among others) such as interaction design, human-computer interaction, in the scientific disciplines of Screen Media and AV-production, mathematics and programming, human and computer audition, vision and touch, evaluation of media products. Theory of Science, scientific theory and scientific methods in general are included in the course Problem Based learning in Science, Technology and Society. Moreover, the students develop their skills in this area in their project work, where they will apply scientific methods in practice and reflect on their applicability in the subsequent process and project evaluation.

3.1 1st semester

Title:
Creative Play – Applied Technology
(Kreativ leg – teknologisk udformning)

Size: 5 ECTS

Prerequisites:
No special prerequisites for the module.

Objectives:
Students who complete the project module will be able to demonstrate preliminary learning outcomes for advancing as a student. Expectations are that the student can design, partly implement and assess the development of a media oriented work, such as a poster campaign, computer game, interactive homepage etc.

Students who complete the project module will obtain the following qualifications:

Knowledge

- **Understanding** of specific basic concepts within media oriented work
- **Understanding** of the scope of technology in a media context
- **Understanding** of problem-based study and the Aalborg model of PO PBL
- **Understanding** of the prerequisites of group work ethics and organization
- **Knowledge** about typical work processes in a problem based project
- **Knowledge** about the basic principles in scientific work e.g. academic honesty

Skills

- Can conceptualize, plan and organize own learning in a group situation (**application**)
- Can demonstrate basic **analysis** on media-oriented work
- Can evaluate practical problems and select relevant solutions in a media oriented context (**understanding)**
- Can verbally communicate to a satisfactory level applied work (**understanding**)
- Analyze individual as well as organizational learning processes (**understanding**)
- Organize a short period (less than a month) of collaboration in-group and with a supervisor (**application**)
- Communicate the reflections and results of the problem based project work; orally, graphically and in writing (**application**)

Competencies

- Students need to demonstrate ability to take independent responsibility of one's own learning during a shorter project period (**application**)

Type of instruction: Academically supervised student-governed problem oriented project work.

Exam format: Individual oral examination with internal censor based on a written project report and a media-technological product plus a written process analysis. The Study Board for Media Technology may decide or exempt that only a technically artefact with documentation can be the basis for the individual oral examination. Furthermore, The Study Board for Media Technology may decide or exempt from the demand for a process analysis. The assessment is performed with the Pass/Non-Pass grade.
Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Designing from Both Sides of the Screen

(Design fra begge sider af skærmen)

Size: 10 ECTS

Prerequisites:

The students must have passed the module: Creative Play – Applied Technology (Kreativ leg - teknologisk udformning)

Objectives:

To provide the student with practical experience defining a project within the area of IT, communication and new media, which includes use of object-oriented programming, to implement the project by working in groups and to document the solution in a project report. Students who complete the project module will be able to demonstrate foundational learning outcomes for advancing as a student.

Students who complete the project module will obtain the following qualifications:

Knowledge

- **Understanding** of problem-based study and the Aalborg model of PO PBL
- **Knowledge** about the history of media and its social-cultural context/application
- **Understanding** of theory, method and practice within media oriented work
- Knowledge about how to identify and describe a target group and the context for a media production (**Application**)
- Must have **understanding** about how an object oriented programming language can be used to solve a specific problem
- Must have **knowledge** about commonly occurring data structures, algorithms and abstract data types and implementation of such
- **Knowledge** about the field of Science, Technology and Society (STS) in order to identify relevant contextual perspectives of a given technology
- **Knowledge** about project management in a long-term problem based project (in this case from 2-3 months)
- **Knowledge** of methodological consideration to describe the theoretical and empirical foundation of the project

Skills

- **Ability** to apply media oriented methods and tools for design and implementation of interactive media oriented projects
- Ability to describe theory, methods and practices in media oriented projects regarding chosen technology, context and target group (**analysis)**
- Must be able to discuss, argue **analyze** and **synthesize** theory, methods and practices in media oriented projects and especially related to the specific semester courses
- Analyze individual as well as organizational learning processes by scientifically recognized concepts and methods (**application**)
- Organize and manage a longer-term project considering group and supervisor collaboration

(**application**)

- Structure and communicate the reflections and results of the problem based project work; orally, graphically and in writing (**analysis**)
- Must be able to use an object-oriented programming language and associated class library to implement parts of programs and small programs in order to solve a specific problem
- Must be able to plan and perform systematic test of the programme applied (**application**)
- Must be able to discuss/assess the quality of the solution(s) of the project in a wider context (**analysis**)

Competencies

- Must have competencies in using object oriented programming in solving programming tasks, especially programming tasks related to Medialogy, communication and IT/new media (**application**)
- Must have competencies in documenting and discussing the wider market related implications of a real world project/application (**application**)
- Take responsibility of one's own learning during a longer-termed project period and be able to generalize the gained experiences (**synthesis**)

Type of instruction:

Academically supervised student-governed problem oriented project work.

Furthermore the Study Board for Media Technology wishes to note for implementation:
1) Students have to prepare a written P1 process analysis
2) Students will get support to identify relevant contextual perspectives by consultancy; a group meeting and commenting on papers and presentation at the status seminar
3) Students will get support to transfer project management theory to the projects by a PBL-seminar and related to this comments on papers as well as presentations in order to secure action on a mid-term process-analysis
4) A written comment to the group's process analysis will be provided to support project-examination

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral examination with internal censor based on a written project report and a media-technological product plus an A/V production that illustrates and summarizes the project plus a written process analysis.

The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Problem based learning in Science, Technology and Society

(Problembaseret læring i videnskab, teknologi og samfund)

Size: 5 ECTS

Prerequisites:

No special prerequisites for the module.

Objectives:

The students shall theoretically as well as practically understand how to plan and execute a scientific problem-based project with technological, social and humanistic relevance. This includes an understanding of how technological aspects and contextual circumstances can be identified and included in the development of a problem solution.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** of basic learning theories
- Must have **knowledge** of project planning and managements techniques
- Must have **knowledge** of different approaches to problem-based learning (PBL); including the Aalborg Model approach, where problems are related to social and/or humanistic contexts
- Must have **understanding** of different resources for analysis and assessment of Medialogy-problems and solutions from scientific, technological, ethical and social perspectives
- Must **apply** methods for analysis and assessment of a Medialogy-problem; including user segmentation, user tests and technology assessment

Skills

- Must be able to **apply** basic principles related to planning and management of a problem-based project; basic study techniques, phases in a problem-oriented project, from initial problem to problem analysis and problem formulation, design and implementation
- Must be able to **analyse** and **evaluate** the organisation of the project group work and collaboration, especially regarding identification of strong and weak factors and, based on this, suggest how group organisation and collaboration can be improved in future situations; team roles, group dynamics, communication within the group and externally, creativity, methods for analysis and documentation of learning processes
- Must be able to **analyse** group conflicts; causes and possible solution
- Must be able to **analyse** and **evaluate** own contribution to study and learning, especially regarding identification of strong and weak factors and, based on this, consider continuous course of events and their contributions to the learning processes, learning styles and the study
- Must be able to **analyse** methods used in the project from a scientific point of view; science theory, qualitative and quantitative approaches
- Must be able to **apply** fundamental key areas, concepts, and methods for evaluation and development of technical solutions considering the technology in itself, and in relation to

social contexts and human circumstances (holistically); technology assessment methods, contexts and communication, media sociology (e.g. life styles, consumption, sociological methods), different forms of user test, innovation and creativity

Competencies

- Must be able to apply knowledge (**application**) and **understanding** regarding being part of a team-based project work
- Must be able to **understand** and communicate project work (**application**)
- Must be able to **analyze** own learning processes
- Must be able to analyze and document learning processes within the group (**analysis**)
- Must be able to create optimal collaborative learning processes (**application**)
- Must be able to evaluate professional situations in relation to the surrounding society (**analysis**)
- Must be able to apply knowledge and understanding of science, technology and society (**application**); from a technological perspective (including competencies on applying different technology assessment methods) and from a holistic perspective (including competencies on life style, consumption and technology development, different contexts and forms of communication, innovative and creative processes)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral or written examination with internal censor. The assessment is performed with the Pass/Non-Pass grade.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Animation and Graphic Design
(Animation og grafisk design)

Size: 5 ECTS

Prerequisites: Previous or simultaneous studies of “Introduction to Programming”

Objectives

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about the basic theory and history of graphic design and aesthetics and the relation to animation
- Must have **knowledge** about the history, techniques and principles of animation and the relation to graphic design
- Must be able to **evaluate** on the visual relationships in a composition of images (e.g. posters) and time-based media (e.g. animation)
- Must **understand** the concept of animation and its relation to graphic design
- Must have **knowledge** about the graphic design and animation production pipeline, including storyboards and animatics for animated short films
- Must **understand** the basic theories of 3D animation (e.g. the differences between forward and inverse kinematics)
- Must have **knowledge** about the state-of-the-art techniques used in computer animation and graphic design

Skills

- Must be able to **apply** basic principles within graphic design: Text and typefaces, different contrasts, color theory, balance in a composition, proportion, flow and grid design
- Must be able to evaluate and **understand** different graphical communication forms: Typefaces, shapes, contrasts, colors, balance, proportion and flow
- Must be able to **apply** the fundamentals of key framing to create traditional animation
- Must be able to **apply** the steps needed to design, model, animate, light and render a computer animated 3D scene
- Must be able to **apply** knowledge of modeling, rigging and animation to render a 3D computer animated character
- Must be able to **apply** theories of graphic design, traditional and 3D animation techniques and theories to produce an animated short film

Competencies

- Must have **knowledge** and **understanding** of fundamentals of software applications within visual design, 3D modeling and animation

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Introduction to Programming

(Grundlæggende programmering)

Size: 5 ECTS

Prerequisites:

No special prerequisites for the module.

Objectives:

Students who complete the module obtain a solid foundation in working with computers and other digital devices, which will be built upon in future coursework to enable programming for different media platforms and working with analog and digital sensors.

Furthermore, to provide the student with a foundation and basic introduction for the systematic development of programs using object oriented modelling and programming. The student should acquire an understanding of basic concepts and mechanisms in an object oriented programming language such that the student is able to use the language and associated class library to implement small programs.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Understanding** of flow control structures, both logical (e.g., if, case), and loop (e.g., for, while)
- **Understanding** data types and structures (e.g., array, struct, list)
- **Understanding** functions
- **Understanding** basic principles of Object Oriented programming, such as using application programming interfaces (APIs), the need to create custom classes, concepts of access (e.g., public, private, protected) and the concepts of inheritance, composition and encapsulation
- **Understanding** of design methodologies for programming and **understanding** of the distinction between good and bad programming practices
- **Understanding** of programming design patterns

Skills

- Ability to **apply** knowledge to the design of a simple event-driven interactive interface, e.g., a simple game
- **Interpret** and **analyze** programming code and work out manually
- Ability to **apply** programming skills to the implementation of input devices, e.g., keyboard, mouse
- Ability to **apply** programming skills to the design and implementation of basic functions and classes
- **Synthesize** built-in functions and classes from APIs
- Ability to **apply** knowledge to the systematic design of software with proper documentation
- Must be able to plan and perform systematic test of small programs (**application**)

- Must be able to discuss/assess the quality of a given program (**analysis**)

Competencies

- **Evaluate** existing code, judge its design and recommend changes
- Must have competencies in using object oriented programming in solving programming tasks, especially programming tasks related to Medialogy, communication and IT/New Media (**application**)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

3.2 2nd semester

Title:

Interaction Design – Human Computer Confluence

Interaktionsdesign – sammenløbet af menneske og computer)

Size: 15 ECTS

Prerequisites: 1st semester or similar.

Objectives:

After completing the project module the student shall be able to demonstrate knowledge, skills and competencies in how to develop and evaluate an artifact using a user-centered approach. The students shall develop their theoretical and methodological skills by designing a physical/virtual interface, which examine new modalities for individual and/or group perception, actions and experience towards delivering unified experiences and/or new forms of perception/action. Furthermore, the students develop key competences in using system development processes for development of media-technological artefacts and in working with requirements specifications developed from user needs.

Students who complete the project module will obtain the following qualifications:

Knowledge

- **Understanding** of a human centred design approach to the development and evaluation of new interfaces
- **Knowledge** about how to design and implement a simple artefact
- **Knowledge** about methods, tools and theories to allow people to explore and augment the human interaction capabilities and awareness in action and interaction
- **Knowledge** about new forms of interaction with the real world and physical/virtual models which sense information
- **Understanding** of how human computer confluence can enhance the foundations for future applications of societal value
- Must have **understanding** about how to design the interaction between a potential user and an IT product
- Must have **understanding** about methods for planning and developing an IT product
- Must have knowledge of development of requirement specifications as a basis for developing an IT project (**application**)
- Knowledge about theories and methods within the field of Science, Technology and Society (STS) in order to identify, analyze and assess the contextual impacts and perspectives of a given technology (**synthesis**)

Skills

- Ability to **apply** user centred methods and tools for design and implementation of a simple physical artefact
- Ability to **apply** new forms of interaction with the real world and physical models
- Ability to **apply** knowledge to the development of new scenarios, which support unobtrusive

interaction

- Ability to **apply** theories and methods of interaction design in order to improve early prototypes
- **Understanding** of fundamental aspects of user-centred evaluation methods
- Must be able to develop a requirement specification for a given media-technological product (**understanding**)
- Must be able to apply user interaction models as a basis for requirements specifications (**application**)
- Must be able to link user requirements with the requirement specification for a given artefact **(application**)
- **Understanding** of how to collect information via a variety of resources, libraries, internet, interviews etc.
- Analyze and model individual as well as organizational learning processes based on experiences from P0 and P1 (**analysis**)
- Reflect on the construction and reconstruction of science and technology in a user and society perspective (**analysis**)
- Relate the professional practice within the discipline to the needs of humans and different societies (**analysis**)
- Analyze technical or natural scientific problems by use of social science methodology (**understanding**)
- Assess the impacts on human and society from the proposed solutions (**understanding**)
- Must be able to evaluate a media-technological project based on requirements (**analysis**)

Competencies

- Ability to design, implement and **evaluate** interfaces that go beyond the traditional mouse and keyboard, from a designer perspective
- Ability to **synthesize** theories and methods in the cooperation within interdisciplinary group situations towards delivering unified human-computer experiences, including new forms of perception/action
- Ability to **synthesize** and critically reflect upon theories, tools and methods to the design of physical/virtual interfaces where new modalities of actions and interactions are considered
- Ability to **understand** cultural and societal implications of the use of selected artefacts
- Must have competencies in development of a requirements specification (**application**)
- Must have competencies in elicitation of user requirements and to translate these into the requirement specification for a specific product (**application**)
- Must have competencies in user interaction models (**analysis**)
- Manage a longer termed project independently (**synthesis**)
- Generalize the gained experiences with project management and put them into perspective of the future course of study (**evaluation**)
- Reflect on the ethical perspective of engineering and science and discuss implications of a responsible professional practice (**analysis**)

Type of instruction:

Academically supervised student-governed problem oriented project work.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology: Individual oral examination with external censor based on a written project report and a media-technological product plus a written P2 process analysis plus an A/V production that illustrates and summarizes the project. The assessment is performed in accordance with the 7-point grading scale.
Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Mathematics for Multimedia Applications
(Matematik til multimedie-applikationer)

Size: 5 ECTS

Prerequisites: Mathematics B or better (or equivalent level or better from foreign upper secondary institutions)

Objectives:
Introduction of the mathematics needed for media technology applications.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Understand** trigonometric functions and identities
- **Understand** logarithmic and exponential functions
- **Understand** differentiation and integration of functions of one variable, including numerical methods
- **Understand** vectors and basic vector operations, dot product and cross product
- **Understand** basic geometry in 2 and 3 dimensions: points and distance; lines, planes, spheres and their intersections
- **Understand** parametric curves: position, velocity and acceleration
- **Understand** matrices, basic matrix operations and linear transformations
- **Understand** systems of linear equations
- **Understand** matrix inversion
- **Understand** the relevance and application of mathematics to modeling and understanding systems and phenomenon

Skills

- Ability to perform basic algebraic calculations (**application**)
- Ability to work with trigonometric, logarithmic and exponential functions (**application**)
- Ability to calculate derivatives of functions of one variable (**application**)
- Ability to calculate integrals of functions of one variable (**application**)
- Ability to perform calculations involving vectors, vector operations, matrices and matrix operations (**application**)
- Ability to determine equations for lines, spheres and planes, to calculate intersections and find distances (**application**)
- Ability to differentiate and integrate vector functions (**application**)
- Ability to determine solvability and complete solutions for systems of linear equations (**application**)
- Ability to determine the invertability of a small square matrix and its inverse if it exists (**application**).

Type of instruction:
Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are

decided and given by the Study Board for Media Technology.

Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

Individual written examination with internal censor. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Physical Interface Design
(Fysisk Interface Design)

Size: 5 ECTS

Prerequisites:
All course and project-modules on the 1st semester must have been followed by the student.

Objectives:
Physical Interface Design is a course module where students learn about basic principles of electronics and how different touch based sensors can be interfaced to a microcontroller to design novel forms of interactions between man and machines.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about basic user interface design principles for realizing a physical interface for human-computer interaction
- Must have **knowledge** of related work in sensors technology and media applications
- Must have **knowledge** of basic electronics: capacitor, diode, and transistor
- Must have **knowledge** of sensing possibilities: push buttons, potentiometers, photo resistors and force sensitive resistors (FSR)
- Must have an **understanding** of data mapping strategies
- Must have **understanding** on using micro-controllers: interface to the computer, analog/digital input/output
- Must have **understanding** of circuit applications: DC filtering, circuit protection and amplifier
- Must have an **understanding** of basic programming concepts in context of real-time use of signals (such as sampling rate, scaling and filtering)

Skills

- Must be able to apply knowledge to the development of a physical interface artifact used in conjunction with a PC software application - and demonstrate its use (**application**)
- Must be able to **apply** theories and methods to the design of a user-test of artifact, including: meeting end-user(s), assessing needs, translation of needs into design goals, arranging test and designing test-set up including data collection for evaluation of test according to goals
- Must be able to **analyze** use of the artifact
- Must be able to **synthesize** knowledge in written documentation

Competencies

- Must have ability to **evaluate** the artifact

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Interaction Design
(Interaktionsdesign)

Size: 5 ECTS

Prerequisites: All course and project-modules on the 1st semester must have been followed by the student.

Objectives:
The objective of the course is to provide the students with an understanding of the theories and methods of interaction design and the ability to apply these theories and methods for concrete design problems.

Students who complete the course module will obtain the following qualifications:

Knowledge

- The iterative process of interaction design (different life cycle models) (**application**)
- User centered methods for design (**application**)
- Methods for user tests **application**)
- Conceptualizing interaction (**understanding**)
- Characterise users and their needs, preferences and capabilities (**understanding**)
- Conceptual design and using prototypes in design (**application**)
- Data gathering (**application**)
- Data analysis and interpretation: (**application**)
    - Qualitative (identifying recurring patterns and themes, categorizing data, looking for critical incidence etc.)
    - Quantative analysis including basic descriptive statistics, measures of central tendency (mean, median and mode) and variability (standard deviation and variance)
- Graphical data representation (**knowledge**)
- Physical computing (i.e., designing interfaces which go beyond the traditional graphical user interfaces) from a designer perspective (**understanding**)
- The concept of designing and building lo-fi and hi-fi prototypes as an integral part of the interative design process and to evaluate these in user tests (**understand/apply**)
- **Applying** usability test design of goals and principles such as user friendliness, learnability, likeability, sociability, playability etc. using both:
    - Empirical methods (focus group, questionnaires, interviews, observation, case studies, field studies etc.)
    - Theoretical methods (cognitive walkthroughs, task analysis, heuristic evaluation etc.)
- **Understanding** techniques processes and issues involved in creating successful physical and virtual interfaces
- **Understanding** and **applying** principles and goals for the interaction design of physical and virtual interfaces: Affordances, constraints, mapping, causality, feedback, modes etc.

Skills

- Design (**apply**) solutions to simple interaction design related problems, including uses in the process
- **Understanding** and **applying** how to perform user evaluations
- Ability to demonstrate **(application)** the concept behind their interface design through conceptual models and sensor data mapping

Competencies

- **Analyse** needs of different target groups
- **Compare** different user-centred evaluation methods, on a level to decide which of them are applicable and suitable for certain evaluations.**Apply** and **evaluate** selected user-centered evaluation methods
- **Apply** the iterative method for interaction design

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual assessment based on active participation during the course. The assessment is performed with the Pass/Non-Pass grade.

Note that if parts of the assessment are to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

3.3 3rd semester

Title:
Visual Computing
(Visual Computing)

Size: 10 ECTS

Prerequisites:
MED2 or similar

Objectives:
One of the cornerstones in Medialogy is to build systems that automatically react to humans. In this module the focus is on doing so using visual computing, i.e., automatically analyzing visual information recorded by one of more cameras. For example, a computer game controlled by human movements or a dynamic art installation reacting to the constellation of people in an environment. The students will work with a concrete problem where automatic analysis of visual data is central. The problem will be analyzed and a concept for a solution suggested. The concept (or parts hereof) will be designed, implemented and evaluated using relevant theories and methods from the sub-fields of visual computing: image processing, programming and perception.

Students who complete the project module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about the terminology within visual computing
- Must be able to **understand** how a particular visual computing system e.g. the semester project of the student, relates to similar systems and to the surrounding society

Skills

- Must be able to **analyze** a problem and (if possible) suggest a solution that uses relevant theories and methods from visual computing
- Must be able to **analyze** a system that is based on visual computing and identify relevant constraints and assessment criteria. This relates both to the usability of the system, the technical aspects of the system and (if relevant) the usefulness to society
- Must be able to **synthesize**, i.e., design and implement, a system (or parts hereof) using relevant theories and methods (if possible) from visual computing
- Must be able to **evaluate** a visual computing system (or parts hereof) with respect to the afore mentioned assessment criteria
- Must be able to communicate the above knowledge and skills (using proper terminology) both orally and in a written report

Competencies

- Must be able to select relevant theories and methods from the field of visual computing and **apply** these in a new context
- Must be able to plan, structure and execute a project, within the field of visual computing

and use of information technology systems in organizations
Type of instruction: Academically supervised student-governed problem oriented project work.
Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology: Individual oral examination with internal censor based on a written project report and a media-technological product plus an A/V production that illustrates and summarizes the project. The assessment is performed in accordance with the 7-point grading scale.
Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
A/V Production
(A/V produktion)

Size: 5 ECTS

Prerequisites: No special prerequisites for the module.

Objectives:

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Knowledge** of fundamentals of copyright, financing and distribution so as to be able to set up a business plan
- **Understanding** standard contracts for film on video and archive sales and license terms
- **Understanding** of the production phases and the production crew jobs
- **Understanding** about development of programme concept such as idea, relevance to viewers, target group, story angle, genre, program elements, audio and visual concept
- **Understanding** about development of production concept such as production plan, plan of crew, financial plan, productions routines: editorial meeting, editorial management, after criticism and facility coordination
- **Knowledge** of fundamentals of software applications within AV-productions within preproduction and postproduction
- **Understanding** the use of pre-viz for difficult shots combining storyboard with floor plan
- **Understanding** the use of script styling
- **Understanding** how to analyze a script in relation to the Sound-production
- **Understanding** the use of gain as noise and as an effect
- **Understanding** the gamma curve
- **Understanding** calculators for the setting of Footage, Aspect Ratio, Depth of Field and Power Load
- **Understanding** how to choose a microphone

Skills

- Ability to methodically create different DOF's according to the substance of the scene (**application**)
- Ability to explore and discuss the lighting principles for one distinct filmlighting style (**application**)
- Ability to **analyze** basic lighting set-ups for all greenscreen production
- Ability to **apply** methods for analysis and evaluation of own productions based on Anglosaxon and Scandinavian TV- and Filmdramaturgy
- Ability to discuss the dramaturgical methods in TV-entertainment shows, TV-serials, TV-series and the emerging formats such as web serials (**analysis**)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

The exam Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Image Processing
(Billedbehandling)

Size: 5 ECTS

Prerequisites: Mathematics for Multimedia Applications

Objectives:
Cameras capture visual data from the surrounding world. Building systems which can automatically process such data requires image processing methods. Students who complete the module will understand the nature of digital images and have an overview of different theories and methods within image processing and their applicability.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about the primary parameters of the camera and lens
- Must have **knowledge** about the representation of a digital image
- Must be able to **understand** the general framework of image processing
- Must be able to **understand** and interpret image histograms
- Must be able to **understand** color images and their different representations
- Must be able to **understand** the principle of point processing
- Must be able to **understand** principle of neighborhood processing
- Must be able to **understand** what a BLOB is and how it can be extracted
- Must be able to **understand** how moving objects can be segmented in a video sequence

Skills

- Must be able to **apply** the following point processing methods: grey-level mapping, histogram stretching, thresholding and image arithmetic
- Must be able to **apply** the following neighborhood processing methods: median filter, mean filter and edge detection
- Must be able to **apply** the following morphologic operations: dilation, erosion, opening and closing
- Must be able to **apply** basic feature extraction and matching
- Must be able to **apply** image differencing and background subtraction
- Must be able to **apply** geometric transformations to an image

Competencies

- Must be able to **apply** the general framework of image processing in a new context. This includes choosing the relevant methods and evaluating the output
- Must be able to combine different morphologic operations and **understand** the resulting effect they have on a binary image

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.
Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology: Individual oral or written examination with internal censor. The assessment is performed with the Pass/Non-Pass grade.
Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Perception
(Perception)

Size: 5 ECTS

Prerequisites: Interaction Design (Med 2)

Objectives:
We perceive and interpret the world around us using our senses. The same senses can also be deceived, often because we expect the world to look, sound or feel as we have been used to. Students who complete this module should be able to design systems that take advantage of the sensitivities and insensitivities of the human senses.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** of the basic physiology of the human senses (vision, hearing, touch and vestibular)
- Must have **knowledge** about the sensitivity and limitations of the human senses (vision, hearing, touch and vestibular)
- Must have **knowledge** about the basic principles of neural function and communication: neural firing; receptive fields and after effects
- Must be able to **understand** how objects and scenes are perceived
- Must be able to **understand** attention theories
- Must be able to **understand** motion perception theories
- Must be able to **understand** frequency, amplitude, pitch, loudness and timbre of a sound
- Must be able to **understand** basic theories of auditory scene analysis
- Must be able to **understand** masking effects
- Must be able to **understand** Gestalt theories

Skills

- Must be able to **apply** a list of constraints with regards to human sensitivity when designing a medialogy application; limits of audibility and visibility; latency vs. reaction time etc.
- Must be able to **apply** knowledge of sensitivity when assigning computational resources in the design of digital media applications

Competencies

- Must be able to **apply** general theories on perception to concrete phenomenon and situations
- Must be able to **apply** current knowledge on human perception in the evaluation of systems, reflecting on what users can and cannot perceive
- Must be able to **apply** theories on human perception and attention in designs that take the human user into account

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual assessment based on active participation during the course. The assessment is performed with the Pass/Non-Pass grade.

Note that if parts of the assessment are to be based on written work, a deadline is stipulated for when the work must be handed in. If the student hands in a paper after the deadline, the student has used an examination attempt.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Procedural Programming

(Proceduremæssig programmering)

Size: 5 ECTS

Prerequisites: Introduction to Programming (MED 1)

Objectives:

Students who complete the module enrich their background in working with computers and other digital devices in procedural ways to enable programming for different media platforms and working with analog and digital sensors.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Understand** integrated development environments
- **Understand** differences between run-time and compile-time computer programming languages
- **Understand** recursive functions
- **Understand** instances of inheritance, composition and encapsulation, and explain their utility
- **Understand** pointers and references
- **Understand** types, declarations, expressions and statements
- **Understand** libraries and the concept of linking
- **Understand** the complexity of a program
- **Understand** different methods for debugging code

Skills

- Design an event-driven interactive interface, e.g., a simple game and integrate external libraries **(application)**
- Interpret and **analyze** a basic object oriented program and elaborate its functionality
- Interpret compiling error messages (**understanding)**
- Design and implement algorithms for data structure manipulation using references and addresses where necessary (**application)**
- Work out the complexity of a program **(understanding)**
- Explain how to use algorithms, functions and data for solving problems **(understanding)**

Competencies

- Evaluate (**analysis**) existing code, judge its design and recommend changes

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are

decided and given by the Study Board for Media Technology.
Exam format: In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology: Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.
Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

3.4 4th semester

Title:
Sonic Interactions: Design and Evaluation
(Lydlige interaktioner: design og evaluering)

Size: 15 ECTS

Prerequisites:
MED 3

Objectives:
Hearing is one of the fundamental senses of the human perceptual system. Being able to understand how auditory signals are created and how they can be used as input or output devices in solving problems in interactive media is an essential element of the Medialogy education.

In this project module, students pose problems which include the design and implementation of systems being able either to analyze an auditory signal in real-time or to produce interactive auditory feedback. Such feedback is either created from scratch using sound synthesis techniques or obtained by manipulating recorded samples. Examples of such systems are an interface which is controlled by the human voice or an interactive installation where the sounds change according to users' motions, or a tangible sonic interface embedded with sensors.

The posed problem must be motivated, analyzed and its solution evaluated using a user-centred design approach.

Students who complete the project module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about theories and techniques within audio design and computing
- Must be able to **understand** basic concepts and terminologies in the field of sound design and processing
- Must be able to **understand** how to evaluate the proposed solution
- Must have **knowledge** of interactive sound

Skills

- Must be able to **analyze** a problem and suggest a solution that uses relevant theories and methods from interactive sound design and computing
- Must be able to program a multimedia system where sound and interaction play an important role (**application**)
- Must be able to **apply** a human centered design approach to the development of audio artifacts
- Must be able to identify relevant constraints and assessment criteria for a system based on audition. This relates both to the usability of the system, the technical aspects of the system and its ability to solve a problem in the field of medialogy (**application**)
- Must be able to design and implement an interactive system where audio is used as either input and/or output, using relevant theories from the field of sound and music computing (**synthesis**)
- Must be able to design, plan and conduct a quantitative experiment which assesses the

proposed solution (**synthesis**)

- Must be able to describe, communicate and argue the designed solution using proper terminologies and theories from the fields of sound and music computing and experiment design, both orally and in a written report (**synthesis**)

Competencies

- Must be able to select relevant theories and methods from the field of sonic interaction and **apply** these to solve a problem
- Must be able to plan, structure, execute and evaluate a project within the field of sonic interaction (**synthesis**)

Type of instruction:

Academically supervised student-governed problem oriented project work.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral examination with internal censor based on a written project report and a media-technological product plus an A/V-production that illustrates and summarizes the project. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria:

The criteria for the evaluation are specified in the Framework Provisions.

Title:
Sound and Music Computing
(Lyd- og musikbehandling)

Size: 5 ECTS

Prerequisites:
A/V Production (MED3), Perception (MED3), Procedural Programming (MED3)

Objectives:
The objective of this course is to give the students an understanding of the communication networks, technologies, architecture, topologies and standards, including the major technological components used in the communication networks. The aim is further to have an understanding of the major parameters, which are decisive when constructing network infrastructures.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Apply** knowledge from auditory perception in working with digital sound
- **Understanding** of how to use sound for communication and control to enable a more natural human-computer interface
- **Knowledge** of the use of sound design in interactive media
- **Understanding** differences between speech, music, environmental sound and designed sounds
- **Understanding** time and frequency domain
- **Understanding** the differences between the following types of sound signals: speech, music, environmental and designed sound, and their use in a variety of media applications as input and output
- **Understanding** sampling and quantization, uncompressed audio data formats, such as, WAV, AIFF and aliasing and quantization noise
- **Understanding** sampled audio in time and frequency domain and the shape of common sound components in the time and frequency domain
- **Understanding** filtering in the time domain (impulse response) and frequency domain (frequency response)
- **Understanding** reverberation, spatial audio: stereo, and recent surround stereo standards
- **Understanding** basic sound synthesis techniques (additive, subtractive, granular and modulation)
- **Understanding** feature extraction and its use to sound and music computing
- **Understanding** basic sound effects
- **Understanding** aspects of audio processing in real-time and off-line

Skills

- Ability to quantitatively **analyze** digital audio by methods of auto-correlation, the Fourier transform and the extraction of relevant features, such as pitch, spectral energy distribu-

tions, harmonicity and noisiness
- **Apply** knowledge to the design of an interactive soundscape for multimedia product
- Ability to implement interactive sound effects (**application**)
- Ability to implement basic filters for processing digital audio in the time and frequency domains (**application**)
- Ability to **understand** the importance of specifications such as sample rate, bit rate and quantization for multimedia applications

Competencies

- Students who complete this module will be able to effectively and efficiently collaborate and communicate with others in different disciplines to build useful and innovative software applications to meet a diversity of needs

Type of instruction: Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

Individual oral or written examination based on mandatory exercises and mini-project with internal censor. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Design and Analysis of Experiments

(Design og analyse af eksperimenter)

Size: 5 ECTS

Prerequisites:

Interaction Design (Med2), Mathematics for Multimedia Applications (Med2), Perception (Med3)

Objectives:

A crucial aspect of designing medialogy systems, tools or applications is the need to evaluate the work experimentally. The knowledge of how to properly design experiments to collect and evaluate data is essential to answer many of the problems within medialogy. Examples are testing which of two tracking algorithms that is the most efficient; how users perform with different kinds of feedback; possible relationship between age and performance etc.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must be able to **understand** the basic concepts of probability: sample space of all possible events; combinatorics; independent events; conditional probability; binomial distribution etc.
- Must display **knowledge** about basic statistic terminology and treatment of data: distribution functions; measures of central tendency and variability; histogram; central limit theorem etc.
- Must be able to **understand** advantages and disadvantages with different types of designs and studies (between-group and within-group design; correlational study; blind/double blind etc.)
- Must be able to relate frequency distribution to the concept of hypothesis testing (**understanding**)
- Must be able to **understand** possible ethical concerns for a study

Skills

- Must be able to design an experiment to measure changes in a dependent variable, identifying and efficiently controlling all relevant independent variables (**application**)
- Must be able to properly inform and instruct persons participating in a study (**application**)
- Must be able to **understand** and select among the most common methods for statistical analysis and assessment of experimental data (e.g. t-test, chi-square tests, correlation and simple linear regression)
- Must be able to **understand** different measurement scales and discuss experiments in terms of reliability, bias and sensitivity
- Must be able to discuss own data in terms of assumptions for statistical testing (**application**)
- Must be able to use an existing statistical package to **analyze** and present experimental results
- Must be able to discuss and represent empirical data in different ways (describing text, numbers, formulas, graphs and figures) and shift between these according to the needs of the situation and context (**application**)

- Must be able to read, understand and implement experimental and empirical work as described in relevant literature (**application**)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual assessment based on active participation during the course. The assessment is performed with the Pass/Non-Pass grade.

Note that if parts of the assessment are to be based on written work/exercises, a deadline is stipulated for when the work must be handed in. If the student hands in paper(s)/exercise(s) after the deadline, the student has used an examination attempt.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Object Oriented Software Engineering
(Objektorienteret Software Engineering)

Size: 5 ECTS

Prerequisites: Procedural Programming (MED3)

Objectives:
To build upon the foundation acquired from the programming courses from MED1 and MED3 in working with computers and other digital devices; to learn, practice and perfect the art and science of software engineering from design and implementation to delivery; to learn about communications between digital devices; to learn how to develop graphical user interfaces.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Understanding** OOSE principles: objects, classes and instances; encapsulation; inheritance; virtual functions and polymorphism; overriding and overloading; private vs. public vs. protected class members; templates
- **Understanding** OOSE elements: object and class definitions; instances, data members and functions; pointers and references; UML
- **Understanding** OOSE advantages: code comprehension; debugging; modular development and reusability; abstraction
- **Knowledge** of the development of large projects using an integrated development environment (IDE)
- **Understanding** concepts of programming for the Internet and its various applications, such as e-mail, WWW, peer-to-peer and file transfer
- **Understanding** the top three layers in the 5-layer Internet protocol stack: Application, Transport and Network
- **Understanding** concepts of programming for networks: clients and servers; sockets; establishing a connection; ports; IP address; Ethernet address
- **Knowledge** on the concepts behind graphical user interfaces (GUIs): common GUI elements; message passing; issues with cross-platform development; multithreaded programming
- **Knowledge** on the concepts behind multithreaded programming: processes and threads; scheduling; bottle necks and deadlock; shared data; mutex locks; the race condition

Skills

- Design and implement an existing solution to a problem using OOSE principles: objects, classes and instances; encapsulation; inheritance; virtual functions and polymorphism; overriding and overloading; private vs. public vs. protected class members; templates (**application**)
- Design and implement a new solution to an existing problem using OOSE principles that is modular, well-documented and comprehensible (**synthesis**)

- **Analyze,** interpret and explain pre-existing code and UML
- **Analyze** and interpret an application programming interface (API)
- **Analyze** and work out computational complexity of an algorithm
- Demonstrate the use of an IDE for code development (**understanding**)
- **Understand** digital application and communication protocols: HTTP; FTP; SMTP; TCP and UDP
- Implement a program that communicates between two digital devices at the Application and Transport layers (**application**)
- Explain how to use a common GUI API (**understanding**)
- Implement a useful GUI with: common GUI elements; message passing; issues with cross-platform development; multithreaded programming (**application**)

Competencies

- Evaluate and combine adapt pre-existing code, such as libraries and application programming interfaces (APIs) (**application**)
- Recommend changes to an algorithm (**analysis**)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

3.5 5th semester

Title:
Audio-Visual Experiments – Pre-Rendered Experiences
(Audio-Visuelle eksperimenter – pre-renderede oplevelser)

Size: 15 ECTS (Elective)

Prerequisites: Med 4

Objectives:

The students shall learn about screen media production, animation and computer graphics, including the analysis of relationships between audio-visual communication and the communication offered by animation and computer graphics technologies. The students shall develop their technical and methodological skills by creating audio-visual experiments and experiences that are pre-rendered.

Computer generated imagery (CGI) is an integral part of visual media products. It is so abundant and of so high quality, that oftentimes it is no longer noticed. We find computer generated imagery in movies that are either entirely computer generated or substantial elements are made as special effects and we find CGI in commercials, music videos or for example visualizations of molecular biology.

In this project module students will be working with analyzing, designing and implementing/producing (parts of) media-technological experiments and/or products in which pre-rendered computer graphics imagery is an essential part. This can for example be an animated short story, developing technology and/or methodology for a special effect or production tools for aiding in the implementation/production of such products.

It is essential that projects contain elements of pre-rendered computer graphics, and addresses an audio aspect, if applicable (and it has to be considered that many of the desired impacts on an audience can be achieved through the use of audio instead of or in combination with visuals).

Projects of a filmic nature must be informed or inspired by film theory and cinematography. Projects of a more technical nature must address a well-defined problem for which performance requirements can be established. For all types of projects, evaluations of the produced solution must be conducted to test formulated hypotheses or set design criteria.

Students who complete the project module will obtain the following qualifications.

Knowledge

- **Understanding** of modelling, animation and rendering techniques for high quality computer graphics imagery
- **Understanding** of film form and dramaturgic models

Skills

- Ability to **analyze**, design and implement/produce an audio-visual artifact with a narrative element and aimed at communicating a formulated message or experience to a human user of group of users
- Ability to **apply** cinematographic concepts in commercial graphics rendering tools such as

3ds Max or Maya

- Ability to **analyze** the audio-visual communication possibilities and requirements associated with a chosen project subject
- Ability to **analyze** the technical requirements associated with the chosen project subject
- Ability to **synthesize** an effective solution to the chosen project domain by bringing together relevant concepts, theories and techniques from the fields of film theory and 3D computer graphics

Competencies

- Ability to synthesize knowledge, methodology or techniques concerning a problem centred around computer generated imagery, and/or
- Ability to synthesize animation sequences that are effective according to some chosen communication requirements

Type of instruction:

Academically supervised student-governed problem oriented project work.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral examination with external censor based on a written project report and a product (technical artefact) plus an A/V-production that illustrates and summarizes the project. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Audio-Visual Experiments – Interactive Experiences

(Audio-Visuelle Eksperimenter – interaktive oplevelser)

Size: 15 ECTS (Elective)

Prerequisites: Med4

Objectives:

The students shall learn about screen media production, animation and computer graphics, including the analysis of relationships between audio-visual communication and the communication offered by animation and computer graphics technologies. The students shall develop their technical and methodological skills by creating audio-visual experiments and experiences that are interactive.

Interactive 3D computer graphics applications are becoming increasingly abundant and find themselves into ever more aspects of our lives. They range from 3D computer games for entertainment over mobile augmented-reality applications for navigation to visualizations of abstract phenomena in web-based applications. In addition to its wide range of applications areas, interactive 3D computer graphics is also mediated in many different ways, from high-end desktop computers to handheld devices, from projection screens to head-mounted displays, from monitors to laser light displays.

In this project module students will be working with analyzing, designing and implementing (parts of) applications in which real-time, interactive 3D computer graphics is an essential part. This can, for example, be a 3D game based on a game-engine, a custom-designed application for data visualization, an interactive edutainment installation, a mobile navigation application or even a production tool for aiding in the implementation of such applications.

It is essential that projects contain elements of real-time, interactive 3D computer graphics and address an audio aspect, if applicable (and it has to be considered that many of the desired impacts on an audience can be achieved through the use of audio instead of, or in combination with visuals). Film theory and cinematography must be applied wherever it can be applicable for the project or wherever the project can benefit from such theoretical and practical considerations. Evaluations of the designed solution must be conducted to test formulated hypotheses or set design criteria.

Students who complete the project module will obtain the following qualifications:

Knowledge

- **Analysis** of fundamental concepts and theories within screen media production, animation and computer graphics
- **Understanding** of the mathematical transformations and interpolations involved in animating and projecting 3D models on 2D displays
- **Understanding** of real-time rendering techniques for interactive 3D computer graphics

Skills

- Ability to **analyze** relationships between established theories for audio-visual communication and the communicative possibilities offered by animation and computer graphics technologies

- Ability to **apply** theories, methods and techniques within animation and computer graphics (to create an interactive application or a communicative artefact/installation)
- Ability to **analyze** theoretical and practical issues in interactive 3D computer graphics and to synthesize solutions for such issues
- Ability to **apply** 3D modeling, animation and rendering techniques to synthesize an interactive 3D computer graphics application

Competencies

- Ability to **analyze** the product requirements of an interactive graphics application and to synthesize a functional specification for it
- Ability to critically **evaluate** their knowledge in comparison to the knowledge required for the project work - in particular knowledge in 3D computer graphics, human-computer interaction and/or audio design and programming

Type of instruction:

Academically supervised student-governed problem oriented project work.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral examination with external censor based on a written project report and a product (technical artefact) plus an A/V-production that illustrates and summarizes the project. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Computer Graphics Programming

(Computergrafik programmering)

Size: 5 ECTS

Prerequisites: Introduction to Programming (MED1), Mathematics for Multimedia Applications (MED2), Image Processing (MED3) and Procedural Programming (MED3)

Objectives:

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Knowledge** of the programmable, hardware-accelerated graphics rendering pipeline as exposed for example by OpenGL
- **Understanding** of rotations of 3D space and their different mathematical representations: matrix, axis/angle, quaternion
- **Understanding** of homogeneous coordinates and the matrix representation of translations
- **Understanding** of the mathematical transformations involved in creating 2D projections from 3D models
- **Understanding** of interpolation with Bezier curves and splines
- **Understanding** of the interpolation of vertex attributes such as colors (for Goraud Shading), normals (for per pixel lighting) and texture coordinates (for texture mapping)
- **Understanding** of real-time local illumination models, in particular the Phong reflection model including the use of the halfway vector
- **Understanding** of texture mapping including compositing of multiple textures, normal maps, environment/reflection maps and shadow maps
- **Knowledge** of framebuffer operations including blending, stencil tests and depth tests
- **Knowledge** of acceleration techniques such as viewport culling, back face culling, occlusion culling and deferred rendering
- **Knowledge** of techniques to improve image quality such as antialiasing by super sampling and anisotropic mipmap texture filtering

Skills

- Ability to **apply** a graphics API such as OpenGL and GLUT for procedurally generating and interactively controlling three-dimensional content
- Ability to **apply** simple vertex and fragment shaders (e.g. implementing per-vertex diffuse lighting and normal mapping)
- Ability to **apply** a graphics application that imports two-dimensional and three-dimensional content (such as textures and meshes) from a modeling tool (such as Blender, 3ds Max or Maya)
- Ability to **analyse** the design and implementation of interactive graphical applications with personnel of different professional backgrounds (such as artists, designers, programmers etc.)

Competencies

- Ability to **synthesize** an interactive graphical application and to choose appropriate frameworks and APIs (OpenGL, scene graph, game engine etc.)
- Ability to learn further graphics APIs (such as Direct3D, OpenGL ES, SVG, X3D and canvas graphics in HTML5), game engines and APIs for user interaction (**application**)

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a papers/exercises after the deadline, the student has used an examination attempt.

The exam Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Computer Graphics Rendering
(Computer Graphics Rendering)

Size: 5 ECTS

Prerequisites: Animation and Graphic Design (MED1), A/V Production (MED3)

Objectives:

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Knowledge** of basic concepts of radiometry/photometry
- **Understanding** of the ray tracing rendering technique
- **Understanding** of mathematical concepts necessary for working with radiometry and global illumination, including spherical coordinates, solid angles, numerical and analytical integration, integration over spherical domains
- **Understanding** of the final gather and the photon mapping techniques for global illumination simulation
- **Understanding** of aspects of the trade-offs between rendering quality and rendering time
- **Knowledge** of High Dynamic Range imaging (HDRi)
- **Knowledge** of match moving technology for camera matching
- **Knowledge** of texture mapping techniques such as normal and bump maps

Skills

- Ability to **apply** radiometric/photometric concepts and associated mathematical concepts to compute radiance/luminance levels in scenes with known illumination sources
- Ability to **apply** cinematographic elements to rendered animation sequences, i.e., working with camera effects (depth-of-field, motion blur, lens flares etc.) and illumination, in order to achieve a desired visual expression
- Ability to **apply** camera matching and HDRi light probes for illumination matching, for rendering virtual objects into real footage
- Ability to **analyze** (experiment with and choose) relevant strategies for reducing rendering time for a given animation sequence such as re-use of global illumination computations
- Ability to **apply** MaxScript (3ds Max) or MEL (Maya) scripting techniques to simplify setup of scene content and controlling cinematographic elements

Competencies

- Ability to **synthesize** (design and generate) rendered image sequences according to some desired visual expression, and to work iteratively with developing visual expressions using commercial rendering tools such as 3ds Max or Maya

Type of instruction:

Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in papers/exercises after the deadline, the student has used an examination attempt.

The exam Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Screen Media
(Screen Media)

Size: 5 ECTS

Prerequisites: Med 4, A/V Production (Med3), Perception (Med3) and Animation and Graphic Design (MED1)

Objectives:

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** of historical and theoretical aspects of motion picture and screen media production and technology
- Must be able to **understand** general theories and practices within film/video/game productions, advertising and communication industry
- Must be able to **understand** film form
- Must be able to **understand** dramaturgic models for scriptwriting
- Must be able to **understand** continuity and discontinuity editing: spatial and temporal relations
- Must be able to **understand** film production elements

Skills

- Must be able to **apply** theoretical aspects of motion picture in analysis of production
- Must be able to **understand** mise-en-scene, cinematography and framing
- Must be able to **analyze** traditional narrative theories and interactive narrative forms
- Must be able to **analyze** film types and genres
- Must be able to **analyze** major film theories and approaches
- Must be able to **apply** theoretical knowledge to conduct film/media analysis

Competencies

- Ability to **synthesize** new audio-visual artifacts based on theories and techniques
- Ability to **synthesize** theoretical knowledge to construct audiovisual sequences and/or tools for designing audiovisual experiences or effects
- Ability to s**ynthesize** soundscapes and audio-visual artifacts

Type of instruction:
Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are

decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in papers/exercises after the deadline, the student has used an examination attempt.

The exam Individual oral or written examination with internal censor. The assessment is performed in accordance with the 7-point scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

3.6 6th semester

Title:
Interactive Systems Design
(Design af interaktive systemer)

Size: 20 ECTS

Prerequisites: All previous semesters (projects and course-modules) must have been passed (1st to 5th semester)

Objectives:
Interactive Systems Design is a core element of Medialogy. The goal of the Medialogy 6th semester project module is for students to use the acquired knowledge, skills and competences from previous semesters and combined with what is in this semester learnt how to create their final bachelor project. Concerning design, analysis and evaluation, the final semester demands an advanced theoretical, methodological and reflective thinking.

Students who complete the project module will obtain the following qualifications:

Knowledge

- Understanding of emerging technologies when designing interactive media (**synthesis**)
- Understanding of theories and methods for processing of sensory input, synthesizing of outputs (sounds, graphics, touch) and design rules and concepts of software systems (**application**)
- Understanding of societal contexts of a Medialogy application (analysis)
- Understanding of the 'vocabularies' of specialized Medialogy disciplines to be able to communicate ideas and processes to experts (**synthesis**)
- Knowledge of principles for designing, realizing, analyzing and evaluating an interactive media product (**evaluation**)
- **Synthesis** of methodological consideration to describe the theoretical and empirical foundation of the project
- Understanding of theories of interactive systems design (application areas can be e.g. a game, an art installation, an edutainment system, a rehabilitation system or a different service to the public) (**application**)

Skills

- Ability to **analyze** previous research, theories and current trends concerning interactive and converging media
- Ability to use such an analysis to **synthesize** an interactive media system involving auditory, visual and/or haptic feedback and alternative input devices (i.e. computer vision or tangible interfaces)
- Ability to **synthesize** learned theories and methods in the design and implementation of an interactive media application
- Ability to **synthesize** scientific methods in the investigation of previous research in the re-

lated field of interest

- Ability to discuss the developed system with both end users and peers/professional experts (**evaluation**)
- Ability to plan, design and perform and evaluate systematic test(s) of the media-technological artefact from a human-centered and/or system-based perspective wherever applicable in the specific context of the interactive system (**analysis**)
- Ability to implement and discuss feasibility, design requirement specifications and sustainability of the developed interface (**evaluation**). Furthermore feasibility should not be limited to economic considerations such as cost/benefit, but go beyond and include e.g. societal, political and technological impact-factors
- Must be able to discuss/assess the quality of the solution(s) of the project in a wider context (**evaluation)**

Competencies

- Generalize the gained experiences with managing the bachelor project and put them into perspective of the future course of study (**evaluation**)
- Ability to **synthesize** knowledge, methods, theories and techniques concerning a problem centered around an interactive system
- Must have competencies in combining a wide range of technologies, such as auditory and visual displays, input- and output devices, network and communication protocols in order to realize advanced and non-trivial applications and solutions (**synthesis**)
- Ability to collaborate with industry professionals e.g. game designers, interaction designers, designers of interfaces for children and the disabled, GUI designers, in order to participate to the design and implementation of an interactive media product (**evaluation**)
- Ability to **synthesize** knowledge in various forms of documentation e.g. written, oral presentations, A/V productions, portfolio and prototypes
- Ability to communicate and present the project applying scientific-based descriptions of aspects such as design, construction, analysis and evaluation of an interactive media including consideration of human factors (**evaluation**)
- Reflect on the possible ethical perspective of the interactive system, the science behind and discuss implications of a responsible professional practice (**analysis**)
- Must have competencies in comparing and assessing the potential of different technologies, methods and approaches in order to make the proper design choices for optimum functionality (**synthesis**)
- Must show command of the knowledge, skills and competencies acquired in the semesters 1-5 at least to the level of learning as described for the individual respective courses and project modules

Type of instruction: Academically supervised student-governed problem oriented project work.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

Individual oral examination with external censor based on a written project report and a media-technological product plus an A/V-production illustrating and summarizing the project. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:

Real-time Interfaces and Interactions

(Realtids interfaces og interaktioner)

Size: 5 ECTS

Prerequisites: Med 5

Objectives:

Real-time Interfaces and Interactions is a course module offering the students opportunities to investigate several technologies from different modalities that are commonly associated with creation of an integrated multimodal system. The course is built upon the previous five semesters to augment foundational knowledge, skills and competences needed to achieve integration of technologies and evaluation methods.

Students who complete the course module will obtain the following qualifications:

Knowledge

- **Understanding** of input/output technologies for multimodal interfaces
- Knowledge of the state-of-the-art in the field of alternative input and output devices **(application)**
- **Understanding** of visualization techniques for multimodal interfaces (**application**)
- **Understanding** of audio design methods to the development of a 3D sound system (application)
- **Understanding** of haptic interfaces
- Ability to interface input and output devices (**application**)
- **Understanding** of real-time system adaptiveness
- **Understanding** of iterative design processes
- **Understanding** of measurement and analysis of physiological data
- **Understanding** of applied interactive systems information communication e.g. semiotics, non-verbal behavior and affordances

Skills

- Ability to scientifically **analyse** and argue with theoretical and methodological justification to demonstrate understanding of related research/work
- Ability to **synthesize** an interface component to log feedforward/feedback data from interactions for data analysis
- Ability to **apply** biofeedback measurements to refine design of a media product
- Ability to **synthesize** and apply contextual understanding and knowledge related to human factors to the design of novel interfaces
- Ability to **apply** theories, techniques and methods to design and implement systems which adapt in real-time to human needs and level of expertise

Competencies

- Ability to **synthesize** knowledge and understanding regarding previous research and current trends concerning interactive media systems
- Ability to **apply** such knowledge, understanding and skills toward creation of a real-time interface and interactive media system

Type of instruction: Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in a paper/exercises after the deadline, the student has used an examination attempt.

Individual oral or written examination based on mandatory exercises and mini-project with internal censor. The assessment is performed in accordance with the 7-point grading scale.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Title:
Media Sociology and Psychology
(Mediesociologi og psykologi)

Size: 5 ECTS

Prerequisites: Med 5

Objectives:
The students shall understand how choices of approach, conceptual framework and method in relation to development of media technology produce different kinds of possible analyses. This includes user-centered, contextual and situational understanding when analyzing use of media technology.

Students who complete the course module will obtain the following qualifications:

Knowledge

- Must have **knowledge** about psychological and sociological methods at work in different forms of studies
- Must **understand** analytical implications based on specific approaches to media technology development
- Must **understand** how theories and methods are guidelines for testing and evaluation
- Must **understand** and **apply** fundamental theories and methods related to case study, e.g. grounded theory, interaction analysis and ethnographic analysis, diary studies and cultural probes, and how those theories and methods can be implemented in user-oriented problems
- Must **understand** and **apply** user-centered theories and methods
- Must **understand** different lab experiments

Skills

- Must be able to **apply** methods for empirical investigations
- Must be able to **evaluate** media texts/communicative resources in relation to end-user groups and lifestyle
- Must be able to **evaluate** social and digital interaction
- Must be able to **create** guidelines and **apply** adequate theories and study designs, using advanced qualitative and quantitative methods for collection and analysis of data; focus groups, in depth interviews, narrative interviews, projective techniques and experimental evaluation
- Must be able to **create** guidelines and **apply** different ethnographic and observational methods, including video observations and exploration of emotions

Competencies

- Must be able to **synthesize** and **apply** knowledge and understanding regarding the consequences of choosing a specific approach, method, conceptual framework and theory in relation to media technology development and a specific research question or problem
- Must be able to **synthesize** and **understand** advantages, disadvantages, possibilities and limitations regarding use of specific methods in different contexts and situations
- Must be able to **create**, **understand** and **apply** a user-centered approach, including adequate methods and theories in relation to media technology development

Type of instruction: Refer to the overview of instruction types listed in the start of chapter 3. The types of instruction for this course are decided in accordance with the current Framework Provisions and directions are decided and given by the Study Board for Media Technology.

Exam format:

In accordance with the current Framework Provisions and directions on examination from the Study Board for Media Technology:

To be eligible to take the exam the student must have fulfilled:

- handing in of written assignments or the like
- completion of certain – or all – study activities

Note that if admittance to the exam or parts of the assessment is to be based on written work or exercises, a deadline is stipulated for when the work must be handed in. If the student hands in papers/exercises after the deadline, the student has used an examination attempt.

The exam Individual oral or written examination with internal censor. The assessment is performed with the Pass/Non-Pass grade.

Evaluation criteria: The criteria for the evaluation are specified in the Framework Provisions.

Chapter 4: Entry into Force, Interim Provisions and Revision

The curriculum is approved by the Dean of the Faculties of Engineering and Science and enters into force as of September 2010.

In accordance with the Framework Provisions and the Handbook on Quality Management for the Faculties of Engineering, Science and Medicine at Aalborg University, the curriculum must be revised no later than 5 years after its entry into force.

Chapter 5: Other Provisions

5.1 Rules concerning written work, including the Bachelor's project

In the assessment of all written work, regardless of the language it is written in, weight is also given to the student's spelling and writing ability, in addition to the academic content. Orthographic and grammatical correctness as well as stylistic proficiency are taken as a basis for the evaluation of language performance. Language performance must always be included as an independent dimension of the total evaluation. However, no examination can be assessed as 'Pass' on the basis of good language performance alone; similarly, an examination normally cannot be assessed as 'Fail' on the basis of poor language performance alone.

The study board can grant exemption from this in special cases (e.g., dyslexia)

The Bachelor's project must include an English summary. The summary must be at least 1 page and not more than 2 pages (this is not included in any fixed minimum and maximum number of pages per student). The summary is included in the evaluation of the project as a whole.

5.2 Rules concerning credit transfer (*merit*), including the possibility for choice of modules that are part of another program at a university in Denmark or abroad

In the individual case, the study board can approve successfully completed (passed) program elements from other Master's programs in lieu of program elements in this program (credit transfer). The study board can also approve successfully completed (passed) program elements from another Danish program or a program outside of Denmark at the same level in lieu of program elements within this curriculum. Decisions on credit transfer are made by the study board based on an academic assessment. See the Framework Provisions for the rules on credit transfer.

5.3 Rules concerning the progress and completion of the Bachelor's program

The student must participate in all first year examinations by the end of the first year of study in the Bachelor's program, in order to be able to continue the program. The first year of study must be passed by the end of the second year of study, in order that the student can continue his/her Bachelor's program.

In special cases, however, there may be exemption from the above if the student has been on a leave of absence. Leave is granted during first year of study only in the event of maternity, adoption, military service, UN service or where there are exceptional circumstances.

The Bachelor's program must be completed no later than six years after it was begun.

5.4 Special project process

In the 3rd, 4th and 5th semesters, the student can upon application, design an educational program where the project work is replaced by other study activities; cf. the Framework Provisions section 9.3.1.

5.5 Rules for examinations

The rules for examinations are stated in the Examination Policies and Procedures published by the Faculties of Engineering, Science and Medicine on their website.

5.6 Exemption

In exceptional circumstances, the study board can grant exemption from those parts of the curriculum that are not stipulated by law or ministerial order. Exemption regarding an examination applies to the immediate examination.

5.7 Rules and requirements for the reading of texts in foreign languages and a statement of the foreign language knowledge this assumes

It is assumed that the student can read academic texts and in modern English and use reference works and similar.

5.8 Additional information

The current version of the curriculum is published on the study board's website, including more detailed information about the program, including exams.