STUDIEORDNINGEN FOR BACHELORUDDANNELSEN I MEDIALOGI, 2010, KØBENHAVN

BACHELOR (BSC)
KØBENHAVN

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

CREATIVE PLAY – APPLIED TECHNOLOGY

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

No special prerequisites for the module.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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**)

COMPETENCES

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

- 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

EXAMS

Name of exam	Creative Play – Applied Technology
Type of exam	Oral exam based on a project 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 individ-ual 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/Fail grade.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kreativ leg – teknologisk udformning
Module code	MSNMEDB1101
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

DESIGNING FROM BOTH SIDES OF THE SCREEN

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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)

COMPETENCES

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

- 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 processanalysis
4. A written comment to the group's process analysis will be provided to support project-examination

EXAM

EXAMS

Name of exam	Designing from Both Sides of the Screen
Type of exam	Oral exam based on a project 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 mediatechnological 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.
ECTS	10
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Design fra begge sider af skærmen
Module code	MSNMEDB1102
Module type	Project

Duration	1 semester
Semester	Autumn
ECTS	10
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

PROBLEM BASED LEARNING IN SCIENCE, TECHNOLOGY AND SOCIETY

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

No special prerequisites for the module.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Problem Based Learning in Science, Technology and Society
Type of exam	Written or oral exam 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/Fail grade.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Problembaseret læring i videnskab, teknologi og samfund
Module code	MSNMEDB1103
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology

Faculty	Technical Faculty of IT and Design

Faculty	Technical Faculty of IT and Design

ANIMATION AND GRAPHIC DESIGN

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Previous or simultaneous studies of "Introduction to Programming"

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Animation and Graphic Design
Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-per/exercises after the deadline, the student has used an examination attempt. Individual oral or written examination with internal censor. The assessment is performed in accord-ance with the 7-point scale.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Animation og grafisk design
Module code	MSNMEDB1104
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

INTRODUCTION TO PROGRAMMING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

No special prerequisites for the module.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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**)

COMPETENCES

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

- **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

EXAMS

Name of exam	Introduction to Programming
Type of exam	Written or oral exam 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 accord-ance with the 7-point scale.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Grundlæggende programmering
Module code	MSNMEDB1105
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology, Study Board of Electronics and IT
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

INTERACTION DESIGN – HUMAN COMPUTER CONFLUENCE

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

1st semester or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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**)

COMPETENCES

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

- 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

EXAMS

Name of exam	Interaction Design – Human Computer Confluence
Type of exam	Oral exam based on a project 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.
ECTS	15
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Interaktionsdesign – sammenløbet af menneske og computer
Module code	MSNMEDB2101

Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

MATHEMATICS FOR MULTIMEDIA APPLICATIONS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Introduction of the mathematics needed for media technology applications.

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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

EXAMS

Name of exam	Mathematics for Multimedia Applications
Type of exam	Written exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-per/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.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Matematik til multimedie-applikationer
Module code	MSNMEDB2102
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

PHYSICAL INTERFACE DESIGN

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Physical Interface Design
Type of exam	Written or oral exam 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 accord-ance with the 7-point grading scale.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Fysisk interfacedesign
Module code	MSNMEDB2103
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology, Study Board of Electronics and IT
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

INTERACTION DESIGN

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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**)
    - º Qualitative (identifying recurring patterns and themes, categorizing data, looking for critical incidence etc.)
    - º 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:
    - º Empirical methods (focus group, questionnaires, interviews, observation, case studies, field studies etc.)
    - º 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

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

- 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

COMPETENCES

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

- **Analyse** needs of different target groups
- **Compare** different user-centered 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

EXAMS

Name of exam	Interaction Design
Type of exam	Active participation and/or written assignment 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 per-formed with the Pass/Fail 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.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Interaktionsdesign
Module code	MSNMEDB2104
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology

Faculty	Technical Faculty of IT and Design

Faculty	Technical Faculty of IT and Design

VISUAL COMPUTING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

2nd semester or similar

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Visual Computing
Type of exam	Oral exam based on a project 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 as-sessment is performed in accordance with the 7-point grading scale.
ECTS	10
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Visual Computing
Module code	MSNMEDB3101
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	10
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

A/V PRODUCTION

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

No special prerequisites for the module.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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

EXAMS

Name of exam	A/V Production

Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-per/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.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	A/V produktion
Module code	MSNMEDB3102
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

IMAGE PROCESSING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Mathematics for Multimedia Applications

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Image Processing
Type of exam	Written or oral exam 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/Fail grade.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Billedbehandling
Module code	MSNMEDB3103
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

PERCEPTION

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Interaction Design (2nd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Perception
Type of exam	Active participation and/or written assignment 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/Fail 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.
ECTS	5
Permitted aids	With certain aids: See Semester Description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Perception
Module code	MSNMEDB3104
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

PROCEDURAL PROGRAMMING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Introduction to Programming (1st semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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)**

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Procedural Programming
Type of exam	Written or oral exam 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 accord-ance with the 7-point scale.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Proceduremæssig programmering
Module code	MSNMEDB3105
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

SONIC INTERACTIONS: DESIGN AND EVALUATION 2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

3rd semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Hearing is one of the fundamental senses of the human perceptual system. Being able to under-stand 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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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**)

COMPETENCES

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

- 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

EXAMS

Name of exam	Sonic Interactions: Design and Evaluation
Type of exam	Oral exam based on a project 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 that illustrates and summarizes the project. The as-sessment is performed in accordance with the 7-point grading scale.
ECTS	15
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Lydlige interaktioner: design og evaluering
Module code	MSNMEDB4101
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

SOUND AND MUSIC COMPUTING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

A/V Production (3rd semester), Perception (3rd semester), Procedural Programming (3rd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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 distributions, 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

COMPETENCES

- 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

EXAMS

Name of exam	Sound and Music Computing
Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-per/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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Lyd- og musikbehandling
Module code	MSNMEDB4102
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen

Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

DESIGN AND ANALYSIS OF EXPERIMENTS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Interaction Design (2nd semester), Mathematics for Multimedia Applications (2nd semester), Percep-tion (3rd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- 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

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Design and Analysis of Experiments
Type of exam	Active participation and/or written assignment 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/Fail 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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Design og analyse af eksperimenter
Module code	MSNMEDB4103
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

OBJECT ORIENTED SOFTWARE ENGINEERING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Procedural Programming (3rd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

To build upon the foundation acquired from the programming courses from 1st and 3rd semester 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.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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**)

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Object Oriented Software Engineering
Type of exam	Written or oral exam 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 accord-ance with the 7-point grading scale.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Objektorienteret Software Engineering
Module code	MSNMEDB4104
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

COMPUTER GRAPHICS PROGRAMMING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Introduction to Programming (1st semester), Mathematics for Multimedia Applications (2nd semester), Image Processing (3rd semester) and Procedural Programming (3rd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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.)

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Computer Graphics Programming
Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-pers/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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Computergrafik programmering
Module code	MSNMEDB5103
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English

Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology, Study Board of Electronics and IT, Study Board of Computer Science
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

COMPUTER GRAPHICS RENDERING

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

Animation and Graphic Design (1st semester), A/V Production (3rd semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Computer Graphics Rendering
Type of exam	Written or oral exam 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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Rendering af computergrafik
Module code	MSNMEDB5104
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

SCREEN MEDIA

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

4th semester, A/V Production (3rd semester), Perception (3rd semester) and Animation and Graphic Design (1st semester)

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- 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

Students who complete the module will obtain the following qualifications:

- 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

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Screen Media
Type of exam	Written or oral exam 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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Screen Media
Module code	MSNMEDB5105
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

BSC PROJECT (INTERACTIVE SYSTEMS DESIGN)

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

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

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- 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

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

- 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 related 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**)

COMPETENCES

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

- 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

EXAMS

Name of exam	BSc Project (Interactive Systems Design)
Type of exam	Oral exam based on a project 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 assess-ment is performed in accordance with the 7-point grading scale.
ECTS	20
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Bachelorprojekt (Design af interaktive systemer)
Module code	MSNMEDB6101
Module type	Project
Duration	1 semester
Semester	Spring

ECTS	20
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

REAL-TIME INTERFACES AND INTERACTIONS 2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

5th semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- **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

Students who complete the module will obtain the following qualifications:

- 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

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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

EXAMS

Name of exam	Real-time Interfaces and Interactions
Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in a pa-per/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.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Realtids interfaces og interaktioner
Module code	MSNMEDB6102
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen

Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

MEDIA SOCIOLOGY AND PSYCHOLOGY

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

5th semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The students shall understand the societal, cultural, and psychological role of media. This includes structures and organization of media, content, audience, effects, emotions, nonformal learning, and meaning, as well as an understanding of the users by going out into their world.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module will obtain the following qualifications:

- Must have **knowledge** of empirical and critical research, including systematic quantitative and qualitative research methods
- Must **understand** the impact of media globalization and convergence
- Must have **knowledge** of history and current trends in media, effects, and ideology, for example concerning audience, life style, media influence, and the role of power
- Must **understand** the concept of culture and intercultural communication and their relevance and implications to media development and globalization
- Must **understand** and **apply** interpretative paradigm to media development. This includes those approaches that promote qualitative methodologies, such as ethnography, grounded theory, diary studies, cultural probes
- Must **understand** that the theory and methodology adopted behind chosen methods are important to the understanding of the nature of evidence in media related research
- Must have **knowledge** of psychological and sociological approaches to the study of emotions and their relevance and implications to media development. This includes cognitive, biological, social, and cultural aspects of emotions
- Must have **knowledge** of the concept of non-formal learning and its relevance and implications to media development. This includes aspects such as user empathy, play, and playfulness

SKILLS

Students who complete the module will obtain the following qualifications:

- Must be able to **apply** methods for empirical and critical investigations
- Must be able to **apply** the ideas of convergence and globalization to the history and current trends in media development
- Must be able to **evaluate** media texts/communicative resources in relation to end-user groups and lifestyle
- Must be able to critically **apply** the idea of digital identities, social class and mediascapes, and how they are communicated through cultural artifacts
- Must be able to **apply** interpretative methods. This includes ethnographic and focus groups methods, together with fieldwork, video observations, in depth and narrative interviews
- Must be able to **apply** rigorous and disciplined analysis of data, including grounded theory
- Must be able to **evaluate** emotions and the concept of non-formal learning. This includes a holistic approach to the understanding of the user where situations and contexts are units of the analysis

COMPETENCES

Students who complete the module will obtain the following qualifications:

- 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 development

- Must be able to **synthesize** and **understand** advantages, disadvantages, possibilities, and limitations regarding the issues of globalization and convergence
- Must be able to **synthesize**, **understand** and **apply** interpretative methods
- Must be able to **synthesize** knowledge and understanding of sociological and psychological aspects of the use and development of media technology and **apply** those factors to the design, use, and analysis of media technology

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

EXAMS

Name of exam	Media Sociology and Psychology
Type of exam	Written or oral exam 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 ex-ercises, a deadline is stipulated for when the work must be handed in. If the student hands in pa-pers/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/Fail grade.
ECTS	5
Permitted aids	With certain aids: See semester description
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Mediesociologi og psykologi
Module code	MSNMEDB6103

Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology
Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

AUDIO-VISUAL EXPERIMENTS – PRE-RENDERED EXPERIENCES

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

4th semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

KNOWLEDGE

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

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

SKILLS

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Audio-Visual Experiments – Pre-Rendered Experiences
Type of exam	Oral exam based on a project 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 assess-ment is performed in accordance with the 7-point grading scale.
ECTS	15
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Audio-Visuelle eksperimenter – pre-renderede oplevelser
Module code	MSNMEDB5101
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

ORGANISATION

Study Board	Study Board of Media Technology

Department	Department of Architecture, Design and Media Technology
Faculty	Technical Faculty of IT and Design

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AUDIO-VISUAL EXPERIMENTS – INTERACTIVE EXPERIENCES

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
4th semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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 hand-held 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.

LEARNING OBJECTIVES

KNOWLEDGE

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

- **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

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

- 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

COMPETENCES

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

- 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

EXAMS

Name of exam	Audio-Visual Experiments – Interactive Experiences
Type of exam	Oral exam based on a project 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 assess-ment is performed in accordance with the 7-point grading scale.
ECTS	15
Permitted aids	With certain aids: See Semester Description
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Audio-Visuelle Eksperimenter – interaktive oplevelser
Module code	MSNMEDB5102
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	English
Location of the lecture	Campus Aalborg, Campus Copenhagen
Responsible for the module	Claus Brøndgaard Madsen

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