STUDIEORDNING FOR KANDIDATUDDANNELESEN I DATALOGI, 2020

MASTER OF SCIENCE (MSC) AALBORG

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SECURE, SCALABLE AND USEFUL SYSTEMS

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer.
This is an English translation of the module. In case of discrepancy between the translation and the Danish version, the Danish version of the module is valid.

The project must include considerations on all three aspects: security, scalability and usability. But the project is expected to focus in depth on one of these topics

LEARNING OBJECTIVES

KNOWLEDGE

• concepts, results and theories in an advanced field of computer science
• security, scalability and usability in general as well as how it relates to project work

SKILLS

• to apply knowledge from a theory formation in computer science to select and argue for a model formation in an advanced field of computer science
• model formation and the ability to set up a model of a computer science problem and apply this model to understand the problem
• to ensure that the designed systems have a balance of security, scalability and usability that can be described, explained and defended

COMPETENCES

• identify a problem within a problem within research in or application of computer science
• contribute to the solution of the problem by using own model formation based on computer science theories
• analyze and evaluate the resulting contribution to solution analyze and evaluate applications of relevant computer science models to solve this problem
• assessment of scalability, security and / or usefulness using experimental or analytical methods
• be able to argue for and apply key elements of security, scalability and / or usability
• apply project management

TYPE OF INSTRUCTION

The project work is supported with digital resources on research methods and applied statistics

EXTENT AND EXPECTED WORKLOAD

The student is expected to spend 27.5 hours per ECTS, which for this activity means 412.5 hours.
EXAM

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ADDITIONAL INFORMATION

Contact: Study Board for Computer Science via cs-sn@cs.aau.dk or 9940 8854

FACTS ABOUT THE MODULE

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PROGRAMMING PARADIGMS

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should gain knowledge of the important concepts and terminology of programming paradigms. Furthermore, the student must gain a deeper understanding of one or more paradigms in relation to the prerequisites described. Specifically, the student should gain knowledge of at least the following:

- advanced function oriented programming, including referential transparency, evaluation order, closures, higher order functions, continuations and type systems for feature programming including parametric polymorphism.
- programming in languages with dynamic types
- programming techniques within one or more of the four main paradigms: the function-oriented, the imperative, the object-oriented and the logical programming paradigm

SKILLS

- apply concepts and terminology important to the paradigm in question to describe and reason about programs from this paradigm.
- explain how a program within the illuminated paradigms should be executed.
- construct programs with high paradigmatic attention.
- assess the strengths and weaknesses of each paradigm in relation to a specific programming problem.

COMPETENCES

- choose a suitable paradigm for a given task and argue for the choice made
- identify concepts and constructions in a given paradigm and argue how these differ from concepts and constructions in other paradigms
- apply paradigmatic constructions in smaller programs

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

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RELIABLE INNOVATIVE SYSTEMS

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer
This is an English translation of the module.

In case of discrepancy between the translation and the Danish version, the Danish version of the module is valid.

PURPOSE
That students work on creating advanced computer science models of a problem themselves and use these models to develop innovative solutions balanced in relation to the reliability of the solution.

LEARNING OBJECTIVES

KNOWLEDGE

• be able to explain concepts, results and theory within an advanced field of computer science
• have knowledge of empirical and mathematical-based methods for securing and assessing the reliability of a system

SKILLS

• apply knowledge from a theory within computer science to select and argue for a model developed within an advanced computer science field

• from such a model development be able to form a computer science problem and use that model to understand the problem

• argue for appropriate choice of method (empirical or mathematical-based) to assess the reliability of the solution developed for the problem

COMPETENCES

• identify a problem within a research or application field of computer science

• contribute to solving the problem using own model formation based on computer science theories

• analyze and evaluate the contribution made to a solution

• analyze and evaluate applications of relevant computer science models to solve this problem
• assess the reliability of the developed solution from either an empirical, statistical or mathematically oriented method

TYPE OF INSTRUCTION

The project work is supported by digital resources on empirical / qualitative and mathematical methods for assessing the reliability of a solution.

EXTENT AND EXPECTED WORKLOAD

The student is expected to spend 27.5 hours per ECTS, which for this activity means 412.5 hours.

EXAM

PREREQUISITE FOR ENROLLMENT FOR THE EXAM

• An approved PBL competency profile is a prerequisite for participation in the project exam

EXAMS

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ADDITIONAL INFORMATION

Contact: Study Board for Computer Science via cs-sn@cs.aau.dk or 9940 8854

FACTS ABOUT THE MODULE

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SOFTWARE INNOVATION

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained in the 3rd and 4th semesters of the bachelor's degree programmes in Computer Science and Software, including System Development and Agile Software Engineering.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

By software innovation is meant innovation based on software. The emphasis is on innovation in products and processes, but also the management of the innovation part in development projects is included in the subject.

LEARNING OBJECTIVES

KNOWLEDGE

The student should gain knowledge of the following:

- software Innovation theory:
- central paradigms and theories of innovation and innovation processes
- personal and organizational prerequisites for innovation
- theories and concepts of software innovation
- Innovation Methods:
- methodologies and methods to support innovation
- techniques and tools for software innovation
- Innovation Practice:
- experience with methods and techniques in innovative processes
- assessing the strengths and weaknesses of innovative software development processes

SKILLS

- be able to explain precisely and using the concepts of the subject the subject's theories
- be able to explain approaches to selecting and leading innovative processes in software development
- be able to discuss types and prerequisites for software innovation
- be able to explain and discuss tools and techniques to support software innovation

COMPETENCES

- be able to assess the innovative potential of a software-intensive product or software-intensive process

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours
EXAM

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ADDITIONAL INFORMATION

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PRE-SPECIALISATION IN COMPUTER SCIENCE

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer
This is an English translation of the module. In case of discrepancy between the translation and the Danish version, the Danish version of the module is valid.

The project module must be implemented in one of the subject areas: database technology, distributed systems, human-computer interaction, semantics & verification, machine intelligence, programming technology, or system development. The project module must be completed in conjunction with the corresponding specialization course.

LEARNING OBJECTIVES

KNOWLEDGE

After completing the project module, the student should be able to:

• document in-depth knowledge and overview of a current research problem in one of the disciplines:
  ◦ database technology
  ◦ distributed systems
  ◦ human-computer interaction
  ◦ semantics & verification
  ◦ machine intelligence
  ◦ programming technology
  ◦ system development

SKILLS

• reason about and with the concepts and techniques concerned
• apply and create theory courses in the subject area in connection with the formulation and analysis of a problem in the subject area research
• communicate a current computer science problem and the related conceptual apparatus within the framework of the subject area

COMPETENCES

• be able to use the concepts and reasonings in the subject area to formulate and analyze a problem within a current research problem in the subject area

TYPE OF INSTRUCTION

Project work in connection with the field of specialization

EXTENT AND EXPECTED WORKLOAD

The student is expected to spend 30 hours per ECTS, which means 600 hours for this activity.

EXAM

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ECTS | 20
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

**ADDITIONAL INFORMATION**

Contact: Study Board for Computer Science via cs-sn@cs.aau.dk or 9940 8854

**FACTS ABOUT THE MODULE**

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MASTER'S THESIS

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the project and course modules from previous semesters

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

PURPOSE
That the student can formulate, analyze and contribute to solving a current research problem in computer science independently, systematically and critically through the application of scientific theory and method

REASON
University programs are research-based programs; all students must obtain in-depth knowledge of the current research problem and methods in the master's program, so that this insight can be used to solve problems in research

LEARNING OBJECTIVES

KNOWLEDGE

• document in-depth knowledge and overview of a current problem in computer science research and its possible solutions

SKILLS

• be able to reason about and with the concepts and techniques concerned
• be able to apply and create theory courses in the subject area in connection with the formulation and analysis and solution of a problem in computer science research
• be able to convey a current computer science problem, a contribution to its solution and the related conceptual apparatus within the framework of the research area

COMPETENCES

• be able to use the concepts and reasoning in the subject area to formulate, analyze and contribute to solving a problem within a current problem in computer science research

TYPE OF INSTRUCTION

Project work

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 450 hours
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ADDITIONAL INFORMATION

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SELECTED TOPICS IN DATABASE RESEARCH AND PRACTICE

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should gain knowledge of the following topics in advanced databases:

• concepts and techniques within multidimensional databases, such data warehousing, On-Line Analytical Processing, and data mining
• concepts and techniques within spatial (spatial) and spatiotemporal databases, including query indexing and processing
• distributed and parallel database systems
• concepts and techniques in complex data in databases, eg XML or the like.

In addition, one or more optional topics will be included within data-intensive systems, including but not limited to:

• concepts and techniques within temporal databases
• other scalable data management and analysis techniques
• relevant topics in database research

SKILLS

• be able to explain concepts and techniques in advanced databases
• be able to select and discuss relevant concepts and techniques for a given problem within advanced databases
• be able to apply relevant concepts and techniques to a given problem within advanced databases

COMPETENCES

• be able to apply concepts and techniques from advanced databases, including in the design and implementation of advanced databases

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

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Type of grading | Internal examination
Criteria of assessment | The criteria of assessment are stated in the Examination Policies and Procedures

**ADDITIONAL INFORMATION**

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<td>Technical Faculty of IT and Design</td>
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</table>
DISTRIBUTED SYSTEMS
2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should gain knowledge of basic and advanced theories and methods in distributed systems:

- Distributed systems models: structuring (including, e.g., peer-to-peer, client-server, service-oriented architecture) and behavior (communication, error, and security models)
- Time concept in distributed systems (clock synchronization and logical time)
- Distributed algorithms, such as algorithms for mutual exclusion, selection, consensus, transactions, replication, and error tolerance
- Programming of distributed systems, e.g. languages, coordination models, principles for distribution of calculation and data
- One or more topics among:
  - Techniques for analysis, such as monitoring, testing, formal verification, and benchmarking
  - Designing and building complex distributed infrastructures and applications for e.g. IoT, cloud, peer-to-peer, distributed embedded systems
  - System and network software for (distributed) embedded systems
  - Distributed and parallel computation, parallel algorithms
  - Advanced security solutions

SKILLS

- Be able to explain precisely and using the terminology and notation of the subject
- Assess how and to what extent the results presented can be used
- Designing and deploying distributed applications

COMPETENCES

- Be able to apply concepts and techniques from distributed systems to the design and analysis of distributed systems

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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<tr>
<th>Name of exam</th>
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### ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at [cs-sn@cs.aau.dk](mailto:cs-sn@cs.aau.dk) or 9940 8854

### FACTS ABOUT THE MODULE

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SELECTED TOPICS IN HCI

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student must gain knowledge in selected topics within human-computer interaction (HCI) in theory or practice. Topics may include but are not limited to:

• concepts, methods and techniques within selected topics in interaction design
• concepts, methods and techniques within selected topics in usability evaluation or user experience

SKILLS

• be able to accurately and in-depth explain issues, theory, methods, results and conclusions within HCI
• be able to apply theories and methods to solve a specific problem
• critically relate to theories and methods within HCI

COMPETENCES

• be able to use the concepts, techniques and methods to understand a given problem and to design and / or evaluate a specific system

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854
## FACTS ABOUT THE MODULE

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SYSTEMS DEVELOPMENT IN PRAXIS
2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer
This is an English translation of the module. In case of discrepancy between the translation and the Danish version, the Danish version of the module is valid.

LEARNING OBJECTIVES

KNOWLEDGE
The student should gain knowledge of advanced topics within system development in theory and practice. Topics may include but are not limited to:

- analysis of system development practices
- system development methods, processes and competencies
- organization and management of system development
- development of systems for complex contexts, e.g. supporting collaborations in organizations, knowledge-intensive systems and information infrastructure

SKILLS

- be able to understand and present the course topics including premises, issues, theories, methods, results and conclusions
- be able to apply theories and methods to analyze and describe a problem in practical system development
- be critical of systems development theories and methods

COMPETENCES
The student must be able to describe, analyze and evaluate a specific practice in a system development company, including:

- relate to the theories and empirical methods of the course
- perspectives in relation to selected topics such as: requirements management, quality management, outsourcing, distributed development, agile processes, and model-driven processes

TYPE OF INSTRUCTION
The teaching is organized in accordance with the general teaching methods for the education, cf. section 17.

EXTENT AND EXPECTED WORKLOAD
The student is expected to spend 27.5 hours per ECTS, which for this activity means 137.5 hours.

EXAM

EXAMS

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Written or oral exam

**ECTS**
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**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

**ADDITIONAL INFORMATION**
Contact: Study Board for Computer Science via cs-sn@cs.aau.dk or 9940 8854

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MACHINE LEARNING

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

Key models in machine learning and their associated learning and inference techniques, such as:

• Statistical linear models
• Markov chains and hidden Markov models
• Support Vector machines
• Neural Net
• Probabilistic Graphic Models
• Matrix factorization

The use of machine learning methods in selected fields of application, such as:

• Web and network mining
• Recommendation Systems
• Computer games
• Image analysis
• Text mining

SKILLS

• be able to apply advanced techniques from machine learning to the construction of intelligent systems

COMPETENCES

• to understand advanced machine learning methods for designing intelligent systems
• to analyze their usefulness and impact in solving specific tasks

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

EXAMS

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Criteria of assessment

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ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

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SELECTED TOPICS IN MODELLING AND VERIFICATION

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should gain knowledge of recent research in advanced mathematical models for formal description and verification of programs, software systems and programming languages. These can, e.g. be

- Binary Decision Diagrams (BDD)
- SAT algorithms
- predicate logic
- Petri nets, temporal logic
- mobile process calculations.

SKILLS

- be able to explain precisely and using the terminology and notation of the subject important important theories for description and analysis of software systems;
- be able to use specification and verification methods based on formal models;
- be able to make use of the necessary writing skills in this context

COMPETENCES

- be able to use formal models and associated verification tools for description, analysis and verification of software systems

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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ENTREPRENEURSHIP

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should achieve knowledge about entrepreneurship and business development related to software (information and communication technologies) including typically:

• different scientific approaches to entrepreneurship, including effectuation
• intra-/entrepreneurship
• competition and market conditions
• business models and business plans
• intellectual property rights
• market development and marketing
• growth strategies
• open entrepreneurship

SKILLS

• the ability to explain course concepts precisely using the professional terminology of the discipline
• the ability to use those concepts to explain practical and empirical (case based) contexts

COMPETENCES

• should be able to formulate, develop and present their own software-related business ideas to a qualified audience.

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

EXAMS

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IT LAW

2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer
This is an English translation of the module.
In case of discrepancy between the translation and the Danish version, the Danish version of the module is valid.

LEARNING OBJECTIVES

KNOWLEDGE

The course should provide the students with in-depth knowledge and understanding of:

• Legal method and the sources of law
• Relevant legal concepts, terminology and reasoning
• The functioning of the court in society and the relationship between law, ethics and politics
• The main elements of the course, including
  ○ Privacy and privacy data
    - The relevant legal rules of EU law, the Human Rights Convention and the Data Protection Act
    - Relevant case law
    - Relationship between Privacy and Freedom of Expression: Legal, Ethical and Political Aspects
  ○ Immaterial rights
    - Copyright protection of software
    - Copyright vs. open access: legal, economic and political aspects
  ○ Cybercrime and cyber security
    - Basic understanding of the essential rules and trends
    - Surveillance of citizens vs. the right to privacy
  ○ IT contracts
    - Basic rules and principles regarding the conclusion and implementation of IT contracts
    - Controlling contracts

SKILLS

During the course, the students must acquire the following skills

• application of legal method, argumentation, concepts and terminology
• identification of relevant legal issues and sources of law
• use and interpretation of legal sources and conduct of legal analysis

COMPETENCES

During the course, the students must acquire the following competences:

• knowledge of relevant legal issues within IT
• identification and use of relevant legal sources in the field
• analysis and resolution of legal issues within IT-law

TYPE OF INSTRUCTION

A mix of lectures, student presentations and assignments. The teaching is also organized in accordance with the general teaching methods for the education, cf. section 17.
EXTENT AND EXPECTED WORKLOAD

The student is expected to spend 30 hours per ECTS, which means 150 hours for this activity.

EXAM

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SPECIALISATION COURSE IN HUMAN-COMPUTER INTERACTION

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the 1st - 2nd semester at the Master's Programme in Computer Science or Software

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE
The student should achieve in-depth insight into key issues in contemporary research in human-computer interaction

SKILLS
Based on a scientific article in the course's central themes, the student should be able to:

• give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
• explain relevant theories, methods and arguments presented in articles

COMPETENCES
Based on a scientific article in the course's central themes, the student should be able to:

• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

EXAMS

<table>
<thead>
<tr>
<th>Name of exam</th>
<th>Specialisation Course in Human-Computer Interaction</th>
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<tbody>
<tr>
<td>Type of exam</td>
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<td>Criteria of assessment</td>
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**ADDITIONAL INFORMATION**

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

**FACTS ABOUT THE MODULE**

<table>
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<tr>
<th>Danish title</th>
<th>Specialiseringskursus i menneske-maskine interaktion</th>
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<tr>
<td>Responsible for the module</td>
<td>Lone Leth Thomsen</td>
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**ORGANISATION**

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SPECIALISATION COURSE IN DATABASE TECHNOLOGY

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the 1st - 2nd semester of the Master's Programme in Computer Science or Software

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should achieve in-depth insight into key issues in contemporary research in database technology.

SKILLS

Based on a scientific article in the course's central themes, the student should be able to:

• give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
• explain relevant theories, methods and arguments presented in the article

COMPETENCES

Based on a scientific article in the course's central themes, the student should be able to:

• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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### Criteria of assessment

- The criteria of assessment are stated in the Examination Policies and Procedures.

### ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

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Studieordning for kandidatuddannelsen i datalogi, 2020

35
SPECIALISATION COURSE IN DISTRIBUTED SYSTEMS

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the 1st - 2nd semester of the Master's Programme in Computer Science or Software

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE
The student should achieve in-depth insight into key issues in contemporary research in distributed systems

SKILLS
Based on a scientific article in the course's central themes, the student should be able to:

• give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
• explain relevant theories, methods and arguments presented in the article

COMPETENCES
Based on a scientific article in the course's central themes, the student should be able to:

• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

TYPE OF INSTRUCTION
The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD
It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

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ADDITIONAL INFORMATION

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SPECIALISATION COURSE IN SEMANTICS AND VERIFICATION

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the 1st - 2nd semester of the Master's Programme in Computer Science or Software

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE
The student should achieve in-depth insight into key issues in contemporary research in semantics and verification.

SKILLS
Based on a scientific article in the course's central themes, the student should be able to:
• give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
• explain relevant theories, methods and arguments presented in the article

COMPETENCES
Based on a scientific article in the course's central themes, the student should be able to:
• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

TYPE OF INSTRUCTION
The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD
It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

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Type of grading | External examination
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Criteria of assessment | The criteria of assessment are stated in the Examination Policies and Procedures

**ADDITIONAL INFORMATION**

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

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SPECIALISATION COURSE IN MACHINE INTELLIGENCE
2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
The module adds to knowledge obtained during the 1st - 2nd semester of the Master's Programme in Computer Science or Software

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE
The student should achieve in-depth insight into key issues in contemporary research in machine intelligence

SKILLS
Based on a scientific article in the course's central themes, the student should be able to:

- give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
- explain relevant theories, methods and arguments presented in the article

COMPETENCES
Based on a scientific article in the course's central themes, the student should be able to:

- relate the theories, methods and results presented in the article to the course topics
- assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective

TYPE OF INSTRUCTION
The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD
It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

EXAM

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### ADDITIONAL INFORMATION

Contact: The Study board for Computer Science at cs-sn@cs.aau.dk or 9940 8854

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SPECIALISATION COURSE IN PROGRAMMING TECHNOLOGY

2020/2021

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained during the 1st - 2nd semester of the Master's Programme in Computer Science or Software.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should achieve in-depth insight into key issues in contemporary research in programming technology.

SKILLS

Based on a scientific article in the course's central themes, the student should be able to:

• give a clear and understandable presentation of the article's key elements, including its premises, issue(s), theory, methods, results and conclusions
• explain relevant theories, methods and arguments presented in the article

COMPETENCES

Based on a scientific article in the course's central themes, the student should be able to:

• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

TYPE OF INSTRUCTION

The type of instruction is organised in accordance with the general instruction methods of the programme, cf. § 17.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours.

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**Type of grading**  
External examination

**Criteria of assessment**  
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**ADDITIONAL INFORMATION**

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SPECIALISATION COURSE IN SYSTEM DEVELOPMENT
2020/2021

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

The student should achieve in-depth insight into key issues in contemporary research in system development

SKILLS

Based on a scientific article in the course’s central themes, the student should be able to:

• give a clear and understandable presentation of the article’s key elements, including its premises, issue(s), theory, methods, results and conclusions

• explain relevant theories, methods and arguments presented in the article

COMPETENCES

Based on a scientific article in the course’s central themes, the student should be able to:

• relate the theories, methods and results presented in the article to the course topics
• assess the proposed solutions, results and/or conclusions of the article as well as assess their qualities and practicality and put them into perspective.

EXTENT AND EXPECTED WORKLOAD

It is expected that the student uses 30 hours per ECTS, which for this activity means 150 hours

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ADDITIONAL INFORMATION

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