CURRICULUM FOR MASTER OF SCIENCE (MSC) IN ENGINEERING (SOFTWARE), 2022

MASTER OF SCIENCE (MSC) IN ENGINEERING AALBORG

MODULES INCLUDED IN THE CURRICULUM
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INTERNET
2022/2023

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
The purpose of the project module is to contribute to the students gaining knowledge about and being able to develop an internet application or service. Internet application or service must be understood broadly and ranges from the more common internet applications to autonomous agents and the so-called "Internet of Things", where the internet is used to link physical objects, such as household electronics, where a traditional browser-based user interface is not necessarily used.

REASONS
The internet, internet technologies, internet services, and internet applications are all key technological elements in today's society.

LEARNING OBJECTIVES

KNOWLEDGE
• demonstrate knowledge and understanding of the internet, internet technologies and internet services
• understand and utilize internet concepts
• analyze and model requirements for internet application development
• structure an application in a multilayer architecture using common application patterns
• design, implement and test an internet application or service

SKILLS
• carry out systematic testing of the application / service and demonstrate that the application / service corresponds to the intentions and needs of the users
• carry out systematic evaluation of the selected user interface
• argue for choices made in all activities of the development process, including explaining requirements, architecture and that users' needs are related
• demonstrate skills in the development of an internet application or service of high, internal and external quality, focusing on a scalable architecture and "quality of service"

COMPETENCES
• develop a running internet application or service that solves the users' problem
• describe and reflect on the form of work used in the development project
• apply project management

TYPE OF INSTRUCTION

Project work to include:
• an analysis of a problem whose solution can naturally be described in the form of analysis, design and realization of a specific internet application or service
• design, implementation and testing of an internet application or service
• assessment of scalability and "quality of service" using experimental methods
• reflection on one's own development process

Digital support for competence development in research methods.
EXTENT AND EXPECTED WORKLOAD

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

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ADDITIONAL INFORMATION

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

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PROGRAMMING PARADIGMS

2022/2023

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

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**ADDITIONAL INFORMATION**

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MOBILITY

2022/2023

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer.
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PURPOSE
The purpose of the project module is to help students gain knowledge about and develop mobile applications and services. Mobile applications and services must be understood broadly; they are specifically characterized by the use of equipment with limited resources in terms of screen, interaction, processor and memory. At the same time, these are applications that, with a limited power consumption, can use wireless communication with other equipment and servers, and that the users and the equipment are mobile, i.e. can move.

Mobile applications and services are used in a wide range of situations and environments where desktop technologies cannot be used. Justification: Today, mobile technologies, applications and services are key technological elements in society, organizations and for the individual.

LEARNING OBJECTIVES

KNOWLEDGE
• demonstrate knowledge and understanding of the use of mobile technologies, mobile applications and services
• understand and exploit concepts of mobile applications and services
• analyze and model requirements for a mobile application or service
• structure an application or service in a relevant software architecture using common design patterns
• design, realize, test and evaluate a mobile application or service
• understand and explain what is special about mobile applications and services

SKILLS
• carry out analysis, design, programming and evaluation of mobile applications and services
• demonstrate and apply techniques, models, methods and tools to develop mobile applications and services
• argue for the choices made in all the activities of the development process, including explaining how requirements, architecture and users’ needs are related
• develop a mobile application or service using minimal resources such as screen, interaction, processor, power consumption and memory and take advantage of wireless communication with other equipment or servers and the mobile options such as location and user mobility

COMPETENCES
• be able to develop a running mobile application or service that solves the users’ problem
• be able to describe and reflect on the form of work used in the development project
• be able to assess scalability and “quality of service” using experimental methods

TYPE OF INSTRUCTION

Project work including:
• an analysis of a problem whose solution can naturally be described in the form of analysis, design and realization of a specific mobile application or service
• design, implementation, testing and evaluation of a mobile application or service
• assessment of scalability and “quality of service” using experimental methods
• well-performed experiments
• reflection on the development process that has taken place

EXTENT AND EXPECTED WORKLOAD

The student is expected to spend 30 hours per ECTS, which for this activity means 450 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

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SELECTED TOPICS IN PROGRAMMING

2022/2023

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
In step with the growth and spread of computer technologies, programming technologies are constantly evolving. To develop and maintain modern software, students must be able to use the latest programming techniques as well as understand how these techniques relate to the classical principles of programming.

LEARNING OBJECTIVES

KNOWLEDGE
The student must acquire knowledge of advanced programming technologies and techniques, including elements of the programming languages that support these techniques. The course will focus both on new trends in programming, and on classic advanced topics. Possible topics include:

- advanced libraries
- library design
- syntactic abstraction and language extensions
- declarative programming
- generic programming
- concurrent, parallel and distributed programming
- reactive programming
- typed and typeless programming
- scripting
- module concepts
- various hardware platforms
- resource consumption
- optimizations
- performance studies

SKILLS
- be able to select the right programming tools for a given task
- be able to write accurate, efficient and maintainable programs
- be able to assess resource consumption, and make optimizations and performance studies

COMPETENCES
- be able to solve advanced programming tasks

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 30 hours per ECTS, which for this activity means 150 hours.
EXAM

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PRE-SPECIALISATION IN SOFTWARE

2022/2023

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

Disclaimer.
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The project module must be completed within 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 along with the associated specialization course

LEARNING OBJECTIVES

KNOWLEDGE

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

• document in-depth knowledge of and overview of a current issue within research in one of the subject areas:
  ° database technology
  ° distributed systems
  ° human-computer interaction
  ° semantics & verification
  ° machine intelligence
  ° programming technology
  ° system development

SKILLS

• reason about and with the given concepts and techniques
• apply and create theories within the subject area in connection with the formulation and analysis of a problem within the subject area's research
• communicate a current computer science problem and the associated conceptual apparatus within the framework of the subject area

COMPETENCES

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

TYPE OF INSTRUCTION

Project work connected to the subject area's specialization courses

EXTENT AND EXPECTED WORKLOAD

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

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MASTER'S THESIS

2022/2023

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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WEB INTELLIGENCE

2022/2023

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 must acquire knowledge and skills in web intelligence techniques, for example:

- applications of web intelligence techniques
- web agents and web services
- web information retrieval
- web navigation support
- recommender systems
- intelligence for social web
- knowledge representation
- user modeling, adaptation and personalization

SKILLS

- demonstrate knowledge of web intelligence methods and techniques
- be able to select relevant concepts and techniques for a given problem within web systems
- be able to use correct notation and terminology within web intelligence

COMPETENCES

- be able to apply web intelligence methods and techniques including in the design and implementation of web systems

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 30 hours per ECTS, which for this activity means 150 hours.

EXAM

EXAMS

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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**

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

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INDUSTRIAL TEST AND VERIFICATION

2022/2023

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

After completing the project module, the student must have knowledge of:

Test:
- classical test techniques and test theory
- test specification
- models for formal testing and model based testing
- software tools for automated testing, test generation and test execution

Verification:
- formal models for the behavior of software systems
- software tools for verifying models, including the following techniques:
  - static analysis model
  - checking
  - bounded model checking
  - quantitative model checking
- challenges and examples of how verification can be scaled for industrial applications

SKILLS

- be able to explain accurately and using the subject's terminology and notation for properties and behavior of formal models of software systems
- be able to use the subject’s techniques to plan and conduct tests

COMPETENCES

By synthesizing the concepts and techniques of the subject, the student must be able to:

- describe key aspects of a software system using formal models
- assess the applicability of different testing techniques to a software system in a given context

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 30 hours per ECTS, which for this activity means 150 hours.
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DATA-INTENSIVE SYSTEMS

2022/2023

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 must gain knowledge of the following topics within data-intensive systems:

• concepts and techniques for analyzing large amounts of data, such as data warehousing, On-Line Analytical Processing, and data mining
• concepts and techniques for handling spatio-temporal data, including indexing and processing queries
• concepts and techniques for scalability for data-intensive systems, e.g. cloud computing or distributed and parallel data systems

There will also be one or more optional topics within data-intensive systems, including, but not limited to:

• concepts and techniques for handling unstructured or semi-structured data, such as XML
• alternatives to traditional relational database systems such as NoSQL or NewSQL systems

SKILLS

• be able to explain concepts and techniques within data-intensive systems
• be able to select relevant concepts and techniques for a given problem within data-intensive systems
• be able to apply relevant concepts and techniques for a given problem in data-intensive systems

COMPETENCES

• be able to apply concepts and techniques from data-intensive systems, including in the design and implementation of data-intensive systems

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 30 hours per ECTS, which for this activity means 150 hours.

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DISTRIBUTED SYSTEMS
2022/2023

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

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SOFTWARE INNOVATION

2022/2023

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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MOBILE HCI

2022/2023

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE
Recommended professional prerequisites: insight into basic HCI, including design of graphical user interfaces, evaluation of usability, and prototyping

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 must gain knowledge of challenges and opportunities in user interaction with mobile devices, systems and services, or interaction in mobile contexts. This includes focus on technology, interaction, and usage context. In relation to this, the student must gain knowledge about the design of interaction, and the evaluation of usability and user experience.

Possible topics include:

- interaction design for small displays
- interaction design for small physical devices
- interaction design for mobile use, and dynamic usage
- contexts multi- and / or cross-device interaction
- digital ecologies
- wearables
- methods / techniques for evaluating mobile usability of user experience
- methods / techniques simulation of mobility and context
- advantages and disadvantages of resp. lab and field evaluation
- longitudinal field studies, experimental control and ecological validity

SKILLS

- be able to design and empirically evaluate interaction design / user interfaces for mobile devices, systems and services.
- be able to select and apply appropriate mobile technologies for a given context of use, select and apply appropriate interaction techniques
- be able to select and apply appropriate evaluation methods.

COMPETENCES

master principles of interaction design and evaluation for mobile devices, systems and services and be able to select and apply these in mobile usage scenarios

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 30 hours per ECTS, which for this activity means 150 hours.
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WEB INFORMATION PROCESSING

2022/2023

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

That the student acquires knowledge and skills in web information processing techniques, eg:

- information representation incl. semantic web
- information extraction
- information transformation
- information integration
- Web query

SKILLS

- demonstrate knowledge of web information processing methods and techniques
- be able to select relevant concepts and techniques for a given problem in web information processing
- be able to apply relevant concepts and techniques for a given problem within web systems
- be able to use correct notation and terminology in web information processing

COMPETENCES

- be able to apply web information processing methods and techniques including in the design and implementation of web systems

TYPE OF INSTRUCTION

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

EXTENT AND EXPECTED WORKLOAD

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MOBILE DATA AND LOCATION-BASED SERVICES

2022/2023

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 must gain knowledge in the following topics within development of mobile data and location-specific services:

• issues related to the architecture of location-specific services, such as standalone, client / server, and peer-to-peer
• positioning and tracking both indoors and outdoors
• mobile services and location based services both indoors and outdoors
• handling, mining and analysis of mobile data
• mobile databases
• mobile cloud computing
• location /privacy

In addition, the following topics can be included in the course:

• indoor / outdoor integration
• middleware platforms for mobile services
• design outline for mobile technologies
• smart transport systems

SKILLS

• to design software architectures for location-specific services
• to apply positioning and tracking techniques in various indoor and outdoor scenarios
• to explain typical techniques for mobile data
• to explain principles of mobile databases
• to explain principles of mobile cloud computing
• to explain typical privacy techniques in relation to the location of persons

COMPETENCES

The student must learn typical technologies and principles of location-based service systems and the student must be able to apply these technologies and principles in different mobile application scenarios both indoors and outdoors

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 30 hours per ECTS, which for this activity means 150 hours.
EXAMS

<table>
<thead>
<tr>
<th>Name of exam</th>
<th>Mobile Data and Location-based Services</th>
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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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ORGANISATION

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ENTREPRENEURSHIP

2022/2023

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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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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<td>The Technical Faculty of IT and Design</td>
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IT-RET

2022/2023

MODULETS INDHOLD, FORLØB OG PÆDAGOGIK

Det overordnede formål er at give de studerende et grundlæggende kendskab til og forståelse for juridisk metode inden for kursets udvalgte retsområder; Databeskyttelsesretten, herunder Cybercrime og Cybersikkerhed, Immaterialretten med særligt fokus på ophavsretlig beskyttelse og IT-kontraktretten.

LÆRINGSMÅL

VIDEN

• Fagets begreber og terminologi
• De videnskabelige problemstillinger, som knytter sig til faget
• De relevante retskilder, herunder fagets teori, lovbestemmelser og afgørende retspraksis
• Fagets begreber, terminologi og relevante retskilder i forbindelse med diskussion af fagets videnskabelige problemstillinger
• Gældende ret

FÆRDIGHEDER

• Anvende de udvalgte retsområders begreber og terminologi korrekt
• Kendskab til relevant praksis fra tilsynsmyndigheder og nævn, Danmarks Domstol og EU-Domstolen
• Viden om eksistensen af afgørelser fra andre internationale administrative organer samt domstole
• Viden om retsområdernes relevante retskilder (herunder også EU-rettige kilder)
• Anvende den juridiske metode på de praktiske problemstillinger, som knytter sig til retsområderne

KOMPETENCER

• Identificere og løse videnskabelige og praktiske problemstillinger inden for fagets retsområder
• Bruge den videnskabelige indsigts til at opstille nye løsninger på IT-rettige problemstillinger, vælge de rette løsninger i en IT-rettig kontekst og i begge sammenhænge være i stand til at begrunde de valg, der træffes
• Kunne formidle forskningsbaseret viden inden for retsområderne
• Diskutere professionelle og videnskabelige problemstillinger inden for retsområderne med både fagfæller, ikke-specialister, IT-professionelle, samarbejdspartnere og brugere i et korrekt sprog, og med afsæt i den tilegnede viden selvstændigt kunne tage ansvar for sin egen faglige udvikling og specialisering inden for kurset

UNDERVISNINGSFORM

• Forelæsninger

OMFANG OG FORVENTET ARBEJDSINDSATS

137,5 timer

EKSAMEN

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**ORGANISATION**

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**LITTERATUR**

- Der henvises til lektions- og pensumsoversigt
SPECIALISATION COURSE IN HUMAN-COMPUTER INTERACTION

2022/2023

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

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ADDITIONAL INFORMATION

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FACTS ABOUT THE MODULE

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SPECIALISATION COURSE IN DATABASE TECHNOLOGY

2022/2023

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

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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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SPECIALISATION COURSE IN DISTRIBUTED SYSTEMS

2022/2023

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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SPECIALISATION COURSE IN SEMANTICS AND VERIFICATION

2022/2023

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

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<td>Lone Leth Thomsen</td>
</tr>
</tbody>
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ORGANISATION

<p>| | |</p>
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SPECIALISATION COURSE IN MACHINE INTELLIGENCE

2022/2023

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

EXAMS

<table>
<thead>
<tr>
<th>Name of exam</th>
<th>Specialisation Course in Machine Intelligence</th>
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<tbody>
<tr>
<td>Type of exam</td>
<td>Oral exam</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>
<thead>
<tr>
<th>Danish title</th>
<th>Specialiseringskursus i maskinintelligens</th>
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<tbody>
<tr>
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SPECIALISATION COURSE IN PROGRAMMING TECHNOLOGY

2022/2023

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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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 SYSTEM DEVELOPMENT

2022/2023

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

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• 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

Contact: The Study board for Computer Science at cs-en@cs.aau.dk or 9940 8854
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Curriculum for Master of Science (MSc) in Engineering (Software), 2022