AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER´S PROGRAMME IN COMPUTER SCIENCE (IT), 2023

MASTER OF SCIENCE (MSC)
AALBORG

Link to this studyline

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§ 1: PREFACE

Pursuant to consolidation Act 778 of August 7, 2019 on Universities (the University Act), the following is established. The programme also follows the Examination Policies and Procedures incl. the Joint Programme Regulations for Aalborg University.

§ 2: BASIS IN MINISTERIAL ORDERS

The Master's programme is organised in accordance with the Ministry of Higher Education and Science's Order no. 2285 of December 1, 2021 on Full-time University Programmes (the University Programme Order) and Ministerial Order no. 2271 of December 1, 2021 on University Examinations (the Examination Order). Further reference is made to Ministerial Order no. 35 of January 13, 2023 (the Admission Order) and Ministerial Order no. 1125 of July 4, 2022 (the Grading Scale Order).

§ 3: CAMPUS

The programme is offered in Aalborg.

§ 4: FACULTY AFFILIATION

The Master's programme falls under The Technical Faculty of IT and Design, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under Study Board of Computer Science

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners corps on Computer Science

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal right of admission (retskrav)

- Bachelor of Science (BSc) in Information Technology with Specialisation in Technology, Aalborg University

Applicants without legal right of admission

- Bachelor of Science (BSc) in Data Science, Aalborg University
- Bachelor of Science (BSc) in Data Science, IT University in Copenhagen
- Bachelor of Science (BSc) in Data Science, Aarhus University

All applicants without a legal claim must prove that their English language qualifications is equivalent to level B (Danish level) in English.

Admission to the master's programme in Computer Science IT requires that the applicant has passed a relevant qualifying bachelor's or professional bachelor's degree programme. A bachelor's or professional bachelor's degree programme is defined as relevant if the degree programme contains modules on computer science related subjects with a minimum of 150 ECTS in total, among which the following must be included:

- Programming, including object-oriented programming [15 ECTS]
- Software Engineering [5 ECTS]
- Algorithms and Data Structures [5 ECTS]
- Databases [5 ECTS]
- Discrete mathematics, or a related module on mathematical foundations [5 ECTS]

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's programme entitles the graduate to the Danish designation Cand.scient. i datalogi (it). The English designation is: Master of Science (MSc) in Computer Science (IT).

§ 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The Master's programme is a 2-year, research-based, full-time study programme. The programme is set to 120 ECTS credits.

§ 10: RULES CONCERNING CREDIT TRANSFER (MERIT), INCLUDING THE POSSIBILITY FOR CHOICE OF MODULES THAT ARE PART OF ANOTHER PROGRAMME AT A UNIVERSITY IN DENMARK OR ABROAD

The Study Board can approve that passed programme elements from other educational programmes at the same level replaces programme elements within this programme (credit transfer).

Furthermore, the Study Board can, upon application, approve that parts of this programme is completed at another university or a further education institution in Denmark or abroad (pre-approval of credit transfer).

The Study Board's decisions regarding credit transfer are based on an academic assessment.

§ 11: EXEMPTIONS

The Study Board's possibilities to grant exemption, including exemption to further examination attempts and special examination conditions, are stated in the Examination Policies and Procedures published at this website: https://www.studyservice.aau.dk/rules

§ 12: RULES FOR EXAMINATIONS

The rules for examinations are stated in the Examination Policies and Procedures published at this website: https://www.studyservice.aau.dk/rules

§ 13: RULES CONCERNING WRITTEN WORK, INCLUDING THE MASTER'S THESIS

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

The Study Board can grant exemption from this in special cases (e.g., dyslexia or a native language other than Danish).

The Master's Thesis must include an English summary. If the project is written in English, the summary can be in Danish. The summary is included in the evaluation of the project as a whole.

§ 14: REQUIREMENTS REGARDING THE READING OF TEXTS IN A FOREIGN LANGUAGE

It is assumed that the student can read academic text and use reference works, etc., in English

§ 15: COMPETENCE PROFILE ON THE DIPLOMA

The following competence profile will appear on the diploma:

A Candidatus graduate has the following competency profile:

A Candidatus graduate has competencies that have been acquired via a course of study that has taken place in a research environment.

A Candidatus graduate is qualified for employment on the labour market based on his or her academic discipline as well as for further research (PhD programmes). A Candidatus graduate has, compared to a Bachelor, developed his or her academic knowledge and independence so as to be able to apply scientific theory and method on an independent basis within both an academic and a professional context.

§ 16: COMPETENCE PROFILE OF THE PROGRAMME

The graduate of the Master's programme

Knowledge

- has knowledge in computer science that, in selected areas, is based on the highest level of international research in the subject area
- can understand and, on a scientific basis, reflect over challenges in computer science and identify solutions to scientific and engineering problems

Skills

- are proficient in scientific methods and tools and general skills related to computer science
- can evaluate and select among the theories, methods, tools and general skills and, on a sound scientific and engineering basis, advance new analyses and solutions
- can communicate research-based knowledge and discuss professional, scientific and engineering problems with both peers and non-specialists

Competencies

- can manage work and development situations that are complex, unpredictable and require new solutions
- can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility
- can independently take responsibility for own professional development and specialization

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

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

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

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

§ 18: OVERVIEW OF THE PROGRAMME

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

Options

Students have to choose between option A and option B on the 2nd Semester:

- Students with a formal computer science bachelor degree that include knowledge of programming language design and compiler construction should choose option A
- Students without a formal computer science bachelor, especially students with a degree from UCN and BAIT, should choose option B to gain knowledge of programming language design and compiler construction
- Students who are in doubt about their choice are recommended to contact the education coordinator for advice

Offered as: 1-professional						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Secure, Scalable and Useful Systems (DSNCSITK120)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Programming Paradigms (DSNCSITK115)	Course	5	7-point grading scale	External examination	Written or oral exam	English
Machine Intelligence (DSNCSITK121)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Electives 1st semester Select 1 course	Course	5				
2 SEMESTER Option A						
Reliable Innovative Systems (DSNCSITK220)	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Electives 2. semester, option A Select 3 courses	Course	15				
2 SEMESTER Option B						
Design, Definition and Implementation of Programming Languages (DSNCSITK221)	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Agile Software Engineering (DSNCSITK224)	Course	5	7-point grading scale	External examination	Written or oral exam	English
Languages and Compilers (DSNCSITK222)	Course	5	7-point grading scale	External examination	Written or oral exam	English
Computability and Complexity (DSNCSITK223)	Course	5	7-point grading scale	External examination	Written or oral exam	English
3 SEMESTER						
Pre-Specialisation in Computer Science (DSNCSITK301)	Project	20	7-point grading scale	External examination	Oral exam based on a project	English
Entrepreneurship (DSNCSITK320)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Electives 3rd semester Select 1 specialisation course	Course	5				
4 SEMESTER						
Master's Thesis (DSNCSITK411)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English

Electives 1st semester Select 1 course						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Selected Topics in Database Research and Practice (DSNCSITK116)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Distributed Systems (DSNCSITK117)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Selected Topics in HCI (DSNCSITK118)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English

Electives 2. semester, option A Select 3 courses						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Machine Learning (DSNCSITK225)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Selected Topics in Modelling and Verification (DSNCSITK226)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Software Innovation (DSNCSITK227)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Systems Development in Praxis (DSNCSITK228)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Quantum Information and Computing (DSNCSITK229)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English

Electives 3rd semester Select 1 specialisation course						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Specialisation Course in Human-Computer Interaction (DSNCSITK321)	Course	5	7-point grading scale	External examination	Oral exam	English
Specialisation Course in Database Technology (DSNCSITK322)	Course	5	7-point grading scale	External examination	Oral exam	English
Specialisation Course in Distributed Systems (DSNCSITK323)	Course	5	7-point grading scale	External examination	Oral exam	English
Specialisation Course in Semantics and Verification (DSNCSITK324)	Course	5	7-point grading scale	External examination	Oral exam	English
Specialisation Course in Machine Intelligence (DSNCSITK325)	Course	5	7-point grading scale	External examination	Oral exam	English

Specialisation Course in Programming Technology (DSNCSITK326)	Course	5	7-point grading scale	External examination	Oral exam	English
Specialisation Course in System Development (DSNCSITK327)	Course	5	7-point grading scale	External examination	Oral exam	English

Selected modules are created to the extent that the Board of Studies assesses that there is sufficient enrollment for them. If an elective course is not created, the registered students are offered other elective courses. The specified optional modules are offered and created following a study board decision. This means that not all elective modules are created every year.

Prior to the registration period for the 3rd semester, the study board for computer science will inform the students about which specialization courses from the curriculum will be offered in the coming semester. Likewise, new specialization courses may be added as a result of current research topics.

§ 19: ADDITIONAL INFORMATION

Further information about the programme, including exams are published on the Board of Studies' website.

All students who have not participated in Aalborg University's PBL introductory course during their Bachelor's degree must attend the introductory course "Problem-based Learning and Project Management". The introductory course must be approved before the student can participate in the project exam. For further information, please see the Department of Computer Science's website.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of September 1, 2023.

The Study Board does not offer teaching after the previous curriculum from 2020 after the summer examination 2024.

The Study Board will offer examinations after the previous curriculum, if there are students who have used examination attempts in a module without passing. The number of examination attempts follows the rules in the Examination Order.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

On May 4th, 2023, The Vice-Dean of Education has approved the revision of the examination in the module "*Languages and Compilers*", on the 2nd semester, from "practical´" to "written or oral". The amendment is valid from spring 2024.

On January 17, 2024, The Vice-Dean of Education has approved a newer version of the module "*Quantum Information and Computing*", valid from spring 2024.

The Vice dean of Education has on February 12, 2025, approved that the prerequisite for enrollment for the exam is erased in the module *Reliable Innovative Systems*, valid from Spring 2025.

On February 17, 2025, The Vice-Dean of Education has approved a revision of the admission requirements (§ 7). The amendment is valid from September Intake 2025.