AALBORG UNIVERSITET

MASTER OF SCIENCE (MSC) IN ENGINEERING (NETWORKS AND DISTRIBUTED SYSTEMS) 2018

MASTER OF SCIENCE (MSC) IN ENGINEERING
AALBORG

Link to this studyline

TABLE OF CONTENTS

§ 1: PREFACE

Pursuant to Act 261 of March 18, 2015 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's programme in Networks and Distributed Systems is stipulated. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for The Technical Faculty of IT and Design.

§ 2: BASIS IN MINISTERIAL ORDERS

The Master's programme is organised in accordance with the Ministry of Higher Education and Science's Order no. 1328 of November 15, 2016 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 1062 of June 30, 2016 on University Examinations (the Examination Order). Further reference is made to Ministerial Order no. 111 of January 30, 2017 (the Admission Order) and Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order) with subsequent changes.

§ 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 the Board of Studies for Electronics and IT.

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners for engineering educations: electro (In Danish: censorkorps for Ingeniøruddannelsernes landsdækkende censorkorps; elektro).

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal claim to admission (retskrav):

Aalborg University offers no bachelor's programmes with a legal right of admission to this Master's program.

Applicants without legal claim to admission:

Bachelor's programmes qualifying students for admission:

- Bachelor of Science (BSc) in Engineering (Electronic Engineering and IT with specialisation in Communication Systems) (AAU)
- Bachelor of Science (BSc) in Engineering (Electronic Engineering and IT with specialisation in Signal Processing) (AAU)
- Bachelor of Science (BSc) in Engineering (Electronic Engineering and IT with specialisation in Informatics) (AAU)
- Bachelor of Science in Engineering (Electronic Engineering and IT with specialisation in Control Engineering), Aalborg University
- Bachelor of Science (BSc) in Engineering (Internet Technologies and Computer Engineering with specialization in Communication Systems) (AAU)
- Bachelor of Science (BSc) in Engineering (Internet Technologies and Computer Engineering with specialization in Signal Processing) (AAU)
- Bachelor of Science (BSc) in Engineering (Internet Technologies and Computer Engineering with specialization in Informatics)
- Bachelor of Science (BSc) in Engineering (Internet Technologies and computer Engineering with specialisation in Control Engineering), Aalborg University
- Bachelor of Science in Engineering (Robotics); Aalborg University
- Bachelor of Science (BSc) in Engineering (Mathematical Engineering).
- Bachelor of Science (BSc) in Engineering (Electronics and Computer Engineering) (AAU Esbjerg)
- Bachelor of Engineering (BScEE) in Electronics (AAU)

- Bachelor of Engineering (BScEE) in Electronics (AU)
- Bachelor of Engineering (BScEE) in Information Technology (AU)
- Bachelor of Engineering (BScEE) in Electronics (SDU)
- Bachelor of Science (BSc) in Engineering (Robot Systems) (SDU)
- Bachelor of Engineering (BScEE) in IT-Electronics (DTU)
- Bachelor of Engineering (BScEE) in Electrical engineering (DTU)
- Bachelor of Science (BSc) in Engineering in Electrical Engineering (DTU)
- Bachelor of Science (BSc) in Computer Science
- Bachelor of Science (BSc) in Engineering (Software)

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's programme entitles the graduate to the designation civilingeniør, cand.polyt. (candidatus/candidata polytechnices) i netværk og distribuerede systemer. The English designation is: Master of Science (MSc) in Engineering (Networks and Distributed Systems)

§ 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.studieservice.aau.dk/regler-vejledninger

§ 12: RULES FOR EXAMINATIONS

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

§ 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 texts in his og her native language as well as in English and use reference works etc. in other European languages.

§ 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

Knowledge:

- Has an understanding of the concept of complex distributed systems
- Has an understanding of methods within network planning.
- Has an understanding of network design of both general purpose, multipurpose and dedicated networks.
- Has knowledge in one or more subject areas that is based on the highest international research within the fields of networks and distributed systems

Skills:

- Can analyze and apply methods, including analytical, numerical and experimental methods, for analysis, design and test of networks and distributed systems, including systems with reliability and/or timing requirements.
- Demonstrate insight in relevant theories, methods and techniques used for distribution, storage and processing of data in a distributed system
- Demonstrate insight in real-time, performance, safety and robustness aspects
- Can apply modeling methods for the behavior of a network, including traffic and queuing.
- Can select and apply advanced methods within analysis and simulation of networks.
- Can apply appropriate methods for performance analysis within networks and distributed systems.
- Can communicate research-based knowledge and discuss professional and scientific problems with peers as well as non-specialists, using the correct terminology.

Competences:

- Have a deep understanding of analysis and design of networks, distributed systems and applications within this domain.
- Can select and apply appropriate methods for solving a given problem within networks and distributed systems and evaluate the results regarding their accuracy and validity
- Can identify scientific problems within networks and distributed systems and select and apply proper scientific theories, methods and tools for their solution
- Can develop and advance new analyses and solutions within networks and distributed systems
- Can manage work-related situations that are complex and unpredictable, and which require new solutions
- Can initiate and implement discipline-specific as well as interdisciplinary cooperation and assume professional responsibility
- Can take responsibility for own professional development and specialization.
- Work according to a scientific method and present results in the form of a scientific article and at a seminar/scientific conference

- Formulate and explain scientific hypotheses and results achieved through scientific work
- Analyze results and draw conclusions on a scientific basis

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The programme is structured in modules and organised 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 organised based on the following work and evaluation methods that combine skills and reflection:

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

§ 18: OVERVIEW OF THE PROGRAMME

Offered as: 1-professional Study programme: MSc Networks and Distributed Systems						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Networks and Distributed Systems	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Stochastic Processes	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Distributed Real Time Systems	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
1st Semester Elective courses (1 course) Choose 1 course module	Course	5				
2 SEMESTER						
Distributed Systems Design	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Wireless Systems Performance	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Fault Detection, Isolation and Modelling	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

Network Performance and Applications	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3 SEMESTER Option A						
Performance Analysis and Network Planning	Project	20	7-point grading scale	Internal examination	Oral exam based on a project	English
3rd Semester Elective courses (2 courses) Choose 2 course modules	Course	10				
3 SEMESTER Option B1						
Academic Internship	Project	20	7-point grading scale	Internal examination	Oral exam based on a project	English
3rd Semester Elective courses (2 courses) Choose 2 course modules	Course	10				
3 SEMESTER Option B2						
Academic Internship	Project	25	7-point grading scale	Internal examination	Oral exam based on a project	English
3rd Semester Elective courses (1 course) Choose 1 course module	Course	5				
3 SEMESTER Option B3						
Academic Internship	Project	30	7-point grading scale	Internal examination	Oral exam based on a project	English
3-4 SEMESTER Option C1						
Master's Thesis	Project	45	7-point grading scale	External examination	Oral exam based on a project	English
Systems of Systems/Complex Systems	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Machine Learning	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Non-linear Control	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3-4 SEMESTER Option C2						
Master's Thesis	Project	50	7-point grading scale	External examination	Oral exam based on a project	English
3rd Semester Elective courses (2 courses) Choose 2 course modules	Course	10				
3-4 SEMESTER Option C3						
Master's Thesis	Project	60	7-point grading scale	External examination	Oral exam based on a project	English

4 SEMESTER Master's Thesis						
Master's Thesis	Project	30	7-point grading scale	External examination	Oral exam based on a project	English

1st Semester Elective courses (1 course) Choose 1 course module						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Wireless PHY/MAC Fundamentals	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Communication Networks and Ambient Intelligence	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

3rd Semester Elective courses (1 course) Choose 1 course module						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Systems of Systems/Complex Systems	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Machine Learning	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Non-linear Control	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

3rd Semester Elective courses (2 courses) Choose 2 course modules						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Systems of Systems/Complex Systems	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Machine Learning	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Non-linear Control	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

If choosing a 20 ECTS academic internship the student must earn the remaining credits on the 3rd semester by following two of the elective courses under option A.

If choosing a 25 ECTS academic internship the student must earn the remaining credits on the 3rd semester by following one of the elective courses under option A.

If choosing to write long master's thesis of less than 60 ECTS the student must earn the remaining credits on the 3rd semester by following elective courses under option A.

§ 19: ADDITIONAL INFORMATION

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.

The number of ECTS for the project unit has to be reflected in the scope of the project (e.g. by the theories, methods, and experiments addressed).

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the Dean of The Technical Faculty of IT and Design and enters into force as of 09.01.2018.

Students who wish to complete their studies under the previous curriculum from 2017 must conclude their education by the summer examination periode 2019 at the latest, since examinations under the previous curriculum are not offered after this time.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

Minor editorial changes have been made during the digitalization.