AALBORG UNIVERSITET

MASTER OF SCIENCE IN TECHNOLOGY (GLOBAL SYSTEMS DESIGN) 2017

MASTER OF SCIENCE (MSC) IN TECHNOLOGY COPENHAGEN

Link to this studyline

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§ 1: PREFACE

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

§ 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 Copenhagen.

§ 4: FACULTY AFFILIATION

The Master's programme falls under the Faculty of Engineering and Science, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under the Study Board of Industry and Global Business Development.

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Master's programme is associated with the external examiners corps on Nationwide engineering examiners/Machine.

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal claim to admission (retskrav):

- None

Applicants without legal claim to admission:

- Bachelor of Science (BSc) in Engineering (Manufacturing and Operations Engineering), Aalborg University

Students with another Bachelor degree may, upon application to the Board of Studies, be admitted following a specific academic assessment if the applicant is considered as having comparable educational prerequisites. The University can stipulate requirements concerning conducting additional exams prior to the start of study.

From September 2018 Mathematics C or documentation of equivalent qualifications is required.

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master programme entitles the graduate to the Danish designation Cand.tech. (candidatus/candidata technologiae) i globalt systemdesign. The English designation is: Master of Science (MSc) in Technology (Global Systems Design).

§ 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 successfully completed (passed) programme elements from other Master's programmes in lieu of programme elements in this programme (credit transfer). The Study Board can also approve successfully completed (passed) programme elements from another Danish programme or a programme outside of Denmark at the same level in lieu of programme elements within this curriculum. Decisions on credit transfer are made by the Study Board based on an academic assessment. See the Joint Programme Regulations for the rules on credit transfer.

§ 11: EXEMPTIONS

In exceptional circumstances, the Study Board study can grant exemption from those parts of the curriculum that are not stipulated by law or ministerial order. Exemption regarding an examination applies to the immediate examination.

§ 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/Studielegalitet/

§ 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 (or another foreign language: French, Spanish or German upon approval by the Study Board). If the project is written in English, the summary must be in Danish (The Study Board can grant exemption from this). The summary must be at least 1 page and not more than 2 pages (this is not included in any fixed minimum and maximum number of pages per student). The summary is included in the evaluation of the project as a whole.

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

At programmes taught in Danish, it is assumed that the student can read academic texts in modern Danish, Norwegian, Swedish and English and use reference works, etc., in other European languages. At programmes taught in English, 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 programme:

Knowledge

- Has attained thorough understanding of a broad range of theoretical, numerical and experimental techniques within the area of designing and applying autonomous systems.

- Has thorough knowledge of the concepts and key elements of autonomous systems, as well as the fundamental technologies that enable systems to be intelligent and autonomous.
- Has knowledge in one or more selected subject areas of autonomous systems and global systems design that is based on the highest international research.
- Has in-depth knowledge about the effects of autonomous systems on the way that related operations are conducted In the area of Global System Design, and has insights into the potentials and limitations of such systems when applied in a specific case.
- Demonstrate an understanding of research work and be able to become a part of a research environment.
- Demonstrate insight into the implications of research work, including research ethics.

Skills

- Be able to analysze a given use-case problem and design suitable autonomous systems and solutions by applying scientific methods and tools, general skills related to problem solving and systems design.
- Be able to apply a wide range of technologies and an engineering approach for solving problems within the domain of designing globally functioning systems.
- Be able to evaluate and select among scientific theories, methods and tools for the conception, design, implementation and operation of autonomous systems.
- Be able to apply theories, methods and concepts in different organizational and empirical settings in order to solve complicated technical problems in a societal context.
- Be able to participate in the development and implementation of novel and innovative technology-based concepts, systems and solutions.
- Can disseminate and communicate research-based knowledge and discuss professional and scientific problems within the domain of designing autonomous systems in a global context with both peers and non-specialists.

Competencies

- Be able to manage work and development in complex and unpredictable situations requiring new solutions.
- Be able to take part in technical development and research.
- Can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility within the area of Global System Design.
- Be able to direct the technical management of development projects within the industry.
- Be able to independently take responsibility for own professional development and specialization.

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The Master's programme in Global Systems Design aims at providing graduates with competences to solve complex problems related to the design and deployment of autonomous systems and has been developed to build both theoretical understanding and practical experience of students enrolled in the programme. The programme focuses on topics as: Systems Engineering & Validation, Modelling and Control of Mechatronic Systems, Optimization Scheduling and routing, Sensing and Perception, Machine Learning and Big Data, and Networks of Autonomous Systems. Those topics can be applied across industrial sectors in order to provide flexible autonomous solutions to problems ranging from classical manufacturing to service production

The programme is structured giving the graduate the opportunity to specialise within specific areas of autonomous systems; ranging from e.g. autonomous solutions in Automation and Robotics to autonomous operation of Logistics systems. The specialisation is carried out through the project work.

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 aim 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 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)
- Teacher feedback
- Reflection
- Portfolio work.

§ 18: OVERVIEW OF THE PROGRAMME

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

Offered as:					
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method
1 SEMESTER					
Engineering of Autonomous Systems	Project	15	7-point grading scale	Internal examination	Oral exam based on a project
Systems Engineering and Validation	Course	5	7-point grading scale	Internal examination	Written or oral exam
Modelling and Control of Mechatronic Systems	Course	5	7-point grading scale	Internal examination	Written or oral exam
Optimization, Scheduling and Routing	Course	5	7-point grading scale	Internal examination	Written or oral exam
2 SEMESTER					
Intelligent Autonomous Systems	Project	15	7-point grading scale	External examination	Oral exam based on a project
Sensing and Perception	Course	5	7-point grading scale	Internal examination	Written or oral exam
Machine Learning and Big Data	Course	5	7-point grading scale	Internal examination	Written or oral exam
Networks of Autonomous Systems	Course	5	7-point grading scale	Internal examination	Written or oral exam
3 SEMESTER Elective track A					
Autonomous Systems in Practice	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
3 SEMESTER Elective track B					
Academic Internship	Project	30	7-point grading scale	Internal examination	Oral exam based on a project
3-4 SEMESTER					
Long Master’s Thesis	Project	60	7-point grading scale	External examination	Master's thesis/final project
4 SEMESTER					
Master’s Thesis	Project	30	7-point grading scale	External examination	Master's thesis/final project

The 3rd Semester offers different ways of organisation – depending on the student's choice of content; traditional project work at Aalborg University, study visit at an educational institution in Denmark or abroad, voluntary internship with project work at a company in Denmark or abroad, or a Semester programme that comprises cross-disciplinary programme elements composed by the student. The total work load of the Semester must be equivalent to 30 ECTS. The project may be finalised with a project report or in the form of a scientific paper, or, if the project is continued on the 4th Semester, with a midterm evaluation.

On the 4th Semester, the Master's Thesis is completed. The Master's Thesis may be combined with the 3rd Semester in an extended Master's Thesis.

§ 19: ADDITIONAL INFORMATION

The current version of the curriculum is published on the study board's website, including more detailed information about the programme, including exams.

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.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the Dean of the Faculty of Engineering and Science and enters into force as of September 2017.

Students who wish to complete their studies under the previous curriculum from 2016 must conclude their education by the summer examination 2018 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 in connection with digitisation of the study curriculum.

April 8, 2019: Starting from September 2018 Mathematics C or documentation of equivalent qualifications is required.