AALBORG UNIVERSITET

CURRICULUM FOR THE MASTER'S PROGRAMME IN VISION, GRAPHICS AND INTERACTIVE SYSTEMS, 2020

MASTER OF SCIENCE (MSC) IN ENGINEERING
AALBORG

Link to this studyline

Link(s) to other versions of the same line:

Curriculum for the Master's Programme in Vision, Graphics and Interactive Systems, 2019

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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 Joint Programme Regulations and the Examination Policies and Procedures 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. 20 of January 9, 2020 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 22 of January 9, 2020 on University Examinations (the Examination Order). Further reference is made to Ministerial Order no. 153 of February 26, 2020 (the Admission Order) and Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order).

§ 3: CAMPUS

The programme is offered in Aalborg.

§ 4: FACULTY AFFILIATION

The Master's programme falls under the The Technical Faculty of IT and Design.

§ 5: STUDY BOARD AFFILIATION

The Master's programme falls under the Study Board of Electronics and IT.

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The programme is affiliated with the Nationwide engineering examiners/Electronics, IT and Energy (Electromagnetic direction).

§ 7: ADMISSION REQUIREMENTS

Applicants with a legal claim to admission (retskrav):

Applicants with one of the following degrees are entitled to admission:

- Bachelor of Science in Engineering (Electronic Engineering and IT with specialisation in Informatics), Aalborg University
- Bachelor of Science in Engineering (Internet Technologies and computer Engineering with specialisation in Informatics), Aalborg University
- Bachelor of Science (BSc) in Engineering (Computer Engineering), Aalborg University

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 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 specialisation in Control Engineering), Aalborg University
- Bachelor of Science in Engineering (Robotics); Aalborg University

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

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Master's programme entitles the graduate to the designation Civilingeniør, cand.polyt. i vision, grafik og interaktive systemer. The English designation is: Master of Science (MSc) in Engineering (Vision, Graphics and Interactive 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.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 texts 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

Knowledge:

- Has knowledge on an advanced level in computer vision, computer graphics and interactive systems based on the highest international research in these areas
- Can understand and, on a scientific basis, reflect over the aforementioned subject area's key knowledge and can identify scientific problems and propose solutions within these
- Has a comprehensive knowledge of the core subjects for computer vision, such as image recognition, visual scene analysis, object tracking, etc.
- Has knowledge about methods for computer graphics, augmented reality, 3D rendering, etc.
- Has knowledge about interactive systems design, in particular multi modal user interaction and user experience design.
- Has knowledge about machine learning methods and techniques and pattern recognition
- Has knowledge of the theories and methods for realizing complex software systems for vision, graphic and interactive systems

Skills:

- Excels in scientific methods, tools and general skills related to design, simulation, real-time implementation, test, evaluation, and documentation of systems within the fields of computer vision, graphics and user interaction
- can evaluate and select among the scientific theories, methods, tools and general skills within the fields of computer vision, graphics and user interaction and, on a scientific basis, advance new analyses and solutions
- can communicate research-based knowledge and discuss professional and scientific problems with both peers and non-specialists
- Can apply methods and tools for solving complex problems within the aforementioned domains
- Can analyze and apply state-of-the-art methods in Computer Vision
- Can analyze and apply state-of-the-art methods in Computer Graphics
- Can apply user cantered design methods to design, implement and test multimodal user interaction strategies

Competences:

- 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
- Can analyze and apply appropriate theories and methods for computer vision problems within e.g. surveillance, robotics, etc.
- Can select and apply appropriate methods for solving a given problem within computer vision, graphics and interactive systems and evaluate the results regarding their accuracy and validity
- Can identify scientific problems within control and auto computer vision, graphics and interactive systems and select and apply proper scientific theories, methods and tools for their solution
- Can develop and advance new analyses and solutions within computer vision, graphics and interactive systems
- 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

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).

Offered as: 1-professional						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Computer Graphics (ESNVGISK1P1)	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Computer Graphics Programming (ESNVGISK1K1A)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Machine Learning (ESNSPAK3K2FA)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
User Experience Design for Multi Modal Interaction (ESNVGISK1K2B)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2 SEMESTER						
Computer Vision (ESNVGISK2P2)	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Image Processing and Computer Vision (ESNVGISK2K1A)	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
2nd Semester Elective courses (2 courses) Choose 2 course modules	Course	10				
3 SEMESTER Option A						
Interactive Systems (ESNVGISK3P5)	Project	20	7-point grading scale	Internal examination	Oral exam based on a project	English
Platforms and Methods for Multi Modal Systems (ESNVGISK3K1)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

Research in Vision, Graphics and Interactive Systems (ESNVGISK3K2)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3 SEMESTER Option B						
Project-Oriented Study in an External Organisation (ESNVGISK3P2N)	Project	20	Passed/Not Passed	Internal examination	Oral exam based on a project	English
Platforms and Methods for Multi Modal Systems (ESNVGISK3K1)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Research in Vision, Graphics and Interactive Systems (ESNVGISK3K2)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3 SEMESTER Option C						
Project-Oriented Study in an External Organisation (ESNVGISK3P3N)	Project	25	Passed/Not Passed	Internal examination	Oral exam based on a project	English
3rd Semester Elective courses (1 course) Choose 1 course module	Course	5				
3 SEMESTER Option D						
Project-Oriented Study in an External Organisation (ESNVGISK3P4N)	Project	30	Passed/Not Passed	Internal examination	Oral exam based on a project	English
3-4 SEMESTER Option E: Long Master's Thesis						
Master's Thesis (ESNVGISK4P2)	Project	50	7-point grading scale	External examination	Master's thesis/final project	English
Platforms and Methods for Multi Modal Systems (ESNVGISK3K1)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Research in Vision, Graphics and Interactive Systems (ESNVGISK3K2)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
4 SEMESTER Master's Thesis						
Master's Thesis (ESNVGISK4P1)	Project	30	7-point grading scale	External examination	Master's thesis/final project	English

2nd Semester Elective courses (2 courses) Choose 2 course modules						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Algorithms, Data Structures and Software Engineering for Media Technology	Course	5	7-point grading scale	Internal examination	Written or oral exam	English

(MSNMEDM2172)						
Numerical Scientific Computing (ESNSPAK2K3)	Course	5	Passed/Not Passed	Internal examination	Active participation/continuous evaluation	English
Robot Vision (ESNVGISK2K2)	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
Platforms and Methods for Multi Modal Systems (ESNVGISK3K1)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Research in Vision, Graphics and Interactive Systems (ESNVGISK3K2)	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

§ 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. For further information, please see the course description.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the dean and enters into force as of 01.09.2020.

The Study Board does not offer teaching after the previous curriculum from 2019 after the summer examination period 2021.

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 March 25, 2022 the Vice-Dean of Education has approved that the type of exam in the module *"Numerical Scientific Computing"* is changed from *"Written or oral"* to *"Active participation/continuous evaluation"* and that the re-exam will be *"Written or oral"*. The amendment is valid as of Spring 2022.