IF245X Degree Project in Micro Electronics, Second Cycle 30.0 credits

Examensarbete inom mikroelektronik, avancerad nivå

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for IF245X valid from Spring 2019

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

- All courses that are required for issuing the Degree of Bachelor and at least 60 credits of courses for second-cycle studies should be fully completed. These 60 credits should include all courses in the programme/s relevant to the degree project and a course in the theory of knowledge.

- A course in scientific methodology should be completely reported with a passing grade.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The purpose of the degree project is that the student should apply and deepen knowledge, understanding, abilities, and approaches within the contexts of the education. The degree project should be carried out at the end of the education and imply a specialised study and synthesis of earlier acquired knowledge. In the degree project, within a Master of Science in Engineering programme, both the technical/scientific content and method knowledge are emphasised.

After having completed the degree project, the student shall demonstrate the knowledge and skills required to work autonomously as a graduate engineer, according to the national qualitative outcomes for the Degree of Master of Science in Engineering, as well as for Degree of Master of Science in the Higher Education Ordinance. These include:

- considerably advanced knowledge within the main field of study/the specialisation for the education, including advanced insight into current research and development work,
- specialised methodological knowledge within the main field of study/the specialisation for the education,
- demonstrate the ability to participate in research and development work and so contribute to the formation of knowledge
- demonstrate, with a holistic approach, the ability to critically, independently and creatively identify, formulate, analyse, assess and deal with complex phenomena, issues and situations even with limited information,
- demonstrate the ability to plan and with adequate methods undertake advanced tasks within predetermined parameters, as well as the ability to evaluate this work,
- demonstrate ability to create, analyse and critically evaluate various technological/architectural solutions,
- demonstrate the ability to integrate knowledge critically and systematically, as well as the ability to identify the need for additional knowledge,
- demonstrate the ability to, in English, clearly present and discuss his or her conclusions and the knowledge and arguments on which they are based in speech and writing to different audiences,
- demonstrate the ability to, within the framework of the degree project, identify the role of science and the engineer in the society,
- demonstrate the ability to, within the framework of the specific degree project, identify the issues that need to be answered in order to observe relevant dimensions of sustainable development, and
- demonstrate the ability to, within the framework of the degree project, assess and show awareness of ethical aspects on research and development work with respect to methods, working methods and the results of the degree project.

Course contents

Learning activities

Before the degree project course starts, the student shall identify an appropriate degree project task and formulate a project proposal that can be presented to the examiner for approval. The assignment must be chosen, so that it implies a natural progression of the knowledge and skills that have been acquired within the education, and in a possible specialisation within the education.

The student must write an individual plan for the degree project in which the problem description/assignment and the preconditions for the implementation of the work should be specified. The individual plan for the degree project should include a background including a problem description and scientific aspects/question formulations, purpose(s), goals, delimitations, the relevance of the project, methods and time schedule for the implementation of the degree project. The individual plan shall also include a brief self-reflection where the student accounts for his knowledge to carry out the assignment and the planning for how potential remaining courses, that are required for higher education qualification, shall be completed. The individual plan, for the degree project, shall be approved by the examiner.

The student carries out an in-depth pre-study including discussions of method choice and theoretical background with a literature study that is reported as a part of a draft to a preliminary version of the written degree project report.

The student carries out an individual independent project where knowledge and methods, from the education, are applied.

The student plans and carries out an oral presentation and defence of the own degree project.

The student carries out an oral and written opposition of another student's degree project on the same level.

The student writes and presents a written degree project report, where the student clearly presents and discusses own conclusions in the degree project and the knowledge and the arguments that support them.

The student carries out a self-assessment of the degree project according to the model of "Assessment of the quality of degree project for Degree of Master of Science in Engineering and Degree of Master of Science".

Disposition

- The degree project is an individual independent project that is carried out by one student. Although several students are working within the same project, it shall result in individual reports, where each report has to satisfy the requirements for a degree project.
- The student contacts an appropriate examiner before the work starts. Alternatively, the director of studies for degree project or programme co-ordinator can propose an examiner.
- The student shall prepare a brief written project proposal describing the work. This description shall be enclosed to the registration form. The description shall contain background, purpose, objective and method.

- The examiner ensures that the students satisfy the general and specific prerequisites for the degree project and that the suggested degree project can satisfy the expected learning outcomes for a degree project. The examiner verifies that the degree project falls within the degree programme/s subject area and that the issues studied show an appropriate progression within the education. The examiner signs the registration form.
- The examiner appoints a supervisor at KTH and approves a possible industry supervisor in consultation with the director of studies for degree projects.
- The degree project can be registered after the examiner has accepted the assignment.
- The student writes a detailed individual plan for the degree project and delivers it to the examiner for approval.
- The student carries out a pre-study, an investigation of choices of methods, as well as a literature study, which are delivered to the supervisor at KTH for approval.
- During the implementation of the degree project, the student shall regularly (at least every second week) report how the work progresses to the supervisor at KTH.
- The student shall, continuously during the degree project, document the work in writing and work on the preliminary version of the written report.
- When the supervisor at KTH assesses that the student has reached the objectives, according to the plan for the degree project, and that the quality of the preliminary written report holds high quality, the student shall write a self-assessment of the degree project according to the model for "Assessment of the quality of degree project for Degree of Master of Science in Engineering and Degree of Master of Science". The supervisor gives feedback on the self evaluation, and the student will be given the opportunity to remedy possible deficiencies.
- The report andself-assessment shall be delivered together with the supervisor's summary of the assessment of the degree project report, according to the model for "Assessment of the quality of the degree project", to the examiner for a preliminary approval.
- For opposition, the student is assigned another student's degree project report, who is working on a second-cycle degree project, to publicly discuss his or her report. The date for opposition and the choice of degree project, to publicly discuss, shall be approved by the examiner. The student shall carry out an oral and written opposition of the other student's presentation of his or her degree project. The opposition is assessed by the examiner of the other student.
- The student shall carry out an oral presentation and a defence of his or her report.
- After the presentation, and no later than two weeks after presentation, the student shall deliver a final report to examiner. To the report, the student shall enclose an updated self-reflection based on the model for "Assessment of the quality of degree project for Degree of Master of Science in Engineering and Degree of Master of Science".
- The examiner is responsible for checking the degree project report for plagiarism.
- The examiner fills in the model for "Assessment of the quality of degree project for Degree of Master of Science in Engineering and Degree of Master of Science".
- The grade should be determined by a teacher (examiner), particularly appointed by the higher education institution.
- The examiner should acquire support for grading from at least one other teacher on KTH, competent in the subject area, (who constitutes reviewer for the degree project).
- KTH's policy for public attendance applies to the implementation of the degree project and for publication of the report. The degree project report should be published electronically

in Diva, according to the rules that apply to electronic publication of degree projects at KTH.

Examination

- XUPP - Degree Project, 30.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Other requirements for final grade

- An individual plan for the degree project
- Active attendance at two oral presentations of degree projects for second-cycle studies. Pilot study, discussion of method choices and literature study
- Self-assessment report
- Oral presentation
- Written and oral review of other student's degree project for second-cycle studies
- Written report with summary/abstract in both Swedish and English

Time limit

Requirements according to KTH's regulatory frameworks for degree projects and all examination parts as above should be approved within a year from the starting date of the degree project. Otherwise, the degree project will be ended with a failed grade, unless special circumstances apply.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.