MF213X Degree Project in Machine Design, Second Cycle 30.0 credits

Examensarbete inom maskinkonstruktion, avancerad nivå

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

Establishment

Course syllabus for MF213X valid from Spring 2022

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

The specific prerequisites for a degree project of 30 credits at advanced level are:
all courses from the syllabus years 1-3, or courses required for issuing a Bachelor's degree, and at least 60 credits of courses at the advanced level must be completed. The courses at the advanced level must include courses in the MSc in engineering programme that are relevant to the degree project as well as a course in scientific theory and research methodology.

Intended learning outcomes

From the goals for degree project for engineering degree established by KTH, the student should be able to:

1. demonstrate knowledge and understanding of the scientific foundation and best practices for the chosen subject, as well as an advanced understanding in current research and development, and advanced knowledge on methods.

2. demonstrate the ability to search for, gather and integrate knowledge and identify their need for additional knowledge, all with a holistic, critical and systematic work approach

3. demonstrate the ability to identify, analyse, assess and handle complex phenomena, issues and situations also with limited information

4. demonstrate the ability to plan and with adequate methods carry out qualified assignments within given time frames and to evaluate this work

5. demonstrate the ability to develop and evaluate products, processes, systems, methods or technical solutions with respect to people's circumstances and needs, as well as society's goals in term of economically, socially and ecologically sustainable development

6. demonstrate the ability, both orally and in writing, in dialogue with different groups, to clearly account for and discuss their conclusion and the knowledge and arguments on which these are based

7. demonstrate the ability to make assessments considering relevant scientific, social and ethical aspects

8. show such skills that is required to participate in research and development or to work independently in other qualified activities

Course contents

At the end of the education, there is a degree project in which the student be expected to demonstrate his ability to independently solve a mechanical engineering problem in an engineering way. The work should be based on relevant theories and be presented as a written report and an oral presentation. In the degree project it is required to be present at the public presentations of two other degree projects at KTH and to publicly discuss another student's degree project.

The degree project must have significant mechanical engineering contents, while focus can vary considerably between different degree projects. Examples of different focuses can be:

- to develop a new concept for a technical system

- to design and evaluate a new component in an existing technical systems

- to investigate and develop new design methods and/or tools.

Provided that the degree project satisfies the requirements above, as decided by the course coordinator or examiner, and provided that qualified supervision is provided throughout the

degree project, the student can choose to carry out the degree project either at an academic department, within an industrial company, or at a consulting firm in Sweden or abroad.

Examination

- INL1 - Half time report, 15.0 credits, grading scale: P, F
- EXAM - Thesis Project, 15.0 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.

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

he course coordinator manages the thesis process: in consultation with the examiner, they appoint a supervisor at KTH, select an external examiner for the thesis, and are responsible for the registration and publication of the thesis

Other requirements for final grade

The criteria to pass degree project for engineering degree established by KTH are:

The literature study is well executed. Current research and development relevant to the work is presented in a clear manner. The selected method is well justified, based on science or proven experience and evaluated against other methods. Relevant knowledge from previous courses is adequately used.

The thesis task is handled autonomously and systematically, based on critical analysis and synthesis of relevant literature. The work demonstrates a holistic view. Relevant databases and search tools are used. The need for further knowledge is discussed.

Relevant complex phenomena, issues and situations are identified in the degree project. The work clearly shows that these are well managed and analysed, even if available information is limited. Adequate judgements related to the research questions and results are implemented.

The project plan was followed. An advanced project is carried out within the agreed time and with the methodology agreed upon. Any changes to the plan or the have been agreed, between student and supervisor. Resources and limitations in the study are clearly presented.

The chosen strategy is motivated and implemented so that developed and evaluated products, processes, methods, systems or technical solutions, are adapted to human needs and conditions. Consideration to relevant social aims is shown in such a way that the ability of future generations to meet their needs is not jeopardised.

The report is well organized and well-written, in a coherent language. The discussion on the conclusions is well motivated. The citations are relevant, phrased in the student's own wording, and well integrated. The oral presentation and the review, as well as the communication during the work, demonstrate the ability to present and sensitively discuss the work and its

conclusions with different parties, such as employers, supervisors, teachers, researchers and students.

The degree project demonstrates judgement abilities, for example to explain, justify, criticize and recommend. Relevant topic-specific assessments based on science or proven experience have been made in the degree project. The degree project reflects on social and ethical aspects, unless this is shown to be irrelevant.

The student familiarizes him/herself with the task and demonstrates the ability to be a part of the working environment where the study was performed. The student demonstrates an ability to test, evaluate and also reject ideas and solutions in the discussions on the task. The student shows initiative and is open for supervision and criticism. The degree project is carried out largely independently.

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.