



# MF224X Degree Project in Mechatronics, Second Cycle 30.0 credits

Examensarbete inom mekatronik, avancerad nivå

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

## Establishment

On 2019-04-11, the Dean of the ITM School has decided to establish this official course syllabus to apply from spring term 2020 (registration number M-2019-0923).

## Grading scale

P, F

## Education cycle

Second cycle

## Main field of study

Mechanical Engineering

## Specific prerequisites

To start the degree project second cycle, are required:

- completed courses equivalent to at least 60 higher education credits at second cycle level.
- completed course in scientific research methodology
- Demonstration of sufficiently deep knowledge of the chosen area for the degree project

## Language of instruction

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

## Intended learning outcomes

From KTH's established objectives for degree projects for Master's degree (120 credits) 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 of current research and development within the area and in-depth knowledge of research methodology.
2. demonstrate the ability to search, create and integrate knowledge and to identify if there is a 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, both orally and in writing, in dialogue with different groups, to clearly explain and discuss conclusions and the knowledge and arguments on which these are based
6. demonstrate the ability to make assessments considering relevant scientific, social and ethical aspects
7. show such skill that is required to participate in research and development or to work independently in other qualified activities

Subject-specific aims:

After passing the course, the students should be able to:

- demonstrate advanced knowledge of the principles of the structure of a mechatronic system and its function
- suggest, explain and defend (industrial) design solutions for composite mechatronic products
- orally and in writing, in dialogue with others, account for and discuss one's conclusions, for mechatronic problems and solutions.

## Course contents

The main contents are adapted to the situation that the degree project is expected to be carried out; the in-depth subject study, application area, academic or industrial environment, national or international etc

With a high degree of initiative and independence, formulate and solve an engineering problem by using a wide range of skills. The subject for the degree project can vary, but it must contain significant technical contents and include a clear application of mechatronics.

## Examination

- XUPP - Thesis 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.

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

## Other requirements for final grade

KTH's established criteria for a pass in a degree project course for Master's degree (120 credits) 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. Appropriate 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 developed during early phases of the degree project has been followed. An advanced project is carried out within the agreed time and with the methodology agreed upon. Any changes to the plan or the work have been agreed, between student and supervisor. Resources and limitations in the study are clearly presented.

The report is well organized and written in a well formulated and 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.