



MH202X Degree Project in Materials and Process Design, Second Cycle 30.0 credits

Examensarbete inom material och processdesign, 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 MH202X valid from Spring 2020

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Materials Science and Engineering

Specific prerequisites

To start the degree project, it is required that the student:

- has completed at least 60 credits of second-cycle studies
- have taken a course in Scientific Research Methodology

- is able to demonstrate sufficient specific subject knowledge in relation for the chosen area for the thesis project

Language of instruction

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

Intended learning outcomes

Besides the objectives for degree projects for Master's degree (120 credits) established by KTH, these are the course specific objectives:

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

- apply relevant knowledge and skills that have been acquired within the field of technology on a given problem
- within given frames, also with limited information, independently analyse and discuss complex issues and handle larger problems for second-cycle studies within the field of technology
- reflect on, evaluate and critically review their own and others' scientific results
- document and present his/her work for a given target group with high requirements on structure, formalities and language
- identify his/her need for additional knowledge and continuously develop his/her skills

Course contents

The degree project consists of an individual assignment with a topic that is decided by the examiner. It should constitute a part of a specialisation within chosen field of technology and be relevant for second-cycle studies. The degree project should correspond to 20 weeks of full-time studies. The degree project should be presented in a written report and orally at a public seminar, in English or Swedish.

Disposition

Degree project in project form, being supervised by supervisors at the company/organisation and/or examiner at KTH. Can be carried out at KTH or at another site in Sweden or abroad. The degree project is carried out individually or together with one other student. In the latter case, the examiner should make sure that each student's effort corresponds to the requirements for an individual degree project. Supervisors are appointed by examiner. Several supervisors can be appointed. If the degree project is carried out at a company, a supervisor should also be appointed at the company.

To ensure that the student reaches the expected learning outcomes of the course, the student should have a compulsory course introduction with the course responsible teacher at the beginning of the project

Course literature

An independent literature search and study within the relevant field is expected. A complementary reading list can also be suggested by the examiner or the supervisor

Examination

- XUPP - Examination Question, 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.

The degree project will be assessed according to the criteria below. After completed degree project, the student should be able to:

- **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.**

Pass 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.

Fail The literature study is insufficient. Connections to current research and development is missing or is inadequate. The explanation of the chosen methods, or the evaluation of these methods is inadequate. The work shows on insufficient knowledge from previous courses.

- **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**

Pass 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.

Fail Relevant literature is to a great extent absent, or has not been integrated in the work. The literature is not examined critically. The work does not build on previous knowledge in the area. Discussions about possible further studies is missing.

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

Pass 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.

Fail Relevant complex phenomena, issues and topics are not formulated, handled or analysed in the degree project. The work displays an unsatisfactory overall view of the topic or the topic is unnecessarily limited to avoid the complexity of the assignment. Relevant assessments connected to the topic of the degree project are lacking.

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

Pass 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.

Fail The work does not reach the level that was intended initially (or subsequently adjusted). Critical evaluation of the work is missing. The project plan regarding time and methodology has not been implemented.

- **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**

Pass 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.

Fail The contents is not systematically presented, and the text or the oral presentation is difficult to understand. The argumentation in the discussion is unsatisfactory. The citations have an unclear aim, are too close to the original source, or are presented without clear relationship. The written report is not linguistically sound or coherent. The continuous communication or the oral presentation do not show perceptiveness, clarity or ability to discuss the work and the conclusions.

- **demonstrate the ability to make assessments considering relevant scientific, social and ethical aspects**

Pass 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.

Fail Judgement is lacking or inadequate. The work shows an inability to place the study in a larger context. The degree project does not consider ethical and social aspects even if these are relevant to the study, alternatively an explanation of why these aspects have not been discussed is absent.

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

Pass 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.

Fail Despite supervision and guidance the student does not show the ability or will to participate and be part of the working environment. The student does not come up with constructive ideas during discussions with supervisors and does not show interest in advice and new

proposals. The student does not demonstrate independent and creative work between the supervision sessions.

Other requirements for final grade

KTH's established criteria for passing the degree project for Master's degree (120 credits).

The degree project should be presented at a seminar. The degree project should be written and presented in Swedish or English. A summary should be included in both languages. The Master thesis will be checked for plagiarism.

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.