MH201X 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.

Establishment

On 17/06/2021, the Dean of the ITM school has decided to establish this official course syllabus to apply from spring term 2022 (registration number M-2021-1212).

Grading scale

P, F

Education cycle

Second cycle

Main field of study

Materials Science and 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.

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
- deepen his/her knowledge and skills in the area of materials and process design

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 an public seminar, in English or Swedish.

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.

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

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

- demonstrate knowledge of the chosen topic's scientific foundation and established background, in-depth insight into current research and development, as well as in-depth knowledge of related 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.

- show the ability to holistically, critically and systematically search, collect and integrate knowledge, and to identify oneÂ´s need for further knowledge

Pass 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.

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.

- show the ability to identify, analyse, assess, and handle complex phenomena, issues and situations, even 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 shows a deficient 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.

- show the ability to plan and with adequate methods carry out advanced tasks 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.

- show the ability to develop and evaluate products, processes, systems, methods, or technical solutions while taking into consideration human preconditions and needs, and the society's aim for an economically, socially and ecologically sustainable development

Pass 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.

Fail Product, process, systems, method or technical solution have not been evaluated or developed in the degree project. Relevant analysis of manageablility and effects on our society, environment and economy is lacking.

- show the ability to clearly present and discuss conclusions and the underlying arguments with different groups both orally and in writing

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.

- show 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 the skills required to participate in research and development work, or to work independently in other advanced 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 engineering degree.

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 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.