



# MH101X Degree Project in Materials and Process Design, First Cycle 15.0 credits

Examensarbete inom material och processdesign, grundnivå

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 MH101X valid from Spring 2016

## Grading scale

P, F

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Requirements established by the engineering programme, for starting a degree project. These requirements are found in the programme syllabus.

Generally, at least 120 credits should be completed before the degree project may be started. It is the responsibility of the examiner to make sure that the student has an appropriate specialisation and that the student has completed sufficient parts of the studies before the degree project is started. Exemption can (only) be granted by the director of first and second cycle education. The degree project should normally be carried out under the sixth semester of the engineering programme.

## 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 Bachelor degree established by KTH, these are the course specific objectives:

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

• apply acquired knowledge and skills about metals, ceramics, polymers and fibre-based materials on problems in the area of materials and process design

• formulate a technical problem and apply methodology within materials and process design to search and evaluate solutions to the problem

• use independent study forms to consolidate and deepen his knowledge within materials and process design

• present the solution to an engineering problem in a written technical report with requirements of contents structure and languages

• demonstrate a professional behaviour at presentation of own work and review of the work of others

• use basic concepts and tools for an active career start

In addition, the student should, when necessary, be able to:

• make assumptions and evaluate their validity through sensitivity analysis

• carry out rough estimations to be able to validate models and assess their plausibility

## Course contents

The course consists of a larger degree project that should include a specialisation within materials and process design and training in general engineering skills. The work should treat problems within materials and process design. The aim of the project is to integrate technical aspects with the requirements that are set from the society, including laws, ethics, economics and environment.

The course coordinator provides suitable project tasks, and each project is assigned a special supervisor. It is also possible to suggest one's own project, and a supervisor from KTH will also then be appointed. Projects are carried out individually or in groups of no more than two or three students.

The project should generally contain the following parts

- planning of project work
- project meetings possibly with supervisors (about. 1 h/week)
- literature study
- implementation of experiments, calculations or the like
- analysis and conclusions
- written report
- oral presentation

## Disposition

The degree project is carried out usually over 2 periods during the spring semester and should correspond to 10 weeks of full-time studies. The course is scheduled with a nominal workload of 12-16 h/week. Only course dates where a class room is booked that is for teaching activities, other time is for planning and own work. Course is given in parallel with other scheduled courses, which means limited possibilities for larger field exercises, field trips and study visits. The last the week of the third quarter (period 3), is therefore scheduled for field exercises, i.e. free from scheduled classes, to enable these activities.

## 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, 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.

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

- show knowledge of the scientific foundation of the chosen subject area, applicable methods and orientation in current research and development and show advanced knowledge within some part of the subject area

**Pass** A literature study has been complete, including a description of applicable methods within the subject area and an orientation in current research and development. The selected method is explained and based on science or proven experience. 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. Explanation of chosen method deficiencies. The work shows on insufficient knowledge from previous courses.

- demonstrate the ability to search, collect and use relevant information critically and identify his/hers needs of additional knowledge

**Pass** The task of the degree project is largely handled autonomously. Relevant databases and search tools are used. Relevant literature and knowledge are incorporated in the degree project. 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 work does not build on previous knowledge in the area. Discussions about possible further studies is missing.

- demonstrate the ability to formulate, assess and handle problems and critical discuss phenomena, issues and situations

**Pass** The degree project contains a clear problem formulation and a progressive handling of it. Relevant phenomena, issues and situations connected to the work are critically discussed. Adequate judgements are made, regarding the research question(s) of the degree project.

**Fail** The problem formulation is inadequate such as the development of this. Relevant phenomena, issues or situations are not discussed the degree project. Adequate assessments connected to the issue of the degree project be lacked.

- demonstrate the ability to plan and with applicable methods carry out assignments within given time frames

**Pass** The project plan was followed. The task 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.

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

- demonstrate the ability to orally and in writing, account for and discuss information, problem and solutions in dialogue with different groups

**Pass** The report is well organized and well-written, in a coherent language. 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 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 on perceptiveness, clarity or ability to discuss the work.

- 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 work independently within some part of the main field of study technology

**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 shows ability to test and evaluate information in discussions of 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

Apart from the of KTH's established criteria to pass degree project for Bachelor's degree the following course specific criteria apply for passing the degree project.

The student should carry out:

- an oral presentation in English at the final seminar
- an oral public discussion in English at the final seminar

and should submit:

- a written problem statement report including results of the literature study, in English
- a written final report, in English, with a summary both in Swedish and English. The Bachelor thesis will be checked for plagiarism.
- a written review report, in English

## 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.