# EF1100 Engineering Science 6.0 credits

**Ingenjörsvetenskap**

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

## Establishment

Course syllabus for EF1100 valid from Spring 2011

## Grading scale

P, F

## Education cycle

First cycle

## Main field of study

Electrical Engineering, Technology

## Specific prerequisites

Knowledge of mathematics and physics corresponding to upper secondary school.

## Language of instruction

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

## Intended learning outcomes

Technology does not exist in Nature – all technology is designed by man. While the natural sciences focus on laws of Nature, the science of technology is mainly concerned with the methods that humans use to design and manufacture objects to fulfil our wants and desires. Engineering Science extends the science of technology to include topics as mathematical modelling, the science of technology, and the engineer's professional role. These are also the main topics for this course in Engineering Science.

The ambition is that you, after having taken the course, will be able to

- create a mathematical model for a given scenario in the steps problem identification, assumptions, solution, interpretation, validation and implementation
- make estimates, check formulas and carry out dimensional analysis (of derived relations)
- use Maple as a tool for simple problem solving, to serve as a basis for future more advanced applications
- use Excel to draw graphs, make calculations and do simple modelling
- give an account of the major breakthroughs in the history of technology and reflect on their mutual relations
- be able to reflect on the gender perspective of the engineer's role in society
- make short oral and written presentations of technical and scientific matters

## Course contents

The progress of technology.

About understanding and modelling nature.

Quantities. Units. Estimates. Construction of mathematical models. Formula checks. Proportionality. Model fitting. Dimensional analysis. Simulation modelling.

The computer tools Maple and Excel.

The roles of the engineer and the user of technology.

Basic knowledge in communicating technology.

## Course literature

(1) B. Sundin, Den kupade handen, Carlssons, 1998.
(2) F. R. Giordano, M. D. Weir, and W.P. Fox, A First Fourse in Mathematical Modeling, Tompson 2009.
(3) G. Grimvall, Basic facts and skills in physics. 2009, Fysikinst., KTH.
(4) Litteratur om genusfrågor för ingenjörer, utdelas. Viss kurslitteratur kan eventuellt bytas ut mot motsvarande litteratur, vilket då meddelas vid kursstarten.

## Examination

- ANN3 - Assignments, 1.5 credits, grading scale: P, F
- ANN1 - Assignments, 4.0 credits, grading scale: P, F
- ANN2 - Assignments, 0.5 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

Homework assignments, hand in exercises, participation in seminars and lectures, and didactic presentation

Since the course is based on continuous examination, presence during scheduled lessons is essential.

## 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.