



LUND
UNIVERSITY

Faculty of Engineering, LTH
LTH Faculty-wide

Course Syllabus GEM040F
2013-05-28

Theory of Science and Methodology of Research (Vetenskapsteori och forskningsmetodik)

Theory of Science and Methodology of Research is an elective faculty-wide third-cycle (PhD) course at the Faculty of Engineering.

Aim: The aim of the course is to provide an introduction to theory of science issues and methods relevant to research and development in the engineering sciences. A further aim is to encourage reflection and constructive critical discussion of current research, research methods and their background.

Learning outcomes: **Knowledge and understanding**
For a Pass on the course, participants shall

- have general knowledge of key theory of science issues and discussions such as “What is science? What is empirical support? Can a hypothesis be falsified? What is a scientific explanation? What are the roles of experiments and observations in science? Are scientific theories true? How are scientific concepts formed?”.

Competence and skills

For a Pass on the course, participants shall

- be able to analyse their own and others’ research constructively from a theory of science perspective in a way that benefits further PhD studies
- be able to use important concepts of the theory of science in oral and written reports.

Judgement and approach

For a Pass on the course, participants shall

- demonstrate willingness to discuss theory of science issues with other doctoral students and researchers.

Content: The course starts with an introductory part in which the most important scientific strategies and their applicability to different types of research are discussed. This is followed by a part addressing in greater detail theory of science themes such as ontology, observation and explanations. A concluding component addresses the modern debate and present-day engineering research.

Instruction: The course consists of lectures, seminars, oral presentations and written assignments.

- Assessment:** The assessment is based on continual written assignments and oral presentations. For a Pass on the course, participants must have passed all assignments in the course and made an oral presentation.
- Scope:** The course corresponds to 3 weeks of full-time work and to 4.5 credits in third-cycle (PhD) studies (with Pass and Fail as available grades), if this is in line with the individual study plan.
A current timetable is available on the course homepage.
- Admission:** To be admitted to the course applicants have to be part of a PhD programme at LTH.
- Selection:** Priority is given to: 1) PhD students who have previously applied to the course and were eligible at the time, 2) PhD students who are closest to finishing their PhD programmes.
- Language:** The course is taught in both English and Swedish.
- Homepage:** http://www.lth.se/omlth/kompetensutveckling/gemensamma_forskarutbildningskurser
- Reading:** Chalmers, A. (1999) *What is this thing called science?* Open University Press. ISBN 0-335-20109-1
Hacking, I. (1983) *Representing and intervening: Introductory topics in the philosophy of natural science*, Cambridge University Press. ISBN 0-521-23829-3
Persson, J. och Sahlin, N.-E. *Vetenskapsteori för sanningssökare*, Fri Tanke 2013. ISBN 978-9186061869
- Course directors:** Professor **Nils-Eric Sahlin** (nils-eric.sahlin@med.lu.se) Department of Medical Ethics.
Professor **Johannes Persson** (johannes.persson@fil.lu.se) Department of Philosophy.
Information on current teachers on the course is available on the course homepage.
- Category:** The course is a faculty-wide third-cycle (PhD) course at LTH.
- Other:** -