



# FME3513 Philosophy of Science and Knowledge Formation of Engineering 10.0 credits

Vetenskapsfilosofi och ingenjörarbetets kunskapsbildning

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 FME3513 valid from Autumn 2015

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

Enrolled as a doctoral student in the PhD programme Industrial economics and management.

## Language of instruction

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

## Intended learning outcomes

After finishing the course, the student shall be able to:

- Understand and explain puzzles about what science describes and seeks to explain;
- Describe the range of explanatory narratives at hand in the social sciences broadly conceived;
- Demonstrate the ability to critically evaluate various aspects of the scientific endeavor.
- Position their own research with respect to competing social theories and research methodologies in terms of their ontological and epistemological presuppositions;

## Course contents

The course encompasses an introduction to the main philosophical questions concerning scientific knowledge and methodology, such as the following themes: natural vs. social sciences, positivism, rationalism, relativism, falsification theory, hypothetic-deductive method, induction and deduction, description vs. explanation, notions, models and scientific frameworks.

Part of the course is dedicated to the logic and craft of research, from the statement of the research problem to the assessment of a finalized dissertation. During the course, tools are provided for assessing scientific publications and especially for taking a critical approach to one's own scientific endeavor.

## Disposition

The course combines seminars, lectures over research issues that are relevant from the point of view of philosophy of science. The course literature and current doctoral theses are used to elucidate the issues. The doctoral students are expected to study the literature before the issues are discussed at a seminar. The late seminars are directed to issues and questions that are important for the participants and their particular doctoral projects.

## Course literature

Chalmers, Alan F. (2013): What is this thing called science? Bristol: Open University Press.

Gorton, William, A. (2015): The Philosophy of Social Science. Internet Encyclopedia of Philosophy. (<http://www.iep.utm.edu/soc-sci/>)

Hempel, Carl (first published in 1966): Philosophy of Natural Science. Upper Saddle River: Prentice Hall.

Machlup, Fritz. (1961): Are the Social Sciences Really Inferior? Southern Economic Journal 17: 173-84.

Rudestam, Kjell Erik, Newton, Rae R. (2007) Surviving Your Dissertation. London: Sage., Chapter 1 and 2.

Doctoral thesis (seminar assignment) ca 200 pages.

## Examination

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.

Critical analysis of a published article (written home assignment)

Presentation of a pre-structured analysis of a dissertation (seminar)

## Other requirements for final grade

Active, well prepared, participation in the seminars of the course

Written home assignment.

## 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.