



# FAK3014 The Theory and Methodology of Science - Minor Course 3.0 credits

Vetenskapsteori och forskningsmetodik - mindre kurs

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 FAK3014 valid from Spring 2012

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

## Language of instruction

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

## Intended learning outcomes

The course provides an introduction to the theory and methodology of science and is intended for the beginning PhD student. One aim is to supply the basic concepts needed for placing the techniques and knowledge acquired in the student's other courses or research in the wider context of the natural sciences. Another aim is to provide the basic intellectual tools that allow for a reasoned and critical assessment of results and methods from the wide variety of disciplines that the student is likely to encounter during his or her continued career in research and/or in professional life.

The course is mainly focused on the general theoretical and methodological issues that arise in the natural and technological sciences; but basic theoretical issues, techniques and problems from the social sciences are also covered to provide the student with a wider outlook. Emphasis is placed on the fundamental problems common to the natural sciences and on the general strategies, methods and concepts that modern science has developed to address these problems.

After completed course, the student should be able to

- account for and apply fundamental concepts from the theory and methodology of science on problem areas within the theory and methodology of science.
- account for fundamental theories concerning the epistemological and explanatory status of science.
- identify and critically discuss, both orally and in writing, fundamental theoretical and methodological issues in the technical, natural and social sciences.
- identify and critically discuss, both orally and in writing, specific methodological problems in a study, the design of an experiment, the use of a particular method of measurement, or the use of a particular model.
- analyze the relationship between the basic results of a study and the conclusions that legitimately can be drawn on the basis of the results.

## Course contents

The following is an incomplete list of topics covered in the course.

- Scientific knowledge
- Hypothesis testing
- Causes and correlations
- Observations and measurements
- Experiments
- Models
- Law and explanations
- The development of science
- Research ethics
- Scientific papers and peer review

## Course literature

Sven Ove Hansson "The art of being scientific" (kompendium). Artiklar som delas ut.

## 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.

## Other requirements for final grade

- SEM1, 1 credit
- TEN1, 2 credits

## 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.