AK2040 Theory and Methodology of Science with Applications (Computational Science) 7.5 credits

Vetenskapsteori och vetenskaplig metodik med tillämpningar (beräkningsvetenskap)

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

Establishment

Course syllabus for AK2040 valid from Autumn 2008

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

For "free movers" applying to single courses:

General entrance requirements for university studies, i e completed upper secondary schooling incl documented proficiency in English.

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 Master student or 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 in the wider context of the computational 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 science, with an emphasis on the natural and computational 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 computational, social and natural sciences and on the general strategies, methods and concepts that modern science has developed to address these problems.

Course contents

- Scientific knowledge
- Hypothesis testing
- Causes and correlations
- Observations and measurements
- Experiments
- Models
- Law and explanations
- Science for societal decision-making
- The development of science
- Research ethics

Disposition

Lectures and seminars.

Course literature

- A.F. Chalmers "What Is This Thing Called Science?"
- Sven Ove Hansson "The art of being scientific"

Examination

- SEM1 - Seminars, 1.5 credits, grading scale: P, F
- PRO1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, 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.

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.