FAK3137 Theory of Science and Research Method, Technological and Natural Sciences 7.5 credits

Vetenskapsteori och forskningsmetodik, teknik- och naturvetenskaplig inriktning

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

The course syllabus is valid from Autumn 2023 according to the Head of school decision: A-2023-2373, 3.2.2Decision date: 2023-10-29

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Entry requirements for PhD studies.

Language of instruction

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

Intended learning outcomes

After having completed the course, the student should, with regards to the theory and methodology of science, both orally as well as in writing, be able to:

- Identify definitions and descriptions of concepts, theories and problem areas, as well as identify the correct application of these concepts and theories.
- Account for concepts, theories and general problem areas, as well as apply concepts and theories to specific cases.
- Critically discuss the definitions and applications of concepts and theories as they applies to specific cases of scientific research
- identify and critically discuss fundamental theoretical and methodological problems within the PhD-student's area of research,
- identify and critically discuss specific theoretical and methodological problems within the PhD-student's own research,
- identify and critically discuss specific theoretical and methodological problems within others' research.

Course contents

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

- Scientific knowledge
- Definitions
- Hypothesis testing
- Observations and measurements
- Experiments
- Models
- Statistical reasoning
- Causes and explanations
- Engineering design
- Qualitative methods
- Risk and risk assessment
- Research ethics

Examination

- SEM1 - Seminars, 1.5 credits, grading scale: P, F

- TENA - Written exam, 3.0 credits, grading scale: P, F
- UPP1 - Essay, 3.0 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.

A student may request a home exam, if it is not possible for the student to attend the written exam because the student is, at the point of the request, residing outside of Sweden and will be residing outside of Sweden for at least twelve months following the request. The examiner approves or denies these requests.

Transitional regulations

Former module EXA1 can be replaced by TENA

Former module DEL1 can be replaced by module SEM1

Former module TEN1 can be replaced by the new module TENA

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.