



Course Syllabus
Methods in Systems Science for Defence and Security

Metod i försvarssystem

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| Course Code | 2FS039 | Main Field of Study | Systems Science for Defence and Security |
| Valid from Semester | Autumn 2023 | Department | Department of Systems Science for Defence and Security |
| Education Cycle | Advanced level | Subject | Systems Science for Defence and Security |
| Scope | 15.0 | Language of Instruction | The teaching is conducted in English. |
| Progression | A1N | Decided by | The Research and Education Board's Course Syllabus Committee at the Swedish Defence University |
| Grading Scale | Fail, Pass, Pass with Distinction | Decision date | 2022-08-23 |
| Revision | 1.0 | | |

Entry Requirements

A minimum of at least 180 credits that include

- written thesis project including at least 15 credits, and knowledge corresponding to English 6 (B).

Course Content and Structure

The course, which focuses on how social science and engineering methods can be used to study and develop socio-technical systems, centers on the approaches and methods for research, development and decision support that are key to the Master program's focus on defence systems. The methods are studied from general perspectives on scientific method, epistemology and research ethics. The course focuses on in-depth study of a few approaches and on practical application of methodology, rather than on broad overviews and theoretical knowledge.

The methods course serves three related purposes by: 1) providing a bridge between the theory course and more practical courses in the program, 2) preparing the student for further study of defense systems, and 3) preparing the student for future work in defense and security systems. The course aims to be equally relevant to undergraduates in engineering and social sciences as it is to students who wish to work in the development of defence and security systems or in the study of such systems in academia.

The overarching aim of the course is to develop the student's ability to plan and evaluate studies based on their claim to knowledge contribution. The course therefore aims to increase the student's knowledge and skills in 1) evaluating, assessing and choosing approaches based on the knowledge claims sought and 2) formulating scientifically sound knowledge claims within different methodological orientations.

In essence, the course adopts an applied approach to method. The student develops knowledge and skills through the application of methodology on an individual - and group basis, complemented and supported by lectures and seminars in which advantages and disadvantages are discussed on the basis of scientific theory. The course begins with the theory and ethics of science, research design and methods of data collection and analysis. A selection of methodological approaches is then applied, which the student prepares, implements, and evaluates in groups. Examination is partly done through compulsory participation in applications and seminars, which are examined through two reports (one individual and one in a group), and partly through a final individual examination task in which the student is asked to apply a critical and reflective approach. Throughout the course, one key practical example that is relevant to the field is used to clarify the respective advantages and disadvantages of different approaches.

Intended Learning Outcomes

After completing the course, the student is expected to:

Knowledge and understanding:

- explain the meaning and function of general concepts in the philosophy of science,



- describe the meaning of basic principles of research ethics,
- summarise the advantages and disadvantages of methodological approaches central to the field, as well as data collection and analysis techniques (both qualitative and quantitative).

Skills and abilities:

- plan studies based on social science and engineering approaches aimed at decision support, development and academic knowledge, respectively,
- apply relevant approaches to empirical problems.

Evaluation and approach:

- compare and evaluate the knowledge claims made by methodological approaches central to the field,
- critically reflect on and evaluate the implications of the methodological conventions and traditions that characterise the field of defence and security systems.

Type of Instruction

Seminars

Lectures

Practical exercise

Project Work

Assessment

Examination

Scope: 7.5

Grading Scale: Fail, Pass

Compulsory participation in methodological applications and seminars. Participation is examined through two submitted reports after completed seminars and method applications: a single report and a group report.

The examiner may decide that absence from a maximum of two compulsory sessions may be compensated by the submission of a written supplementary assignment.

Examination

Scope: 7.5

Grading Scale: Fail, Pass, Pass with Distinction

The examination consists of the submission of a final individual written assignment.

Grading

Grading is based on a three-point scale: fail (U), pass (G) and pass with distinction (VG).

A pass (G) grade for the course requires a pass (G) score on the reports and a pass (G) on the individual written assignment.

A Pass with distinction (VG) in the course requires a Pass (G) in the reports and a Pass with distinction (VG) in the individual written assignment.

Grading criteria will be presented at the start of the course at the latest.

The examiner may decide on supplementary work in order for the student to obtain a pass grade for the course. Late examinations are not marked unless there are special reasons approved by the examiner. The supplementary assignment must be submitted within five working days of the notification of the result and supplementary assignment for the examination module in question, unless special reasons are approved by the examiner.

Restrictions in Number of Examinations

There is no limit on the total number of examination opportunities.

Restrictions Concerning Degree



The course cannot be part of a degree whose content is wholly or partly in accordance with the content of this course.

Transitional Provisions

When a course is no longer provided or when the content of a course has been significantly altered, the student/participant retains the right to be examined in accordance with this course syllabus once per term during a three-term period.

Miscellaneous

On the completion of the course, an evaluation will be conducted under the auspices of the course director, which will form the basis for any changes to the course.

The course will be held in English.

If the Swedish Defence University has formally decided that the student is entitled to receive special educational support due to a disability, the examiner may decide on alternative forms of examination for the student.



Reading List
Methods in Systems Science for Defence and Security

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| Course Code | 2FS039 |
| Revision | 1.0 |
| Reading List Valid from Date | 2020-05-04 |
| Reading List Decided Date | 2020-05-04 |

Säfsten, K and Gustavsson, M., Research methodology – for engineers and other problem solvers, Studentlitteratur, 2020

- Washburn, A. and Kress, M., Combat modeling, Springer, 2009
- Birta, L.G. and Arbez, Modelling and simulation - Exploring dynamic system behaviour, Springer, 2013

Distributed literature during the course