



**Course Syllabus**  
**Introduction to Engineering for Social Scientists**

Introduktion till Ingenjörsvetenskap för samhällsvetare

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<b>Course Code</b>	2FS021	<b>Main Field of Study</b>	Systems Science for Defence and Security
<b>Valid from Semester</b>	Autumn 2022	<b>Department</b>	Department of Systems Science for Defence and Security
<b>Education Cycle</b>	Advanced level	<b>Subject</b>	Systems Science for Defence and Security
<b>Scope</b>	15.0	<b>Language of Instruction</b>	The teaching is conducted in English.
<b>Progression</b>	A1N	<b>Decided by</b>	The Research and Education Board's Course Syllabus Committee at the Swedish Defence University
<b>Grading Scale</b>	Fail, Pass, Pass with Distinction	<b>Decision date</b>	2021-06-21
<b>Revision</b>	1.1		

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#### Entry Requirements

- bachelor's degree with a minimum of 180 credits,
- at least 90 credits in the field of Defense, Crisis management and Security,
- and knowledge corresponding to English B / 6.

#### Course Content and Structure

Capability for defense and security is a central object of study in the subject of defense systems. To study it requires an understanding of the technical and social components and how they interact in the special context of the defense and security sector.

Social scientists in the field of war, crisis management and security have the tools of the social sciences to start from to understand the need for and evaluate capability in defense and security. This course aims to complement that ability with key engineering tools and to create an understanding of the approach of engineering. This creates the conditions for a developed understanding of the technical and social components and how they interact in the special context of the defense and security sector, which is not achieved with just a social science perspective.

The course deals with common military issues from an engineering perspective. It is divided into two modules. The first module provides basic knowledge in problem solving with the support of statistics and probability theory, numerical methods, modeling and simulation. The second module is intended to give an introduction to the design process. In this module, knowledge from the first module must be applied.

The course consists of two modules with the following specialization and scope:

Module 1: Problem solving with statistics and other mathematical tools, 10 credits.

Module 2: The Engineer's Design Process, 5 credits.

In module 1, teacher-led lessons are varied with arithmetic exercises, applied problem solving and own studies. The applied problem solutions are carried out as computer labs. Module 1 ends with a written examination. Module 2 is conducted as teacher-led lessons, literature studies, seminars and a final written home assignment in the form of a project. The examination of module 2 will be by an oral examination and individual written presentations of the assigned project.

#### Intended Learning Outcomes

After completing the course, the student is expected to be able to:

Module 1: Problem solving with statistics and other mathematical tools, 10 credits.

##### Knowledge and understanding:

- explain how statistics and probability theory are used to solve applied problems.



Skills and Abilities:

- describe and solve practical problems through the application of statistics and probability theory,
- solve minor problems with the help of suitable mathematical tools.

Module 2: The Engineer's Design Process, 5 credits.

Skills and Abilities:

- plan, solve, present and defend a solution to an applied problem based on the methods covered in the course.

Evaluation ability and approach:

- reflect on the role of the engineer and engineering science in the design process.

**Type of Instruction**

Seminars

Project Work

Independent Study

Exercises

**Assessment**

**Examination module one**

Scope: 10.0

Grading Scale: Fail, Pass, Pass with Distinction

Examination will be by written examination.

**Examination module two**

Scope: 5.0

Grading Scale: Fail, Pass

Examination will be by and oral examination an individual written presentations of an assigned project for module 2.

The examiner may decide that supplementary work is required in order for a pass grade to be achieved. Examination papers submitted late will not be graded, unless there are special reasons, which have been approved by the examiner. Supplementary assignments are to be submitted no later than five working days after the notification of results and the supplementary assignment for the examination in question, unless there are special reasons, which have been approved by the examiner.

**Grading**

Grades are set according to a three-grade scale: Pass with merit (VG), Pass (G) and Fail (U). Grading criteria are stated no later than at coursestartup.

In order to achieve a pass (G) for the course, a pass (G) is required for the written examination in module one together with a pass for the oral and written project report in module two.

In order to achieve a pass with merit (VG) for the course, a pass with merit (VG) is required for the written examination in module one together with a pass for the oral and written project report in module two.

**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

The course is held as a compulsory element of the Master's Programme in Defence and Security Systems Development for students who have not completed an engineering diploma.

The examiner may decide on alternative forms of examination for a student, if that student has an approval from the Swedish National Defense College concerning special pedagogical support due to disability.

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.

**Reading List****Introduction to Engineering for Social Scientists**

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<b>Revision</b>	1.1
<b>Reading List Valid from Date</b>	2022-05-13
<b>Reading List Decided Date</b>	2022-05-13

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**Course literature**

Course literature

- Navidi, W.C., Statistics for Engineers and Scientists, McGraw-Hill, 2019 (Fifth Edition)
- Fosmire, M Radcliffe, D, Integrating Information into the Engineering Design Process, Purdue University Press, 2014 (E-book via ALB)
- Meijers, A, Philosophy of Technology and Engineering Sciences, Elsevier, 2009 (First Edition) (E-book via ALB)

Distributed literature during the course

Reference literature:

- Harvey, G, Excel 2010 All-in-One For Dummies, Wiley Publishing Inc, 2010 (E-book via ALB)

Others:

Calculator