# EP2500 Networked Systems Security 7.5 credits

**Säkra nätverkssystem**

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

## Establishment

Course syllabus for EP2500 valid from Spring 2019

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Information and Communication Technology, Computer Science and Engineering

## Specific prerequisites

Eligible students should be comfortable with engineering mathematics and programming, and they should have previously taken first-level courses on most of, or all if possible, the following topics: data networks, operating systems, wireless networks, Internet-working, and basic system security. If equivalent knowledge was acquired through a different path, the students should contact the instructor to obtain his agreement.

## Language of instruction

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

## Intended learning outcomes

The course intends to consolidate a crisp understanding of fundamental concepts and technologies related to the security of modern networked systems, building on two pillars: (a) a conceptual substrate that would prepare for future deeper work on the topic, and (b) the ability to deal with open-ended, real-world engineering problems.

At the end of the course, students shall be able to:

(i) Identify, comprehend, and analyze vulnerabilities, threats, and attacks against a variety of modern networked systems.

(ii) State clearly security properties and requirements for networked systems security solutions.

(iii) Analyze and design security protocols and mechanisms that safeguard the network operation against attacks.

(iv) Comprehend and analyze qualitativelyand quantitativelythe overhead of security mechanisms.

(v) Identify and analyze best practices for security schemes currently deployed widelyin networked systems.

This course is planned for students in their fourth year, i.e., their first year in their MSc programs. It sets the ground for its companion course, “Advanced Networked System Security.” The latter will offer the opportunity to deal with security and privacy problems in a deeper and entirely hands-on manner.

## Course contents

The course content will be detailed in the detailed description at the start of the course each year. Basically, the course will work on security, including privacy, for a spectrum of networked systems, covering: (i) Internet and TCP/IP networks, (ii) Cellular data and voice networks, (iii) wireless local and personal area networks, (iv) Internet of Things and embedded systems, (v) Wireless Sensor Networks, (vi) Mobile ad hoc and hybrid networks, such as vehicular communication systems. While the first three types of networked systems have been the predominant ones, and shall get significant attention, the course shall strive to keep a balance and present upcoming technologies, including, for example, elements on other networked infrastructures such as the smart grid. The emphasis, throughout the course, shall be on basic concepts and technologies, on common security requirements across various systems, and on how features of each system determine the state-of-the-art of security solutions.

## Disposition

The course is structured around weekly lectures, a set of assignments that are mandatory and graded, and two in-class exams, one mid-term and one at the end of the quarter. The assignments are distributed throughout the course period. Students are supported via extensive office hours, held by the instructor and the teaching assistants throughout the course. All material and instruction shall be in English.

## Course literature

The course literature will consist of a short list of recommended textbooks, a reading list of articles related to the covered material, and the course lecture slides and notes. The recommended textbooks shall be on reserve at the library. The exact list of all the course literature shall be made available on-line, at the start of the course, to the students.

## Equipment

Students are assumed to have access to computers.

## Examination

- KON1 - Assignment, 2.5 credits, grading scale: P, F
- INL1 - Assignment, 2.5 credits, grading scale: P, F
- TEN1 - Examination, 2.5 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.

Assignments and exams will be graded and they are all mandatory for successfully completing the course and they are all part of the calculation of the final grade. Each component (exam and assignment) will be graded independently. The exams shall be 25% and 30% of the total grade respectively, and the assignments shall weigh the remaining 45%.

## Other requirements for final grade

Requirements for final grades: they are in the letter scale, A-F.

## 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.