



EP2500 Säkra nätverkssystem

7,5 hp

Networked Systems Security

Fastställande

Kursplan för EP2500 gäller från och med VT12

Betygsskala

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

Utbildningsnivå

Avancerad nivå

Huvudområden

Informations- och kommunikationsteknik, Datalogi och datateknik

Särskild behörighet

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.

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

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 qualitatively and quantitatively the overhead of security mechanisms.
- (v) Identify and analyze best practices for security schemes currently deployed widely in 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.

Kursinnehåll

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.

Kursupplägg

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.

Kurslitteratur

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.

Utrustning

Students are assumed to have access to computers.

Examination

- KON1 - Kontrollskrivning, 2,5 hp, betygsskala: P, F
- INL1 - Inlämningsuppgift, 2,5 hp, betygsskala: P, F
- TEN1 - Tentamen, 2,5 hp, betygsskala: A, B, C, D, E, FX, F

Examinator beslutar, baserat på rekommendation från KTH:s handläggare av stöd till studenter med funktionsnedsättning, om eventuell anpassad examination för studenter med dokumenterad, varaktig funktionsnedsättning.

Examinator får medge annan examinationsform vid omexamination av enskilda studenter.

När kurs inte längre ges har student möjlighet att examineras under ytterligare två läsår.

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%.

Övriga krav för slutbetyg

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

Etiskt förhållningssätt

- Vid grupparbete har alla i gruppen ansvar för gruppens arbete.
- Vid examination ska varje student ärligt redovisa hjälp som erhållits och källor som använts.
- Vid muntlig examination ska varje student kunna redogöra för hela uppgiften och hela lösningen.