EP2510 Säkra nätverkssystem, fortsättningskurs 7,5 hp

Advanced Networked Systems Security

Fastställande

Kursplan för EP2510 gäller från och med HT12

Betygsskala

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

Utbildningsnivå

Avancerad nivå

Huvudområden

Informations- och kommunikationsteknik, Datalogi och datateknik

Särskild behörighet

Eligible students should be already prepared by a basic course on network security, systems security, or Internet security. Preparation on most of, or all if possible, among data networks, operating systems, wireless networks, Internet-working, is presumed. If equivalent knowledge was acquired through a different path, the students should contact the instructor to obtain his agreement. Following the companion “Networked Systems Security” course is not a strict requirement, but it is strongly encouraged for continuity and best results.

Undervisningsspråk

Undervisningsspråk anges i kurstillfällesinformationen i kurs- och programkatalogen.

Lärandemål

The course intends to enhance and extend the crisp understanding of fundamental concepts and technologies related to the security of modern networked systems. It builds on the preparation of students through the Networked Systems Security course (EP2500). It seeks to hone the ability to deal with open-ended, real-world engineering problems, as well as prepare for independent work on related topics.

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

(i) Comprehend, analyze, and identify vulnerabilities, threats, and attacks against a variety of modern or emerging networked systems.

(ii) Define precisely security properties and requirements for networked systems security solutions.

(iii) Design and analyze security protocols, mechanisms, and architectures that safeguard the network operation against attacks.

(iv) Comprehend and analyzequalitatively and quantitativelythe overhead of security mechanisms.

(v) Identify, analyze, and apply best practices for security schemes deployed widely or currently advancing towards standardization for networked systems.

This course is planned for students in their fifth year, i.e., the beginning of their second year in their MSc programs. It naturally complements its companion course, “Networked System Security” offering the opportunity to deal with security and privacy problems in a deeper and 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 honing the student’s understanding of concepts and technologies, on common security requirements across various systems, on how features of each system determine the state-of-the-art of security solutions, and on how design decisions should be made for effective and efficient security solutions. The course is project oriented, and it gives the opportunity for students to deal with real-world problems, gain strong insights on implementation, and prepare themselves for further work in the

industry, towards a MSc thesis, and possibly later Licentiate/PhD work, on any topic related to network and system security.

Kursupplägg

The course is structured around weekly lectures. A set of assignments including a project are mandatory and they are graded. 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 exact list of all the course literature shall be made available on-line, at the start of the course, to the students.

Utrustning

Students should have access to computers during the course.

Examination

- INL1 - Inlämningsuppgift, 3,0 hp, betygsskala: P, F
- PRO1 - Projekt, 4,5 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 enstaka studenter.

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

Assignments and project outcomes will be graded, they are all mandatory for successfully completing the course, and they will result in a single final grade.

Övriga krav för slutbetyg

Final grades 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.