

Network Programming and Security

Programme course

6 credits

Nätverksprogrammering och säkerhet

TNM031

Valid from: 2017 Spring semester

Determined by

Board of Studies for Computer Science
and Media Technology

Date determined

2017-01-25

Main field of study

Media Technology and Engineering

Course level

Second cycle

Advancement level

A1X

Course offered for

- Media Technology and Engineering, M Sc in Engineering

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

Internet Programming and Digital Images, Algorithms and data structures

Intended learning outcomes

The course provides the participants with basic yet fundamental knowledge in networking and security. The overall aim is to give practical skills in designing, analyzing and implementing secure applications. After the course the student will be able to:

- discuss types of attacks and defenses.
- explain the internet protocols IP, TCP, UDP and ICMP, and their security implications.
- describe typical steps in break-in attacks, denial-of-service (DoS) attacks and malware attacks.
- formulate basic cryptographic concepts including symmetric and public key encryption, message authentication digital certificates and public key infrastructure.
- explain the cryptographic system SSL/TLS and the Java secure socket extension (JSSE).
- describe the basic filtering operations of firewalls and common firewall architectures.

Course content

Overview of computer networks and the Internet. Protocols and layers. Client-server model. Overview of network layers and routing. Firewalls, authentication and elements of cryptography: encryption and data integrity techniques. Overview of application security issues with particular emphasis on web-service and e-commerce security.

Teaching and working methods

The teaching consists of lectures, exercises, laboratory work and individual assignments.

Examination

MUN1	Optional oral examination for higher grade	0 credits	U, 3, 4, 5
UPG1	Individual assignments	3 credits	U, 3, 4, 5
LAB1	Laboratory work	3 credits	U, G

A higher grade than 3 can be awarded after an oral examination.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Camilla Forsell

Examiner

Pierangelo Dell'Acqua

Course website and other links

<http://www.itn.liu.se/~piede>

Education components

Preliminary scheduled hours: 34 h

Recommended self-study hours: 126 h

Course literature

Additional literature

Other

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.