COURSE SYLLABUS

Network Programming, 7.5 credits

Nätverksprogrammering, 7,5 högskolepoäng

Course Code:	TNPK18	**Education Cycle:**	First-cycle level
Confirmed by:	Dean Apr 6, 2018	**Disciplinary domain:**	Technology
Revised by:	Director of Education May 26, 2019	**Subject group:**	DT1
Valid From:	Aug 1, 2019	**Specialised in:**	G1F
Version:	2	**Main field of study:**	Computer Engineering

Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding
- demonstrate comprehension of how Internet services are implemented on protocol level
- demonstrate comprehension of how Network Address Translation (NAT), methods to implement NAT, and methods for NAT traversal work
- demonstrate comprehension of how secure communication can be achieved with authentication and encryption
- demonstrate comprehension of data compression principles and how well different types of data typically can be compressed
- demonstrate comprehension of decentralized Internet services

Skills and abilities
- demonstrate the ability to develop client software for Internet services
- demonstrate the ability to develop server push-based applications

Judgement and approach
- demonstrate the ability to compare and choose appropriate architectures and communication protocols for different applications.

Contents

The course introduces to the Internet's architecture and the TCP/IP-protocols but focuses thereafter on the OSI-model's upper layers (session, presentation and application).

The course contains the following topics:
- Introduction to computer networks and the OSI-model
- Introduction to the TCP/IP-protocols
- Client/server notion
- Socket programming
- Scripting language

- Certain standard services and their protocols (Telnet, HTTP, SMTP, DNS, etc.)
- How secure communication can be achieved with authentication and encryption (HTTPS, DNSSEC, S/MIME, PGP, etc.)
- Principles of data compression for text and image
- Decentralized architectures (Tor, Bitcoin, GPG, etc.)

Type of instruction

The teaching is implemented in the form of lectures and laboratory work.

The teaching is conducted in English.

Prerequisites

General entry requirements and completed course Object-oriented Programming, 7,5 credits (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Written examination[I]	5 credits	5/4/3/U
Laboratory Work	2.5 credits	U/G

[I] Determines the final grade of the course, which is issued only when all course units have been passed.

Course literature

Literature
Title: TCP/IP Protocol Suite
Author: Behrouz Forouzan
Publisher: McGraw-Hill
ISBN. 978-0073376042