Internetworking

Programme course

6 credits

Internetteknik

TSIN02

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
Information Technology, Computer Science and Engineering, Computer Science

Course level
Second cycle

Advancement level
A1N

Course offered for
- Communication Systems, Master's Programme
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Computer Science, Master's programme
- Computer Science and Software 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
Basic knowledge in computer science

Intended learning outcomes

The aim of the course is to give knowledge about internetworking technologies, focusing on the Internet. After completing the course, the student is expected to be able to:

- Explain how an internet works, which different components are included and why they are included.
- Give an account of how Internet works on protocol level, what protocols are used, and what functionality these protocols contribute with.
- Understand optical fiber communication, both from a components view and its application in the core and access networks of Internet.
- Choose/design an appropriate protocol for a new application considering the requirements and usage of the application.
- Describe basic principles of source and channel coding for packet networks, Internet service provider pricing, special networks for clouds and Internet-of-things.

Course content

Introduction, Packet switching vs Circuit Switching, the TCP/IP model, the network layer (IPv4 IPv6, routers, switches, DHCP, mobility in LTE, virtual circuits, routing), the transport layer (UDP, TCP), optical fiber communication, sensor networks, Internet service provider pricing, clouds (Clos networks), DNS, multicasting, peer-2-peer, Skype NAT traversal, source and channel coding for packet networks (error concealment, interleaving, multiple description coding, layered coding, Shannon bounds).

Teaching and working methods

The course consists of lectures, problem-solving classes and home assignments.

Examination

UPG1	Hand-in assignments	1.5 credits	U, G
TEN1	Written examination.	4.5 credits	U, 3, 4, 5

Grades

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

Department

Institutionen för systemteknik

Director of Studies or equivalent

Klas Nordberg

Examiner

Guilherme B. Xavier

Course website and other links

http://www.icg.isy.liu.se/en/courses/tsin02/

Education components

Preliminary scheduled hours: 38 h
Recommended self-study hours: 122 h

Course literature

Additional literature

Books

Behrouz A. Forouzan, McGraw-Hill, *TCP/IP Protocol Suite* McGraw-Hill
Mung Chiang, *Networked life, 20 questions and answers* Cambridge University Press
Rajiv Ramaswami, *Optical Networks: A Practical Perspective* 3rd Edition Morgan Kaufmann

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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.