COM-208

Computer networks

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Cursus	Sem.	Type
Communication systems minor	H	Opt.
Communication systems	BA3	Obl.
Computer science minor	H	Opt.
Computer science	BA3	Obl.
Cyber security minor	H	Opt.
HES - IC	H	Obl.
HES - IN	H	Obl.
HES -SC	H	Obl.
UNIL - Sciences forensiques	H	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course provides an introduction to computer networks. It describes the principles that underly modern network operation and illustrates them using the Internet as an example.

Content

- Overview of Internet operation (main components and protocols).
- Application layer (web, cookies, peer to peer).
- Socket programming (how to write a very simple network application).
- Transport layer (UDP, TCP, congestion control).
- Network layer (IP forwarding and basic routing).
- Data link layer (switching).
- Security (secure email, SSL, IPsec).

Keywords

- Computer networks
- Internet
- HTTP
- Peer-to-peer networks
- Sockets, TCP/IP, congestion control, routing, switching, network security.

Learning Prerequisites

Required courses

- CS 107 - Introduction to programming
- COM 101 - Advanced Information Computation Communication I

Learning Outcomes

By the end of the course, the student must be able to:

- Design simple network applications.
- Choose which functions to implement at each network layer.
- Compare different network protocols.
- Perform simple network troubleshooting.
- Use simple network monitoring tools.
- Implement simple client-server applications.
- Investigate simple network attacks.
- Explain how basic Internet applications work.
- Explain how TCP/IP works.

Transversal skills

- Use both general and domain specific IT resources and tools
- Use a work methodology appropriate to the task.
- Demonstrate the capacity for critical thinking
- Demonstrate a capacity for creativity.

Teaching methods

- Lectures
- Reading sssignments
- Homework problems
- Hands-on exercises

Expected student activities

The students are expected to:

- attend the lectures
- complete homework problems
- complete hands-on exercises
- study their notes and -- when needed -- complement by reading relevant book chapters

Assessment methods

- Final exam
- Midterm exam (online)
- Quizzes (online)

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Bibliography

Computer Networking: A Top-Down Approach by James F. Kurose and Keith W. Ross.

Ressources en bibliothèque

- Computer Networking / Kurose

Websites

- https://sites.google.com/site/com208computernetworks/

Moodle Link

- https://go.epfl.ch/COM-208