**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, ads, email, 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 and basic shared access protocols).
- 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 106 - Introduction to programming
- COM 101 - Information sciences

**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.

Teaching methods

• Lectures
• Reading assignments
• Homework problems
• Hands-on exercises

Expected student activities
The students are expected to:
• attend the lectures
• read the assigned book sections
• complete homework problems
• complete hands-on exercises.

Assessment methods

• Quizzes and short essay (bonus points that can contribute up to 10% of the grade).
• Midterm exam (40% of the grade).
• Final exam (60% of the grade).

Resources

Bibliography

Ressources en bibliothèque
• Computer Networking / Kurose