**Summary**

In the lectures you will learn and understand the main ideas that underlie and the way communication networks are built and run. In the labs you will exercise practical configurations.

**Content**

The TCP/IP architecture.
Layer 2 networking; Bridging.
The Internet protocol versions 4 and 6.
The transport layer, TCP, UDP, sockets, QUIC.
Link state routing, OSPF, Distance Vector routing, Interdomain routing, BGP.
Congestion control principles. Application to the Internet. The fairness of TCP. Tunnels and hybrid architectures.

**Keywords**

TCP/IP
Computer Networks

**Learning Prerequisites**

**Required courses**
A first programming course

**Recommended courses**
COM-208 Computer Networks

**Learning Outcomes**

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

- Run and configure networks
- Understand the main ideas that underlie the Internet
- Write simple communicating programs
- Use communication primitives for internet and industrial applications.

**Transversal skills**
• Access and evaluate appropriate sources of information.
• Continue to work through difficulties or initial failure to find optimal solutions.

Teaching methods
Lectures.
Online quizzes.
Labs on student's computer.

Expected student activities
Participate in lectures
Participate in online quizzes
Make lab assignments (in the rule, every other week)

Assessment methods
Theory grade = final exam
Practice grade = average of labs
Final grade = mean of theory grade (50%) and practice grade (50%).
The research exercise may add a bonus of at most 0.5 points in 1-6 scale to the practice grade.

Supervision
Office hours Yes
Assistants Yes
Forum Yes

Resources
Bibliography
"Computer Networking : Principles, Protocols and Practice", O. Bonaventure, open source textbook,
http://inl.info.ucl.ac.be/CNP3

Ressources en bibliothèque
• Computer Networking / Bonaventure

Notes/Handbook
Slides are on moodle

Websites
• http://moodle.epfl.ch/course/view.php?id=523

Moodle Link
• https://go.epfl.ch/COM-407