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

Content
LECTURES: 1. The TCP/IP architecture 2. Layer 2 networking; Bridging. 3. The Internet protocol versions 4 and 6. 4. The transport layer, TCP, UDP, sockets, QUIC. 5. Link state routing, OSPF, Distance Vector routing. Interdomain routing, BGP. 6. Congestion control principles. Application to the Internet. The fairness of TCP.

Keywords
TCP/IP
Computer Networks

Learning Prerequisites
Required courses
A first programming course

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 with questionnaires.
Labs on student's computer and in the Internet Engineering Workshop

**Expected student activities**
- Participate in lectures
- Participate in graded test every other week
- Make one lab assignment every other week, including handing in a written report
- Optional: research exercise: gather information about a specific topic and explain it to class

**Assessment methods**
- Theory grade = max(40% tests + 60% final exam, final exam)
- Practice grade = average of labs
- Final grade = harmonic mean of theory grade and practice grade.
  - The research exercise may give a bonus of at most 0.5 points in 1-6 scale.
  - When computing the test grade, the best 5 out of 7 tests are taken.

**Supervision**
- Office hours: Yes
- Assistants: Yes
- Forum: Yes

**Resources**

**Bibliography**

**Ressources en bibliothèque**
- Computer Networking / Bonaventure

**Notes/Handbook**
- Slides are on moodle

**Websites**

**Moodle Link**

**Videos**