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
-- The internet architecture.
-- Layer 2 networking; switching/bridging.
-- The Internet protocol versions 4 and 6.
-- The transport layer, TCP, UDP, sockets, QUIC.
-- Routing algorithms: Link state routing, OSPF, Distance Vector routing, Interdomain routing, BGP.
-- Congestion control principles. The fairness of TCP. Application to the Internet (TCP Reno, Cubic, DCTCP, BBR).
-- Tunnels and hybrid architectures.
-- A few things about internet security.
-- Application layer protocols.

Keywords
TCP/IP
Computer Networks

Learning Prerequisites
Required courses
A first programming course (Python)

Recommended courses
An undergraduate course on 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


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