

COM-405

Mobile networks

Cursus	Sem.	Type
Communication systems minor	E	Opt.
Computer science	MA2, MA4	Opt.
Cyber security minor	E	Opt.
Cybersecurity	MA2, MA4	Opt.
Electrical and Electronical Engineering	MA2, MA4	Opt.
Robotics, Control and Intelligent Systems		Opt.
SC master EPFL	MA2, MA4	Obl.

Contact language	English
Credits	8
Session	Summer
Semester	Spring
Exam	Written
Workload	240h
Weeks	14
Hours	5 weekly
Lecture	3 weekly
Exercises	2 weekly
Number of positions	

Remark

pas donné en 2023-24

Summary

This course provides a detailed description of the organization and operating principles of mobile and wireless communication networks.

Content

Introduction to wireless networks
 Wireless PHY Layer Techniques
 MAC (Medium Access Control) Layer Protocols
 Wi-Fi & Bluetooth
 Cellular networks (3G, 4G, 5G).
 Internet of Things (IoT) Networks and Technologies.
 Multi-Hop Networks, Mesh Networks, and Sensor Networks
 Routing in Wireless Networks
 Network Coding
 Cross Layer Networking
 Wireless Sensing and Localization

Keywords

Communication networks, protocols, wireless, IoT

Learning Prerequisites**Required courses**

COM-208 Computer Networks

Recommended courses

COM-302 Principles of Digital Communications

Important concepts to start the course

Operating principles of communication protocols and layer organization.

Learning Outcomes

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

- Synthesize the way a mobile network operates
- Interpret the behavior of such networks
- Propose evolutions to existing protocols
- Identify weaknesses, bottlenecks and vulnerabilities
- Identify weaknesses and bottlenecks

Teaching methods

Lectures
Weekly Readings
Exercise sessions
Homework Problems

Expected student activities

Class participation, readings, homework, exercise sessions

Assessment methods

Homeworks + final exam

Supervision

Office hours	No
Assistants	Yes
Forum	No

Resources

Virtual desktop infrastructure (VDI)

No

Bibliography

Handouts, recommended books (see course URL)

Ressources en bibliothèque

-

Moodle Link

- <https://go.epfl.ch/COM-405>