EPFL

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.

Language of teaching	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

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Moodle Link

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