### Mobile networks

#### Cursus

<table>
<thead>
<tr>
<th>Cursus</th>
<th>Sem.</th>
<th>Type</th>
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<tbody>
<tr>
<td>Communication systems minor</td>
<td>E</td>
<td>Opt.</td>
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<tr>
<td>Computer science</td>
<td>MA2, MA4</td>
<td>Opt.</td>
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<tr>
<td>Cyber security minor</td>
<td>E</td>
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<td>Cybersecurity</td>
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<td>Opt.</td>
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<tr>
<td>Electrical and Electronical Engineering</td>
<td>MA2, MA4</td>
<td>Opt.</td>
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<tr>
<td>Robotics, Control and Intelligent Systems</td>
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<td>Opt.</td>
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<tr>
<td>SC master EPFL</td>
<td>MA2, MA4</td>
<td>Obl.</td>
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#### 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:

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Mobile networks
• 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