Mobile networks

COM-405  
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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 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
Assistant Yes
Forum No

Resources
Virtual desktop infrastructure (VDI)
No

Bibliography
Handouts, recommended books (see course URL)

Ressources en bibliothèque
• Fundamentals of Mobile Data Networks / Miao

Moodle Link
• https://go.epfl.ch/COM-405