

# PERFORMANCE AND DESIGN OF WIRELESS NETWORKS (6 CFU)



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- Semester: Second
- Exam mode: Oral Colloquium
- Pre-requisites: Basic Networking
- Area: GR-a (Networking)

# Syllabus



- Objectives

The objectives of the course are the presentation of the cellular network evolution, of the most popular technologies for Wireless LAN and MAN, and of the different solutions available for the Wireless Mesh Networks (WMN). Furthermore, the course aims at providing the tools necessary for the design of these networks and at highlighting their performance problems.

- Topics

- Cellular Networks : General structure of a cellular network, GSM network Architecture, UMTS network Architecture, Mobility and session management in cellular networks
- Wireless LAN : The standard IEEE 802.11, Operative modes of IEEE 802.11 networks, Distributed Coordination Function and Point Coordination Function, IEEE 802.11 systems evolution, Security threats and solutions in IEEE 802.11 networks
- Wireless Mesh Networks (WMN) : MAC protocols, Capacity, Routing protocols, Transport protocols, Fairness issues, QoS, Security and Management issues, The working group IEEE 802.11s
- Multimedia over IP (MoIP): Design issues, The Session Initiation Protocol (SIP), Techniques for the evaluation of the Quality of Experience (QoE)

# Thesis available



- Energy Optimization in 5G and WLAN

The power consumption of network equipment has stimulated several research efforts devoted to the study of new mechanisms to optimize the energy utilization. The characterization of the energy consumption of a network equipment in function of its traffic throughput, denoted as Energy Profile (EP), permits the study of network solutions aimed at minimizing the overall energy consumption. In this framework, the main goal of this master thesis is the study of new algorithms able to minimize the power consumption of the network, while maintaining the performance required by the applications.