INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	GRADUATE						
COURSE TITLE	**Mobile and Wireless Networks**						
COURSE CODE	**C12**		**Semester**	**Fall**	**ECTS**	**6**	
TEACHING HOURS per week	**THEORY**	**3**	**SEMINAR.**		**LABORATORY**	**1**	
URL	https://eclass.uoa.gr/courses/D211/						

COURSE CONTENT

The rapid development of wireless and mobile communications, that started in the 80's, mainly through WiFi and GSM, continues in our days with 4G and now with 5G mobile networks. The aim of this course is to describe the principles and architecture of modern wireless and mobile networks, focusing on their main functionalities. The course is divided into two parts: A) Wireless/mobile Internet access: - History, general principles of mobile communications - Problems of Internet Protocol (IP) over wireless networks - Wireless communications modulation and transmission - Wireless networks (local, personal, metropolitan) - IP mobility support. B) Mobile Networks: - 4G network architecture and operation - Quality of Service / Quality of Experience support in modern networks - Radio resource management - Interference mitigation/management - Mobility support in mobile networks - Introduction to 5G architecture and protocols.

The course also includes an individual assignment for the students, in the form of a 15-minute presentation on a relevant subject. A list of available subjects is proposed to the students around the middle of the semester, while they are also allowed to propose a subject of their own choice. The presentations are recorded and uploaded by the students through eclass by the end of the semester. The grade of the presentation is 30% of the final grade (70% is through the final examinations).

STUDENT LEARNING OBJECTIVES

Upon successful completion of the course the student will be able to:

- Describe and explain the principles governing modern wireless and mobile networks: Functional entities, their role, processes of communication between them and their evolution over the years.
- Describe and explain why wireless communication features and user mobility make it difficult to provide quality of service and quality of experience to wireless users.
- Obtain knowledge to the most advanced protocols of wireless local area networks, their advantages and disadvantages, and their evolution from their original form to the present day.
- Describe and explain mobility support requirements for mobile communication networks, the procedures required to meet them, and the appropriate signaling between the functional entities of the system, with emphasis on location update and handover.
- Describe and explain the initialization and support of communication processes on mobile communications networks, focusing on continuous service provision.

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In Class (Face to Face)

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process supported by the e-class platform (Announcements, Teaching Material, Exercises, Recorded Videolectures) Email communication Live streaming of lectures Ability to view recorded lectures
TEACHING ORGANIZATION *Describe in detail the way and methods of teaching:* *Enhanced Lectures,* *Online Lectures,* *Seminars,* *Tutorial,* *Laboratory,* *Laboratory Exercise,* *Study & analysis of literature,* *Practice (Positioning),* *Interactive teaching,* *Developing a project,* *Individual / group work* *Telework (reference to tools) etc.* *Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS*	Theory is presented with slide projection. The lectures are broadcasted live and recorded so that students can rehearse the lectures. The laboratory is organized through exercises/presentations that the students deliver through eclass at the end of the semester.

Activity	***Student Workload*** *(hours)*
Lectures	44
Laboratory	18
Preparation for the Laboratory	40
Independent Study	48
Total Course (25 hours of workload per unit of credit)	***150***

ASSESSMENT OF STUDENTS *Description of the assessment process* *Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other* *Fully defined evaluation criteria are mentioned and if and where they are accessible to students.*	Students are assessed by written examination and submission of the laboratory exercise/presentation. The written examination covers the theoretical part. The written examination is 70% of the final grade. The laboratory exercise is 30% of the final grade. Complaints and retrains are allowed.

Assessment methods	***Number***	***Percentage***
Written examination	1	70%
Laboratory	1	30%

LITERATURE AND STUDY MATERIALS / READING LIST
Mobile and Wireless Networks, Volume 2 Author(s): Khaldoun Al AghaGuy PujolleTara Ali-Yahiya Wiley, 2016