

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	UNDERGRADUATE						
COURSE TITLE	Telecommunication Networks						
COURSE CODE	ΕΠ20		Semester	5	ECTS	6	
TEACHING HOURS per week	THEORY	3	SEMINAR.		LABORATORY	1	
COURSE TYPE	Elective (ΠΜ)						
	K	E1	E2	E3	E4	E5	E6
	B					B	
URL	https://eclass.uoa.gr/courses/D76/						
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	YES (K16)						
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK						
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO						

COURSE CONTENT	
<p>The course covers issues related to the design and implementation of Telecommunication Networks as well as current issues of administrative and financial regulation of telecommunication infrastructures. The following are presented in more detail: The structure of Public Telecommunication Networks, the principles of multiplexing, the basic Transmission Systems and the Synchronous Digital Hierarchy (SDH). The principles, the basic devices and the most important switching techniques and systems with emphasis on Digital Switching are also presented. Also, issues related to Switching Systems and Signaling Control, Intelligent Telecommunication Networks (IN) and their services are addressed. In addition, the evolution and the technologies of modern access networks are presented: from the ISDN network (services, basic features, architecture, signaling) to the packet switching public telecommunication networks (ATMs, MPLS).</p> <p>The challenges posed by the migration to Ethernet and IP telephony technologies are presented in detail. Analytical issues of NGA networks with particular emphasis on xDSL-based networks and FTTH (FTTH)</p>	

The above are related to issues related to the liberalization of the Telecommunication Market, Telecommunication Policies and Regulation as well as basic concepts of Administration and Economic Telecommunication Networks and Infrastructures.
The laboratory part works as a simulation laboratory of Telecommunication networks using OMNET+ network simulator and models in GNS3.

STUDENT LEARNING OBJECTIVES

The course presents the developments in the telecommunications, connecting technical concepts of telecommunication systems and networks with current issues of regulation, management and economic infrastructure of telecommunication.

The course aims to present to the students the current technological, regulatory and economic field of telecommunication. Starting with the development of telecommunications networks and ending with the latest advances in FTTC and FTTH optical fiber technologies, the course familiarize students with what they can face in a modern telecommunications organization.

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

- Distinguish the structure of a public telecommunications network and knows the transmission techniques
- Identify the methods and principles that apply to the design and operation of the telecommunication networks.
- Define new architectures in trunk and access networks and understands the problems in their development
- Evaluate the limits per technology in access networks
- Design a broadband access network
- Estimate the consequences of market liberalization and the problems it solves
- Identify the different independent authorities that are associated with telecommunications and the communications extended area.

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 (Discussions, Announcements, Task assignments, Student groups) Email communication Live transmission of lectures Ability to track recorded lectures Exhibition Lab exercises	
	Theory is presented with slide projection. Software topics are presented in simulation laboratories. Laboratory exercises are given in simulation tools. Support for workshops with discussions in e-class.	
TEACHING ORGANIZATION <i>Describe in detail the way and methods of teaching:</i>	Activity	Student Workload <i>(hours)</i>

<p><i>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.</i></p> <p><i>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</i></p>	Lectures	39	
	Tutorial	-	
	Laboratory OMNET	12	
	Laboratory GNS3	4	
	Study for the Lab	15	
	Study for the exams	20	
	Independent Study	60	
	Total Course (25 hours of workload per unit of credit)	150	
<p>ASSESSMENT OF STUDENTS <i>Description of the assessment process</i></p> <p><i>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</i></p> <p><i>Fully defined evaluation criteria are mentioned and if and where they are accessible to students.</i></p>	<p>The evaluation includes: the final - recapitulative written examination, including closed or open-ended questions and problems. The evaluation is done in the Greek language. Participation in the exam requires the presence in the laboratory and the written examination includes both theoretical lectures and the laboratory. Complaints and retrains Allowable.</p>		
	Assessment methods	Number	Percentage
	Written examination	1	100%

LITERATURE AND STUDY MATERIALS / READING LIST	
<i>In Greek</i>	
•	(Next Generation Access Networks) Δίκτυα Πρόσβασης Νέας Γενιάς, Χ. Βασιλόπουλος κλπ. Εκδ. Κλειδάριθμος
•	(Broadband Networks) Δίκτυα Ευρείας Ζώνης, Τεχνολογίες και Εφαρμογές με έμφαση στο Διαδίκτυο, Ι. Βενιέρης, Εκδ. Τζιόλα
<i>In English</i>	
•	Broadband Network Architectures: Designing and Deploying Triple-Play Services: Designing and Deploying Triple-Play Services”, Hellberg, Greene & Boyes, ISBN-10: 0132300575, Prentice Hall.