



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

HELLENIC REPUBLIC

Α.Δ.Ι.Π.

H.Q.A.

ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ

HELLENIC QUALITY ASSURANCE

ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

AND ACCREDITATION AGENCY

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΚΑΙ ΘΡΑΚΗΣ  
ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΤΕΙ ΑΜΘ

## Quality Assurance in Higher Education Course Data Collection Form

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ  
ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ & ΘΡΑΚΗΣ

EASTERN MACEDONIA AND THRACE INSTITUTE  
OF TECHNOLOGY

ΑΓΙΟΣ ΛΟΥΚΑΣ,

AGIOS LOUKAS

65404 ΚΑΒΑΛΑ

65404 KAVALA

## COURSE OUTLINE

### 1. GENERAL

<b>Name and surname of lecturer</b>	Panagiotis Kogias		
<b>SCHOOL</b>	of Technological Applications		
<b>ACADEMIC UNIT</b>	Department of Electrical Engineering		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	EN1	<b>SEMESTER</b>	5 <sup>o</sup>
<b>COURSE TITLE</b>	<b>TELECOMMUNICATION SYSTEMS</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
Lectures	3th+2lab	6,0	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	background Skills development		
<b>PREREQUISITE COURSES:</b>			
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	NO		
<b>COURSE WEBSITE (URL)</b>	<a href="http://eclass.teikav.edu.gr/ED185/">http://eclass.teikav.edu.gr/ED185/</a>		

## 2. LEARNING OUTCOMES

### Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

The aim of the course is theoretical and practical training of students to the basic concepts of telecommunication systems as well as to digital communication systems. Is introduced on modulation techniques (width and angle) in order to understand the most basic functions of a communication system and in processing techniques, transmission and reception of signals.

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

- To know the basic principles of operation of telecommunication systems
- analyze and describe simple building telecommunications charts systems
- to calculate the signal-ratio at the output of simple analog systems
- analyzing the PCM technique for transmitting a signal
- produce modulated, demodulated signals (eg voice) and sampled signals with the help of laboratory equipment

### General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	.....
Production of new research ideas	Others...

- Search, analysis and synthesis of data and information, the use and the necessary technologies
- Autonomous Work
- Teamwork
- Design and Project Management
- Generate new research ideas

## 3. SYLLABUS

- I. Introduction to Telecommunications Systems and principle of operation
- II. Transmission media, wired and wireless connections, fiber optics, wave propagation telecommunications
- III. Spectrum, power spectral density, frequency shift Systems Analog Transmission, signal range
- IV. Sampling and converting analog signal to digital
- V. Analog modulation techniques (AM, FM)

- VI. Digital modulation techniques (PCM, PSK, FSK, PAM, PPM)
- VII. Configuration phase and frequency (angle) Deviation phase and frequency, Spectrum FM signal
- VIII. Multiplexing, methods, multiple access systems
- IX. Pulse Code Modulation (PCM), compression-restoration Multiplexing PCM signals
- X. signal-connection
- XI. Codes decoding
- XII. Noise in analog and digital telecommunications systems
- XIII. Processing Telecommunication signals (A / D, D / A, voice coding error correction codes, data compression, channel equalizers)

#### 4. TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face (in the classroom)	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Presentation and Theory and Laboratory with the help of slides. Website of the course with supporting and auxiliary material. In the laboratory using the laboratory equipment for the generation and control of various modulated signals.	
<b>TEACHING METHODS</b>  <i>The manner and methods of teaching are described in detail.</i>  <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i>  <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<b>Activity</b>	<b>Semester workload</b>
	lectures	39
	laboratory Exercises	39
	independent Study	72
	<b>Total Course (25 hours workload per credit unit)</b>	150
<b>STUDENT PERFORMANCE EVALUATION</b>  <i>Description of the evaluation procedure</i>  <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	<p>Theory Final written examination (100%)</p> <p>Laboratory Course Final examination (100%) by direct creation and analysis of a number of modulated signals.</p>	

#### 5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

- Sp. L. Panetsos, communications and computer networks
- Amsterdam. Alexopoulos - C. Lagogiannis, "Telecommunications and Computer Networks", Seventh edition

- Günther Mahlke, - Peter Gössing, "Fiber Optic Cables", Siemens Inc., 1987
- Luis E. Frenzel, "Electronic Communication" A. Tziola E, 1994
- C. Karagiannidis "Telecommunication Systems", edition Tziola, 2009
- Taub Herbert, Shilling Donald, "Telecommunication Systems", edition Tziola, 2003
- Ph. Constantine, "Introduction to Telecommunications", edition Tziola, 1995