

<b>INSTITUTION</b>	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
<b>SCHOOL</b>	SCHOOL OF SCIENCE						
<b>DEPARTMENT</b>	INFORMATICS AND TELECOMMUNICATIONS						
<b>COURSE LEVEL</b>	UNDERGRADUATE						
<b>COURSE TITLE</b>	<b>Special Topics in Communications and Signal Processing: Transmission Lines, waveguides and optical fibers</b>						
<b>COURSE CODE</b>	ΕΠ22		Semester	7/8	ECTS	4	
<b>TEACHING HOURS per week</b>	<b>THEORY</b>	3	<b>SEMINAR.</b>		<b>LABORATORY</b>		
<b>COURSE TYPE</b>	Elective (ΠΜ)						
	<b>K</b>	<b>E1</b>	<b>E2</b>	<b>E3</b>	<b>E4</b>	<b>E5</b>	<b>E6</b>
	B				E	E	E
<b>URL</b>	<a href="https://eclass.uoa.gr/courses/D64/">https://eclass.uoa.gr/courses/D64/</a>						
<b>EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:</b>	YES (K12 , ΕΠ05)						
<b>TEACHING AND EXAMINATIONS LANGUAGE:</b>	GREEK						
<b>THE COURSE IS OFFERED TO ERASMUS STUDENTS</b>	NO						

<b>COURSE CONTENT</b>	
<ol style="list-style-type: none"> <li>1. Theory of Transmission Lines</li> <li>2. Types of Transmission Lines</li> <li>3. Smith Chart. Transmission Line impedance matching</li> <li>4. Homogeneous waveguides (rectangular, circular, coaxial)</li> <li>5. Electromagnetic resonance</li> <li>6. Microstrips</li> <li>7. Parallel dielectric plates</li> <li>8. Rectangular optical waveguides.</li> <li>9. Optical fibers (propagation modes, optical fiber characteristics, linear polarized modes, dispersion, types of optical fibers).</li> </ol>	

### STUDENT LEARNING OBJECTIVES

The lesson is based on the background obtained from the teaching of Electromagnetic Theory is applied to the transmission media. Basic guiding concepts are taught, and the effect of frequency on the different types of transmission media used in telecommunications is demonstrated. It examines the basic provisions of open and closed waveguides as well as the transmission lines from the perspective of the Engineer, defining fundamental figures and produces useful results for telecommunications.

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

- use the principles of electromagnetic theory to solve problems related to transmission media
- use simplistic hypotheses in HM equations in waveguide design
- examine various types of waveguides by highlighting their basic properties and understanding their use

### TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In Class (Face to Face)														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	<p>Learning process supported by the e-class platform (Discussions, Announcements, Task assignments, Student groups)</p> <p>Email communication</p> <p>Live transmission of lectures</p> <p>Ability to track recorded lectures</p> <p>Utilization of Specialized Software - applets</p>														
TEACHING ORGANIZATION	<p><i>Describe in detail the way and methods of teaching:</i> Enhanced Lectures, Online Lectures, Seminars, Tutorial, Laboratory, Laboratory Exercise, Study &amp; analysis of literature, Practice (Positioning), Interactive teaching, Developing a project, Individual / group work Telework (reference to tools) etc.</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> <table border="1"> <thead> <tr> <th>Activity</th> <th>Student Workload (hours)</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>39</td> </tr> <tr> <td>Tutorial</td> <td>8</td> </tr> <tr> <td>Bibliography analysis</td> <td>3</td> </tr> <tr> <td>Small individual exercises</td> <td>10</td> </tr> <tr> <td>Independent Study</td> <td>40</td> </tr> <tr> <td><b>Total Course (25 hours of workload per unit of credit)</b></td> <td><b>100</b></td> </tr> </tbody> </table>	Activity	Student Workload (hours)	Lectures	39	Tutorial	8	Bibliography analysis	3	Small individual exercises	10	Independent Study	40	<b>Total Course (25 hours of workload per unit of credit)</b>	<b>100</b>
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Small individual exercises	10														
Independent Study	40														
<b>Total Course (25 hours of workload per unit of credit)</b>	<b>100</b>														

### 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.*

The evaluation includes: the final - recapitulative written examination, including closed or open-ended questions and problems . The evaluation is done in the Greek language

Assessment methods	Number	Percentage
Written examination	1	50%
Progress		
Exercises	5	20%
Laboratory		
Small project		10%

### LITERATURE AND STUDY MATERIALS / READING LIST

*In greek*

- Σημειώσεις, Θ. Σφηκόπουλος
- Μικροκυματική Τεχνολογία, D.M. Pozar, Εκδόσεις Ίων, 2004
- Διαμόρφωση και Μετάδοση Σημάτων, Π. Κωπτής, Εκδόσεις Τζιόλα, 2006
- Μικροκύματα Κ. Λιολούσης