

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS																			
SCHOOL	SCHOOL OF SCIENCE																			
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS																			
COURSE LEVEL	UNDERGRADUATE																			
COURSE TITLE	Optical Communications and Optical Networks																			
COURSE CODE	ΕΠ16	Semester	7	ECTS	6															
TEACHING HOURS per week	THEORY	3	SEMINAR.	1	LABORATORY															
COURSE TYPE	<p>Select one of the following and delete the rest Electives (ΠΜ)</p> <table border="1"> <thead> <tr> <th>K</th> <th>E1</th> <th>E2</th> <th>E3</th> <th>E4</th> <th>E5</th> <th>E6</th> </tr> </thead> <tbody> <tr> <td>B</td> <td></td> <td></td> <td></td> <td>B</td> <td>B</td> <td></td> </tr> </tbody> </table> <p><i>Fill the table as in the curriculum: Track (A-Computer Science, B- Computer Engineering) / Specialization Compulsory (Y) / Core Specialization (B)/ Elective Specialization (E)</i></p>						K	E1	E2	E3	E4	E5	E6	B				B	B	
K	E1	E2	E3	E4	E5	E6														
B				B	B															
URL	https://eclass.uoa.gr/courses/D68/																			
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	K12																			
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK																			
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO																			

COURSE CONTENT
<p>Basic structural and functional characteristics of the optical communications systems and networks. Transmission properties of the optical fiber, optical transmitters, amplifiers, filters and receivers. Optical communications system architectures , modulation / demodulation schemes. High bit rate linear and nonlinear systems. Optical time and wavelength division multiplexing. Basic architectiutre of core, metro and access networks</p>

STUDENT LEARNING OBJECTIVES

Teaching-Learning Goals-Expected Learning Outcomes

To introduce the students in the major topics of the Optical communications and Optical Networks, covering the related areas at both the theoretical and applied level.

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

- Explain the transmission properties of signal in optical fibers
- Describe the different realization approaches of the optical fibers and their corresponding properties when considered as telecommunication channels
- Explain the principle of operation of semiconductor lasers and their use as optical transmitters
- Classify the different types of semiconductor laser when used as optical transmitters
- Explain the operation of optical amplifiers
- Explain the operation of optical receivers
- Design complex optical communications systems and calculate their performance parameters based on their structural and functional properties
- Describe the topology of different optical core metro and access network architectures

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) Email communication																			
TEACHING ORGANIZATION <i>Describe in detail the way and methods of teaching:</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>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>	<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>13</td> </tr> <tr> <td>Laboratory</td> <td></td> </tr> <tr> <td>Teamwork in a case study</td> <td></td> </tr> <tr> <td>Small individual exercises</td> <td>40</td> </tr> <tr> <td>Independent Study</td> <td>45</td> </tr> <tr> <td>.....</td> <td>...</td> </tr> <tr> <td>Total Course (25 hours of workload per unit of credit)</td> <td>140</td> </tr> </tbody> </table>		Activity	Student Workload (hours)	Lectures	39	Tutorial	13	Laboratory		Teamwork in a case study		Small individual exercises	40	Independent Study	45	Total Course (25 hours of workload per unit of credit)	140
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<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>Describe explicitly methods, evaluation tools and provided feedback. The table below is supplemented accordingly.</p>		
	Assessment methods	Number	Percentage
	Written examination	1	85%
Progress			
Exercises	10	15%	
Laboratory			
Final work			

LITERATURE AND STUDY MATERIALS / READING LIST
G.P. Agrawal, “Communication Systems with Optical Fibers” 4 th Edition 2012, Tziolas Publ.