

**ABDULLAH GÜL UNIVERSITY  
GRADUATE SCHOOL OF ENGINEERING & SCIENCE  
ELECTRONICS AND COMPUTER ENGINEERING PROGRAM  
COURSE DESCRIPTION AND SYLLABUS**

Course Title	Code	Semester	T+L Hours	Credit	ECTS
Photonics	ECE-523	FALL	3 + 0	3	10

**Prerequisite Courses** None

<b>Type</b>	Selective
<b>Language</b>	English
<b>Coordinator</b>	Assoc. Prof. Ibrahim Ozdur
<b>Instructor</b>	Assoc. Prof. Ibrahim Ozdur
<b>Adjunt</b>	none
<b>Aim</b>	Photonics course intends to focus on basic concepts of light and photonics with their applications.
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Learning Electromagnetic spectrum and its properties</li> <li>• Learning beam optics and beam propagation</li> <li>• Learning the polarization of light</li> <li>• Learning the generation of light</li> <li>• Learning Photodetectors</li> <li>• Learning modulation of light</li> <li>• Learning fiber optic cable</li> </ul>
<b>Course Content</b>	<ul style="list-style-type: none"> <li>• Electromagnetic spectrum</li> <li>• Beam propagation</li> <li>• Polarisation</li> <li>• Lasers and LEDs</li> <li>• Photodetectors</li> <li>• Modulators</li> <li>• Fiber optic cable</li> </ul>

**WEEKLY TOPICS AND PRELIMINARY STUDY**

Week	Topic	Preliminary Study
1	Fundamental concepts	The relevant articles from the literature
2	Electromagnetic Spectrum	The relevant articles from the literature
3	Beam optics and ABCD matrices	The relevant articles from the literature
4	Gaussian beams and Gaussian beam propagation	The relevant articles from the literature
5	Polarisation properties of light	The relevant articles from the literature
6	Photon – atom interactions and properties of laser light	The relevant articles from the literature
7	Laser types	The relevant articles from the literature
8	LEDs	The relevant articles from the literature
9	Photodetectors	"
10	Midterm	The relevant articles from the literature
11	Electro optic devices	The relevant articles from the literature
12	Acousto optic devices	The relevant articles from the literature
13	Electro-optical devices	The relevant articles from the literature
14	Optical fiber cable	The relevant articles from the literature
15	Fiber optic communication system	The relevant articles from the literature

16	Final Exam
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SOURCES	
<b>Lecture Notes</b>	Lecture slides
<b>Other Sources</b>	<p><b>Course Textbook:</b> "Fundamentals of Photonics", Bahaa E. A. Saleh, Malvin Carl Teich, 2<sup>nd</sup> Edition, Wiley</p> <p><b>Additional Materials:</b></p> <ol style="list-style-type: none"> <li>"Photonics: Optical Electronics in Modern Communications", Amnon Yariv, Pochi Yeh, 6<sup>th</sup> Edition, 2006, Oxford Series in Electrical and Computer Engineering</li> </ol>

COURSE MATERIALS SHARING	
<b>Documents</b>	Lecture notes, slides and molecular model set
<b>Homeworks</b>	Students will be given one homework each two weeks
<b>Exams</b>	1 Midterm and 1 Final Exam

EVALUATION SYSTEM		
SEMESTER STUDY	NUMBER	CONTRIBUTION
Midterm	1	20
Homework	7	25
Quiz	7	25
<b>SUB-TOTAL</b>		70
<b>Contribution of Semester Study</b>		70
<b>Contribution of Final Exam</b>	1	30
<b>TOTAL</b>		100

Course Category	
Sciences and Mathematics	30%
Engineering	70%
Social Sciences	0%

RELATIONSHIPS BETWEEN LEARNING OUTCOMES AND PROGRAM QUALIFICATIONS						
No	Program Qualifications	Contribution Level				
		1	2	3	4	5
1	Ability to use math, science and engineering knowledge in advanced research				X	
2	Ability to design, realize and analyze a novel system to solve engineering problems					X
3	To be able to use modern measurement equipment, hardware and software for expertise area research				X	
4	Ability to plan and do detailed independent research					X
5	Ability to do literature search, technical presentation, and prepare scientific manuscript					X
6	Be able to do critical and creative thinking and finding innovative methods					X

\*Increasing from 1 to 5.

ECTS / WORK LOAD TABLE			
Activities	Number	Duration (Hours)	Total Work Load
Course Length (includes exam weeks: 16x total course hours)	16	3	48
Out-of-class Study Time (Pre-study, practice)	16	5	90
Internet search, library work, literature search	16	4	64
Presentation	1	21	21
Homework	8	8	64
Midterm	1	15	15
Final Exam	1	20	20
<b>Total Work Load</b>			322

<b>Total Work Load / 30</b>			322/30
<b>Course ECTS Credit</b>			10