AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Photonics								
Course Code	EEE512		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	Introduce the students the fundamental concepts of photonics and optics. Therefore, Photodetectors, Optical Fibers and Optical Fiber Communication devices are in the scope of the course. Various photon sources such as LEDS and lasers are discussed and mathematical modelles are obtained. Lastly, operational principles of photonic devices are examined								
Course Content	The basic descriptions of light as rays (geometrical optics), waves (physical optics), and photons. Electromagnetic theory of light. Reflection and refraction of light rays and waves from planar and curved surfaces. Statistical optics and photon optics.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Demonstration, Discussion, Case Study, Project Based Study, Individual Study, Problem Solving								
Name of Lecturer(s)	Prof. Olcay ÜZENGİ AKTÜRK								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	40
Final Examination	1	50
Assignment	4	10

Recommended or Required Reading	
1	B.E.A. Saleh, M.C.Teich: Fundamentals of Photonics

Week	Weekly Detailed Course Contents	
1	Theoretical	Lightwaves and Paraxial solution of Maxwell s equations
2	Theoretical	Ray Optics
3	Theoretical	Wave Optics
4	Theoretical	Fourier Optics
5	Theoretical	General overview of Laser beam propagation through optical systems
6	Theoretical	Interaction of Lightwaves with dielectric materials
7	Theoretical	Elektromagnetic optics
8	Theoretical	Midterm Exam
9	Theoretical	Polarization and Stokes vectors
10	Theoretical	Statistical optics
11	Theoretical	Photon optics
12	Theoretical	Photon optics (cont.)
13	Theoretical	Characteristic of Laser Light and pulsed lasers
14	Theoretical	Optical devices
15	Theoretical	Optical devices
16	Theoretical	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	5	3	112
Assignment	4	12	3	60
Midterm Examination	1	9	3	12

Final Examination	1	13	3	16
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	To have the ability of obtaining beam solution of Maxwell Equations and its applications
2	Understand the ray, wave, and particle descriptions of light..
3	To be able to describe lightwave-dielectric materia interaction
4	Understand the principles of ray optics, wave optics, Fourier optics, electromagnetics and photonoptics
5	Comprehend refraction and reflection
6	Understand the basic of optical devices

Programme Outcomes *(Electrical and Electronics Engineering Master)*	
1	Developing and intensifying knowledge that requires expertise in the area of Electrical-Electronics Engineering, and gaining the skills necessary to analyze and solve problems using this knowledge
2	Grasping the inter-disciplinary interaction related to Electrical-Electronics Engineering, interpreting and forming new types of knowledge by combining the knowledge from Electrical-Electronics Engineering and the knowledge from various other disciplines
3	Developing new approaches to solve the complex problems arising in Electrical-Electronics Engineering, coming up with solutions while taking responsibility and carrying out a specific study independently
4	Assessing the knowledge and skill gained in the area of Electrical-Electronics Engineering with a critical view
5	Transferring the current developments and one’s own work in Electrical-Electronics Engineering, to other groups in written, oral and visual forms
6	The ability to control the collecting, interpreting, practicing and announcing processes of the Electrical-Electronics Engineering related to data taking into consideration scientific, cultural and ethical values and the ability to teach these values to others
7	Developing application plans concerning the subjects related to Electrical-Electronics Engineering and the ability to evaluate the end results of these plans within the frame of quality processes

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5	L6
P1	4	4	4	4	4	4
P2	4	4	4	4	4	4
P3	4	4	4	4	4	4
P4	4	4	4	4	4	4
P5	4	4	4	4	4	4
P6	4	4	4	4	4	4
P7	4	4	4	4	4	4