INTRODUCTION TO PHOTONIC SENSING

1	Course Title:	INTRODUCTION TO PHOTONIC SENSING
2	Course Code:	EEM4320
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	4
6	Semester:	8
7	ECTS Credits Allocated:	4.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. UMUT AYDEMİR
15	Course Lecturers:	Doç. Dr. Şekip Esat HAYBER
16	Contact information of the Course Coordinator:	umutaydemir@uludag.edu.tr, sehayber@uludag.edu.tr
17	Website:	
18	Objective of the Course:	It is aimed to comprehend the role of sensing by photonic devices in engineering applications.
19	Contribution of the Course to Professional Development:	1. Ability to identify, formulate and solve engineering problems 2. Ability to design a system, part or process to meet desired requirements 3. Ability to use techniques and modern tools necessary for engineering practice 4. Define electromagnetic optics. 5. Explain the light-matter interaction.
20	Learning Outcomes:	

		1	Ability to identify, formulate and solve engineering problems
		2	Ability to design a system, part or process to meet desired requirements
		3	Ability to use techniques and modern tools necessary for engineering practice
		4	Define electromagnetic optics.
		5	Explain the light-matter interaction.
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21	Course Content:

Course Content:	
Week Theoretical	Practice

1	Detectors and detectors, transducers and actuators.	
2	Basic sensor characteristics	
3	Optical sensing and components	
4	Optical waveguides	
5	Circular optical fibers	
6	Losses and loss mechanisms in optical fibers	
7	Fiber optic detection	
8	Fiber optic sensors: Classification - Midterm Exam	
9	Fiber optical sensors: Physical sensors	
10	Fiber optical sensors: Chemical and biological sensors	
11	Fiber optical sensors: Chemical and biological sensors	
12	Fiber optic sensors: Mechanical sensors	
13	Sample designs: Optical sensing	
14	Sample designs: Fiber optic detection	

| 22 | Textbooks, References and/or Other Materials: | CHANG W. S. C., Principles of Lasers and Optics, Cambridge University Press,2005.
Saleh, Bahaa E. A.Fundamentals of photonics, John Wiley and Sons Inc., 2nd ed. 2007
Quimby R. S., Photonics and Lasers: An Introduction |

Activites		Number	Duration (hour)	Total Work Load (hour)
23 Assesment Theoretical		14	3.00	42.00
Practicals/Labs		0	0.00	0.00
Self study and preperation		14	2.00	28.00
Homeworks		0	0.00	0.00
Home work-project		2	10.00	20.00
Field Studies		0	0.00	0.00
Midterm exams		0	0.00	0.00
Others		0	0.00	0.00
Final Exams		1	30.00	30.00
Total Work Load				120.00
Total work load/ 30 hr				4.00
ECTS Credit of the Course				4.00

TERM LEARNING ACTIVITIES	NUMBE	WEIGHT
Midterm Exam	0	0.00
Projects	2	40.00
Midterm exams	3	100.00
Success Grade		100.00

Course		the Rules & Regulations of Bursa Uludağ University on Undergraduate Education.

24	ECTS / WORK LOAD TABLE

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0

ÖK4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives   PQ: Program Qualifications

Contrib ution Level:	1 very low	2 low	3 Medium	4 High	5 Very High