SMART MATERIALS

1	Course Title:	SMART MATERIALS
2	Course Code:	INS5248
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	2
7	ECTS Credits Allocated:	7.50
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. MURAT ÖZTÜRK
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	muratozturk@uludag.edu.tr
17	Website:	
18	Objective of the Course:	Introduces concepts and applications of smart materials, which refer to materials that can sense a certain stimulus and, in some cases, even react to the stimulus in a positive way so as to counteract negative effects of the stimulus.
19	Contribution of the Course to Professional Development:	To provide detailed information about structural materials.
20	Learning Outcomes:	

	1	Understanding the detection mechanism
	2	Learning smart material design
	3	Understanding multifunctional materials
	4	To find and interpret a recently published technical paper and present it in the class
	5	Ability to identify and interpret an up-to-date technical article and make an oral presentation about it
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21 Course Content:

Course Content:

Week	Theoretical	Practice
1	Introduction to multifunctional structural materials	
2	Construction materials with external sensors	
3	Construction materials with internal sensors	
4	Self-sensing structural materials	

5	Piezoelectric materials and applications	
6	Strain/strain sensors and application areas	
7	Electromagnetic wave theory	
8	Electromagnetic wave absorber materials	
9	Designing multifunctional structural materials design	
10	Designing multifunctional structural materials	
11	Shape memory building materials	
12	Usage areas of carbon-based materials	
13	Testing smart materials	
14	Project presentation	

22	Textbooks, References and/or Other Materials:	Lecture notes and literature.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00

Activites	Number	Duration (hour)	Total Work Load (hour)
Contribution of Final Exam to Success Grade	60.00		
Theoretical	14	3.00	42.00
Total	100.00		
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	10.00	140.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	25.00	25.00
Others	0	0.00	0.00
Final Exams	1	25.00	25.00
Total Work Load			232.00
Total work load/ 30 hr			7.73
ECTS Credit of the Course			7.50

Measurement and Evaluation Techniques Used in the Course: Measurement and evaluation is carried out according to the priciples of Bursa uludag University Associate and

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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	2	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					
Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**