

FUNCTIONAL POLYMERS

1	Course Title:	FUNCTIONAL POLYMERS	
2	Course Code:	TEK5040	
3	Type of Course:	Optional	
4	Level of Course:	Second Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	6.00	
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:	Prof. Dr. YAKUP AYKUT	
15	Course Lecturers:	Yok	
16	Contact information of the Course Coordinator:	aykut@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	The aim of the course is to teach functional polymers used in products structures. To investigate the chemical and physical structures of polymers those provide functionality to them and teach how to transfer functionality of the polymers to textile structures without any functionality loss. Conductive, shape memory, self-healing, optical, and biological based polymeric structures will be examined.	
19	Contribution of the Course to Professional Development:	The mechanisms of polymeric structures that have specific functionality such as conductive, shape-memory, self-healing will be comprehended.	
20	Learning Outcomes:		
		1	Being able to understand the functionality of polymers
		2	Being able to argue how the chemical and physical structures of polymer provide functionality to them
		3	Being able to distinguish how to transfer functionality of the polymers to novel structures
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	

1	Introduction to polymer science 1: Types of Polymerization	
2	Introduction to polymer science 2: Types of Polymerization	
3	Functionality Concept in Polymers	
4	Conductive polymers, Electroactive polymers	
5	Organic Electronics and Photovoltaics, Polymers in energy generation and storage	
6	Biopolymers, Biodegradable polymers, Organic Biosensors and Biochips, Biomimetic	
7	Hydrogels, Drug delivery	
8	Self-healing polymers, Shape memory polymers	
9	Liquid crystalline and High performance polymers	
10	Nanostructured functional polymers	
11	Article analysis and student presentations in accordance with the subject content	
12	Article analysis and student presentations in accordance with the subject content	
13	Article analysis and student presentations in accordance with the subject content	
14	Öğrencilerin belirlediği eksik konuları tekrar anlatmak	
22	Textbooks, References and/or Other Materials:	<p>1. BOOK: L. H. Sperling, Introduction to Physical Polymer Science, Wiley Publicaiton, USA, ISBN: 10 0-471-70606X, 2006.</p> <p>2. BOOK: Hari Singh Nalwa, Advanced Functional Molecules and Polymers, CRC Press, ISBN 9789056993085</p> <p>PAPER: During the lessons, articles will be recommended according to the content of the topics.</p> <p>The slides of the lectures will be published on the web page of the course one day before the day of the course at the latest. Students are recommended to come to the lesson by taking the printouts of the slides.</p>
23	Assesment	
TERM LEARNING ACTIVITIES		NUMBE R
Midterm Exam		1
Quiz		0
Home work-project		1
Final Exam		1
Total		3
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		<p>Questions will be asked in the midterm and final exams within the scope of the topics covered in the course. Exams will be done in a classical way In the project assignment, students are asked to search the relevant literature. The project will be evaluated within the scope of the prepared report and presentation.</p>
24	ECTS / WORK LOAD TABLE	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	14	3.00	42.00
Projects	1	10.00	10.00
Field Studies	0	0.00	0.00
Midterm exams	1	1.00	1.00
Others	14	3.00	42.00
Final Exams	1	1.00	1.00
Total Work Load			180.00
Total work load/ 30 hr			6.00
ECTS Credit of the Course			6.00

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	3	5	3	3	5	5	3	2	0	0	0	0	0	0	0	0
ÖK2	5	3	4	4	4	4	3	3	0	0	0	0	0	0	0	0
ÖK3	5	4	5	5	5	3	5	5	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							