E	EXPERIMENTAL TECH	INIQU	ES IN MAGNETIC RESONANCE						
1	Course Title:	EXPERI	IMENTAL TECHNIQUES IN MAGNETIC RESONANCE						
2	Course Code:	FZK5101	I						
3	Type of Course:	Optional							
4	Level of Course:	Second	Cycle						
5	Year of Study:	1							
6	Semester:	1							
7	ECTS Credits Allocated:	6.00							
8	Theoretical (hour/week):	2.00							
9	Practice (hour/week):	2.00							
10	Laboratory (hour/week):	0							
11	Prerequisites:	There ar	e no prerequisites						
12	Language:	Turkish							
13	Mode of Delivery:	Face to f	ace						
14	Course Coordinator:	Dr. Ögr.	Üyesi CENGİZ AKAY						
15	Course Lecturers:	Dr. Öğr.	Üyesi Cengiz AKAY						
16	Contact information of the Course Coordinator:	cenay@ı Bursa Ul Fizik Böl	uludag.edu.tr udağ Üniversitesi, ümü						
17	Website:								
18	Objective of the Course:	Interpret	ing the nuclear magnetic resonance signals technically						
19	Contribution of the Course to Professional Development:	To make used cor scientific	the most of the NMR devices and systems that can be nmercially, to develop them and to add value to their studies.						
20	Learning Outcomes:								
		1	Recognizes magnetic field resources.						
		2	Recognizes the magnetic resonance device.						
		3	Recognizes the radio frequency (RF) power supplies.						
		4	Learns RF pulse techniques.						
		5	Recognizes the Fourier transform NMR spectrometer.						
		6	Knows the application areas of magnetic resonance.						
		7							
		8							
		9							
		10							
21	Course Content:								
		Co	ourse Content:						
VVEEK			Practice						
2									
5									
4	Types of NMP spectrometer								
5	Components of an NIMP spectrometry	٥r							
0	Components of an Mink spectromete	51							

7	Pulsed NMR spectrometers																				
8	Radio frequency pulses																				
9	Pulse sequences																				
10	Gradients																				
11	Gradient coils																				
12	NMR imaging																				
13	NMR imaging methods																				
14	NMR material imaging																				
22	Textbooks, References and/or Other Materials:								1) K.I 2) Mo	 Handbook of MRI Pulse Sequences, M.A. Bernstein, K.F. King, Xiaohong Joe Zhou. MRI from Picture to Proton, D.W.McRobbie, E.A. Moore, M.J. Graves, M.R. Prince. 											
23	Assesment																				
TERML	EAR	NING	ACTI	VITIES	5		R		WE	EIGHT											
Midterm Exam 0								0.0	0.00												
Quiz							0)	0.0	00											
Home work-project 0								0.0	0.00												
Final Exam 1								10	100.00												
Total 1								10	100.00												
Activites									Numb	er		Dura	ition (hour)	Total Work Load (hour)						
Tbeed retical								10	0400			2.00	2.00			28.00					
Practic	Practicals/Labs									14			2.00			28.00					
Self study and preperation									20			2 00			40.00						
Homew	Homeworks									26			2.00			52.00					
Project	Projects								ŕ	14			2.00			28.00					
Field S	Field Studies								()			0.00		0.00						
Midterm exams								(0					0.00							
Others	Others									0					0.00						
Final E	Final Exams									1					2.00						
Total Work Load										1						178.00					
Total work load/ 30 hr									5.93												
ECTS Credit of the Course									6.00												
25	25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS																				
	F	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1 0	PQ11	PQ12	PQ1 3	PQ14	PQ15	PQ16				
ÖK1	4	1	4	5	3	0	4	0	0	4	3	4	0	0	0	0	0				
ÖK2	4	1	5	4	4	0	4	0	0	3	3	4	0	0	0	0	0				
ÖK3	3	3	4	3	4	0	3	0	0	2	3	3	0	0	0	0	0				
ÖK4	2	1	4	4	5	0	4	0	0	4	4	4	0	0	0	0	0				

ÖK5	4	5	4	4	0	3	0	0	3	4	4	0	0	0	0	0
ÖK6	4	4	5	4	0	3	0	0	3	4	4	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contrib 1 very low ution Level:				2 low			3 Medium			4 High			5 Very High			