	ELECTRO	ON SP	IN RESONANCE II						
1	Course Title:	ELECTR	ON SPIN RESONANCE II						
2	Course Code:	FZK6104	1						
3	Type of Course:	Optional							
4	Level of Course:	Third Cy	cle						
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 f	ace						
14	Course Coordinator:	Prof. Dr.	AHMET PEKSÖZ						
15	Course Lecturers:	Doç.Dr. Hüseyin OVALIOĞLU, Dr. Öğr.Üyesi Cengiz AKAY							
16	Contact information of the Course Coordinator:	peksoz@uludag.edu.tr, (0224) 29 41 713, Prof. Dr. Ahmet PEKSÖZ, UÜ Fen Edebiyat Fakültesi, Fizik Bölümü 16059 Görükle Kampüsü Bursa							
17	Website:								
18	Objective of the Course:	Teaches observing and describing of paramagnetic centers occured in matters by electron spin resonance spectroscopy, and determination of properties of the centers							
19	Contribution of the Course to Professional Development:	Learn ESR technique related to determination of magnetic properties of the materials							
20	Learning Outcomes:								
		1	Comments advanced spectroscopic data						
		2	Learns double-rezonance techniques						
		3	Learns investigation of free radicals by ESR						
		4							
		5							
		6							
		7							
		8							
		9							
		10							
21	Course Content:								
Maral.	The exetical	Co	urse Content:						
л	I neoretical	montum	Practice						
	the relation between magnetic momentum, the interaction of spin and angular momentum, the interaction of magnetic dipol moment by external r field	mentum, ent and of magnetic							
2	Energy levels and transitions, detern of g Lande factor	nination							

3	Electron Interaction Hamiltor	ectron Zeeman, Nuclear Zeeman teractions, Hyperfine interactions, Spin amiltonian and operators															
4	Isotropc I=1/2 tra	hyper nsitior	fine in ns, sele	teract ection	ions ar rules	nd S=1	1/2,										
5	Structure principal	e of C∖ s	N spe	ctrom	eters a	nd wo	orking										
6	Isotropic nuclear	: hypei spins (rfine fo of I>1/	or inte 2	raction	s with											
7	Small, m interaction radicals	nodera ons, E	te and xapml	l large es on	e hyper sigma	fine and p	i										
8	MIDTER	IIDTERM EXAM															
9	Spin-Ort values, I	oit inte EPR lii	ractior ne inte	ns and ensitie	d contri s, Pow	butior der sp	is to g bectra	I									
10	Hyperfin Hamiltor	e anis nian m	otropy atrices	r, form S	ation o	of anis	otropi	с									
11	Combine interaction	ed anis	sotropi	c g ar	nd hype	erfine											
12	Anisotro of I>1/2	Anisotropy of interactions with nuclear spins of I>1/2															
13	ESR spe Discussi	SR spectra of some free radicals, Discussions on the examples															
14	Radical	pairs,	high s	pins a	ind ene	ergy te	erms.										
22 Textbooks. References and/or Other Activites							1	Arthur Numb	Schwe oer	eiaer. G	unnar J Dura	nnar Jeschke. Prind Duration (hour)			tiples of Pulse Total Work Load (hour)		
Theoretical							S	Series, Ellis Horwood, C				Bidlester (1993).			42.00		
Practicals/Labs								0			0.00			0.00			
Self3studksaeshReperation									0			0.00			0.00		
Homeworks									1			14.00			14.00		
Project	Projects R								14			6.00	6.00				
Field Studies									0			0.00	0.00			0.00	
Midfern	Midferm exams											20.00	20.00			20.00	
Others									0			0.00	0.00			0.00	
Final E														_	20.00		
								151	50.00						180.00		
Lotat Work load/ 30 hr toal, Loanning fourthes to							Ц					6.00					
ECTS Credit of the Course							дJ	.00						6.00			
Total								10	0.00								
Measurement and Evaluation Techniques Used in the Written examination Course																	
24	ECTS /	/ WO	RK L	OAD	TAB	LE											
25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS																
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1	PQ11	PQ12	PQ1	PQ14	PQ15	PQ16	
ÖK1	4	5	5	4	5	5	5	4	4	3	0	0	0	0	0	0	
ÖK2	3	4	4	5	5	5	4	5	4	4	0	0	0	0	0	0	
		I	I	I	I	I		ļ	1	I	1	I		I	1		

ÖK3	4	5	4	4	4	4	5	4	5	5	0	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			