	QUA		I CHEMISTRY					
1	Course Title:	QUANTUM CHEMISTRY						
2	Course Code:	KIM3016						
3	Type of Course:	Optional						
4	Level of Course:	First Cycle						
5	Year of Study:	3						
6	Semester:	6						
7	ECTS Credits Allocated:	5.00						
8	Theoretical (hour/week):	3.00						
9	Practice (hour/week):	0.00						
10	Laboratory (hour/week):	0						
11	Prerequisites:	-						
12	Language:	English						
13	Mode of Delivery:	Face to face						
14	Course Coordinator:	Prof. Dr. ASIM OLGUN						
15	Course Lecturers:	-						
16	Contact information of the Course Coordinator:	asimolgun@uludag.edu.tr 0 224 29 42863						
17	Website:							
18	Objective of the Course:	The goal of the course is to provide students with a fundamental understanding of the quantum chemical description of atoms and molecules. Particular emphasis is placed on the understanding of properties of light and interaction of light and matter, together with the theoretical basis for optical spectroscopy.						
19	Contribution of the Course to Professional Development:	Students learn how to use quantum chemistry to understand, model, and predict molecular properties and their reactions, properties of nanometer materials, and reactions and processes taking place in biological systems.						
20	Learning Outcomes:							
		1	Learn the basic postulates of quantum mechanics					
		2	Apply the postulates of quantum mechanics to simple systems of chemical interest, such as the particle-in-a-box, harmonic oscillator, rigid ro-tor, and hydrogenic atoms					
		3	Explain how the absorption of light can promote a transition from an energy stat to another energy state, and describe in words, graphs, and equations the relation between an absorption spectrum and energy levels in an atom or molecule.					
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21	Course Content:		• • •					
14/	Course Content:							
Week	Theoretical Practice							

	1							-								
1	Light															
2	Quantum Theory of Light,															
3	Particle Duality of Light,															
4	Wave Duality of Light															
5	Schrödinger equation															
6	Particle in one-dimensional box															
7	Particle in two-dimensional box						Τ									
8	Repeating courses and midterm exam															
9	Particle in three-dimensional box															
10	Rotational energy															
11	Vibrational energy, Harmonic oscillator															
12	Atomic spectrum															
13	Hydrogen atom															
14	Hydrogen molecule															
22	Textbooks, References and/or Other Materials:							D. A. McQuarrie: Quantum Chemistry (2nd Edition), 2007 I N. Levin: Quantum Chemistry (5th Edition), 2008								
23																
TERMI	TERM LEARNING ACTIVITIES NUMBE					W	EIGHT									
Midterr	Midterm Exam 2					4(0.00									
Activit	Activites						Number Duration				ation (h (hour) Total Work Load (hour)				
T beare	pretical 3					1	100.00 3			3.00	3.00			42.00		
Practic	ticals/Labs								0			0.00			0.00	
Serse	Stady and preperation								14			2.00			28.00	
Homev	eworks								6			9.00			54.00	
₽oo pietect	cts							1	1000.00			0.00			0.00	
Field S	Studies								0.00					0.00		
MARHERE	କିମ୍ପା exams							th	the priciples of Bursa Uludago University Associate and					nd		
Others									0			0.00			0.00	
Final E	zams							1			10.00			10.00		
Total V	Work Load														174.00	
Total w	work load/ 30 hr														5.13	
ECTS	Credit of the Course													5.00		
25	25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PG	1 PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ	8 PQ9	PQ1 0	PQ11	PQ12	PQ1 3	PQ14	PQ15	PQ16
ÖK1	3	2	2	3	4	4	3	4	1	4	0	0	0	0	0	0
ÖK2	3	2	2	3	4	4	3	4	1	4	0	0	0	0	0	0
ÖK3	4	3	3	4	5	5	4	5	1	5	0	0	0	0	0	0
			LO: L	.earr	ning C) Dbje	ctives	5	PQ: F	rogra	ı ım Qu	alifica	tions	<u>ا</u> ک		I
LO: Learning Objectives PQ: Program Qualifications																

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