QANTUM MECHANICS

1	Course Title:	QANTUM MECHANICS	
2	Course Code:	FZK3002	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	3	
6	Semester:	6	
7	ECTS Credits Allocated:	8.00	
8	Theoretical (hour/week):	5.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	Fundamental Physics, Classical Mechanics, Waves, Physical Mathematics	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. Mürsel Alper	
15	Course Lecturers:	Yrd. Doç. Dr. Mürşide ŞAFAK HACİİSMAİLOĞLU	
16	Contact information of the Course Coordinator:	malper@uludag.edu.tr, (0224) 29 41 697, UÜ Fen Edebiyat Fakültesi, Fizik Bölümü 16059 Görükle Kampüsü Bursa	
17	Website:		
18	Objective of the Course:	To study the behaviour and physics of microscopic particles such as atoms, molecules, electrons and protons). To learn Quantum Motion Equation and applying to the behaviour of quantum particles. To gain the capabilities to be able to understand micro- and nanotechnology	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	To understand the difference between classical and Quantum mechanics.
		2	To know both light and matter always may have the dual nature
		3	To know an uncertainty is in the quantum mechanical magnitudes and all measurements is expressed in probabilities
		4	To learn a quantum particle must be presented by a wave function as ‘ the state definition’
		5	To learn how physical information is obtained from wave functions
		6	To solve the Scrödinger equation to study the behaviour of a microscopic particle
		7	To learn the relationship between operators and physical observables.
		8	To solve the Schrödinger Equation to study the nature of an atom and its physical properties
		9	To gain the capabilities to be able to understand micro- and nanotechnology
		10	To understand the technological applications of quantum mechanics
21	Course Content:		
	Course Content:		

Week	Theoretical	Practice
1	Why Quantum Physics, Early Quantum Theories	
2	Wave Mechanics, Wave Function, and its interpretation	
3	Wave Packets, Expectation Values	
4	Quantum Motion Equation (Time-Dependent Schreodinger Equation)	
5	Probability Fluid, Probability Flux Density	
6	Stationary Physical Systems	
7	Solutions to Schroedinger Equation Midterm exam 1,	
8	Time-Independent Schrödinger Equation and its Applications	
9	Quantum Simple Harmonic Motion	
10	Operators in Quantum Mechanics	
11	Applications of Operators, Operator Cebric Techniques	
12	Correspondence Principle and Measurements Midterm exam 2	
13	Atoms with One Electron with The Schrödinger Theory	
14	Angular Momentum, Matrix Mechanics	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	5.00	70.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	5.00	70.00
Homeworks	14	5.00	70.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	2	2.00	4.00
Others	14	2.00	28.00
Final Exams	1	2.00	2.00
Total Work Load			244.00
Total work load/ 30 hr			8.13
ECTS Credit of the Course			8.00

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23	Assesment	R	
	Midterm Exam	2	50.00
	Quiz	0	0.00
	Final Exam	1	50.00
	Contribution of Term (Year) Learning Activities to Success Grade		50.00
	Contribution of Final Exam to Success Grade		50.00
	Total		100.00
	Measurement and Evaluation Techniques Used in the Course		

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	3	2	2	0	2	2	3	2	3	3	2	2	0	0	0	0
ÖK2	3	2	2	0	2	3	3	3	2	3	0	2	0	0	0	0

ÖK3	5	5	4	3	2	5	3	0	3	3	0	2	0	0	0	0
ÖK4	5	5	5	3	2	5	3	0	3	4	0	2	0	0	0	0
ÖK5	5	4	5	3	2	5	3	0	3	4	0	2	0	0	0	0
ÖK6	5	5	5	4	2	4	0	3	2	0	0	3	0	0	0	0
ÖK7	5	5	5	3	2	3	3	0	2	3	0	3	0	0	0	0
ÖK8	4	4	3	3	2	2	3	0	2	3	0	0	0	0	0	0
ÖK9	4	3	4	3	2	3	3	0	2	4	0	0	0	0	0	0
ÖK10	4	4	4	3	2	4	3	0	0	3	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**