QUANTUM MECHANICS

1	Course Title:	QUANTUM 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:	9.00
8	Theoretical (hour/week):	5.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Prof. Dr. Mürsel Alper
15	Course Lecturers:	Doç. Dr. Mürşide ŞAFAK HACIİSMAİLOĞLU
16	Contact information of the Course Coordinator:	malper@uludag.edu.tr
17	Website:	
18	Objective of the Course:	To provide students with a basic knowledge of the concepts and applications of quantum mechanics. This course is part one of a two semester course focused on a rigorous exposition to the principles of Quantum mechanics. The Dirac bra-ket formalism will be introduced and used throughout to present the principles of Quantum Mechanics in a general context. We will discuss anyalytic solutions to the Schr¨odinger equation for a variety of potentials in one, two and three dimensions. The role of symmetries as the underlying principle of Quantum Mechanics will be emphasized throughout the course. The use of symmetry principles and operators methods will be discussed
19	Contribution of the Course to Professional Development:	Application of the principles of quantum mechanics to unfamiliar problems. To be able to understand easly high technology such as nanotechnology and have leading-ideas to develop hightechnology
20	Learning Outcomes:	
	1	Use the superposition principle to predict experimental outcomes for measurement of observables on simple quantum systems.
	2	Apply the uncertainty principle and heuristic arguments to obtain rough descriptions of quantum systems
	3	Be able to describe generally the physical implications, such as possible bound states and un-bound states for any given hamiltonian.
	4	Derive the eigenkets of the angular momentum operators and prove properties of completeness and orthogonality.
	5	Learning relations between wave funtions and operatörs and to get information about physical magnitudes using operatörs.

	6	Learning understand and interpretion of advanced technolyg and such as nanotechnology using quantum mechanics.
	7	Learning principals of Quantum technology and applications.
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21	Course Content:

Course Content:

Week	Theoretical	Practice
1	CH1 Why Quantum Mehcanics	
2	CH 2: Early Wuantum Theory	
3	CH 3: Wave Mechanics	
4	CH 3: Wave Packets	
5	CH 4: Quantum Motion Equation. Schrödinger Theory	
6	CH 5: Stationary States Independent Schrödinger Equationd	
7	CH 6: Applicatons of TISE, 1D physical systems, constant potenatials	
8	CH 6: Quantum Simple Harmonic Motions-	
9	CH 7 Operators in Quantum Mechanics	
10	Corresponding Principal	
11	CH 8: Measurement in Quantum Mechanics	
12	CH 9: Atoms with one-electron, Schrödinger	
13	CH 10: Angular momentum and Spin, Matrix presantation, pauli spin matrixes.	
14		

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	5.00	70.00
Practicals/Labs	0	0.00	0.00
Self study and preparation	10	5.00	50.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm Exams	1	60.00	60.00
Others	0	0.00	0.00
Final Exams	1	90.00	90.00
Total Work Load			330.00
Total work load/ 30 hr			9.00
ECTS Credit of the Course			9.00

22	Textbooks, References and/or Other Materials:	1. Prof. Dr. Mürsel ALPER Ders Notları (2020) 2. Bekir Karaoğlu, Kuantum Mekaniğine Giriş Vakıf Yayıncılık ve İletişim A.Ş. Ankara (1998
23	Assesment	

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
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		The system of relative evaluation is applied.

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	5	4	4	4	3	0	0	0	0	0	0	0	0	0	0	0
ÖK2	4	5	3	4	4	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	4	4	3	3	0	0	0	0	0	0	0	0	0	0	0
ÖK4	4	4	5	3	3	0	0	0	0	0	0	0	0	0	0	0
ÖK5	5	4	2	2	4	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	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**				