MODULE DESCRIPTION FORM

Module Information					
Module Title	QUANTUM MECHANICS				
Module Type	CORE	☒ Theory ☒Lecture ☐ Lab ☒ Tutorial ☐Practical ☒ Semina			
Module Code	ZU-SC- MPHY2104				
ECTS Credits	6				
SWL (hr/sem)	125				
Module Level	UGII/ Tow		Semester of Delivery	1	
Administering Department	Medical Physics		College	College of Science	
Module Leader	Sarah Abdulhussein Ali Rasheed		e-mail	sarah.abdulhussain88@gmail.com	
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc.	
Module Tutor					
Peer Reviewer					
Review Committee Approval	15/10/2026		Version Number	1.0	

Relation with other Modules			
Prerequisite module	Fundamental of Mechanics	Semester	UGI-S1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. **To introduce the principles and formalism of quantum mechanics.** 2. **To develop problem-solving skills using quantum theory.** 3. **To explore the application of quantum mechanics in technology and modern physics.** 4. **To understand and discuss the philosophical implications of quantum mechanics.**
Module Learning Outcomes	1. **Demonstrate an understanding of quantum mechanical principles.** 2. **Solve quantum problems using the Schrödinger equation.** 3. **Analyze quantum systems such as particles in potential wells, oscillators, and atoms.** 4. **Discuss quantum entanglement, uncertainty, and measurement.** 5. **Apply quantum mechanics to real-world phenomena and technology (e.g., semiconductors, lasers, quantum computing).**
Indicative Contents	1. Teaching the student the basic concepts of quantum mechanics. 2. Providing the student with the skills of discussing and solving applied problems related to quantum mechanics. 3. Linking theoretical concepts with practical applications.

Learning and Teaching Strategies	
Strategies	1. Discussing the topics of the methodological book and auxiliary references. 2. Theoretical lectures including problem solving and discussion of homework.

	3. Asking students for a set of thinking questions during lectures on specific topics. 4. Giving students homework that requires finding solutions on their own.

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.2
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	2.5
Total SWL (h/sem)	100		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	All
	Assignments& H.W.	1	10% (10)	2, 12	All
	Discussing During Lectures	1	10% (10)	2, 12	All
	Seminar	1	10% (10)	13	All
Summative assessment	Midterm Exam	2 hr	10% (10)	9,13	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction to Quantum Mechanics
Week 2	Mathematical Tools for Quantum Mechanics
Week 3	The Schrödinger Equation – Part 1
Week 4	The Schrödinger Equation – Part 2
Week 5	Quantum Superposition and Interference
Week 6	The Uncertainty Principle
Week 7	Quantum Mechanics in One Dimension
Week 8	Quantum Systems in Three Dimensions
Week 9	Quantum Mechanics of Angular Momentum
Week 10	Quantum Tunneling
Week 11	Quantum Entanglement and Nonlocality
Week 12	Quantum Mechanics and the Hydrogen Atom
Week 13	Midterm exam
Week 14	Quantum Statistical Mechanics
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:

Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Introduction to quantum mechanics, By: David J. Griffith, 3rd ed.,2018.	https://kolegite.com/EE_library/books_/and lectures/Физика/ introduction-to-quantum-mechanics-david-j-darrell--annas-archive--libgenrs-nf-2695391.pdf
Recommended Texts	**Quantum Mechanics, by L.I. Schiff, 1949.**	YES
Websites	Any website related with Quantum Mechanics Subjects.	

Grading Scheme			
Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	(45-49)	More work required but credit awarded
	F – Fail	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Name of the Instructor:

Sarah Abdul Hussein