



Code and Name:

FİZ5420 QUANTUM COMPUTATIONS IN MATERIALS PHYSICS

Unit:

Graduate School of Natural and Applied Sciences

Detail:

Period: 2023-2024

Status: Optional

Class: 1

Credits: 3 0 0 3

ECTS: 6

Language: Turkish

INSTRUCTOR

Title, Name and Surname: -

Phone: -

Email: -

Social Account: -

Student Day and Time: -

COURSE ASSISTANT

Title, Name and Surname:

Phone:

Email:

Social Account:

Student Day and Time:

Lessons Weekly Program:

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

-

Rendering Place:

Face-to-face lessons per week 3 It will be done on an hourly basis.

YY: -

UE: -

Purpose:

To have knowledge about quantum physics and quantum mechanics and to gain the ability to solve physical problems with quantum calculations.

Material:

Gasiorowicz, S., Quantum Physics, New York, John Wiley, 1996.; Cansoy, Ç., Quantum Mechanics, Istanbul, Istanbul University, Faculty of Science; Bohm, D., Quantum Theory, Prentice-Hall, 1956; Powel J., Crasemann B., Quantum Mechanics, New York, McGraw-Hill, 1968.

Student Responsibility :

Conducting research before and after class

Weekly Lesson Plan	Week	Topic			Method	
	1	Fundamentals of Quantum Mechanics			YY	
	2	Quantum Computing in Material Physics Applications			YY	
	3	The Role of Quantum Computing in Materials Design			YY	
	4	Rapid Material Optimization with Quantum Computers			YY	
	5	Quantum Mechanical Analysis of Electronic Structures			YY	
	6	Quantum Mechanical Modeling of Nanomaterials			YY	
	7	Design of Photonic Materials with Quantum Computations			YY	
	8	Investigation of Chemical Bonds by Quantum Computing			YY	
	9	MIDTERM EXAM			YY	
	10	Combination of Materials Chemistry and Quantum Computing			YY	
	11	How Quantum Computers Work			YY	
	12	Advanced Methods in Quantum Chemistry			YY	
	13	High Performance Computational Chemistry Applications			YY	
	14	Computational Analysis of Molecular Dipole Moments			YY	
Assessment and Evaluation	Method				Number	Weight
	Break Exam	Exam	Face		1	% 50
		Quiz	-		-	
		Homework	-			
		Project	-		-	-
	General Exam	Face			1	% 50
Course Outcomes:	1	He will develop his knowledge of quantum computing and materials physics at the level of expertise.				
	2	Critically evaluate knowledge related to quantum computing and materials physics.				
	3	Gain an in-depth understanding of the relationship between quantum computing and materials physics and other topics of physics and its impact on them				
	4	Will be able to use the knowledge gained in quantum computing and material physics in other areas of physics such as Nuclear Physics, Solid State Physics, Atomic and Molecular Physics				
	5	Will be able to develop the ability to solve quantum computing and material physics physical problems at a high level				

Course-Specific Explanations:



T.C.
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Course Syllabus Form

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UE: Distance Education; **YY:** Face-to-Face Education