



Code and Name: FIZ5580 DYNAMICS OF PARTICLE 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: Face-to-face lessons per week 3 It will be done on an hourly basis.
Place: YY: - UE: -

Purpose: Obtaining detailed knowledge about the calculations of basic concepts. Quantum electrodynamics and color dynamics calculations with equations and theories. Calculation of weak interactions separately for muon, pion, and neutron decays. Relative and classical study of adjustment institutions. Study of neutrino oscillations and neutrino mass. Evaluation of the standard model with alternative models.

Material: D. Griffiths, Introduction to Elementary Particle Physics, Wiley 1987

Student Responsibility: Attending classes, submitting assignments on time, and participating in exams.

Weekly Lesson Plan	Week	Topic		Method	
	1	Quantum Electrodynamics : Dirac Equation, covariants, photon			YY
	2	Quantum Electrodynamics : Feynman theories for CAT, Casimir Trick, Impact sections			YY
	3	Quantum Color Dynamics : Hadron formations, elastic particle collisions, color dynamics			YY
	4	Quantum Color Dynamics : Feynman's rules for color dynamics, quark and antiquark, KRD pair formation, asymptotic freedom			YY
	5	Weak Interactions : Charged leptonic interactions, muon decay, neutron decay, pwn decay			YY
	6	Weak Interactions : Yüksüz zayıf etkileşimler, elektrozayıf birleşme, kiral fermiyon durumları, elektrozayıf karışım			YY
	7	Theories of Adjustment : Classical and relativistic Lagrangian formulation			YY
	8	Theories of Adjustment : Local invariance, Yang-Mills Kuramı			YY
	9	Theories of Adjustment : Spontaneous symmetry breakdown, mass term			YY
	10	Neutrino Oscillations : Confirmation, neutrino mass			YY
	11	Neutrino Oscillations : Mixture matrix			YY
	12	Higgs mechanism, the grand merger			YY
	13	Dark matter, dark energy, supersymmetry			YY
14	Sicim Teorisi			YY	
Assessment and Evaluation	Method			Number	Weight
	Midterm WWW	Exam	Face	1	%50
		Quiz	-	-	
		Homework	-		
		Project	-	-	-
General Exam	Face			1	%50
Course Outcomes:	1	Learn about quantum calculus related to particle physics.			
	2	Can perform basic interaction calculations found in particle physics.			
	3	Understand and interpret models that go beyond the standard model.			
	4	Understands classical and relative adjustment theories and can apply these theories.			
	5	Apply and interpret quantum field theories at a fundamental level in particle physics.			
Course-Specific Explanations:					

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T.C.
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Course Syllabus Form

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