

Year	Second semester 2026
Course	Lecture on Basic Quantum Field Theory
Day/Period	Tue.3Period
Credit(s)	2Credits
Instructor	MASAKI YAMADA
Eligible Participants	Master 1st grade
Course code/number	SPH-PHY501B
Main Subjects	
Course of Media Class	
Practical business	
Language Used in Course	English
Course Title	Basic Quantum Field Theory
Purpose/Abstract	Quantum field theory provides the theoretical foundation for modern high-energy physics and has also become an essential tool in the study of many-body systems in condensed matter physics. This course presents the basic concepts and formalism of quantum field theory. A solid understanding of quantum mechanics is assumed.
Goal	The goal of this course is to help students understand the basic concepts of quantum fields.
Contents and progress schedule of the class	1. Review of quantum mechanics 2. Quantization of scalar fields 3. Lorentz symmetry 4. Quantization of Dirac fields 5. Quantization of electromagnetic fields 6. Interactions of quantum fields
Grading	Grades will be based on reports and/or an examination. Details will be announced in class.
Books required/referenced	No specific textbook is required, but the following books may be useful as references: M.Srednicki "Quantum Field Theory" M.E.Peskin, D.E.Schroeder "An Introduction to Quantum Field Theory"
Contents of preparation and review	Students are expected to review quantum mechanics before taking this course. Students should also review the material after each class.
Study time for preparation and review	Standard Hours for Preparation/Review per class: *Lectures 4 hour *Seminar 2-4 hour *Experiment, Laboratory Work, and Skill Test 2 hours
How to contact and Google Classroom Code	Google Classroom will be used for course announcements and submitting report assignments. Class Code: gyzq4ix4
Remarks	
Last Update	

One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15-30 hours of class time and 30-15 hours of preparation and review outside of class. In laboratory, practical skill classes, one credit consists of 30-45 hours of class time and 15-0 hours of preparation and review outside of class.