KEMENTERIAN PENDIDIKAN TINGGI,
SAINS, DAN TEKNOLOGI
UNIVERSITAS LAMPUNG
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jalan Prof. Dr. Sumantri Brojonegoro No.1 Gedong Meneng - Bandar Lampung 35145
Telp./Fax: (0721) 704624 *e-mail*: fkip@unila.ac.id,
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Bachelor of Education in Physics **MODULE HANDBOOK**

Module Name	Quantum Physics
Module Level, if Applicable	Bachelor
Code	KFI620213
Sub-Heading, (*if Applicable)	-
Classes, (*if Applicable)	-
Description	The Quantum Physics course aims to provide an in-depth understanding of the fundamental principles of Quantum Physics, as well as their linkages to Social Science Issues (SSI), Technological Pedagogical Content Knowledge (TPACK), and Nature of Science (NOS). In this course, students will learn to understand and apply quantum physics concepts and phenomena for prospective teachers to support physics learning in schools, as well as how applications of Qauntum Physics affect everyday life, for example in Computer Technology and Quantum Processors and Medical Imaging (MRI). In addition, students will be taught to integrate technology into learning, use simulation and analysis software to illustrate Quantum Physics phenomena. Through an understanding of NOS, students will realise that science is dynamic and ever-evolving, influenced by technological innovations and societal needs. Students will understand the basic characteristics of science, including how quantum physics knowledge is developed through the scientific method and peer review process.
Semester	5th
Module Coordinator	Dr. Abdurrahman, M.Si.
Lecturers	Team Teaching of Qauntum Physics
Language	Indonesian/English
Classification With in the Curriculum	Study Program Compulsory Course

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Teaching Format/Class Hours Per Week During the Semester	Learning activity can be carried out in the form of lecture or students' response: 1. Face to face: 50 minutes/SKS 2. Structured activity: 60 minutes/SKS 3. Independent activity: 60 minutes/SKS
Teaching methods	In class activity : Team Based Project, presentation Structured activity : Group Discussion Independent activity : Expository
Workload	1 CU (SKS) for bachelor degree equal to 3 work hours per week or 170 minutes. 3x50 minutes face to face, 3x60 minutes structured tasks, 3x60 minutes independent learning. for 16 weeks (including midterm and final exam), a total of 136 hours/semester. One CU equals to 1.51 ECTS
Credit Points	3 CU (SKS) = 3 x 1.51 = 4.53 ECTS
Prerequisites Courses	-
Course Outcomes (CO)	1. PLO-1 : Demonstrate knowledge of fundamentals of quantum 2. PLO-2 : Formulate physical systems using mathematics to solve physics problems. 3. CO-1 : Students can analyze the failure of classical physics in explaining microscopic systems 4. CO-2 : Students can study the basic theory of Quantum Planck black body radiation 5. CO-3 : Students can use the postulates of quantum mechanics in Quantum Physics 6. CO-4 : Students can apply the concept of Schrodinger Wave Mechanics 7. CO-5 : Students can describe the concept of Quantum Mechanics Operators and Eigen Price Equations

	8. CO-6 : Students can analyze the application of the Schrodinger method to the hydrogen atom system
Content	This course is presented to equip students to understand and apply quantum physics concepts and phenomena for prospective teachers to support physics learning in schools.
Study/Exam Achievements	Midterm Exam 20% Final Exam 20% Assignment 10% Project Assignment 50 % The initial cut - off points for grades A, B+, B, C+, C, and D should not be less than 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, and 40%, respectively.
Examination Methods	**1. Midterm Exam (UTS)** ✓ UTS is held at the 8th meeting ✓ UTS is a written test in the form of objective and essay, and carried out in the classroom with an implementation time of 120 minutes according to the module schedule ✓ UTS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Quantum Physics module **2. Final Exam (UAS)** ✓ UAS is held at the 16th meeting ✓ UAS is exam with an implementation time of 120 minutes which follows the UAS implementation schedule of the department ✓ UAS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Quantum Physics module.

	3. Project Assignment ✓ Project assignment is given as group task ✓ Project assignment is carried out for one semester and presented at the end of semester ✓ Project assignment is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Quantum Physics module. **4. Assignments** ✓ Assignments are given as exercise in each meeting in the form of worksheet and independent task ✓ Assignments are about analyzing simple problems in physics and solving them with the concept of Quantum Physics ✓ Assignments are given as individual tasks or group tasks and submitted in a limited time. ✓ The assignments are carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Quantum Physics module
Forms of Media	LCD, whiteboard, and online resources
Literature	1. Abdurrahman, dan Maulina. 2016. Fisika Kuantum bagi Calon Guru. Bandar Lampung: Universitas Lampung. 2. S. Rajasekar dan R. Velusamy. 2021. Quantum Mechanics and Quantum Information. 3. J.J. Sakurai dan Jim Napolitano. 2021. Modern Quantum Mechanics. 4. David J. Griffiths dan Darrell F. Schroeter. 2020. Introduction to Quantum Mechanics (3rd ed).

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PLO and CO Mappimg

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1	√										
CO 2	√										
CO 3		√									
CO 4		√									
CO 5		√									
CO 6		√									