



COURSE SYLLABUS OF PHYSICS EDUCATION STUDY PROGRAMME
FACULTY OF EDUCATIONAL SCIENCES
UIN SYARIF HIDAYATULLAH JAKARTA

Document Code
MH-PFIS

COURSE	CODE	CORE MODULE	WEIGHT (CREDITS)	WORKLOAD FOR EACH MODULE (IN MINUTES)	SEMESTER	COMPILATION DATE
INTRODUCTION TO NUCLEAR PHYSICS	FTK6019124	Compulsory	2 SKS 3 ECTS	<ul style="list-style-type: none"> Lecture : 100.0 Laboratory course: Project work: Independent task: 120.0 Structured task: 120.0 Internship: Total : 340	4	March 4, 2024
Language details	Indonesian					
Teaching methods	Case Study, Problem Based Learning and Inquiry (PBL)					
Type of Examination	<ul style="list-style-type: none"> Participation (Attendance / Quiz): 10% Observation (Practice / Assignment): 30% Performance (Presentation): Oral Test (Group Assignment): Midterm Exam: 30% Final Exam: 30% 					
Module Coordinator	Ai Nurlaela, S.Si, M.Si					
Lecturer	Ai Nurlaela, S.Si, M.Si					
Course Requirements	Have or are currently taking the course FST6097116 Advanced Physics					
Learning Outcomes	PROGRAMME LEARNING OUTCOME (PLO)					
	PLO1 Graduates have expertise in physics and physics learning with an approach that is appropriate to Indonesia's social, cultural and environmental context.					
	PLO2 Graduates have the ability to manage, develop and utilize technology in physics learning					
	PLO3 Graduates have the ability to solve physics education problems using scientific methods					
	Intended Learning Outcome (ILO)					
	CPL01 Mastering Professionalism skills in Physics Education: Mastering basic educational concepts, learning theories, and physics and mathematics concepts to design, implement, and evaluate innovative physics learning by utilizing information technology and the environment; able to plan, implement and evaluate innovative physics learning, utilize ICT and the surrounding environment to develop students' critical thinking skills and scientific attitudes, apply mathematical models in explaining physical phenomena, demonstrate independent and quality performance, be responsible for achieving group work results, carry out supervision and evaluation, as well as communicating effectively both written and verbally in educational and research contexts, as well as demonstrating good leadership and administrative skills; and demonstrate faith and devotion to God Almighty and uphold religious, moral and ethical values in every action.					
	Course Learning Outcome (CLO)					
	CPMK01.62.39 Mastering the principles and concepts of Atomic Nucleus Structure: Arrangement and Size, Shape of the Atomic Nucleus & Angular Momentum, Nuclear Magnetic Moment & Nuclear Force, Stability of the Atomic Nucleus & Nuclear Binding Energy, Weizsacker's Semi-Empirical Formula, Basic Quantities of Radioactivity, Introduction to Matter New Serial Decay & Radioactive Equilibrium, Artificial Radioactivity, Alpha, Beta, and Gamma Decay, Classification & Mechanism of Nuclear Reactions, Kinematics & Parameters of Nuclear Reactions, Interaction of Leptons & Muons, Hadrons & Quarks with logical, critical, and independent thinking and upholding high values -religious, moral and ethical values.					
	Sub-CLO					
	SUB-CPMK01.62.39.02.01 Students can explain the composition of the atomic nucleus and determine its size SUB-CPMK01.62.39.02.02 Students can explain the geometric shape of nuclei and the concept of angular momentum SUB-CPMK01.62.39.02.03 Students can understand nuclear magnetic interactions and the nature of nuclear forces SUB-CPMK01.62.39.02.04 Students can explain the criteria for nuclear stability and the concept of binding energy SUB-CPMK01.62.39.02.05 Students can apply the Weizsacker formula to calculate binding energy SUB-CPMK01.62.39.02.06 Students can explain the basic concept of radioactivity SUB-CPMK01.62.39.02.07 Students can explain the concept of successive decay and balance in radioactive processes SUB-CPMK01.62.39.02.08 Students can explain the process of artificially producing radioactivity SUB-CPMK01.62.39.02.09 Students can explain Alpha, Beta, and Gamma decay					

	<p>SUB-CPMK01.62.39.02.10 Students can find out the classification & mechanism of nuclear reactions</p> <p>SUB-CPMK01.62.39.02.11 Students can explain the kinematics & parameters of nuclear reactions</p> <p>SUB-CPMK01.62.39.02.12 Students can find out the interaction of Lepton & Muon</p> <p>SUB-CPMK01.62.39.02.13 Students can understand the basic properties and interactions of hadrons and quarks</p> <p>SUB-CPMK01.62.39.01.01 Students can demonstrate behavior that reflects faith and devotion in every action and daily activity</p> <p>SUB-CPMK01.62.39.01.02 Students can demonstrate an attitude of responsibility and independence in carrying out tasks and work in their field of expertise</p> <p>SUB-CPMK01.62.39.03.01 Students can use mathematical models to explain physical phenomena</p> <p>SUB-CPMK01.62.39.03.02 Students can display independent and measurable work performance of adequate quality</p> <p>SUB-CPMK01.62.39.03.03 Students can make appropriate and effective decisions based on information and data analysis</p>
Brief Description of the Course	This course is a Compulsory course in the Physics Education Program. The topics covered in this course include Core physics. The type of lecture used is 60% Lectures, Tutorials, Responses (40% conducted synchronously and asynchronously) with the method Case Study, Problem Based Learning and Inquiry (PBL), conducted through Scientific, Effective.
Scientific Integration	<p>4. reconstructing auxiliary sciences;</p> <p>6. provide Islamic values as a basis and reference in the application of knowledge;</p> <p>8. look for relationships and points of contact between natural sciences and the texts of the Koran and hadith,</p> <p>9. make the text of the Koran and hadith a source of inspiration or a reference source for the development of knowledge;</p> <p>10. connecting the order of natural law with the greatness of its creator, namely Allah SWT; and/or</p>
Research and Community Service Integration	
Learning Materials	Core physics
References	Cottingham, W. N. dan Greenwood, D. A. (2001). An Introduction to Nuclear Physics Second edition. Cambridge: Cambridge University Press