UNIVERSITY OF LAMPUNG
FACULTY OF TEACHER TRAINING AND EDUCATION
Department of Physics Education
Jl. Prof. Dr. Soemantri Brodjonegoro No. 1 Bandar Lampung 35145

MODULE HANDBOOK

Bachelor in Physics education

Module name	Atomics Nuclei and Radioactivity
Module level	Undergraduate
Code	KFI620211
Courses	Atomics Nuclei and Radioactivity
Description	This course is a mandatory subject for the Physics Education study program which provides students with high level knowledge able to review the knowledge he has obtained in the introductory lecture on Modern Physics and can develop it in depth macroscopic studies. To achieve these competencies, the lecture material consists of: atomic model and nuclear structure, atomic theory, basic concepts nuclear physics, properties of atomic nuclei, nuclear forces, nuclear models, radioactive decay, alpha, Beta and Gamma particle decay, radioactive decay models, neutron interactions, and nuclear reactions, fission reactions, fusion reactions, Neutron Physics, Meson Physics, Particle Physics, and Applications of Nuclear Physics.
Semester	5rd Semester
Lecturer	Dr. I Wayan Distrik, M.Si
Contact Person	
Language	Indonesian
Relation to curriculum	Compulsory

Type of teaching, contact hours	Brainstorming, project-based learning, problem-based learning, discussions, questioning techniques and assignments.
Workload	Contact hours: 14 weeks x 150 minutes Structured learning: 14 weeks x 180 minutes Independent study: 14 weeks x 180 minutes
Credit points	3 (3-0) CP or 4.8 (ECTS) ((14 weeks x 150 minutes) + (14 weeks x 180 minutes) + (14 weeks x 180 minutes) : 60 minutes/hour = 119 hours : 25 hours of study/ECTS = 4.8 (ECTS)
Requirements according to the Examination regulations	Modern Physics
Learning outcomes (course outcomes) and their corresponding PLOs	**After completing this module, a student is expected to:** 1. **KNO-1: Demonstrate knowledge of classical physics (mechanics, electrodynamics, thermodynamics, oscillations, waves and optics) and are familiar with the fundamentals of quantum, atomic and molecular, nuclear, elementary particle and solid state physics.** 2. **KNO-2: Formulate physical systems using mathematics to solve physics problems.**
Competencies/ Course Learning Outcomes	- Students are able to explain and analyze atomic models according to experts and compare them with modern atomic models, analyze the differences between single and many-electron atomic nuclei. - Students are able to analyze and formulate atomic nuclei, atomic nucleus properties and nuclear forces. - Students are able to analyze and formulate models of the core and radioactive decay.

	- Students are able to explain, apply and analyze the decay of alpha, beta and gamma particles. - Students are able to explain, apply, formulate and analyze nuclear reactions and Neutron physics. - Students are able to explain, apply, formulate and analyze core fission and fusion. - Students are able to explain, apply, formulate and analyze Meson Physics and particles and the application of core physics
Contents	Material for Study of Atomic Nuclei and Radioactivity consists of: Atomic model and nuclear structure, atomic theory, basic concepts of nuclear physics, properties of atomic nuclei, nuclear forces, nuclear model, radioactive decay, alpha particle decay, Beta and Gamma, radioactive decay models, neutron interactions, and nuclear reactions, fission reactions, fusion reactions, Neutron Physics, Meson Physics, Particle Physics, and Applications of Nuclear Physics.
Study and examination requirements and forms of examination	Test and Quizzes
Media employed	LCD, whiteboard, and online resources
Assessments and Evaluation	Participants are evaluated based on ; ● Participation Activities (10%) ● Quizzes (20%) ● Assignment (20%) ● Final Semester Exams (30%) ● Midterm exams (25%)
Reading list	INTRODUCTORY NUCLEAR PHYSICS, Kenneth S. Krane, 1988; V Atam P. Arya: Fundamentals of Nuclear Physic.