



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	Modern Optic
Module level	Undergraduate
Code	KFI620307
Courses	Modern Optic
Description	Optika Modern memberikan pemantapan materi optika klasik dan aspek-aspek optik modern, yang mencakup tema optika geometri, optika fisis, pandu gelombang, laser, dan optika tak linier.
Semester	Odd
Lecturer	
Contact Person	
Language	Indonesian
Relation to curriculum	Undergraduate degree program, Elective, 5rd semester
Type of teaching, contact hours	Lecture and discussions.
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) $((14 \text{ weeks} \times 150 \text{ minutes}) + (14 \text{ weeks} \times 180 \text{ minutes}) + (14 \text{ weeks} \times 180 \text{ minutes})) : 60 \text{ minutes/hour} = 119 \text{ hours} : 25 \text{ hours of study/ECTS} = 4.8 \text{ (ECTS)}$
Requirements according to the Examination regulations	A student must have attended at least 80% of the lectures to sit in the exams.

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	1. Students are able to explain the differences between flat mirrors and curved mirrors, as well as identify the properties of shadows produced by mirrors, mention and explain the types and properties of lenses and can paint the course of light and explain the working principles of optical devices. 2. Students are able to master the concepts of interference and diffraction, the concepts of polarization and disperse 3. Students are able to distinguish light and laser light, calculate the rate of transition of atoms and or molecules, and calculate the amount of energy resulting from the transition of atoms and or molecules. 4. Students are able to explain the concept of waveguides, their properties, and their uses. 5. Students are able to understand and explain the concept of difference between linear and non-linear optics, explain the non-linear medium, explain the concept of SHG, Pockel effect, Kerr effect, Faraday effect and design a simple experiment of one of its applications.
Contents	1. Optics geometry 2. Optical tools 3. Physical Optics 4. Lasers 5. Waveguide 6. Non-linear optics
Study and examination requirements and forms of examination	Participants are evaluated based on ; 1. Participation Activities (15%) 2. Assignment (30%) 3. Final Semester Exams (30%) 4. Midterm exams (25%)
Media employed	LCD, whiteboard, and online resources
Assessments and Evaluation	Test and Assignment.

Reading list	1. Gerd Keesser , "<i>Optical Fiber Comunication</i>" 2. Haliday and Resnick , <i>Physics 2</i> 3. Hecht, "<i>Optics</i>" 4. Jenkins and White, "<i>Optics</i>" 5. O Swelto, "<i>Principles of Laser</i>", Plenum Press, 2nd edition , New York, 1982 6. Pedrotti, "<i>Introduction to Optics</i>"
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