

PHYSICS MODULE HANDBOOK - 2023

Module Description

Module Name	Electromagnetic Field Theory II
Modul Level	Bachelor of Physics
Code	18H02130402
Courses (if applicable)	
Semester	Odd (5 th)
Person responsible for the module	Dr. Nurlaela Rauf, M.Sc
Lecturer	1. Dr. Nurlaela Rauf, M.Sc 2. Drs Bangsawang, M.Si
Language	Indonesian and English Language
Relation to Curriculum	Undergraduate, compulsory, 5 th semester
Type of Teaching, Contact Hours	Teaching methods: [group discussion], [case study], [project-based learning] Teaching forms: [lecture] Schedule: Wednesday, 09.10 – 11.50
Workload	For this course, students are required to meet a minimum of 86.40 hours in one semester, which consist of: - 22.40 hours for lecture, - 32.00 hours for structured assignments, - 32.00 hours for private study
Credit Points	2 Credit Points (equivalent with 3.4 ECTS)
Requirements According to the Examination Regulations	A student must have attended at least 80% of the lectures to sit on the final examination.
Mandatory Prerequisites	Basic Physics, Wave Physics
Module objectives/intended learning outcomes	After completing the course, Students are able: Intended Learning Outcomes (ILO): ILO 1: Students have relatively deep understood in classical and basic quantum physics. ILO 3: Students are able to use the basic principles of physics in technology application. Course Learning Objective (CLO): After completing this course, students are expected to be able to apply the concept of electromagnetic field in Maxwell's equations; and apply the concept of electromagnetic waves in a vacuum and/or medium.

PHYSICS MODULE HANDBOOK - 2023

	Sub CLO ILO-1 $\Rightarrow$ CO-1 (three weeks): Students can explain the basic laws of electromagnetic fields, comprehend Maxwell's equations based on these fundamental principles, and understand Maxwell's equations in different media. ILO-3 $\Rightarrow$ CO-2 (eleven weeks): Students are able to explain the equations of electromagnetic waves in a vacuum and in different media. They can also determine the characteristics of electromagnetic waves in various mediums.
Content	Students will learn about: 1. Reduction of the Basic Law of Electromagnets 2. Maxwell equation 3. Electromagnetic wave equation in vacuum 4. Maxwell equation in the medium 5. Electromagnetic wave equation in the medium 6. Solving the electromagnetic wave equation 7. Electromagnetic waves at the boundary of two different mediums 8. Reflection and transmission properties of electromagnetic waves in various mediums 9. Electromagnetic wave radiation 10. Electromagnetic wave guide 11. Electromagnetic waves in communication
Forms of Assessment	Assessment techniques: [participation], [written test], [oral test] Assessment forms: [quiz], [mid-term exam], [final term exam], [assignment] The number of Assesment and Evaluation: Assignment 1, 2, 3, 4; Evaluation (Mid-Term and Quiz). Quiz = 20%, Mid-term exam = 20%, Assignment = 30%, Final-term = 30%. CO 1 $\Rightarrow$ ILO 1: 5% (Assignment 1: case study) CO 1 $\Rightarrow$ ILO 1: 5% (Assignment 2: problem set analysis) CO 1 $\Rightarrow$ ILO 1: 10% (Quiz: problem set analysis)

PHYSICS MODULE HANDBOOK - 2023

	CO 2 => ILO 3: 5% (Assignment 3: problem set analysis) CO 2 => ILO 3: 5% (Assignment 4: problem set analysis) CO 2 => ILO 3: 30% (Final-Term: written test)
Study and examination requirements and forms of examination	Study and examination requirements: - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get final grade. Form of examination: • Written and Quiz exam: Essay
Media Employed	LED, Whiteboard, Learning Management System (SIKOLA), WA, and/or Email.
Reading List	<u>Main:</u> 1. David J. Griffiths, 1999, <i>Introduction to Electrodynamics</i>, Prentice Hall, New Jersey, USA 2. Nurlaela Rauf, 2017, Bahan ajar Medan Elektromagnet, Departemen Fisika– FMIPA – Universitas Hasanuddin 3. PANOFSKY AND PHILIPS -- <i>Classical Electricity and Magnetism</i>, Addison--Wesley Publishing Company <u>Supporting:</u> Books and other articles related to the theory and application of electromagnetic waves from the internet.