

MODULE HANDBOOK

Module Name	:	Science and Technology of Optics and Magnetics
Module Level	:	Bachelor
Abbreviation, if applicable	:	FI 2221
Sub-heading, if applicable	:	
Semester/ term	:	4/second year
Module Coordinator(s)	:	
Lecturer(s)	:	
Language	:	Bahasa Indonesia
Classification within the curriculum	:	Compulsory Course /Elective Course
Teaching format/ class hours per week during the semester	:	2 hours lectures
Workload	:	2 hours lectures, 2 hours tutorial and structured activities, 2 hours individual study, 14 weeks per semester, and total 84 hours a semester
Credits Points	:	2
Requirements	:	(1) FI1102 Elementary Physics 2A
Learning goals	:	<p>Knowledge:</p> <p>(1) Understanding of electromagnetic waves and the nature of its interactions with matter.</p> <p>(2) Understanding of material classifications based on their magnetic properties.</p> <p>Skill:</p> <p>(1) Ability to explain the phenomenon of interference, diffraction, scattering and dispersion</p> <p>(2) Ability to explain the phenomenon of ferromagnetism and superconductivity, and their phenomenological models.</p> <p>Competencies:</p> <p>(1) Ability to explain about various applications of wave phenomena and their interactions with matter.</p> <p>(2) Ability to explain about various applications of magnetic material or the related magnetic phenomena.</p>

Content	:	Maxwell equations and wave equations; Wave propagation and scattering; EM Wave Interactions and Materials; Wave Manipulation; EM Wave Application in Communication; Application of light waves in sensing; Light waves as an energy source; Various types of magnetic materials and their important characteristics, phenomenological models for ferromagnetism and superconductivity, classification of ferromagnetic materials and superconductors, applications related to magnetism. Phase change material, PCM, the influence of the electric field and the outer magnetic field on the freezing of PCM, the effect of magnetic dopant and the external magnetic field on increasing PCM thermal conductivity, the influence of optically active dopants and optical control techniques on PCM performance improvement .
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