MODULE HANDBOOK

Module Name	:	Photonics Theory and Applications
Module Level	:	Bachelor
Abbreviation, if applicable	:	FI3121
Sub-heading, if applicable	:	
Semester/ term	:	
Module Coordinator(s)	:	Dr. Rahmat Hidayat
Lecturer(s)	:	Dr. Rahmat Hidayat, Dr. Alexander Iskandar
Language	:	Indonesian
Classification within the curriculum	:	
Teaching format/ class hours per week during the semester	:	Lectures in class, 14 weeks
Workload	:	
Credits Points	:	2
Requirements	:	
Learning goals	:	Knowledge: (1) understanding the phenomenon of the propagation of light waves in the medium and the interaction of light with the medium (2) understanding the phenomena of absoprtion, emission and light scattering, and the working principles of related devices or systems, such as light emitting devices and solar cells (3) understand the characteristics of the propagation of light waves in waveguides, periodic and nanostructures, including the band structure of photonic crystals Skill: (4) understand how to do calculations and simulations of the propagation of light waves Competencies: (5) able to conceptually explain and design an optical and photonic devices or systems, such as sensor, laser, spectroscopy, optical communication system, etc.
Content	:	This course is offered to provide students with background knowledge on optics and photonics as well as its applications in optical/photonic devices and systems. Topics covered in this course are : Brief review of geometrical optics and transfer matrix method; Fourier optics and applications; Wave propagation in isotropic medium, Wave propagation and mode simulation using Finite Difference Time Domain (FDTD) and semi-emprical method by expansion method; Evanescent wave and surface plasmon resonance; Light absorption, emission and scattering; Spontaneous and stimulated emission as well as laser principles; Propagation of light in layered media and Photonic Crystals; Imaging and spectroscopy systems