MODULE HANDBOOK

Course:	**Modern Physics**
Module Level:	Undergraduate
Code:	FID 201
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	3rd /Second Year
Module Coordinator:	Prof.Dr.Retna Apsari, M.Si.
Lecturer(s):	Prof.Dr.Retna Apsari, M.Si.; Prof. Dr. Suhariningsi;, Dr. Aminatun, Ir.,M.Si. and Dr. Suryani Dyah Astuti, M.Si.
Language:	Bahasa Indonesia
Classification within the Curriculum:	Compulsory Course / ~~Elective Course~~
Teaching format / class hours per week during the semester:	4 hours of lectures (50 min/hour)
Workload:	4 hours of lectures, 4 hours of tutorial and structured activities, 4 hours of individual study, 13 weeks per semester, and total of 168 hours per semester 5.2 ECTS*
Credit Points:	4
Requirement(s):	(FID 101) Basic Physics I, (FID104) Basic Physics II and (FID 107) Basic Physics III
Learning Goals/Competencies:	**General Competence (Knowledge):** 1. To understand basic concept of special relativity. 2. To understand the concept of classic and quantum physics. 3. To understand concept of particle-waves dualism. 4. To understand basic concept of quantum mechanics. **Specific Competence:** 1. To ability to solve quantum mechanics problems. 2. To ability to solve atomics structure problems. 3. To ability to solve quantum theory of hydrogen problems. 4. To ability to solve nuclear structure and radioactivity. 5. To have an ability to formulate, solve problems special relativity.
Contents:	Review of classical physics with emphasis on Galilean transformations; **Special relativity:** Postulates, lorentz transformation, time dilation, length contraction, relativistic energy and momentum, relativistic Doppler effect; **The Particle Nature of Waves:** Blackbody radiation, photoelectric effect, Compton effect, pair production; **The Wave Nature of Particles:** de Broglie hipothesis, particle diffractions, Heisenberg uncertainty principle, Rutherford and Bohr models of the atom;
	Quantum Mechanics: Schrodinger's equation, linearity and superposition, expectation values, operator, potensial well, tunnelling effect; **The Hydrogen Atom:** The Schrodinger's equation for a hydrogen atom, quantum numbers, electron probability density, radiative transition, selection rules, Zeeman effect; **Many Electron Atoms:**

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Contents:	Review of classical physics with emphasis on Galilean transformations; **Special relativity:**