FI1101 Elementary Physics I

Module designation	Elementary Physics I
Semester(s) in which the module is taught	1st Semester (first year of undergraduate program)
Person responsible for the module	Dr. Rer. Nat. Akfiny Hasdi Aimon, S.Si., M.Si.
Language	Indonesian
Relation to curriculum	Compulsory
Teaching methods	Lecture and Tutorial
Workload (incl. contact hours, self-study hours)	Total workload: around 9 hours per week x 16 weeks = 144 hours ● Contact hours: 3 hours x 16 weeks = 48 hours ● Tutorial: 3 hours x 16 weeks = 48 hours ● Self-study hours: 3 hours x 16 weeks = 48 hours
Credit points	3 CU/5 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Ability to demonstrate knowledge of vector concepts to solve the kinematics of 1- and 2- dimensional of single particle and system particles. 2. Ability to demonstrate knowledge of vector concepts and Newton's Laws of dynamics about motion of single particle and system particles. 3. Ability to apply the concept of workenergy in solving simple mechanics problems. 4. Ability to formulate, solve, and analyze the problems in statics and dynamics of simple rigid body systems. 5. Ability to understand the elastic properties of material and oscillations phenomena. 6. Ability to solve the problem in statics and dynamic fluids 7. Ability to demonstrate knowledge of thermodynamics laws and be able to solve and analyze the problems of thermodynamics 8. Ability to design and conduct experiments to understand Newtonian mechanics 9. Ability to prepare and conduct the experiment to study the elastic properties of materials and oscillations phenomena 10. Ability to prepare and conduct the experiment related to fluids 11. Ability to prepare and conduct practical experiments related to thermodynamics of a system 12. Having the ability to design and carry out simple experiments using Elementary Physics IB concepts, as well as analyzing and interpreting the resulting data.

Content	This course activities consists of lectures and practice with scope: ● Kinematics of Particles ● Relative Motion ● Dynamics of Particles (Newton's Laws of the Force Concept ● Work and Energy (Impulse and Momentum, Conservation Laws) ● Dynamics System of Particles (Center of Mass) ● Rotational Motion (Angular Momentum, Rigid Body Rotation with a Fixed Axis) ● Elasticity and Oscillations ● Statics and Dynamic Fluids ● Thermophysics (The Kinetic Theory of Gases, Heat and Work, The Zeroth, First, and Second Laws of Thermodynamics, The Efficiency of Cyclic Processes)
Examination forms	Quiz, Homework, Research-Based Learning (RBL), Experiments, Midterm Exam 1, Midterm Exam 2, and Final Exam
Study and examination requirements	● Midterm exam 1: 20% ● Midterm exam 2: 20% ● Final exam: 40% ● Quiz, homework, and experiments: 10% ● Research-based learning (project): 10%
Reading list	1. Cutnell, J. D, Physics, 10th, John Wiley & Sons, 2015 2. Douglas C. Giancoli, Physics (Principles with Applications), 7th, Pearson, 2014