KEMENTERIAN PENDIDIKAN TINGGI,
SAINS, DAN TEKNOLOGI
UNIVERSITAS LAMPUNG
FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN
Jalan Prof. Dr. Sumantri Brojonegoro No.1 Gedong Meneng - Bandar Lampung 35145
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Bachelor of Education in Physics **MODULE HANDBOOK**

Module Name	Mechanics
Module Level, if Applicable	Bachelor
Code	KFI620202
Sub-Heading, (*if Applicable)	
Classes, (*if Applicable)	
Description	The Mechanics course aims to provide an in-depth understanding of the fundamental principles of mechanics in physics, as well as their linkages to Social Science Issues (SSI), Technological Pedagogical Content Knowledge (TPACK), and Nature of Science (NOS). In this course, students will learn fundamental concepts such as motion, force, energy, and momentum, as well as how applications of mechanics affect everyday life, for example in vehicle design, infrastructure development, and disaster mitigation. In addition, students will be taught to integrate technology into learning, use simulation and analysis software to illustrate mechanics phenomena, and design interactive learning experiences. Through an understanding of NOS, students will realise that science is dynamic and ever-evolving, influenced by technological innovations and societal needs. By conducting research projects and case studies, students will analyse the application of mechanics in social contexts, such as transportation safety issues and energy efficiency, so that they can see the important role of physics in addressing social challenges and improving the quality of life in society.
Semester	3rd
Module Coordinator	Wayan Suana, S.Pd., M.Si.
Lecturers	Teaching of Mechanics

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Language	Indonesian/English
Classification With in the Curriculum	Compulsory Courses in the second year (3rd semester) Bachelor Degree
Teaching Format/Class Hours Per Week During the Semester	Learning activity can be carried out in the form of : 1. Lecture or students' response a. Face to face : 50 minutes/SKS b. Structured activity : 60 minutes/SKS c. Independent activity : 60 minutes/SKS 2. Laboratory activity : 170 minutes/SKS
Teaching methods	In class activity : Inquiry based Learning and Team Based Project Structured activity : Group Discussion using worksheet Independent activity : Individual task
Workload	1 CU (SKS) for bachelor degree equal to 2 work hours per week or 170 minutes for lecture or students' response. 2x50 minutes face to face, 2x60 minutes structured tasks, 2x60 minutes independent learning. 1 CU (SKS) for bachelor degree equal to 1 work hours per week or 170 for laboratory activity. for 16 weeks (including mid and final exam), a total of 136 hours/semester. One CU equals to 1.51 ECTS
Credit Points	3 (2-1) CP or 4.53 (ECTS)
Prerequisites Courses	
Course Outcomes (CO)	After completing this module, a student is expected to: 1. PLO 1 : Demonstrate knowledge of classical physics (mechanics, electrodynamics, thermodynamics, oscillations, waves and optics) and are familiar with the fundamentals of

	quantum, atomic and molecular, nuclear, elementary particle and solid state physics. 2. PLO 2 : Formulate physical systems using mathematics to solve physics problems. 3. CO-1 : Students are able to analyze the problems of motion of objects using the concepts of kinematics and dynamics with friction not being ignored. 4. CO-2 : Students are able to calculate the work done by the force acting on an object and its relation to the energy that the object has. 5. CO-3 : Students are able to analyze the problem of the collision of two objects in 2D using the law of conservation of momentum and the law of conservation of kinetic energy. 6. CO-4 : Students are able to analyze the motion of objects caused by conservative forces and central forces and their relation to the potential of these objects 7. CO-5 : Students are able to analyze the equation of motion of an object. 8. CO-6 : Students are able to use the Lagrangian technique. 9. CO-7 : Students are able to analyze the location of the center of mass of a system of objects and determine the equation of motion of the center of mass. 10. CO-8 : Students are able to analyze the moment and inertia tensor of objects using the principle of tensor multiplication and the relationship between the two quantities
Content	The subject matter discussed in this course is the concepts and principles of kinematics and particle dynamics, work and energy, collision problems, vibration problems (aligned vibrations, damped vibrations, and forced vibrations), motion in two and three dimensions,

	conservative forces and central forces. , lagrangian technique, motion of the center of mass, and tersor inertia.
Study/Exam Achievements	Participants are evaluated based on ; 1. Midterm Exam 25% 2. Final Exam 25% 3. Practicum exam 20% 4. Project Assignment 20% 5. Assignment 10% The initial cut - off points for grades A, B+, B, C+ ,C, and D should not be less than 85%, 80%, 75%, 70%, 65%, 60%, 55%, 50%, and 40%, respectively.
Examination Methods	1. Midterm Exam (UTS) • UTS is held at the 8th meeting • UTS is a written test in the form of objective and essay, and carried out in the classroom with an implementation time of 120 minutes according to the module schedule • UTS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Mechanics module 2. Final Exam (UAS) • UAS is held at the 16th meeting • UAS is a written test in the form of objective and essay, and carried out in the classroom with an implementation time of 120 minutes which follows the UAS implementation schedule of the department

- UAS is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Mechanics module.

3. Practicum Exam
   - Practicum exam is held once in one semester after all the topic of practicum done
   - Practicum exam is used to assess student skills in using tools and reporting measurement results according to scientific rules
   - Practicum exam is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Mechanics module.

4. Project Assignment
   - Project assignment is given as group task
   - Project assignment is carried out for one semester and presented at the end of semester
   - Project assignment is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Basic Mechanics module.

5. Assignments
   - Assignments are given as exercise in each meeting in the form of worksheet and independent task
   - Assignments are about analyzing simple problems in physics and solving them with the concept of Mechanics
   - Assignments are given as individual tasks or group tasks and submitted in a limited time

	• The assignments are carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of the Mechanics module
Forms of Media	E-learning, e-book, video, experiment kits, virtual laboratory LCD, whiteboard, and online resources
Literature	1. Maharta, Nengah. 2003. Buku Ajar Mekanika. Bandar Lampung: FKIP Unila. 2. Symon, Keith R. 1970. Mechanics. Massachusetts: Addison-Wesley. 3. Arya, Atam P. 1997. Introduction to Classical Mechanics. New Jersey: Prentice Hal 4. Halliday, D., Resnick, R., and Walker, J., Principle of Physics, 11th edition, John Wiley & Sons, 2020

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PLO and CO Mappimg

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11
CO 1	√										
CO 2		√									
CO 3	√										
CO 4		√									
CO 5	√										
CO 6		√									
CO 7	√										
CO 8		√									