UNIVERSITY OF LAMPUNG
FACULTY OF TEACHER TRAINING AND EDUCATION
Department of Physics Education
Jl. Prof. Dr. Soemantri Brodjonegoro No. 1 Bandar Lampung 35145

# MODULE HANDBOOK

Bachelor in Physics education

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| Module name | Mechanics |
| Module level | Undergraduate |
| Code | KFI620202 |
| Courses | Mechanics |
| Description | This course is given as a continuation of the mechanics material that has been discussed in Basic Mechanics and Thermodynamics (MTD) and Waves and Basic Electronics (GED). Basic Electronics (GED). The main materials discussed in this lecture a is about the concepts and principles of particle kinematics and dynamics, effort and energy, collisions and energy, collision problems, vibration problems (harmonious vibrations, damped vibrations, and forced vibrations), damped, and forced vibrations), motion in two and three dimensions, conservative forces and central forces, conservative force and central force techniques, conservative and central forces, Lagrangian techniques, centre-of-mass motion, and inertia. |
| Semester | Odd |
| Lecturer | Wayan Suana, S.Pd., M.Si. |
| Contact Person | +62 813-7977-0750 |
| Language | Indonesian |
| Relation to curriculum | Undergraduate degree program, Mandatory, 3rd semester |
| Type of teaching, contact hours | Problem-based learning, Lecture, discussion, presentation, assignment. |
| Workload | Contact hours: 14 weeks x 100 minutes<br>Structured learning: 14 weeks x 120 minutes<br>Independent study: 14 weeks x 120 minutes<br>Practicum session: 14 week x 170 minutes |

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| Credit points | 3 (2-1) CP or 4.8 (ECTS) ((14 weeks x 100 minutes) + (14 weeks x 120 minutes) + (14 weeks x 120 minutes) + (14 week x 170 minutes) : 60 minutes/hour = 119 hours : 25 hours of study/ECTS = 4.8 (ECTS) |
| Requirements according to the Examination regulations | A student must have attended at least 80% of the lectures to sit in the exams. |
| Learning outcomes (course outcomes) and their corresponding PLOs | After completing this module, a student is expected to:<br>1. KNO-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.<br>2. KNO-2 : Formulate physical systems using mathematics to solve physics problems. |
| Competencies/ Course Learning Outcomes | 1. Students are able to analyze the problems of motion of objects using the concepts of kinematics and dynamics with friction not being ignored.<br>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.<br>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.<br>4. 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<br>5. 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<br>6. Students are able to analyze the equation of motion of an object.<br>7. Students are able to use the Lagrangian technique.<br>8. 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.<br>9. 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 |
| Contents | The subject matter discussed in this course is the concepts and principles of kinematics and particle dynamics, work and energy, |

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| | 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 and examination requirements and forms of examination | participants are evaluated based on ;<br>1. Participation Activities (15%)<br>2. Final Semester Exams (50%)<br>3. Midterm exams (35%) |
| Media employed | LCD, whiteboard, and online resources |
| Assessments and Evaluation | Test |
| Reading list | 1. Maharta, Nengah. 2003. Buku Ajar Mekanika. Bandar Lampung: FKIP Unila.<br>2. Symon, Keith R. 1970. Mechanics. Massachusetts: Addison-Wesley.<br>3. Arya, Atam P. 1997. Introduction to Classical Mechanics. New Jersey: Prentice Hal |