



**INSTITUT TEKNOLOGI SEPULUH NOPEMBER
FACULTY OF SCIENCE AND DATA ANALYTICS
DEPARTMENT OF STATISTICS
STATISTICS UNDERGRADUATE PROGRAM**

Course	Course Name	:	Mechanical Physics
	Course Code	:	SF234103
	Credit	:	3 SKS
	Semester	:	I

COURSE DESCRIPTION

In this course, the students will learn to understand the laws of basic physics, Particle kinematics; Particle dynamics; Work and energy; Rotational motion; Vibration and Fluid Mechanics, through simple mathematical explanations and apply the concept including analyzing the material in practicum. The practicum includes physical pendulum, mathematical pendulum, spring constant, fluid viscosity, projectile motion, friction coefficient, and moment of inertia.

PROGRAM LEARNING OUTCOME

- KU1 Applying logical, critical, systematic and innovative thinking in the context of the development or implementation of science and/or technology according to their field of expertise
- KU2 Able to demonstrate independent, quality, and measurable performance
- S9 Show a responsible attitude towards work in their field of expertise independently

COURSE LEARNING OUTCOME

- CLO.1 Understand the physical quantities and unit, including the characteristics of scalar and vector quantities
- CLO.2 Understand the definition of straight and curved motion in graphical and mathematical including its application
- CLO.3 Understand the basic principle of Newton Laws and the types of Force including its application
- CLO.4 Understand the concept of Work and Energy, mechanic energy, The principle of conservation of mechanical energy and its application
- CLO.5 Apply the concept of impulses and momentum, conservation of momentum, collisions and their applications
- CLO.6 Understand the principles of rigid body rotational and translational motion including its application
- CLO.7 Understand the concept of rigid body equilibrium and its application
- CLO.8 Understand the mechanics of objects transition and elasticity including its application
- CLO.9 Understand simple harmonic oscillator, superposition of two vibrations and their application
- CLO.10 Understand the concepts of hydrostatics and hydrodynamics and their application

MAIN SUBJECT

1. Principal and vector
2. Particle kinematics

3. Particle dynamics
4. Work and energy
5. Impuls and momentum
6. Vibartion
7. Fluids mechanics

PREREQUISITE

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REFERENCES

1. Halliday, Resnic, Jearl Walker, 'Fundamental of Physics'. John Wiley and Sons, 10th ed, New York, 2014
2. Douglas C. Giancoli, 'Physics for Scientists and Engineers , Pearson Education, 4th ed, London, 2014
3. Tim Dosen Fisika, "Fisika 1 Mekanika & Termodinamika untuk Sains dan Teknik", Fisika FIAITS, 2018
4. -, "Petunjuk Praktikum Fisika Dasar", Fisika, MIPA-ITS
5. Sears & Zemanky, "University Physics", Pearson Education, 14thed, USA, 2016
6. Tipler, PA, 'Physics for Scientists and Engineers ',6th ed, W.H. Freeman and Co, New York, 2008