BADJI MOKHTAR ANNABA UNIVERSITY
FACULTY OF TECHNOLOGY
DEPARTEMENT OF SCIENCES AND TECHNOLOGY

Domain: Sciences and Technology 1st year L.M.D	Semester 1:Physics 1 Elements of Mechanics	Teaching Unit: UEF 1.1.3 VH/W: 1h 30 course+1h30 TD Credits: 6 - Coefficient: 3

Responsable of matter

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Teaching objectives

The teaching of this subject enables the student to acquire the fundamental concepts of classical mechanics related to the material point through:

- Kinematics

- Dynamics

- Work and energy

Prerequisites

Basics of mathematics and physics

Table of content	
Chapter 1: Review	**· Dimensional analysis and Vector analysis**
Chapter 2: Kinematics	**. Concept of Frame of Reference** **. Analysis of Motion in Space (circular and rectilinear motions, intrinsic coordinates)** **.Coordinate Systems (Cartesian, polar, cylindrical, spherical)** **. Relative Motion (laws of composition of velocities and accelerations)**
Chapter 3: Dynamics	**. Inertia Principle, Inertial Mass and Galilean Reference Frame** **. Principle of conservation of momentum** **. Concept of Force** **. Newton's Laws** **. Differential Equation of Motion** **. Types of Forces (gravity, elastic, viscous)**
Chapter 4: Rotational Motion	**. Angular Momentum, Torque (Moment of a Force)** **. Angular Momentum Theorem and Moment of Inertia**
Chapter 5: Work, Power and Energy	**. Work and Power of a Force** **. Kinetic Energy** **. Potential Energy *(gravitational, elastic) and Equilibrium States*** **. Conservative and Non-Conservative Forces** **. Conservation of Energy** **. Impulse and Collisions *(elastic and inelastic)***