אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2024–25–A term

Course Name Classical Mechanics 1

Course Number 203.1.1281

Course web page
`https://math.bgu.ac.il//en/teaching/fall2025/courses/classical-mechanics-1`

Office Hours `https://math.bgu.ac.il/en/teaching/hours`

Abstract

Requirements and grading[1]

Course topics

Mathematical introduction: Coordinates, vector algebra, partial derivatives. Particle kinematics: general concepts, velocity, acceleration, rotational motion. Newton's laws, Galilean relativity, inertial and non-inertial frames Particle dynamics: applications of Newton's laws, work, kinetic energy, momentum, angular momentum. Potential energy, conservation laws. Motion in a potential I: 1D potential, central forces, Keplerian motion. Motion in a potential II: Oscillations. Mathematical addition: complex numbers. Many particle systems, conservation laws, collisions. Rigid body rotation I: Theory (angular velocity and acceleration, tensor of inertia, moment of inertia, torque, angular momentum, kinetic energy). Rigid body rotation II: Applications (rolling, precession, gyroscopes). Basics of special relativity (Optional) Gravitation.

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates