PEP 111D Mechanics
SPRING 2023

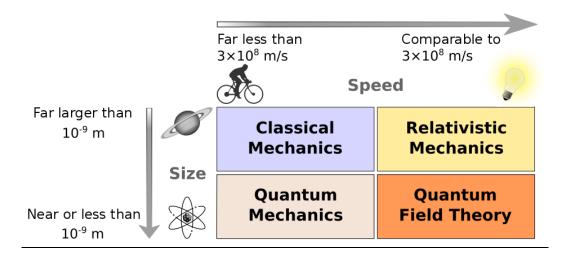|	
Meeting Times:	**Monday-Friday 10:00-10:50AM**
Classroom:	Gateway South 122
Instructor:	Dr. Rupak Chatterjee
Contact Info:	Burchard 709, rchatte1@stevens.edu
Office Hours:	Monday 3:00-5:00

COURSE DESCRIPTION

This is a calculus-based introduction to the basic notions of classical mechanics. Topics will include kinematics and dynamics, Newton's laws of motion, work and kinetic/potential energy, conservative and dissipative forces, linear and angular momentum, elastic and inelastic collisions, rigid body kinematics and dynamics, Newton's law of gravity, Kepler's laws of planetary motion, and linear and rotational conservation laws.

Course Learning Outcomes
Program Outcome 1 *(Scientific foundations)*
    1.1: Develop improved conceptual understanding of the nature of force and acceleration.
    1.2: Be able to distinguish between acceleration and velocity.
    1.3: Become familiar with the concept of conservation laws and be able to apply the conservation of momentum and the conservation of energy to the analysis of simple mechanical systems.
    1.4: Become familiar with the quantitative description of rotational motion
Program Outcome 2: *(Engineering foundations)*
    2.1: Be able to use free body diagrams to analyze simple mechanical systems.
    2.2: Be able to apply Newton's Laws of Motion to analyze simple mechanical systems.
    2.3: Be able to manipulate vector quantities, including vector addition, resolution of vectors into components and dot product.

COURSE MATERIALS
Textbook:
    University Physics Volume 1, William Moebs, Openstax, 2019 (LEGALLY FREE ONLINE)

GRADING PROCEDURES
Homework   (20%)

Three Quizzes   (30%)
Recitation   (10%)
Final Exam   (40%)

Tentative Weekly Schedule

Week		Topics	Quiz
Week One		Chapter 1: Units and Measurement, Chapter 2: Vectors	
Week Two		Chapter 3: Motion Along a Straight Line	
Week Three		Chapter 3: Motion Along a Straight Line	
Week Four		Chapter 4: Motion in Two and Three Dimensions	*THUR Feb 16th*
Week Five		Chapter 4: Motion in Two and Three Dimensions Chapter 5: Newton's Laws of Motion	
Week Six		Chapter 5: Newton's Laws of Motion	
Week Seven		Chapter 6: More Newton's Laws	*THUR Mar 9th*
Week Eight		Chapter 7: Work and Kinetic Energy	
Week Nine		Chapter 8: Potential Energy and Conservation of Energy	
Week Ten		Chapter 8: Potential Energy and Conservation of Energy	
Week Eleven		Chapter 9: Linear Momentum and Collisions	
Week Twelve		Chapter 9: Linear Momentum and Collisions, Chapter 10:10.1-10.3: Moons of Jupiter	*THUR Apr 20th*
Week Thirteen		Chapter 10: Fixed Axis Rotation	
Week Fourteen		Chapter 10: Fixed Axis Rotation	
FINAL		**TBD**	