Instructor: Will McElgin  
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Office Hours: Tuesday, Wednesday, Thursday – 2-5pm  

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Text: Wolfson, “Essential University Physics: Vol 1”  
Course Website: www.physics.smu.edu/mcelgin/P1307_fall2009/P1307.html  
Lecture Times: Tuesday and Thursday – 11:00am-12:20pm  
Lecture Location: Fondren 153

Description of the Course

This course is intended as a calculus-based introduction to classical mechanics. The goal is for the student to gain an understanding of the relationship between force and motion embodied in Newton’s laws, and to understand how to make use of these laws to solve physical problems. Initial topics to be covered will include single particle motion, Newton’s laws of mechanics, and uniform circular motion. The concept of conservation of (kinetic plus potential) energy which follows from Newton’s laws will then be explored in detail, along with a treatment of motion in a gravitational field. Following this, the motion of systems of particles and the concept of conservation of momentum will be discussed. This will be followed by a discussion of rotational motion of extended bodies and the related concepts of torque, angular momentum, and static equilibrium. Finally, the topics of oscillatory, wave, and fluid motion will be explored. There will be an emphasis on in-class problem solving using similar ideas and techniques as required on homework and exams.

Evaluation

There will be three exams (20% each), and a semi-cumulative final (20%). Homework (20% total) will be collected approximately every two weeks. Attendance in class is strongly expected and, unless expressly told otherwise, students are responsible for all aspects of the class discussion.
Student Learning Outcomes

It is expected that students should be able to incorporate physical concepts with mathematical techniques to solve problems in Mechanics and related topics. While only algebraic techniques will be required on exams, calculus will be utilized in the class discussion and in selected homework problems, and is expected that students will be conversant in these descriptions of physics.

Schedule

          Assignment of homework 1.
9/1  : One and Two-dimensional Motion, Vectors and Projectile Motion. Chapter 3.
9/10 : Collection of homework 1.
          Assignment of homework 2.
          Exam 1.
          Assignment of homework 3.
10/6 : Work and Energy Conservation. Chapters 6 and 7
10/8 : Collection of homework 3.
          Assignment of homework 4.
          Exam 2.
          Assignment of homework 5.


11/5: Rotational Motion, Torque and Angular Momentum. Chapters 10 and 11.

11/10: Rotational Motion, Torque and Angular Momentum. Chapters 10 and 11.


Collection of homework 5.

11/19: Exam 3.
Assignment of homework 6.


12/1: Oscillatory Motion and Fluids. Chapters 13 and 15.

12/3: Oscillatory Motion and Fluids. Chapters 13 and 15.

12/8: Fluids. Chapter 15.
Collection of homework 6.

12/14: Final Exam. Exam Time – 8:00am-11:00am.