MECHANICS - PHYSICS 234 Spring '18

Prof. Case

Text: R. Baierlein, Newtonian Dynamics

Course Outline

Week Topics

January 22 Basics (Ch. 1)

January 29 Basics (continued)

February 5 Harmonic Oscillator (Ch. 2)

February 12 Harmonic Oscillator (continued)

February 19 Harmonic Oscillator (continued)

**EXAM #1 FEBRUARY 23 (Fri.)**

February 26 Nonlinear Oscillator (Ch. 3)

March 5 Lagrangian Formulation (Ch. 4)

March 12 Lagrangian (continued)

**SPRING BREAK**

April 2 Lagrangian (continued)

**EXAM #2 April 6 (Fri.)**

April 9 Two Body Problem (Ch. 5)

April 16 Rotating Reference Frames (Ch. 6)

April 23 Rigid Body Motion (Ch. 7)

April 30 Rigid Body Motion (continued)

**EXAM #3 April 30 (Mon.)**

May 7 Special topics (as time allows)

**FINAL EXAM - FRIDAY, MAY 18 - 2-5 PM**

Grading

3 Hour Exams @ 100 300

Problem Sets 200

Final Exam 150

Mechanics Lab 100

750

**Class**: This is your first course in theoretical physics. It will be more mathematical than your previous courses and will involve many somewhat long and subtle derivations. When I present them in class they are still mine. The way to make them yours is to take out a sheet of paper and go over the same derivation, this is the best way to develop a clear understanding and make the argument yours. It should also be noted that several topics covered in the course are not in the text. I will present the material as clearly as possible but that may not be enough. This is where you come in. Ask questions, I need your questions!

**Problem Sets:** Working problems is essential for mastering any area of physics. Although you are free to work on these with others, what you turn in must be your own. Feel free to discuss a problem with others but what you turn in should represent your own understanding. The concepts and techniques learned in this course are used in most advanced courses in physics, so if you want to make the next few years of your life more enjoyable, you should take this opportunity to master this material.

**The Book:** There are no good texts among the currently available mechanics textbooks. They are either poorly organized, too long or poorly written. For our text I have chosen the book by R. Baierlein, Newtonian Dynamics. It is out of print, but is available used. Although not perfect, it is well written, has a reasonable choice and ordering of topics, and is of reasonable length.

**Need more help/information:** I am usually available right after class, but I suspect seeing me after class and setting up a time to meet will be best.