**SYLLABUS FOR PHY630 – Classical Mechanics**

Fall 2018

Time: 4-5 pm, TTR

Location: S281

**Instructor**

Thomas E Wilson, Ph.D.

Office: S153

Lab: S154

Phone: (304) 696-2752

Email: wilsont@marshall.edu

**Office Hours**

(Tentatively) MWF 3-4 pm

If you are unable to make these times, I am happy to meet with you at any time when I am not preparing for class or in class (teaching schedule will be posted on my door).

**Text**

*Classical Dynamics*, 3rd ed., Goldstein, Poole and Safko, Addison-Wesley Publishing. (ISBN: 0-201-65702-3) Most of the homework will be drawn from the text, with some ancillary material taken from other sources. We will plan to cover the first eight chapters in succession.

**Overview**

I will act as your guide, as we will both be learning at our own skill levels. First, I wish to help familiarize students with the techniques and methods of solving problems in classical mechanics at the graduate level. This course will assume one has completed the introductory calculus-based physics sequence and an undergraduate course in classical mechanics. In particular we will pay attention to the areas of classical mechanics that are relevant to other areas of physics. For example, Hamiltonian mechanics forms the foundation for quantum mechanics. Secondly, I wish to introduce the student to advanced mathematical methods and problem-solving techniques that will be useful in areas of physics outside of classical mechanics.

**Lecture**

This will be a traditional ‘talk and chalk’ based lecture. However, one of the things I hope to do is to use software for relevant numerical calculations. I use MathCad and/or Scientific Workplace; in order to do this; we may need to discuss numerical methods of solving differential equations.

**Grades**

Grades for the course will be determined as follows:

Homework: 10%

In-class exams (3) 3\*20%

Final exam 30%

A = 90% or above, B=80% or above, C=70% or above, D=60% or above,

F=less than 60%

**Homework**

Homework will be assigned weekly and will be due approximately one week after it is assigned. Although one might find online solutions, this approach entirely defeats the purpose of being an active-learner and a student of physics - so beware, as I will consider any such submitted solutions to be plagiarism. I may only choose one problem for grading due to time constraints, although most solutions will be explained after the problem solutions are collected. Although you might benefit by very general discussions of homework problems with others, you should realize this is meant to be a solo effort with no collaboration on the details of obtaining problem solution with other students. Problem solutions should be presented in a legible, coherent manner on stapled, standard size paper. Your solution should very much read like an example from the text. The process of solving the problem should be explained along with any calculations that are done. If the calculation is done on a computer, the program used should be discussed as well, and results interpreted in light of the physics involved. Most assigned problems will be taken from end of the chapter from the text, but there will be additional problems based on material discussed in class.

**Exams**

There will be three in-class exams during the semester, along with the final. The dates for the exams (all on Tuesdays) are given below.

Exam 1: September 18th   
Exam 2: October 23th   
Exam 3: November 13thFinal Exam: December 11th (4-6 pm)

The exam format will be closed book, and the student will be asked to solve problems similar to the problems assigned for homework.