

**Haverford College - Physics Department**  
**Physics 308a: Advanced Classical Mechanics**  
**F. Crawford**  
**Fall 2004 General Course Information and Policies**

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Physics 308 is a course in advanced classical mechanics in which Newton's laws are applied to more complex and interesting situations than you have encountered in your earlier mechanics course (e.g., Physics 105). This course uses more sophisticated concepts and methods to solve problems. Although this subject had its real flowering in the 19th century, it has been the basis of several revivals, the most recent of which is the development of chaos and nonlinear dynamics. The last third of the course will cover special topics (such as chaos and fluid dynamics) which have a connection to classical mechanics but which do not fall neatly into other parts of the undergraduate physics curriculum.

### **Location and Times**

It is essential that you come to all classes (including recitations) to master the concepts and material in this course. All absences, for any reason (including illness, athletic events, etc.) should be discussed *in advance* with the instructor.

- **Lectures:** MWF 9:30 - 10:30 in the Observatory.
- **Recitations:** W 1:00 - 2:00 in Koshland INSC Link 205. Attendance is mandatory! The purpose of recitation is two-fold: to provide assistance to the class in working some of the problems, and to help you learn to work in small-group settings to present your work orally. The class will be divided into several working groups (to be assigned after the semester starts). Each group will be assigned to prepare one problem each week for presentation at the Wednesday recitation. The intent here is not to provide the entire solution, but to outline the problem, give appropriate sketches, show how to start on it, point out pitfalls to expect, and give partial answers to be aiming for. The groups must meet in advance of their presentation to confer on the solution to the exercise and to decide how to present the work. One or more students may be involved in the presentation, and it is expected that over the course of a couple of weeks all students in a group will have presented a problem. The group as a whole will receive a grade for each presentation. The grade will depend both on the correctness of the work – I will (hopefully immediately) correct any mistakes to that the rest of the class is not misled – and the quality and clarity of the presentation. I may re-arrange the groups after each exam to give you the opportunity to work with almost every other student in the class.
- **Course Web Page:** [http://cs.haverford.edu/people/fcrawfor/teaching\\_fall\\_2004\\_p308.html](http://cs.haverford.edu/people/fcrawfor/teaching_fall_2004_p308.html)  
This is the web page for the class. You can also access this page through links from the Haverford physics department web site. Assignments, announcements, and other information will be posted here, so please check it regularly.

### **Instructor**

**Instructor:** Fronefield Crawford  
**Office:** Koshland INSC Link L106  
**Phone:** (610) 896-2973 (office)  
**Email:** fcrawfor@haverford.edu

Office hours will be announced shortly after the start of the course, but you should feel free to come see me anytime. Please do not hesitate to contact me; no question or topic is too small. If you are having a lot of trouble with the course, be sure to come to see me as *soon* as possible. You should feel free to send me email when you have a question or comment.

**Feedback:** I will issue course evaluations part-way through the semester to see how things are going. However, if you have concerns about the course or ideas about how to make it better, you should let me know immediately, either in person or by e-mail. Don't wait!

## Textbook and Supplies

- The textbook for the course is *Classical Mechanics*, by John. R. Taylor. This book is available at the college bookstore.
- I will also hand out a lab manual for the computer project.

## Assignments and Tests

- **Homework:** Written work will be assigned weekly, and problems will be assigned from each chapter. The homework is due at the start of class on the assigned date (unless specified otherwise). Assignments will usually be posted electronically on the course web page for download. Solutions will be provided soon after the homework is due. Late homework will be accepted with a 25% penalty if handed in by the same time on the next working day (i.e., for a Friday due date, you would have until Monday). After that, homework will be accepted with a 50% penalty. Collaboration on the homework assignments is encouraged except for those explicitly assigned as “individual exercises”. There will also be assigned reading before each class to prepare you for class discussion. These readings are listed on the course schedule.
- **Computer Project:** The computer project is to be worked on individually (i.e., by yourself) and independently (i.e., outside of class time). Different parts of the project will be due at different times, so that the entire project is not to be handed in at once (see the course schedule for details). Assistance with the project can be obtained by coming to see me.
- **Exams:** There will be two midterm exams and a final exam, each focusing on roughly a third of the course. The exams are cumulative to the extent that current material may depend on ideas from earlier chapters. More details about the material covered in each exam and when the exams will be taken will be decided as the course proceeds.

## Grading

Midterm Exam 1	15%
Midterm Exam 2	20%
Final Exam	20%
Computer Project	10%
Homework Assignments	25%
Recitation Participation and Attendance	10%

## Honor Code Matters

We value Haverford’s honor code for the integrity it fosters and the pedagogical flexibility it affords. The important guiding principle of academic honesty is that you must never represent the work of others as your own. Please request clarification if you find yourself in any doubtful situations.