Physics 410: Classical Mechanics
Spring 2010 — Professor Shawhan

Course topics:
Intermediate applications of Newton's laws; momentum and energy; damped and driven oscillations; nonlinear dynamics and chaos; calculus of variations; Lagrangian mechanics; Hamiltonian mechanics; central force problems; collision theory; noninertial frames; general motion of rigid bodies; coupled oscillators and normal modes; special relativity; wave equations.

Prerequisites:
PHYS 374 (Intermediate Theoretical Methods)
MATH 241, 246, and 240 (Calculus III, Differential Equations, and Linear Algebra)
or, alternatively, MATH 340 and 341

Lectures:
Mondays and Wednesdays from 11:00–11:50, and Fridays from 10:00–11:50 (including a break!). All lectures will be in room 0405 of the Physics Building. Class attendance is strongly encouraged, of course, but is not strictly required. I do not attempt to keep records of class attendance.

Required textbook:
"Classical Mechanics" by John R. Taylor. The ISBN number is 978-1-891389-22-1. We will cover most of the book, but not all sections of every chapter. I will try to remember to be clear about what sections you will be reading and what will be covered on the exams. I have made a complete schedule for the course, but it is subject to change depending on how the course goes.

Homework:
There will normally be one homework assignment per week to be turned in and graded. Feel free to work on the homework with one or more classmates; however, to ensure that you really do learn the material (and will therefore do well on the exams), please follow this simple rule: **do not ever look at another student's written solution before writing yours.** Verbal discussion of how to solve a problem, and sketching together on scratch paper or a blackboard, are fine since they can help you learn while still ensuring that you need to know what you're doing when you write out the actual solution.

Don't wait until the last minute to start a homework assignment! In fact, try to start it early so that you can ask for help if you need it. Please do all of the homework and turn it in on time, unless you have a valid excuse (i.e. illness, a religious observance, or some other compelling reason). If you do not have a valid excuse, you can still turn in the homework up to 24 hours late for half credit; after 24 hours, no credit will be given.

Exams:
There will be two midterm exams and a final exam. The two midterms will be in-class exams; they will be on Fridays so you will have 110 minutes to work. You will not be able to use books or notes, but I will provide copies of the formulae and constants printed on the front and back endpapers of the textbook. The exams must be taken on the scheduled days unless you have a valid excuse. If you know in advance that you will have to miss an exam, please inform me as soon as possible so that we can arrange a make-up. Note that the make-up exam will be identical to the regular exam; I will trust you and your classmates to not allow the contents of the exam to leak out to someone who still has to take it.

The university assigned us a final exam time slot of Saturday, May 15 from 8:00–10:00 a.m. However, instead of an in-class final, I will make it a take-home exam which you will have 24 hours to work on. I will hand out the exam problems on Friday, May 14 at 10:00 a.m. and it will be due on Saturday, May 15 at 10:00 a.m. I know that Friday-to-Saturday will be a problem for some people, so if you would like to shift the time window for your take-home exam (earlier or later by one or two days), let me know what you would like for the start time; it will be due 24 hours later. I am happy to distribute the exam by email and will accept good-quality scanned images in place of paper if you don't want to come to campus just to pick up or turn in the exam. You may use the textbook, your notes, your past exams and the posted solutions while working on the final exam. However, **do not consult with any other person while working on the final exam**. I am counting on you to preserve the integrity of the exam to represent the purely *individual* work of you and your classmates.

Course grade:

30%	Homework
20%	First midterm
20%	Second midterm
30%	Final exam

Contact Information:

Prof. Peter S. Shawhan, room 4205B in the Physics Building, 301-405-1580, pshawhan@umd.edu
Office hours: Mondays, Tuesdays, Thursdays and Fridays 2:00-3:30; Thursdays 1:00-2:30
TA/Grader: Ranchu Mathew, room 0220 in the Physics Building, 301-405-5969, ranchu@gmail.com
Office hours: Tuesdays 11:00-12:00
*** NOTE: Office hours are subject to change – watch for announcements

If you are unable to come during regular office hours, please contact me by email or phone to ask a question and/or arrange a time to meet.

Course Evaluations:

As you probably know, the University of Maryland has a system called CourseEvalUM which collects information from students about the quality of courses and the effectiveness of instructors, and provides online summaries at Testudo for students to view when they are preparing to register for future semesters. This can be a valuable resource for you and for other students, but it depends on your participation! Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the faculty tenure and promotion process.

Honor Code:

The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit http://www.studenthonorcouncil.umd.edu/whatis.html .

Religious observances:

If you need to miss class, a homework deadline, or an exam due to a religious observance, please notify me in advance—preferably at the beginning of the semester.

Students with disabilities:
Accommodations will be provided to enable students with disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester so that appropriate arrangements can be made.

Weather and emergency closures:
If the University is closed due to weather or some emergency situation on a day when homework is due, then that homework must be turned in at the beginning of the next class when the University is open. If the University is closed on the scheduled date of an exam, then the exam will be given during the next class period when the University is open. If the University is closed on any non-exam day, including a review session (the class immediately before an exam), then the exam will still be given according to the original schedule. In these or other exceptional circumstances, I will attempt to send out information by email.