Physics 171
Introductory Physics: Mechanics and Relativity
Spring 2008 — Professor Abazajian

Course topics: Kinematics, Newton's laws, energy and work, special relativity, rotational kinematics, angular momentum, gravity, fluids, and gases. This course is designed for physics majors and those desiring a rigorous preparation in the physical sciences. Knowledge of basic calculus will be assumed.

Prerequisites: Math 140 (Calculus I) and a high school physics class, or permission of the department.

Lectures: Mondays, Tuesdays, Thursdays, and Fridays from 10:00–10:50 in room 0405 of the Physics Building. See the Course Schedule for the planned topic(s) for each lecture. The schedule may shift around by a day or so if some topics take more or less time than expected.

Required textbook: "Physics for Scientists and Engineers" by Tipler and Mosca, sixth edition, volume 1, published by W. H. Freeman and Company with the online Physics Portal Bundle. The ISBN number for this bundle is 1-4292-0605-5. The book alone is also an option, with ISBN number 1-4292-0132-0. If purchased separately, the one-semester PhysicsPortal access costs about $35–40. If you would like to learn more about the portal, visit http://portals.bfwpub.com/pse6e.php. You do not need to bring the book to class. Most lectures are associated with 1–4 sections from the book as indicated on the Course Schedule, and *you should read those*. You can either read those sections before the lecture or after the lecture, but try not to fall behind by more than a day or two.

Homework will be assigned about once per week and must be turned in at the beginning of class on the specified date (or earlier). Don't wait until the last day to get started! 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 that, no credit will be given. As an exception to the 24-hour cutoff, if the homework was due on a Friday, then it will be accepted in class on the following Monday for half credit. (Homework due on Tuesday will be accepted late only up to Wednesday morning, not Thursday.)

If you are unable to finish the complete homework assignment on time, then you may turn in a partial set of answers on time for full credit, and then turn in the remaining answers late for half credit. However, this practice is discouraged since it complicates the grading and bookkeeping. If people take advantage of this *too* often, I may change the policy to disallow it. If you must turn in additional answers late, please write "Additional answers – turned in late" at the top of your page to help us keep things straight.

Exams: There will be three **exams** during the semester plus a final exam. The exams will be given in class, on paper, and will be closed-book. Any needed physical constants or data will be provided. You will need a calculator with standard trigonometry functions, etc. 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.

Up-to-date course information and your scores on assignments will be available on the ELMS (Blackboard) system. If you go to http://elms.umd.edu and log in with your username (which is your campus "Directory ID") and password, you should see the course listed in the "My Courses" panel.

Course grade:

40%	Homework
12%	Each exam during the semester
24%	Final exam

How to do well in this course:
Come to the lectures. Keep up with the reading. Do all the homework. Ask for help (your teacher, TA, or a classmate) whenever there is something you don't understand. Review your notes and past homework assignments before each exam.

Contact Information:
Prof. Kevork Abazajian, 4101 Physics Building, 301-405-6009, kev@umd.edu
Usual office hours: Tuesdays 2:00–3:00 and Thursdays 2:00–3:00 in room 4101
TA: Abraham Sahilemeskel, miramoth@umd.edu
Office hours: TBA
*** NOTE: Office hours are subject to change – watch for announcements

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

Honor Code:
The University of Maryland, College Park 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 .

Students with disabilities:
Accommodations will be provided to enable students with disabilities to participate fully in the course. Please discuss any needs with your instructor 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, we will attempt to communicate with students by email.

Physics 171 Course Schedule
Fall 2007 — Professor Abazajian

Date	HW due	Lecture topic(s)	Reading assignment
Mon Jan 28		Course intro; Measurement and units	1-1 to 1-5
Tue Jan 29		Motion in one dimension	2-1, 2-2
Thu Jan 31		Solving problems with acceleration	2-3, 2-4
Fri Feb 1		Vectors and coordinate systems	1-6, 1-7
Mon Feb 4	HW 1	Motion in two and three dimensions	3-1, 3-2
Tue Feb 5		Circular motion	3-3
Thu Feb 7		Newton's first and second laws	4-1, 4-2, 4-3
Fri Feb 8	HW 2	Various forces	4-4, 4-5
Mon Feb 11		Solving problems with forces	4-6
Tue Feb 12		Newton's third law	4-7, 4-8
Thu Feb 14		Center of mass	5-5
Fri Feb 15	HW 3	Review	
Mon Feb 18		**Exam 1**	
Tue Feb 19		Friction and drag	5-1, 5-2
Thu Feb 21		Solving problems with curved paths	5-3
Fri Feb 22		Solving problems with time-varying forces	5-4
Mon Feb 25		Energy and work	6-1, 6-2
Tue Feb 26	HW 4	Dot products, work, and power	6-3, 6-4
Thu Feb 28		Potential energy	7-1
Fri Feb 29		Conservation of energy	7-2, 7-3
Mon Mar 3		Quantization of energy	7-5
Tue Mar 4		Systems; Solving problems with collisions	8-1, 8-2, 8-3
Thu Mar 6	HW 5	Reference frames	8-4
Fri Mar 7		Relativity	R-1 to R-4
Mon Mar 10		Relativity of Simultaneity tutorial	R-5
Tue Mar 11		Relativistic momentum, energy, and particles	R-6
Thu Mar 13	HW 6	Review	
Fri Mar 14		**Exam 2**	
Spring Break: March 17-21			
Mon Mar 24		Rotational kinematics	9-1, 9-2
Tue Mar 25		Moment of inertia	9-3, 9-4
Thu Mar 27		Solving problems with torque and rotation	9-5
Fri Mar 28		Torque and rolling objects	9-6
Mon Mar 31	HW 7	The vector nature of rotation	10-1
Tue Apr 1		Angular momentum and torque	10-2
Thu Apr 3		Gyroscopes	10-2
Fri Apr 4		Conservation of angular momentum	10-3
Mon Apr 7	HW 8	Quantization of ang. mom.; Static equilibrium	10-4, 12-1, 12-2
Tue Apr 8		Solving problems with static equilibrium	12-3, 12-4
Thu Apr 10		Elasticity	12-7

Fri Apr 11		Problem-solving workshop	
Mon Apr 14	HW 9	Review	
Tue Apr 15		**Exam 3**	
Thu Apr 17		Gravitational force and potential energy	11-2 (part), 11-3
Fri Apr 18		Gravitational fields and tides	11-4
Mon Apr 21		Exam 3 solutions	
Tue Apr 22		Kepler's Laws and Orbital Mechanics	11-1, 11-2 (rest)
Thu Apr 24	HW 10	Density and pressure in fluids	13-1, 13-2
Fri Apr 25		Buoyancy	13-3
Mon Apr 28		Fluids in motion	13-4
Tue Apr 29		Simple Harmonic Motion	14-1, 14-2
Thu May 1		Pendulums	14-3
Fri May 2	HW 11	Damped, driven oscillations	14-4
Mon May 5		Temperature, heat, and thermal equilibrium	17-1
Tue May 6		Thermometers and refrigerators	17-2
Thu May 8		The ideal gas law	17-3
Fri May 9	HW 12	The kinetic theory of gases	17-4
Mon May 12		Review – first half of the course	
Tue May 13		Review – rest of the course	
Date/time TBA		**Final exam**	