

Physics 200B: Mechanics and Waves

Fall 2008

Instructor: Elizabeth George, Science 308B, 327-7854, egeorge@wittenberg.edu

Office hours: See schedule on my door and online, or by arrangement
Physics tutors will also be available— an announcement of specific times will be made soon.

Class meets 10:20-11:20 am MWF, KSC 319; Lab meets in KSC 313

Course Web page: <http://userpages.wittenberg.edu/egeorge/Phys200.html>

WebAssign page: <http://www.webassign.net/>

Wittenberg Catalog Course Description: The study of classical mechanics and waves. Topics include kinematics (the description of motion), dynamics (forces and Newton's laws), work and energy, impulse and momentum, statics, rotational motion, and waves. There will be 3 class meetings and one 3-hour lab each week. This is the first course in various introductory physics sequences designed for science majors and pre-health students.

Required course materials:

Textbook: *Physics for Scientists and Engineers, vol. 1*, Serway and Beichner, 7th ed., with WebAssign access card (comes with new textbooks; available at the bookstore or online for those not purchasing new texts)

Other materials: you will need a scientific calculator.

Grading policy:	4 exams	48 %
	final exam	17 %
	laboratory work	20 %
	quizzes	3%
	assignments	<u>12 %</u>
	TOTAL	100%

Letter grades will be assigned according to the percentage of possible points you have accumulated at the end of the semester. You are guaranteed that the divisions between grades will be no higher than the following: $90\% \leq A \leq 100\%$, $80\% \leq B < 90\%$, $70\% \leq C < 80\%$, $60\% \leq D < 70\%$, $F < 60\%$. Scores within 3 points of a boundary will receive a + or – grade. In borderline cases, attendance, class participation, and trend in exam scores will be used to decide whether to award the higher grade. Exception to above scheme: the overall course grade will be lowered by one grade step (+/-) for each lab that is missed and not made up.

Exams: Exams will cover material from the readings, assignments, and in-class work, including labs. The exams will include quantitative questions that require calculations as well as qualitative (conceptual) questions. If it is acceptable to the entire class, exams may be given during the evening. Let me know ahead of time if you have a legitimate conflict with a scheduled exam so a makeup exam can be arranged. (“Legitimate conflict” means a University-sanctioned event or other unavoidable and documented event.) If you miss an exam, you must contact me as soon as possible (leave a message or send email, if I’m not in), and then bring in documentation of the reason for missing the exam when you return to class.

Assignments: Your assignment grade will be based on homework problems and questions as well as occasional in-class activities. You are encouraged to work with each other, but the work you turn in must reflect your own understanding and not be simply copied from someone else. No late homework will be accepted except by special arrangement with me. There will be no makeup opportunities for in-class activities except in the case of a documented excused absence. The two lowest scores on assignments will be dropped.

Quizzes: There will be a short quiz at the beginning of class every Friday in weeks in which there isn't an exam. Quiz questions will focus on concepts and on the meaning of equations. There will be no makeup opportunities for quizzes, except in the case of a documented and excused absence. The lowest quiz score will be dropped.

Laboratory: The purpose of lab in this course is not primarily to teach you specific techniques but to give everyone experience with physical phenomena and help understand physics concepts. It is therefore very important to not miss labs, and if they are missed, to make them up as soon as possible. Grades in the lab will be based on prelab assignments, work in the lab, and lab homework.

Friendly advice: Physics isn't something you learn primarily by reading and memorizing; the way to learn physics is to do it! Read the text with pencil in hand to jot down notes and questions, and try the quick quizzes and examples. Ask questions in class. Work as many examples and problems as you can. You should approach the study of physics as you would approach playing a sport or a musical instrument--you need to keep actively working and practicing. You should spend 2-3 hours working outside of class for every hour you spend in class.

Disabilities: If you have a documented disability and need to arrange reasonable accommodations, please let me know as soon as possible. Retroactive accommodations will not be given. Please contact Melinda Finkle, Academic Coordinator, mfinkle@wittenberg.edu, 327-7924, Room 203 Recitation Hall, to coordinate accommodations and receive self-identification letters for each professor.

Academic Integrity: Responsible learners and researchers uphold high standards of integrity. Therefore, all exams and certain assignments will carry the Wittenberg Honor Statement:

"I affirm that my work upholds the highest standards of honesty and academic integrity at Wittenberg, and that I have neither given nor received any unauthorized assistance."

I expect that you will be able to affirm this statement for each of these exams and assignments.

We'll talk about standards for academic integrity as we go along. For general information, see <http://www4.wittenberg.edu/academics/academicintegrity/>. Most important: please ask if anything isn't clear.

Tentative Schedule:

week of	Monday	Wednesday	Lab	Friday
Aug. 25	Introduction	Physics & Measurement sections 1.1-1.6	Introduction to Motion and Error Analysis	Displacement, velocity, speed 2.1-2.3
Sept. 1	Acceleration 2.4-2.5	Constant acceleration model 2.6	Changing Motion	1D motion 2.6-2.8
Sept. 8	Vectors 3.1-3.4	Vector components, 2D motion 4.1-4.3	Two-dimensional motion	Circular motion 4.4-4.5
Sept. 15	Relative motion 4.6	Review; Force 5.1	Force and motion	EXAM 1 (Ch. 1-4)
Sept. 22	Force and Newton's first and second laws 5.2-5.4	Gravity, weight 5.5, 13.1-13.2	Newton's second law	Applications of Newton's Laws 5.6-5.7
Sept. 29	Friction 5.8	Forces and circular motion 6.1-6.2	Gravitational forces, passive forces	Accelerated frames, resistive forces 6.3-6.4
Oct. 6	Work 7.1-7.4	Kinetic and potential energy 7.5-7.9	Work and energy	EXAM 2 (Ch. 5-7, 13.1-13.2)
Oct. 13	Conservation of energy 8.1-8.2	Energy and friction 8.3	Conservation of energy	Changes in energy; power 8.4-8.5, 8.8
Oct. 20	FALL BREAK	Impulse and momentum 9.1-9.2	Momentum and impulse	Collisions in one and two dimensions 9.3-9.4
Oct. 27	Center of mass 9.5-9.8	Rotational motion 10.1-10.3	2D collisions	Rotational energy, moment of inertia 10.4-10.5
Nov. 3	Torque 10.6-10.7	Analyzing rotational motion 10.8-10.9	Rotational motion	Vector product, angular momentum 11.1-11.3
Nov. 10	EXAM 3 (Ch. 8-10)	Conservation of angular momentum 11.4	Makeup labs	Planetary motion 13.3-13.6
Nov. 17	Static equilibrium 12.1-12.3	Elastic properties of solids 12.4	Statics	Simple harmonic motion 15.1-15.2
Nov. 24	Energy of oscillation; the pendulum 15.3-15.5	THANKSGIVING BREAK	THANKSGIVING BREAK	THANKSGIVING BREAK
Dec. 1	Wave motion 16.1-16.4	Sound 17.1-17.4	Oscillatory motion	EXAM 4 (Ch. 11-12, 13.3-13.6, 16-17)
Dec. 8	Superposition and standing waves 18.1-18.3	Resonance 18.4-18.5	Waves	Review

FINAL EXAM (Ch 18 + comprehensive): Wednesday, December 17, 8-11 a.m.