

2014

PHYS-113-01 Fundamentals of Physics I

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Instructor:	Professor Bradley <i>office:</i> Sanders Physics 202 <i>e-mail:</i> dabradley@vassar.edu <i>office hours:</i> M 3:00 pm – 4:00 pm; R 12:30 pm – 1:30 pm; R 3:00 pm – 4:00 pm; or by appointment (e-mail to schedule a time)
Time/Location:	M + W 10:30 am – 11:45 am; Sanders Physics 206
Required Text:	<i>Physics for Scientists and Engineers with Modern Physics, 3rd Ed.,</i> by Randall D. Knight
Corequisites:	MATH 121 or MATH 126/127 or equivalent
Course Outline:	This course explores the fundamentals of motion. Under this umbrella, we will focus on mechanics, dynamics, conservation laws, oscillations, and fluids. A beginning knowledge of calculus is required to successfully complete the course. You are encouraged to actively participate in the course. Below is a tentative course schedule with reading assignments for each unit. You should read the sections of the text listed in the schedule both <i>before and after</i> the associated class meetings to gain a firm grasp of the material. This course will require hard work (expect 10-15 hours per week including class meetings, labs, reading, and homework) and, hopefully, you will have fun and learn a lot along the way!
Course Objectives:	Upon successful completion of this course, you will have developed: <ul style="list-style-type: none">• a solid understanding of motion physics fundamentals• analytic skills necessary for approaching introductory physics problems, and the ability to design creative solutions to these problems• effective scientific communication skills in oral, graphic, and written contexts• an increased ability to work as a valuable member of a group
Course Structure:	The structure of this course is different from typical science and math courses in high school and college. This course is designed to support an active learning environment. <i>Active learning; what's that?</i> Active learning requires that you engage with the material on a deep level. This level of learning includes participating in class activities, studying (<i>not just skimming</i>) the text, and completing assignments in a timely manner. Class time will be spent actively engaged in doing/thinking/talking physics. There will be peer interaction and immediate feedback will be provided on your work and facility with the subject matter to help you identify areas of personal strength and areas for improvement. You must complete the reading to be successful in the course. If you thoughtfully prepare for class, and engage during class time, you will gain a greater understanding of the material and will excel in the subject.

- Course Website:** This syllabus, announcements, and other class materials will be made available through moodle.vassar.edu.
- Physics Mentors:** A specially trained student will serve as Physics Mentor (PM) for this course. This person will lead weekly review sessions to help reinforce concepts from the course and facilitate learning. Attendance at PM review sessions is voluntary but highly encouraged. Students often report that regular attendance at these sessions helps them retain and understand concepts better, develop good study habits, and perform well on exams. The designated PM for this course is **Steffi Muhanji** <stmuhanji@vassar.edu>; the review session schedule will be posted in the building during the second week of class.
- Peer Tutoring:** The tutoring program is **designed for all students**. You should use the tutoring service when you **first start to have difficulty with the homework**. Peer tutoring for this class will be available in the Quantitative Reasoning Center (QRC/Q-Center), located in the Main Library, Room 124. Here, you can meet individually or in groups with Quantitative Tutors (Q-Tutors) who are trained to help students with strategies in quantitative learning/reasoning. The Q-Tutors can help you with homework for this physics course, as well as introductory courses in Biology, Chemistry, Math, Psychology, and Economics. The Q-tutor schedule can be found at ltrc.vassar.edu/qrc/qcenterschedules.html
- Coursework:**
- Quizzes: Quizzes will be given on an intermittent basis. These quizzes may be announced or unannounced (i.e. pop-quizzes). The quizzes are designed to test your ongoing knowledge of the course material, and to encourage you to be actively engaged in the course. Since the nature of quizzes will be interactive, and immediate feedback will be provided, *absolutely no allowances* will be made for missing a quiz, inclusive of athletic and medical absences. However, to compensate for this policy, the weighted contribution of your quiz score to the final grade is relatively small, and your lowest quiz score will be dropped from the calculation of your final grade.
- Participation: Successful participation in this class will require you to *actively engage* with your peers, the instructor, and with the material, both in and out of the classroom. You must be on-time and present in class to actively participate. For each class period, you should be prepared to ask questions and discuss the lectures, reading, and homework assignments. Opportunities for participation will include surveys, working problems on the board in class, providing thoughtful questions and comments during class discussion, answering questions posed by the instructor, and attending tutoring, PM sessions, and office hours.
- Labs: The lab is an essential part of the course. Lab is taught by a separate lab instructor who will provide your grade for that component of the course. The lab will be explained in more detail at the first meeting of your lab section. All questions regarding the lab should be presented directly to the lab instructor.

Exams: There will be two 75-minute, in-class midterm exams, and one regularly scheduled 2-hour final exam. Further information will be provided before the exam dates. You are encouraged to bring a calculator to the exam sessions.

Homework: Homework assignments will be given on a regular basis. The homework assignments in this course will utilize a combination of written assignments and the on-line *MasteringPhysics* system. Further information regarding the *MasteringPhysics* system will be given in class. All work must be turned in by the beginning of the class period on the due date. Late work will be deducted by 20%, no exceptions, and no work will be accepted after 24 hours beyond the deadline (0% of the score will be awarded).

Grading Policies: There are several categories of graded material in this course, weighted as shown below. The final grade for this course will be determined from these weighted categories. You may discuss an assignment grade up to one week after it has been returned; after one week, the score will not be changed. The guidelines for acceptance and grading of coursework may be modified if you have extraordinary circumstances; in this case, discuss the appropriate strategy for meeting the requirements with the Dean of Studies office and the instructor.

Category	Percentage
Labs	6%
Quizzes	6%
Homework	10%
Participation	16%
Midterm Exam I	16%
Midterm Exam II	16%
Final Exam	30%

Academic Honesty: You are encouraged to study and discuss class concepts with your classmates. Working with a group can be beneficial to your understanding of the course material. However, you should refrain from claiming someone else's work as your own. All violations of academic honesty, such as cheating or plagiarism, may result in a 0% for the assignment or a failing grade in the course, and will be handled according to the rules and regulations set forth by Vassar College.

Support Services: Academic accommodations are available for students who are registered with the Office of Accessibility and Educational Opportunity (AEO). **Students in need of accommodations must schedule an appointment with the instructor early in the semester** to discuss accommodations that have been approved by the Office of AEO, as indicated in your accommodation letter. The AEO office will proctor exams and provide any other time and equipment accommodations that may be needed. AEO exams will not take place during the in-class session. To access these accommodations, you are responsible for contacting the AEO office at least *one week in advance* of each exam date to request their services.

Course Schedule:

Unit	Date	Topic	Reading Assignment
0	09.03	Course Structure + Introduction	pp. xv-xix, xxix-xxxi, + 1, + syllabus!!!
1	09.08	Motion	Ch. 1
2	09.10	Vectors + 1-D Kinematics	Sec. 3.1-3.2 + Ch. 2
	09.15		
3	09.17	2-D Kinematics	Sec. 4.1-4.4 + Sec. 3.3-3.4
	09.22		
4	09.24	*Force + Dynamics I	Sec. 5.1-5.7, + 6.1-6.5
	09.29		
5	10.01	Newton's Third Law	Ch. 7
	10.06	In-Class Midterm Exam I (units 0-5)	
6	10.08	Dynamics II	Sec. 4.5-4.6 + 8.1-8.5 + pp. 216-217
	10.13		
7a	10.15	Impulse + Momentum I	pg. 219 + Sec. 9.1-9.6
	10.20	<i>October Break! (no class)</i>	
	10.22	<i>October Break! (no class)</i>	
7b	10.27	Impulse + Momentum II	Review Sec. 9.1- 9.6
	10.29	<i>Acoustical Society of America Conference (no class)</i>	
8	11.03	*Energy + Work	Sec. 10.1-10.5, 11.1-11.4, + 11.8-11.9
	11.05		
9	11.10	Rotation	Sec. 12.1-12.5 + 12.10-12.11
	11.12		
	11.17	In-Class Midterm Exam II (units 0-9)	
10	11.19	Oscillations	Ch. 14
	11.24		
	11.26		
11	12.01	Fluids	Sec. 15.1-15.5
	12.03		
	12.08	Review	
	12.10	<i>This is a "Friday" (no class)</i>	
	TBD	Final Exam (units 0-11)	

*long reading assignment