Physics 10A
Summer Session I 2021
Mon, Tue, Wed, Thurs. 7pm-9pm, online

Instructor: Richard J. Williams, Ph.D.
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Office Hours: by appointment only
Location: https://brandeis.zoom.us/j/97719770509

Required Text: *College Physics,* Openstax College, ISBN 9781938168000
https://openstax.org/details/books/college-physics (free online)

Course Description

The goal of this course is to provide students with a basic understanding of the fundamentals of Newtonian Mechanics. Using Algebra based analytical techniques students will begin with the question of how objects move by studying Kinematics in one and two dimensions. Next, students will ask the question of why objects move by studying Newton's laws of motion. Through careful manipulation of Newton's second law students will explore the concepts of Work, Energy, and Energy conservation as well as the principles of momentum and collisions. Finally, students will apply the principles they have learned to statics, rotational dynamics, and Fluid Mechanics.

Students will learn how to apply Newtonian mechanics to solve problems. This provides a basis for understanding all other topics in physics because most theories draw on some of the fundamental concepts such as velocity, acceleration, force, momentum, and energy that are introduced here. Students will also learn how physics, as a discipline, asks questions about the natural world.

Course Format

Lectures: Each class period will consist of a lecture supplemented with class discussions, practice problems, and demonstrations. It is important for the student to read the chapter under discussion prior to the lecture in order for meaningful class discussions and the ability to answer student questions. Please come to class with questions when you have them. Example problems will be worked out during class and some problems will be assigned to the class to discuss and solve either individually or as a group. Lectures will be recorded and posted. This allows for students to re-watch the lectures and for absent students to get caught up. Students are not required to have their webcams on during lecture should they decide not to, however it is encouraged to help build community.

Exams: Exams will be administered during the first hour of the lecture period on the scheduled exam day. Students are required to keep their webcams and audio on during this time. The exam is to be emailed to the instructor immediately upon

completion. The final exam will be given on the final day of class. Students will have the full two (2) hours to complete the exam. The final is to be submitted immediately after the last class. There will be no makeup exams for students who miss the exam. In the case of illness, family emergency, etc. arrangements must be made with the instructor prior to the exam. If this is not possible, arrangements must be made before the graded exams are returned.

Homework: There will be six (6) homework assignments and each will cover two chapters. They will be assigned the day of the lecture covering the first chapter and are due the day the next homework is assigned. Homework assignments will consist of a variety of problems covering the chapters for which they are assigned. No late homework will be accepted.

Labs/Activities: There will be six (6) lab activities. The lab activities are entirely online, and consist of python demonstrations. Instructions will be provided for each lab activity and the appropriate link to the demonstration. No coding knowledge is required of the student and the only software is needed is a web browser and a spreadsheet program (such as excel, google sheets, etc.). No late lab activity will be accepted.

Quizzes: Twelve (12) short quizzes, ranging from 10 – 20 minutes, will be given at the beginning of the lecture period upon starting a new chapter. The quizzes will consist of multiple-choice questions covering the readings. To be successful, students must read the chapter prior to the lecture. The focus of the quizzes is to gauge the student's understanding of the concepts being discussed. Makeup quizzes will not be given, and the lowest two quiz grades will be dropped.

Video Assessments: There will be six (6) video assessments. Students will have the choice of four (4) problems to complete for each assessment. Students will make a short video, no longer than five (5) minutes discussing the physics principles involved in their chosen question. The student may make and use any diagrams or props to help illustrate their ideas. Students may also get feedback from one (1) other student prior to submitting the assessment, in order to make improvements. However, the student giving feedback must not be doing the same problem for their assessment. No late video assessments will be accepted.

Students with disabilities

If you are a student who needs academic accommodations because of a documented disability you should contact me and present your letter of accommodation as soon as possible. If you have questions about documenting a disability or requesting academic accommodations you should contact Student Accessibility Support at http://www.brandeis.edu/accessibility/. Letters of accommodations should be presented at the start of the semester to ensure provision of accommodations. Accommodations cannot be granted retroactively.

Academic Integrity:

You are expected to follow the University's policy on academic integrity, which is distributed annually as Section 4 of the Rights and Responsibilities Handbook (see http://www.brandeis.edu/studentaffairs/srcs/rr/index.html). Instances of alleged dishonesty will be forwarded to the Department of Student Development and Conduct for possible referral to the Student Judicial System. Potential sanctions include failure in the course and suspension from the University. You are encouraged to work with your classmates, however you agree that all submitted work is your own. If you have any questions about how these policies apply to your conduct in this course, please ask.

Grading Policy

Grades will be based on 10% Quizzes, 10% Homework Assignments, 10% Lab Activities, 10% Video Assessments, 20 % Exam 1, 20% Exam 2, and 20% Final Exam

The grade breakdown is as follows:

A 92.5% - 100%
A- 90% - 92.49%
B+ 87.5% - 89.99%
B 82.5% - 87.49%
B- 80% - 82.49%
C+ 77.5% - 79.99%
C 72.5% - 77.49%
C- 70% - 72.49%
D 60% - 69.99%
F Below 60%

Course Schedule

Date	Lecture/Chapter	Quiz/Exam	Assigned	Due
Tu June 01	Chapter 1	Quiz 1	HWK1 (Ch. 1,2) VA 1	
W June 02	Chapter 2	Quiz 2		
Th June 03	Chapter 2		Lab 1	
M June 07	Chapter 3	Quiz 3	HWK 2 (Ch. 3,4) VA2	HWK 1 VA1
Tu June 08	Chapter 3		Lab 2	Lab 1
W June 09	Chapter 4	**Exam 1 (Ch. 1,2,3)**		
Th June 10	Chapter 4	Quiz 4	Lab 3	Lab 2
M June 14	Chapter 5	Quiz 5	HWK 3 (Ch. 5,6) VA3	HWK 2 VA2
Tu June 15	Chapter 6	Quiz 6	Lab 4	Lab 3

W June 16	Chapter 6			
Th June 17	Chapter 7	Quiz 7	HWK 4 (Ch. 7,8) VA4	HWK 3
M June 21	Chapter 7		Lab 5	Lab 4
Tu June 22	Chapter 8	**Exam 2 (Ch. 4,5,6,7)**		Lab 5
W June 23	Chapter 8	Quiz 8	Lab 6	
Th June 24	Chapter 9	Quiz 9	HWK 5 (Ch. 9,10) VA5	HWK 4 VA3
M June 28	Chapter 10	Quiz 10		
Tu June 29	Chapter 11	Quiz 11	HWK 6 (Ch. 11,12) VA6	HWK 5 VA5
W June 30	Chapter 12	Quiz 12		Lab 6
Th July 1	**REVIEW**			HWK 6 VA6
F July 2	**Final Exam (Ch. 8,9,10,11,12)**			