

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

Instructor: Richard J. Williams, Ph.D.

Instructor Email: richardwilliams@brandeis.edu

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 waves, optics, and electricity and magnetism. Using algebraic techniques students will begin with an application of Newtonian mechanics called periodic motion. The concept of periodic motion will be expanded into the more general concept of wave mechanics. Wave mechanics will be used to study optics and the empirical nature of light. In the second half of the semester, students will study the classical theory of electricity and magnetism. The concept of electric and magnetic fields will be developed and shown to be the preferred conceptual tool for understanding the motion of charged objects. With the theory of electric and magnetic fields students will be able to understand real world systems such as electric circuits and gain a deeper understanding of light as an electromagnetic wave.

Students will learn how to apply these concepts to solve problems. Because waves, optics, and electricity and magnetism are a classical theory students will apply the fundamentals of Newtonian Mechanics in order to understand these new concepts. 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 five (5) 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.

Quizzes: Nine (9) short quizzes, ranging from 10 – 20 minutes, will be given at the beginning of the lecture period upon starting a new chapter or as a take home assignment at the discretion of the instructor. 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 quiz grade will be dropped.

Video Assessments: There will be six (5) 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, 15% Video Assessments, 15% Homework Assignments, 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 July 06	Chapter 18	Quiz 1	HWK1 (Ch. 18,19)	
W July 07	Chapter 18		VA1	
Th July 08	Chapter 19	Quiz 2		
M July 12	Chapter 19			
Tu July 13	Chapter 20	Quiz 3	HWK 2 (Ch. 20,21)	HWK 1
W July 14	Chapter 20		VA2	VA1
Th July 15	Chapter 21	Exam 1 (Ch. 18,19,20)		
M July 19	Chapter 21	Quiz 4		
Tu July 20	Chapter 22	Quiz 5	HWK 3 (Ch. 22,23)	HWK 2
W July 21	Chapter 22		VA3	VA2
Th July 22	Chapter 23	Quiz 6		
M July 26	Chapter 23			
Tu July 27	Chapter 24	Exam 2 (Ch. 21,22,23)	HWK 4 (Ch. 24,25)	HWK 3

W July 28	Chapter 24	Quiz 7	VA4	VA3
Th July 29	Chapter 25	Quiz 8		
M August 02	Chapter 25		VA5	VA4
Tu August 03	Chapter 27	Quiz 9	HWK 5 (Ch. 27)	HWK 4
W August 04	Chapter 27			
Th August 05	REVIEW			HWK 5 VA5
F August 06	Final Exam (Ch. 24,25,27)			