Special Relativity and Waves (171.201/171.207), fall 2012

1. Overview.

Special Relativity and Waves is the third course in the four-semester introductory sequence for physics majors. The course is divided into two parts. In the first three-four weeks we study the theory of special relativity (this is where 171.207 course ends after the first midterm and relevant homework). The rest of the semester is devoted to the physics of waves (for those who take the full course 171.201). The course builds upon the background in classical mechanics and electromagnetism, and precedes the full development of quantum physics. The course is calculus-based and includes extensive use of differential equations, complex numbers and matrices.

2. Laboratory.

This course has a new laboratory component this year. The Thursday sections will be either laboratory exercises or problem discussions. The discussion sections have the standard duration of 0h50min, but 1h30min is allocated for the laboratory exercises. The schedule of regular sections vs laboratory sections is tentative.

3. Lecture schedule

Instructor: Prof. Nadia Zakamska
Lectures: Tue/ Thur, 10:30-11:45 am (some exceptions possible), Bloomberg 361
Your section leaders are your first stop for all questions regarding the class. If after that you still need to see the instructor, please email for an appointment (on Tue between 2:00pm and 3:00pm in Bloomberg 507).

4. Section schedule:

Section 1: Edwin Chan, Bloomberg 478, Thur 1:30-3:00 pm lab days, Thur 1:30-2:20 pm section days, office hours Fri 1:00-3:00 pm Bloomberg 478, email: chchan(at)pha.jhu.edu
Section 2: Kevin Grizzard, Bloomberg 478, Thur 3:00-4:30 pm lab days, Thur 3:00-3:50 pm section days, office hours Fri 3:00-5:00 pm Bloomberg 478, email: kgrizz(at)pha.jhu.edu

5. Grades

40% homework assignments and lab reports (due every Tuesday in class)
30% midterms (midterm 1 on Oct 2, Tue; midterm 2 on Nov 6, Tue; tentative)
30% final exam (Dec 21, Fri, 2pm-5pm, Bloomberg 361, tentative)

6. Website

http://www.pha.jhu.edu/~zakamska/FALL2012/index.html
7. Textbooks

Main textbook for the Special Relativity part: “Introduction to Special Relativity”
Author: Robert Resnick
Published: John Wiley and Sons

Main textbook for Waves class:
http://www.people.fas.harvard.edu/~djmorin/book.html (scroll down, the Waves chapters are below “Classical mechanics”) [Used with permission from Prof. Morin]

Other helpful textbooks are
“Vibrations and Waves” (The MIT introductory series) by A.P.French (published by W.W.Norton & Company)
“The physics of vibrations and waves” by H.J.Pain (published by John Wiley and Sons)

8. Academic integrity and grading policy

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

In addition, the specific ethics guidelines for this course are:

- Homework (and lab report) is your individual assignment and direct use of work by others (whether or not they are also in the class) is not allowed.
- A set of midterm and final exams from prior years which can be used for exam preparation will be distributed to the registered students electronically. Students are not allowed to distribute any class materials.
- Collaboration is encouraged in the section problem solving, during the experimental part of the laboratory exercises, and outside of class for discussion of ideas. Collaboration is not allowed in solving home assignments, in preparation of lab report, and during exams.
- One lowest homework grade will be dropped from the final tally. Late homework is accepted up to 48 hours late with 50% penalty if your TA accepts. You must complete the lab in order to submit the lab report (TAs take lab attendance). Labs can be made up only with the permission of the TA, and lab equipment may not be available beyond the Friday following the scheduled lab day.
- Students who require extra time for completing the assignments should provide written documentation and discuss arrangements with the instructor as soon as the situation is known.
- Report any violations you witness to the instructor. You may consult the associate dean of student affairs and/or the chairman of the Ethics Board beforehand. See the guide on “Academic Ethics for Undergraduates” and the Ethics Board Web site (http://ethics.jhu.edu) for more information.
9. Requirements for the lab

Some of the assignments will require the use of Mathematica. You can obtain a Mathematica license for your computer: [http://web.jhu.edu/announcements/students/targetpage.html?baid=34592](http://web.jhu.edu/announcements/students/targetpage.html?baid=34592). A limited number of computers with Mathematica is available in the PUC lab (Bloomberg 478), however it is preferable that you use your own. Mathematica is used in other classes on the physics track as well.

Waves and oscillations labs use a special software package: [https://jshare.johnshopkins.edu/swonnel/software/](https://jshare.johnshopkins.edu/swonnel/software/). Please log in with your JHED username and password, install the software on your laptop and bring your laptop with you to the labs in order to make the requisite measurements. Laptops are connected to the lab equipment via a USB cable which will be provided for you. A limited number of laptops with software are available for use exclusively in the labs. If you are in need of one, contact your TA no later than a week before the first lab.