PREREQUISITES: BE 401, 491

LECTURE: PHO 206 Alternate Mondays 9:05am-9:55am (see Calendar below)

LAB: BTEC
   (B2) Th12:30-3:15pm
   (B3) W6:30-9:15pm
   (B4) Th3:30-6:15pm
   (B5) M6:30-9:15pm

Instructor:
Prof. Jerome Mertz (jmertz@bu.edu) Lectures
   LSEB 202 Office hours: Mon 4:00-5:00pm
Prof. Aleks Zosuls (azosuls@bu.edu) Labs
   TBA Office hours: by appointment

Graduate Teaching Assistants:
Nate Blanke (nblanke@bu.edu) Groups B2a, B2b
   BTEC Office hours: Wed 5-6pm
Anup Tank (anuptank@bu.edu) Groups B3a, B3b
   BTEC Office hours: Tue 9-10am
Jack Kirsch (jrkirsch@bu.edu) Groups B4a, B4b
   BTEC Office hours: Fri 8am-9am
Tony Wu (kuan1031@bu.edu) Groups B5a, B5b
   BTEC Office hours: Thu 9am-10am

Office hours can also be arranged by appointment. It is preferable that you attend office hours of your assigned TA, though you may attend other office hours in the event of scheduling conflicts.

Description:
This is a laboratory course designed to develop basic instrumentation and analysis skills for physiological and biological measurements. Emphasis will be placed on techniques involving light and sound. There will be six labs in total, each preceded by an introductory lecture. You will be divided into groups, according to the lab section you signed up for. For example, if you signed up for section B2 scheduled for Thursdays 12:30-3:15pm, you will be assigned to one of two groups B2a or B2b. Group B2a will perform the lab on the same week as the lecture. Group B2b will perform the lab on the following week (note: the ordering switches after spring break). Lectures take place on alternating weeks. The scheduling is made clear in the calendar below.

A TA will be assigned to you based on your lab section. This TA is your go to person throughout the course, and is the first person you should contact if you have any questions or problems. TA’s will assist you throughout the labs. TA office hours are posted above.
**Expectations:**

You are expected to attend every lecture and perform every lab. Lecture slides and lab handouts will be made available on Blackboard. Lab handouts contain detailed instructions on how to perform each lab and how to complete each associated lab report. You are expected to read though the entirety of the lab handouts prior to starting each lab, concentrating on the in-lab portion of these handouts (i.e. the introduction, sections in italics and appendices). To ensure this, you will be given a brief quiz at the beginning of each lab to make sure you have understood the basic preliminaries both from the lab handout and from the lecture. In addition, each lab handout features a worksheet at the end. These must be completed and signed off by the TA before you leave the lab.

You will work in teams of two to perform each lab. Your TA’s will randomly assign your lab partner, which will change for each lab. Data may not be shared between teams unless the instructor has provided explicit and specific permission.

In the event that you cannot attend a lab for reasons of illness, etc., you must notify your TA in advance to reschedule to a different lab time (provided that the different lab time is not already full).

**Lab report:**

Lab reports are required for each lab. Though labs are performed in teams, lab reports should be written individually. The instructions for what to include in your lab report are provided in the lab handout. Follow these instructions to the letter! Include only what is highlighted in bold. The text in the lab reports should be kept brief and to the point (see sample report). In other words, there is no need for a long introduction, conclusion or description of methods. Answers to queries should be no longer than a few sentences.

The actual text in the reports should be typed, and, by itself, amount to no longer than a page. Interspersed within the text, you will be asked to include plots, figures, and MATLAB code. Make sure these are properly captioned, and that all axes and plot traces are properly labelled (with units!). Reports should be in black and white (please make sure plot traces are easily distinguishable). Regarding MATLAB code, the TAs can provide general guidance regarding concepts or MATLAB functions, but they will not review your specific code. Reports must be submitted in paper form in the submission box located in lab ERA209. They are due no later than one week after the lab, by the start time of the lab period the following week. For example, if your lab is on Wednesdays at 6:30pm, your reports are due no later than the following Wednesdays at 6:30pm. If they are received later than this, your grade will be discounted 10% for every 24-hour delay. Late labs must be dropped off in the submission box, but they must also be sent to your TA by email (the email will provide the time stamp).

Plagiarism will not be tolerated. In the event this is identified, the report will be assigned a zero grade and the College of Engineering Academic Conduct Committee will be notified.

**Grading:**

Lab reports: 70%
Prelab quizzes: 20%
Lab participation: 10%

This course will be graded on a curve.
- **Lecture 1: Spectroscopy I**  Jan 27 (M) 9:05am
  - Lab 1 -- Group B5a  Jan 27 (M) 6:30pm
  - Lab 1 -- Group B3a  Jan 29 (W) 6:30pm
  - Lab 1 -- Group B2a  Jan 30 (Th) 12:30pm
  - Lab 1 -- Group B4a  Jan 30 (Th) 3:30pm
  - Lab 1 -- Group B5b  Feb 3 (M) 6:30pm
  - Lab 1 -- Group B3b  Feb 5 (W) 6:30pm
  - Lab 1 -- Group B2b  Feb 6 (Th) 12:30pm
  - Lab 1 -- Group B4b  Feb 6 (Th) 3:30pm

- **Lecture 2: Spectroscopy II**  Feb 10 (M) 9:05am
  - Lab 2 -- Group B5a  Feb 10 (M) 6:30pm
  - Lab 2 -- Group B3a  Feb 12 (W) 6:30pm
  - Lab 2 -- Group B2a  Feb 13 (Th) 12:30pm
  - Lab 2 -- Group B4a  Feb 13 (Th) 3:30pm
  - Lab 2 -- Group B5b  Feb 18 (Tu) 6:30pm (*)
  - Lab 2 -- Group B3b  Feb 19 (W) 6:30pm
  - Lab 2 -- Group B2b  Feb 20 (Th) 12:30pm
  - Lab 2 -- Group B4b  Feb 20 (Th) 3:30pm

- **Lecture 3: Microscopy I**  Feb 24 (M) 9:05am
  - Lab 3 -- Group B5a  Feb 24 (M) 6:30pm
  - Lab 3 -- Group B3a  Feb 26 (W) 6:30pm
  - Lab 3 -- Group B2a  Feb 27 (Th) 12:30pm
  - Lab 3 -- Group B4a  Feb 27 (Th) 3:30pm
  - Lab 3 -- Group B5b  Mar 2 (M) 6:30pm
  - Lab 3 -- Group B3b  Mar 4 (W) 6:30pm
  - Lab 3 -- Group B2b  Mar 5 (Th) 12:30pm
  - Lab 3 -- Group B4b  Mar 5 (Th) 3:30pm

**SPRING BREAK**

- **Lecture 4: Microscopy II**  Mar 16 (M) 9:05am
  - Lab 4 -- Group B5b  Mar 16(M) 6:30pm
  - Lab 4 -- Group B3b  Mar 18 (W) 6:30pm
  - Lab 4 -- Group B2b  Mar 19(Th) 12:30pm
  - Lab 4 -- Group B4b  Mar 19(Th) 3:30pm
  - Lab 4 -- Group B5a  Mar 23(M) 6:30pm
  - Lab 4 -- Group B3a  Mar 25(W) 6:30pm
  - Lab 4 -- Group B2a  Mar 26(Th) 12:30pm
  - Lab 4 -- Group B4a  Mar 26(Th) 3:30pm
- **Lecture 5: Ultrasound I**
  - Lab 5 -- Group B5b
  - Lab 5 -- Group B3b
  - Lab 5 -- Group B2b
  - Lab 5 -- Group B4b
  - Lab 5 -- Group B5a
  - Lab 5 -- Group B3a
  - Lab 5 -- Group B2a
  - Lab 5 -- Group B4a

  **Mar 30 (M) 9:05am**
  - Mar 30 (M) 6:30pm
  - Apr 1 (W) 6:30pm
  - Apr 2 (Th) 12:30pm
  - Apr 2 (Th) 3:30pm
  - Apr 6 (M) 6:30pm
  - Apr 8 (W) 6:30pm
  - Apr 9 (Th) 12:30pm
  - Apr 9 (Th) 3:30pm

- **Lecture 6: Ultrasound II**
  - Lab 6 -- Group B5b
  - Lab 6 -- Group B3b
  - Lab 6 -- Group B2b
  - Lab 6 -- Group B4b
  - Lab 6 -- Group B5a
  - Lab 6 -- Group B3a
  - Lab 6 -- Group B2a
  - Lab 6 -- Group B4a

  **Apr 13 (M) 9:05am**
  - Apr 13 (M) 6:30pm
  - Apr 15 (W) 6:30pm
  - Apr 16 (Th) 12:30pm
  - Apr 16 (Th) 3:30pm
  - Apr 22 (W) 6:30pm (*)
  - Apr 29 (W) 6:30pm (*)
  - Apr 23 (Th) 12:30pm
  - Apr 23 (Th) 3:30pm

(*) Off-schedule because of holiday