

BME 385J (14352) Biomedical Micro- and Nanotechnology

Cross-listed as ChE 384 (14817)

Lecture Time: MWF 4 to 4:50 pm @ RLM 5.126

Instructors: Professor Tim Yeh (Hsin-Chih Yeh)

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Office hour: MW 5-6pm or by appointments (BME 5.202C)

Prerequisites:

Desire to learn, ability to take challenges and work alone, enjoy reading research articles and making comments, and common sense.

Course Objectives:

The main objective of the course is to introduce to students the broad impact of miniature technologies on all fields of science and engineering, while focusing on applications in biological and medical fields. Students will select a topic of their interest (potentially aligning with their own research projects) to make a presentation in class and write a review paper. Through these exercises students learn how to present an idea and how to search for and utilize cutting-edge techniques (especially those in different disciplines) in solving problems during their graduate studies.

Course Topics:

- Overview of micro- and nanotechnology
- Fundamentals of biochemistry and molecular biology techniques
- Micro- and nanofluidics, single-cell manipulation and analysis techniques
- Single-molecule detection techniques
- Nanobiosensors
- Nanomedicine

Textbooks:

Required: none

Supplemental/Optional:

1. Fundamentals of microfabrication, Madou, 2002
2. Nanomaterials handbook, Taylor and Francis, 2006
3. Nanobiotechnology, Niemeyer and Mirkin, 2004
4. Nanobiotechnology II, Mirkin and Niemeyer, 2007
5. Handbook of fluorescent probes and research products, Haugland, 2002
6. Single-molecule detection in solution methods and applications, Zander, Enderlein, and Keller, 2002
7. Nanomedicine, Freitas, 1999

Teaching Approach:

Students will attend 3 lectures per week. There will be 4 homework assignments, one oral presentation, and one review term paper. In addition, there will be 2 midterm exams.

Attendance Policy:

Attendance is suggested for lectures.

Grading and Evaluation:

Homework	25%
Midterm 1	15%
Midterm 2	15%
Presentation	20%
Review article	25%

Class Website:

All materials for the class will be distributed electronically via Blackboard (<http://courses.utexas.edu>). You will be responsible for checking the Blackboard course site regularly for class work and announcements.

Use of E-mail:

In this course, e-mail will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work and announcements. All students should become familiar with the University's official e-mail notification policy. It is the student's responsibility to keep the University informed as to changes in his or her e-mail address. Students are expected to check e-mail on a frequent and regular basis in order to stay current with University-related communications, recognizing that certain communications may be time-critical. It is recommended that e-mail be checked daily, but at a minimum, twice per week. The complete text of this policy and instructions for updating your e-mail address are available at <http://www.utexas.edu/its/policies/emailnotify.html>

Notice:

Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam the student should remind the instructor of any testing accommodations that will be needed. See website below for more information: <http://deanofstudents.utexas.edu/ssd/providing.php>