MCEN4228-006/5228-006 and MCDB4100-003/MCDB6440-002
Tuesdays and Thursdays ECCR 150 12:30-13:45
Molecular Biology and Micro/Nano-Scale Engineering
http://dosequis.colorado.edu/Courses/MicroNano/

Course Objectives: The purpose of this course is to provide you with an interdisciplinary introduction to state-of-the-art research and technology in small-scale engineering and molecular biology. Engineering students will learn molecular biology through lectures and design calculations. MCDB (and most of engineering students) will learn micro/nano-scale engineering through lectures and design calculations. More importantly, all students will learn synergistic integration of molecular biology and micro/nano-scale engineering through lectures and cross-disciplinary team projects.

Instructor:
Y. C. Lee, Mechanical Engineering, ECME 122, 303-492-3393, leeyc@colorado.edu.
Michael H. B. Stowell, MCD Biology, Porter B231, 303-735-2983, stowellm@colorado.edu.
Office Hours:
14:00 to 15:00, Thursdays (Y. C. Lee)
14:00 to 15:00, Tuesdays (Michael H. B. Stowell)
TA: An hourly grader will be hired to grade homework.
Textbook: No textbook. Supplementary reference books on Molecular Biology are reserved in the Engineering Library. They are: 1) Essential Cell Biology by Alberts et al.; 2) Molecular Biology by Weaver; and 3) Molecular Structurs in Biology by Diamond et al. An on-line Webbook can be found at http://www.web-books.com/MoBio/ . Free search for topics covered by an excellent textbook can be found at http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=mboc4.TOC&depth=2. All the lectures' Power Point slides will be posted on the class Web site before the lectures.

Semester Schedule

Dates	**Mostly Bio (Tuesday)**	**Mostly Micro Nano (Thursday)**
Jan 14 & 16	Introduction (YC)	Micro-Engineering 1 (YC)
Jan 21 & 23	Moc-Bio-1-Chemistry (MS)	Micro-Engineering 2 (YC)
Jan 28 & 30	Moc-Bio 2- Thermodynamics (MS)	Moc-Bio-3-Functions of Biomolecules (MS)
Feb 5 & 7	Micro-Engineering-3 (YC)	Guest Lectures
Feb 11 & 13	Moc-Bio-4-Mutations (MS)	Micro-Engineering 4 (YC)
Feb 18 & 20	Nano-Engineering-1 (YC)	Moc-Bio-5 Coordination in Cells (MS)
Feb 25 & 27	Moc-Bio-6-Manipulation of Biomolecules (MS)	Nano-Engineering-2 (YC)
Mar 4 & 6	Moc-Bio-6 Production and Purification (MS)	Nano-Engineering-3 (YC)
Mar 11 & 13	**MIDTERM REVIEW BIO**	**MIDTERM REVIEW MICRO-NANO**
Mar 18 & 20	**MIDTERM EXAM**	Independent Projects
Mar 25 & 27	**SPRING BREAK NO CLASS**	
Apr 1 & 3	Special Topic Moc-Bio (MS)	Project Definitions
Apr 8 & 10	Special Topic Moc-Bio (MS)	Special Topic Micro-Nano (YC)
Apr 15 & 17	Special Topic Moc-Bio (MS)	Special Topic Micro-Nano (YC)
Apr 22 & 24	Special Topic Moc-Bio (MS)	PROJECT PRESENTATIONS
Apr 29 & May 1	PROJECT PRESENTATIONS	Conclusion (YC)

Independent Project

The purpose of the team project is for engineering and MCD biology students to work together to propose new concepts that integrate micro/nano-scale engineering and molecular biology. For example, a) lab-on-a-chip systems for marker (DNA or proteins) detection or b) novel prototyping or manufacturing processes. The project is to be carried out by a team of 4 students having a mixed background of MCD biology and engineering. The teams will be assigned after the mid-term exam. Each team is expected to present its "project definition" on April 10. One of the instructors or invited faculty members will be assigned as the team advisor. The team will meet with the advisor once per week to discuss the project. By the end of the semester, each team will give an oral presentation to the class and submit a final written report. The format of the final report and the presentation evaluation criteria will be announced by April 10.

Grading

Homework	30%
Workshop Participation	5%
Midterm Exam	30%
Independent Project	35%

Course Policy and Important Information

1. Homework assignments, projects, and other important course related information will be distributed electronically through http://dosequis.colorado.edu/Courses/MicroNano/ and e-mail list. If you have not received any e-mail invitation to join micronanobio@yahoogroups.com, please send an e-mail to leeyc@colorado.edu.
2. You will be asked to complete homework assignments in this course. It is expected that you will abide by the University of Colorado at Boulder honor code at all times. Therefore, you may not plagiarize a problem set or allow another student to plagiarize your answers to a problem set. Examples of plagiarism include: copying from a solution manual, copying from Internet sites, copying from previous academic year homework sets, and copying directly from classmates. Helping one another, asking questions of one another, and working together, are not considered plagiarism! If you have any doubt that you are using sanctioned materials to assist with your homework solution, please ask your current instructor/professor. On assignments that require you to use supplemental materials, it is also essential that you document the sources of information.
3. Discriminatory and harassing behavior will not be tolerated. A safe and inclusive environment will be created and maintained by the students and faculty members. Students with concerns about discrimination or harassment should immediately contact the instructors, the Department Chair or their academic advisor, or contact the Office of Discrimination and Harassment.
4. If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see guidelines at http://www.colorado.edu/disabilityservices/go.cgi?select=temporary.html. Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please provide at least two weeks notice of occasions that conflict with course due dates, so that other arrangements can be made. See full details at http://www.colorado.edu/policies/fac_relig.html.