Required DEB courses

MCB 263

Course Title & Units: Biotechnology Fundamentals and Application (2)

Course Number & Quarter: MCB 263, Winter Quarter (II).

Course Goals: To teach and train graduate students who are interested in going into the biotechnology career track; to learn modern recombinant DNA technology, rate processes of biological systems, optimization of bioreactor performance, practical issues in biotechnology, and some specific case studies of the development of biotechnology products and processes.

Entry Level: Graduate students in good standing, mostly from the fields of biological science and chemical engineering. Prerequisites are BIS 101, BIS 102, and MIC 102.

Grading and Course Requirement: Letter grade; two one-hour exams, one research paper on a selected topic relevant to biotechnology, and regular reading assignments.

MCB 282

Course Title & Units: Biotechnology Internship (1-12)

Course Number & Quarter: MCB 282, I, II, III, Summer

Course Goals: The course will expose qualified graduate students to research activities in a biotechnology company, to company culture, to legal and business aspects of industry, and to another career option. This course will be offered in conjunction with the Designated Emphasis in Biotechnology Program.

Entry Level: Graduate students in good standing or consent of the instructor.

Grading and Course Requirement: S/U grading; research performance will be evaluated by the Professor in charge and in consultation with the company trainer.
MCB/ECH 294

**Course Title & Units:** Current Progress in Biotechnology (1)

**Course Number & Quarter:** MCB294, I, II, III. May be repeated.

**Course Goals:** To have graduate students who are interested in going into the biotechnology career track the opportunity to listen to lecturers from universities and companies speak about their research. Also the students will have an opportunity to discuss the seminar topic with the lecturers and to learn about biotechnology research activities at companies and to network with university and company personnel.

**Entry Level:** Graduate students in good standing or consent of the instructor.

**Grading and Course Requirement:** S/U grading; attendance is required; individual written reports on assessment of progress in biotechnology will be required. A summary report on the seminars is required at the end of the quarter.

MIC 292

**Course Title & Units:** “From Discovery to Product: An Introduction to Biotechnology at the Industrial Level” (1 unit)

**Instructor of Record:**
Judith A. Kjelstrom, PhD (microbiology)
Director, Biotechnology Program

**Lead Instructor:**
Debbie Yaver, PhD (microbiology)
Director
Novozymes, Inc.

**Course Goals:** This course is designed to provide a unique opportunity to gain insight into basic and applied biotechnology at the industrial level. A tour of the research facilities will be arranged. Lectures will be presented by senior scientists from Novozymes Biotech, Inc. ([http://www.novozymes.com/](http://www.novozymes.com/)) in Davis California.

**Entry Level:** Appropriate for graduate students in all areas of biology, engineering and agriculture, especially those in the Designated Emphasis in Biotechnology (DEB) Program. MIC 292 is an approved seminar elective for the DEB program. *This seminar series is open to the public.*
Required DEB Courses - Bioethics
(Students MUST complete one Ethics course)

ABG 401
Course Title & Units: Ethics and Professionalism in Animal Biology, 2 units
Course Number & Quarter: ABG 401, Spring Quarter
Course Goals: Case studies and discussion of ethical and professional issues for animal biologists, including the use of animals in research and teaching, patenting and intellectual property, consulting and conflict of interest, scientific integrity, dealing with the media, and mentoring relationships.

BIM 209
Course Title & Units: Scientific Integrity for Biomedical Engineers, 2 units
Course Number & Quarter: BIM 209, Spring Quarter
Course Goals: Scientific integrity and ethics for biomedical engineers with emphasis and discussion on mentoring, authorship and peer review, use of humans and animals in biomedical research, conflict of interest, intellectual property, genetic technology and scientific record keeping.

CLH 204/464 RCR
Course Title & Units: Responsible Conduct of Research, 3 units
Course Number & Quarter: CLH 204 / 464 RCR, Summer and Fall (depending on interest)
Course Goals: Topics studied include: avoiding and investigating research/scientific misconduct, use of human subjects in research, publication practices and responsible authorship, conflict of interest/commitment, intellectual property/technology transfer and industry collaborations/entrepreneurship, responsibilities in collaborative research, mentor/trainee responsibilities, the scientist and society, peer review/grant process, responsible data acquisition and data management.

ECL 290
Course Title & Units: Responsible Conduct of Research for Environmental Scientists, 2 units
Course Number & Quarter: ECL 290, Spring Quarter
Course Goals: Discuss issues in professional ethics with students in a seminar setting before you actually are confronted with them in real life. Led by Graduate Studies Associate Dean
(and ecologist) Ed Caswell Chen and Carol Hom with contributions from other faculty. Course topics will include statistics, data massaging and management, intellectual property, ownership, authorship, and money, manuscript reviewing, philosophical and practical considerations in mentor/mentee interactions, and the roles of scientists in society.

GGG 296

**Course Title & Units:** Scientific Professionalism and Integrity, 2 units

**Course Number & Quarter:** GGG 296, Fall Quarter

**Course Goals:** Review of basic skill required of contemporary scientists. Topics include scientific conduct, manuscript preparation, grant writing, seminar presentations, and time management. Emphasis on responsibilities of scientists to factually and thoughtfully communicate results.

PLP 298

**Course Title & Units:** Scientific Ethics in Biotech Research, 2 units

**Course Number & Quarter:** PLP 298, Winter Quarter

**Course Goals:** Discussion and case study presentations on scientific integrity, misuse of technology, fraud, objectivity, conflict of interest, peer review, communication, intellectual property, human and animal research protections. The term paper should focus on case studies/topics that illustrate the subject, describing relevant issues, potential problems, and suggested actions given the principles discussed.

PMI 250

**Course Title & Units:** Philosophy and Ethics of Biomedical Science, 1 unit

**Course Number & Quarter:** PMI 250, Spring Quarter

**Course Goals:** Presentations by faculty and guest speakers followed by discussions of relevant current events by graduate students.