

## **BIOE 108: Genetic Engineering**

### Required Textbook:

1. *An introduction to Genetic Engineering, Third Edition, Desmond S. T. Nicholl* (2008)
2. Assigned journal literatures

Lecture time and location: 3 Credits, CLASSRM 127

Professor: Chih-Wen Ni  
Office Hour: MW 3-4PM @ SE1 326  
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TA: N/A

### Overview/Course Description:

In this course, students will explore the molecular methods and applications of recombinant DNA technology and the issues regarding their use through case studies on the effect of genetic engineering on medicine, agriculture, biology, forensics and other areas of technology. The course has 3 major components: 1) techniques used in the generation of recombinant molecules, 2) application of recombinant technology to diagnostics and therapeutics and 3) genetically modified organisms. The discussion of potential ethic concerns of genome manipulations will also be included in the course.

### Course Objective/ Student Learning Outcome:

This course will provide students with the recent knowledge of genetic engineering. At the end of the course, a successful student will be able to

- 1.) understand and explain the concept of genetic engineering including the techniques, applications and limitations.
- 2.) demonstrate the ability to design recombinant molecules and apply information extracted from a variety of sources including journal articles, technical bulletins, product manuals, and drug information sheet to solve problems.
- 3.) apply learned knowledge to their future research.

Learning Outcomes will be assessed through exams, assignments, and classroom discussion

Program Learning outcomes:

The course relates to these following bioengineering program learning outcomes:

(a)	an ability to apply knowledge of mathematics, science, and engineering	M
(b)	an ability to design and conduct experiments, as well as to analyze and interpret data	H
(c)	an ability to design a system, component, or process to meet desired needs	
(d)	an ability to function on multi-disciplinary teams	
(e)	an ability to identify, formulate, and solve engineering problems	
(f)	an understanding of professional and ethical responsibility	L
(g)	an ability to communicate effectively	
(h)	a recognition of the need for broad education necessary to understand the impact of engineering solutions in a global and societal context	
(i)	a recognition of the need for, and an ability to engage in life-long learning	
(j)	a knowledge of contemporary issues	M
(k)	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	

H – High

M – Medium

L – Low

Prerequisites by Topic: BIO 002, CHEM 002 and CHEM 010

Course Policies:

**Grading:**

30 % Midterm exam

40 % Final exam

30 % Assignments, Classroom discussion

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100% Total

Academic Dishonesty Statement:

Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy.

Disability Statement:

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.