

BIO 6330
Principles and Applications of Biotechnology II
Winter 2020
Instructor: Dr. Miriam L. Greenberg

Time: Tuesday and Thursday
1:00 – 2:15 p.m.

Place: 0253 Manoogian

Instructor: Dr. Miriam L. Greenberg
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577-5202

Office hours: By appointment

Reading: No textbook is assigned. PDF's of articles from the literature will be posted on Canvas. In addition, useful textbooks include:
Weaver, Molecular Biology, 5th edition
Allison, Fundamental Molecular Biology, 2nd edition
Clark and Pazdernik, Molecular Biology, 2nd edition
Lodish et al., Molecular Cell Biology, 5th or 6th edition

It is not necessary to purchase these texts.

Class format:

The format of the class will be active learning through reading and class discussion, **not** through traditional lectures. Reading for each topic will be taken from book chapters and published papers. Classes will be devoted to analyzing the assigned readings. Students are expected to read assignments **before** class, and to be prepared to discuss the material from each assigned reading. Therefore, **attendance is mandatory**.

Anticipated learning outcomes:

- Familiarity with eukaryotic molecular methods, including:
 - sequence-directed mutagenesis, genome editing and manipulation of gene expression
 - methods for discovery of complex molecular interactions
 - strategies of genetic and chemical biology screens
- Ability to critically read and understand papers from the literature that incorporate these approaches.
- Ability to design experiments using these approaches to address important unanswered questions in eukaryotic biology.

Assignments:

A number of assignments will be given throughout the course, varying in point value for individual assignments, totaling 200 points.

Tests and grading

The course grade will be calculated based on four exams (100 points each) and several assignments (200 points) for a total of 600 points. Exams will be given on the dates listed below.

There will be no make-up exams except for medical emergencies, which must be documented by a physician.

Conflicts regarding the grading of exams or assignments must be resolved within one week of the return date. The exam or assignment in question must be returned along with a written statement explaining the concern.

Exam Dates:	Exam I	February 4
	Exam II	February 27
	Exam III	March 31
	FINAL EXAM	April 23

Grading Policy:

Final grades will be calculated using a distribution curve. After each exam, the class grade distribution will be given. At that time, tentative grade scales will be announced.

Cheating:

In the unlikely event that cheating occurs, a zero-tolerance policy will be enforced. Anyone caught cheating will automatically receive a failing grade for the class, and the student will be prosecuted in accordance with the guidelines of the WSU Policy on Academic Misconduct (<https://doso.wayne.edu/conduct/academic-misconduct>).

Individuals with disabilities:

WSU is committed to creating an accessible community in which students with disabilities have the opportunity to participate fully in the educational experience. If you have a documented disability that requires accommodations, please register with Student Disability Services located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services Department, phone no. 313 577-1851 or 313 577-3365 (TDD only). I will also be happy to meet with you privately to discuss your special needs.

Religious conflicts:

If you have a conflict with scheduled class or exam times due to religious holidays, you must notify me in writing during the first week of class.

Add/drop policy:

Add forms will not be signed after the second week of class. Withdrawals will be signed/approved in accordance with the policies and regulations of the University.

Unexpected University closures:

If the University is officially closed on an exam day, the exam will be held on the next regularly scheduled class day. Closure of the University is announced by the following mechanisms:

The University Newsline	313 577 5345
WSU Homepage	www.wayne.edu
WDET-FM	public radio station 101.9 FM
WSU emergency broadcast system	

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Class schedule

Session	Date	Topic
1	January 7 T	Course introduction; model organisms
2	January 9 Th	Introduction of DNA into eukaryotic cells
3	January 14 T	Targeted gene expression in yeast
4	January 16 Th	Targeted gene expression in yeast
5	January 21 T	Targeted gene modification in mice
6	January 23 Th	Targeted gene modification in mice
7	January 28 T	To be determined
8	January 30	To be determined
9	February 4 T	Exam I
10	February 6 Th	Genome editing – ZFNs
11	February 11 T	Genome editing - TALENS
12	February 13 Th	Genome editing - CRISPR
13	February 18 T	Protein-protein interactions
14	February 20 Th	Protein-protein interactions
15	February 25 T	Protein-protein interaction networks
16	February 27 Th	Exam II
17	March 3 T	Introduction to lipids; protein lipid interactions
18	March 5 Th	Protein-lipid interactions
	March 9-13	Spring Break
19	March 17 T	Protein-nucleic acid interactions
20	March 19 Th	Chemical biology
21	March 24 T	To be determined
22	March 26 Th	To be determined
23	March 31 T	Exam III
24	April 2 Th	Stem cells
25	April 7 T	Stem cells
26	April 9 Th	To be determined
27	April 14 T	Gene therapy
28	April 16 Th	Why science?
	April 23 Th	FINAL EXAM

Additional topics: Next generation sequencing, biophysical approaches, GWAS, personalized medicine, why science?