Biotechnology BIOL 304
Fall 2025, 2:00 – 3:15 pm
Newton 212

Instructor information
Dr. Jani Lewis
Office hours: ISC 354
Tuesday, 2 – 4 pm, Friday 8 – 10 am
And by appointment
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Course Description: This course explores the many aspects of Biotechnology using both background material and major advances in the various disciplines of biotechnology. The course utilizes a "Flipped classroom" design to develop participants' ability to become self-learners and educators.

Required Textbook: None.

Learning Objectives

Students who complete this course successfully will be able to:

- Explain to others what biotechnology and its current associated techniques are.
- Utilize basic analytical and synthesis skills by reading and understanding review papers and primary research articles.
- Utilize public speaking skills through class discussions, and through oral and poster presentations.
- Develop the ability to synthesize different sources of information in order to:
    - Present on a particular biotechnological development to the entire class.
    - Design and present a poster on a particular discipline of biotechnology.

Course design or how this course will run (note, it may be very different from any other science course you have taken thus far):

- This class is designed to have you, the learners, also become the educators. Some people describe the set up as a "flipped classroom" but it will have some elements of both a traditional and a flipped classroom set up. This is going to require you to do outside reading and watching of assigned videos **before** coming to class. There will be some questions to help guide you through the reading and videos.
- In class a worksheet will be handed out that you will do in groups assigned by your instructor. The worksheets will be due at the end of the class period, written in legible handwriting. There will be time to discuss the worksheets and, in fact, some of the questions will require discussion by the entire class.
- Each group will also be presenting on a specific development in biotechnology. It will be the responsibility of that group to make up the worksheet for their presentation. More on the presentation is addressed below.

- Attendance is a key element to making this system of learning work effectively. Therefore, attendance and participation will be a significant part of your grade. There is the possibility of pop quizzes, particularly if attendance drops significantly.

Group worksheets – 45 %
Oral Presentation (with Journal article assignments) (group) – 30%
Reflections (individual) – 10%
Poster Session (group) – 15 %
Quizzes (individual) – only if necessary* will be counted in with your group worksheets.

Grading
Grading Scale
The following scale will be used to calculate final grades. Student point totals or grading scheme maybe adjusted to reflect course difficulty or section differences (instructor's discretion).

A = 100-93%	A^- =92.9-90%	B^+= 89.9-87%	B = 86.9-83%
B -= 82.9-80%	C^+ = 79.9-77%	C = 76.9-73%	C- = 72.9-70%
D = 69.9-60%	F = 59-0%		

How To Get the Most out of this class.
- Take charge of your own learning.
- Practice "synthesis" reading. This means not just reading something straight through but taking notes and jotting down questions related to the reading. Include items that you find particularly interesting or confusing. Feel free to look up items that you might want to refer to while in class.
- **Come to class each week**.
- **Before** coming to class, watch the recommended videos that are posted for each week. Read over any articles that are also posted for that day's class discussion.
- Get help when necessary. Feel free to email me anytime and set up a meeting if you need any help. It is worthwhile to come to office hours even if you only have one question. Your one question might help other students who come to office hours at that time and vice versa. While there are no exams for this course you must make sure to demonstrate your participation in the course through group worksheets and class discussions. If you have issues with a group member you should come discuss this with me as soon as you notice something is not working. We can usually sort out differences and come to compromises together once the issues are identified.

Tentative Schedule /2025 (may change due to unforeseen circumstances)			
Date	**Topics**	**In class**	**Reading/video assignment**
8/25	**Introduction and what is Biotechnology**	**Wkst.#1**	https://time.com/5709241/open-insulin-project/
8/27	**Review of basic genetics needed for this course**	**Wkst.#2**	There is a preclass worksheet with videos that you should go

			through before coming to class on Wednesday.
9/01	Labor Day no class		
9/03	Recombinant DNA technology	Wkst#3	
9/08	Recombinant DNA technology and Amgen	Wkst#4 Presentation Paper on cloning of erythropoietin	Read over history of Amgen https://www-ext.amgen.com/about/amgen-history.
9/10	Microbial Biotech	Wkst#5	Background
9/15	Student presentation – Group 1	Wkst#6	Story of insulin and biotech.
9/17	Bioterrorism	Wkst#7	Case study
9/22	Antibodies and vaccines	Wkst#8	
9/24	Student presentation – Group 2	Wkst#9	Operation Warp speed
9/29	Plant Biotechnology	Wkst#10	What is plant biotechnology/GMO's
10/01	Genetic Engineering Techniques in plants	Wkst#11	Methods and Case study with RNAinterference
10/06	Student presentation – Group 3	Wkst#12	Selective breeding and Monsanto vs. the small farmer
10/08	Animal Biotechnology	Wkst#13	Animals as model systems for Biotechnology
10/13	Fall Break – no class		
10/15	Creating Dolly the sheep	Wkst#14	A major breakthrough and controversy.
10/20	Forensic Science	Wkst#15	DNA fingerprinting, PCR, STR analysis
10/22	Student presentation – Group 4	Wkst#16	Use in identification of deceased individuals (World Trade Center, Southern Asia tsunami)
10/27	Bioremediation	Wkst#17	Background and basics
10/29	The PCB dilemma and the Hudson River	Wkst#18	Case study
11/03	Aquatic Biotechnology	Wkst#19	Goals, benefits and practices
11/05	Student Presentation – Group 5	Wkst#20	Green genes and Anti-freeze proteins
11/10	Medical Biotechnology	Wkst#21	What is it and how is it currently employed in today's society
11/12	Utilizing Genetic Engineering in Sickle-Cell Anemia	Wkst#22	
11/17	Student Presentation – Group 6	Wkst#23	KG baby case https://youtu.be/SBkx-36V0hU?si=dwh4Ny1LhiCvfAPj
11/19	International Biotechnology	Wkst#24	The who, what, why and where
11/24	Discussion – Policies on Human Genome editing worldwide	Wkst#25	
11/26	Thanksgiving Break – no class		

12/01	**Ethics and Biotechnology**	**Wkst#26**	
12/03	**Student Presentation – Group 7**	**Wkst#27**	**The case of Professor He Jiankui and gene-edited babies**
12/08	**Work on posters**	**No worksheet**	
12/12	**Scheduled for final – 3:30 – 6:00 pm (note time change)**	**Poster session**	

Important Links that you can find in this Brightspace Course

Office hours and more about your professor
About this Course
Grading Scale
Appealing Grades
IMPORTANT POLICIES (in alphabetical order)
ACADEMIC DISHONESTY
ACADEMIC INTEGRITY AND PLAGARISM
ACADEMIC SUPPORT SERVICES
ACCESSIBILITY
BIAS RELATED INCIDENTS
COMMUNICATION
COMPUTER AND TECHNOLOGY SUPPORT
COPYRIGHT NOTICE
EMERGENCY FUNDING
FOOD SECURITY FOR SUNY GENESEO STUDENTS
GENESEO MISSION AND VALUES
GUIDELINES FOR ATTENDANCE AND PUBLIC HEALTH
LIBARY RESEARCH HELP
MILITARY OBLIGATIONS AND CLASS ATTENDANCE
POLICY EXCEPTIONS AND CHANGES
PROFESSIONALISM
RELIGIOUS OBSERVATIONS AND CLASS ATTENDANCE
SAFEGUARDING YOUR MENTAL HEALTH
WELL BEING