

Middlesex Community College

Course: Bio 109 Principles of Biotechnology, CRN: 3009, Fall 2016

Instructor: Dr. Frank Stellabotte, Ph.D., pronounced /stella-bó-té/

Office: 209 Wheaton Hall Phone: (860) 343-5747

Office Hours: Monday and Wednesday 12:30PM – 3:30 PM and by appointment.

Email Address: fstellabotte@mxcc.edu

Course Learning Goals:

Upon successful completion of this course the student will be able to:

- Give examples of the diverse career options and levels within the field of biotechnology and the training that is necessary to achieve them
- Explain the basic molecular biology concepts employed in biotechnology research.
- Identify the fundamental techniques employed in various sectors of the biotechnology industry.
- Articulate the goals and contributions of each sector in biotechnology.
- Recognize what local biotechnology industry companies produce, what techniques they use, and their role in our community.
- List the major regulatory agencies that impact the biotechnology industry.
- Discuss the past, current, and future ethical issues that arise in biotechnology.

Course Outline (this is subject to change)

Week	Date	Module	Assignments	Due Date
1	8/31	<u>Introductions</u>	1. Assignment 1: Write your Intro.	Monday, September 5 th
	9/2	<u>What is Biotechnology?</u>	2. Assignment 2	Friday, September 9 th
2	9/7	<u>Genes, Genomes, and Gene Editing</u>	3. Assignment 3	Friday, September 16 th
3	9/14	<u>Recombinant DNA Technology</u>	4. Assignment 4	Friday, September 23 rd
4	9/21	<u>Proteins</u>	5. Assignment 5	Friday, September 30 th
5	9/28	<u>Protein Project</u>	6. Complete Protein Project	Friday, October 7 th
6	10/5	<u>Microbial Biotechnology</u>	7. Assignment 6	Friday, October 14 th
			Exam 1 (Exam on Material from Weeks 1-4)	Monday, October 17 th
7	10/12	<u>Plant Biotechnology</u>	8. Assignment 7	Friday, October 21 st
8	10/19	<u>Animal Biotechnology</u>	9. Assignment 8	Friday, October 28 th
9	10/26	<u>DNA Fingerprinting and Forensic Analysis</u>	10. Assignment 9	Friday, November 4 th
10	11/2	<u>Bioremediation</u>	11. Assignment 10	Friday, November 11 th
			Exam 2 (Exam on Material from Weeks 5, 6, 7, 8, 9)	Monday, November 14 th
11	11/9	<u>Aquatic Biotechnology</u>	12. Assignment 11	Friday, November 18 th
12	11/16	<u>Medical Biotechnology & Jobs in Biotechnology</u>	13. Assignment 12	Monday, November 28 th

13	11/23	<u>Biotechnology Regulations</u>	14. Assignment 13	Friday, December 2 nd
14	11/30	<u>Ethics and Biotechnology</u>	15. Assignment 14	Friday, December 9th
15	12/7	<u>Product Pipeline Study</u>	16. Complete Product Pipeline Study	Wednesday, December 13th

Required Course Materials:

There is no required textbook for this course. However you are required to have access to an internet connected computer, which will allow you to complete course assignments. There is no specific software requirement as the projects may be completed using any presentation (PowerPoint, Keynote), word processing (Word, WordPerfect, Pages), or screen capturing software.

Course Description and Prerequisites:

BIO 109, Principles of Biotechnology (3 credits)

This course provides a basic introduction to the field of biotechnology. Students will gain a broad understanding of the goals, products, practices, regulations, ethics, and career paths in the biotechnology industry. Students will acquire the fundamental knowledge of the biotechnology industry through the introduction of molecular biology, contemporary techniques, and applications. In addition, students will learn about current topics from lectures, as well as guest speakers from industry partners. This course is intended for students in the biotechnology program as well as the student who is interested in pursuing careers science, but wants to know more about the field.

Prerequisite: Eligible for ENG*101.

COURSE REQUIREMENTS

A common misconception about on-line courses is that they are “self-paced” - that you can do the work any time during the semester. **Keep in mind that this is NOT a self-paced course.** This course is designed in one-week units, with various deadlines approximately every week to keep everyone working on the same material and better able to participate in discussions.

In an on-ground 3-credit course, we meet in the classroom for 3 hours per week. It is generally expected that you will study 2 to 3 hours for every hour in the classroom, for a total of 6 to 9 hours per week in addition to class time. The same math applies to online courses. For an online 3-credit course, you should expect to spend a total of 9 – 12 hours per week studying and completing assessment activities for that week. Last minute glitches can occur with computer equipment, and the instructor will allow one extension (no later than 24 hours past deadline) per student for assignments ONLY with no penalty upon request. However, ongoing computer problems will not be an acceptable excuse for incomplete work; you are expected to have a backup plan that allows you to complete work on time throughout the semester.

Due to the nature of the course, discussion of sensitive or controversial topics may arise. The right of every student to learn in a safe, respectful environment is of primary importance and hence disruptive, threatening, or profane language or behavior will not be tolerated in this course. Please be aware of your writing and responses to your classmates.

WEEKLY MODULES

This course is broken up into 15 topics called modules. As the course progresses students should become familiar with the topics in each module through reading, watching videos, and other activities. Each module includes important concepts and vocabulary which will provide the students with an introduction to these topics and a means for the student to continue their learning.

EXAMS

Two exams will be administered during the semester in order to assess student understanding of the basic technical skills required of people within the field of Biotechnology. **Therefore, there will be WEEKLY MODULE topics that will NOT be assessed on Exams.** Exam 1 and Exam 2 are each worth 125 points and may include a combination of multiple choice questions, fill in the blank, match the following, or short essays. Makeup for an exam will ONLY be granted during a documented, extenuating circumstance. The makeup exam may be different than the original. Contact me within 24 hours to make arrangements. The exams are conducted

online and are **TIMED**. You may use any source for the exam, but you are required to work independently and without the help of another student or anyone else. Be advised, if you spend a long time searching for answers to each question you will **NOT** have enough time to complete the exam.

WEEKLY ASSIGNMENTS

Every week there will be at least one assignment that will involve analysis of the Weekly Module covered that week. The homework assignment will be posted on Blackboard and must be submitted via the **ASSIGNMENT** page by 11:59 PM of the due date. I will **NOT** accept late work. If serious circumstances prevent you from completing work within this time frame, you must notify the instructor prior to the due date. You will receive zeros for missed assignments unless prior approval was given. If prior approval is given for valid, documented reasons you may make up the assignment within a certain time-frame.

Some assignments require posting in the discussion board via the **DISCUSSION** page. In order to receive full credit for the discussion board, you must log on and you may be required to respond to the current questions as well as interact with your classmates. Please use correct grammar, punctuation, and full sentences. You may be required to respond to at least one (1) or two (2) other postings which offer insight to the classmates posting each week in order to receive full credit. Postings of just “good description” or “explained well” although they are encouraging to your classmates and welcome, will not receive credit. There will be not be discussion questions each week. Your discussion and responses to other posts should be submitted on Blackboard by 11:59 PM of the due date for that assignment. As discussion board posts involve participation and engagement among classmates, you cannot submit late work or request make-ups.

PROJECTS

You will prepare TWO projects this semester. The first project is in the form of a paper. It requires you to research the structure and function of a protein. You are required to use a minimum of four references, two of which should be peer-reviewed journal articles. Your sources cannot be older than 10 years. The second project requires you to create a presentation that describes the history, structure, function, and market for a Biotechnology product.

To submit your project, click on the tab labelled “Project” on the left hand menu of Blackboard page. Then click on the title named “Project 1”, it will take you to the project submission page. At the project submission page, you have an option to attach your word or pdf document and then click submit. Submission of the project should be made by 11:59 pm of the due date. Late submission will not receive credit. There will be NO make-up opportunity for this project. PLAN AHEAD. DO NOT wait till the last day to figure out how to submit your project. If you have question or are not sure, ask beforehand.

PROBLEMS

If you are struggling with any aspect of the course, or unexpected situations arise, you should always contact the instructor immediately. The instructor can reached via **Blackboard messages**, office phone (860)343-5747, or during office hours (see above). Your instructor wants to see you succeed in the course and will make every effort to help you do so.

ACCOMMODATIONS

Students with a physical or learning disability who may require accommodation are encouraged to contact the Disability Support Services office (Hilary Phelps, Disabilities Support Specialist at 860-343-5879 or hphelps@mxcc.edu; her office is in Founders Hall, Room 121). After disclosing the nature of the disability, students are urged to discuss their needs with individual instructors. This should be done at the beginning of each semester as accommodations are NOT made retroactively. Instructors, in conjunction with appropriate college officials, will provide assistance

Grading Policy:

Weekly Assignments (30 points each):	450
Exam 1:	125
Exam 2:	125
Project 1:	150
Project 2:	150
1000	

Letter Grade Equivalents:

A = 93 – 100%	B = 83 – 86%	C = 73 – 76%	D = 63 – 66%
A - = 90 – 92%	B - = 80 – 82%	C - = 70 – 72%	D - = 60 – 62%
B + = 87 – 89%	C + = 77 – 79%	D + = 67 – 69%	F = 0 – 59%

The lecture portion of the course will be 75% of your final grade (750 points). The laboratory grade will comprise the remaining 25% (250).

Final Grades will be submitted before 9:00 AM on Tuesday, December 20th.

Withdrawal Policy:

Add/Drop period ends on Sunday, September 11th for ONLINE courses. You may withdraw from this class any time before the end of the work day Friday, November 11th, 2016 at 4:30PM. A completed and signed withdrawal form must be on file in the Records Office in order to receive a “W” on your transcript. If you fail to complete this process on time, you will receive a letter grade at the end of the semester, which will include zeroes for any work not submitted. Course withdrawals may affect financial aid and veteran’s benefits. Please make this decision carefully and with the help of your advisor. See the Academic Calendar and the College Catalog for specific dates and procedures regarding the withdrawal process.

Plagiarism & Academic Honesty:

- Plagiarism is defined as the use of another’s’ idea(s), or phrase(s) and representing that/those idea(s) as your own either intentionally or unintentionally.
- Plagiarism includes (NOT limited to) cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, copying from another student, cutting/pasting from another source without referencing, falsifying an excuse for absence and other proscribed activities.
- Whether this is done intentionally or unintentionally, plagiarism will result in loss of credit for the work in question and a report will be filed to the Dean.
- Repeated cases of plagiarism will result in an “F” for the course and a report will be filed to the Dean.
- Always write using your own words when submitting a written assignment.
- When you get information from any source, make sure you provide a citation to protect yourself if there is a question about copying.
- College’s policy on Plagiarism can be found by clicking on the following link:

<http://www.mxcc.edu/catalog/syllabus-policies/>

Communication:

The following are important points to consider when writing emails and Blackboard messages to any of the faculty with which you interact. A polite Blackboard or email message consists of:

1. A salutation (e.g. Dear Dr. S.,)
2. The content of your message, written in grammatically correct English.
3. A sign off and your name (e.g. Thanks!, Jane Student)

Response time: I will usually respond to messages quite rapidly, I am not always able to do so. Messages received during the week will be responded to within 24 hours. Emails and messages received on the weekends will be responded to within 48 hours. When in doubt, please check this syllabus, it probably has the answer to your questions.

COLLEGE POLICIES

IMPORTANT COLLEGE POLICIES!! PLEASE READ CAREFULLY!



For information about the college's policies and procedures regarding academic honesty, accessibility/disability services, attendance, audio-recording in the classroom, grade appeals, plagiarism, religious accommodations, weather and emergency closings, and more, please go to the following website: www.mxcc.edu/catalog/syllabus-policies/ or scan the QR code with your smart phone. Also, please become familiar with the policies regarding nondiscrimination, sexual misconduct, and general student conduct at the following website: www.mxcc.edu/nondiscrimination/.

NON-DISCRIMINATION STATEMENT

Middlesex Community College does not discriminate on the basis of race, color, religious creed, age, sex, national origin, marital status, ancestry, present or past history of mental disorder, learning disability or physical disability, sexual orientation, gender identity and expression or genetic information in its programs and activities. In addition, the College does not discriminate in employment on the additional basis of veteran status or criminal record.

The following people have been designated to handle inquiries or complaints regarding non-discrimination policies and practices:

Primary Title IX Coordinator

Dr. Adrienne Maslin

Dean of Students/Title IX and Section

504/ADA Coordinator

amaslin@mxcc.edu; 860-343-5759;

Founders Hall Room 123

Secondary Title IX Coordinator

Ms. Queen Fordham

Coordinator of the Meriden Center

Welcome Desk

qfordham@mxcc.edu; 203-608-3011

Course Alignment with MxCC TAP Competencies:

The Transfer and Articulation Program (TAP) is a new program for ensuring Connecticut community college students complete degree programs that transfer to Connecticut State Universities and Charter Oak without either losing or generating excess credit.

This course is designated for the following competency:

Appreciation of the Ethical Dimensions of Humankind

1. Recognize and reflect critically on ethical issues.
2. Apply appropriate concepts and terminology in identifying ethical problems and proposing and defending solutions to them.
3. Apply standards and practices of scholarship, research, and documentation to defend positions and beliefs, including reevaluating beliefs in light of unforeseen implications or new evidence.
4. Recognize the value of creative, collaborative, and innovative approaches to problem-solving, including the ability to acknowledge differing points of view.

This course meets the following competencies as embedded:

Scientific Knowledge /Understanding

1. Communicate using appropriate scientific terminology.
2. Use representations and models to communicate scientific knowledge and solve scientific problems.
3. Evaluate the quality of scientific information on the basis of its source and the methods used to generate it.

Written Communication in English

1. Respond to Rhetorical Situations
 - Identify and evaluate the specific audience and purpose in different writing situations, and adapt their writing appropriately to those situations.
 - Develop effective prose that influences attitudes, beliefs, and actions through appropriate logical, ethical, and emotional appeals.
2. Use Sources
 - Locate and evaluate sources appropriate to the rhetorical situation.
 - Read, comprehend, and summarize an argument from a complex piece of writing.
 - Analyze, evaluate, and respond to an argument from a complex piece of writing.
 - Summarize, paraphrase, and quote accurately the ideas of others, clearly differentiating them from the students' own ideas.
 - Synthesize and integrate others' ideas purposefully and ethically with correct and appropriate documentation.