Fundamentals of Biotech (LS)

BTEC - 1010 301

Course Description

This lab-focused course introduces students to biotechnology: the use of materials from living organisms to improve our quality of life. With ancient roots in food fermentation and selective breeding, modern biotechnology produces insulin, biofuels, and other high-value molecules; improved high-yield crops; and tests, drugs, and vaccines for diseases like COVID-19. Biotechnology is being used to protect endangered species, and even bring back some that have gone extinct. And while current laws forbid it, cloning and genetic engineering of humans is coming.

Because biotechnology affects all our lives, it provides a useful lens for general education in the life sciences. Students in this course carry out hands-on biotech experiments, including genetic modification of a microbe, biomolecular separation, and genetic analysis. These and other experiments, supported by open educational resources and popular science media, bring context to life science concepts from energy flow to evolution.

This section of the course is offered in a competency-based, open lab format. This means that there are no standard meeting times, instead you will sign up to attend the open lab, which is always staffed by a faculty member who will help you complete the labs and answer any questions you may have.

Course Student Learning Outcomes

- Carry out hands-on experiments in biotechnology, including genetic modification of a microbe, biomolecular separation, and genetic analysis.
- Analyze data resulting from their own experiments in biotechnology.
- Explain how genetic information is stored, expressed, and exchanged, both naturally and in the context of biotechnology.

- Compare the change that happens naturally through evolution to what is accomplished by biotechnology.
- Discuss how biotechnology affects humans and the natural world.

Course Prerequisites

None

Engagement Plan

I will respond to email within 2 working days. I will offer feedback on major assignments within one week. The best way to contact me is via the Canvas Inbox, as I will prioritize this email over other modes of communication.

Brief Description of Assignments/Exams

There are three categories of assignments in this course.

40% of your grade will be from successful completion of the 10 labs.

40% of your grade will be from quizzes. These will test your understanding of course content, including material from the (free online) textbook, lab protocols, and news/popular science media.

20% of your grade will be from the General Education Signature Assignment - a lab report on the GMO lab.

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	Ethical issues in Biotech	Discussion	0
	Introduce Yourself	Discussion	0

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	Introduce Yourself	Discussion	0
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	Quiz: pGLO Transformation	Quiz	12
10/18/24	Library Research Module: Check for Understanding	Quiz	0
9/4/25	Lab: Micropipetting Exercise	Assignment	25
9/8/25	News: Girl whose T cells beat cancer	Quiz	10
9/8/25	News: Meet the Plastic Eating Worms	Quiz	9
9/11/25	Lab: pGLO transformation	Assignment	25
9/18/25	Lab: Checking transformation and starting cultures	Assignment	25
9/22/25	Quiz: Central dogma	Quiz	25
9/25/25	Lab: GFP Purification	Assignment	25
9/29/25	News: Genes as Medicine	Quiz	10
9/29/25	News: mRNA vaccines	Quiz	15
10/2/25	Lab: SNP DNA collection and PCR	Assignment	25

Due Date	Assignment Name	Assignment Type	Points
10/9/25	Lab: SNP digest, gel & results	Assignment	25
10/23/25	Lab: GMO prepare templates and PCR	Assignment	25
10/30/25	Lab: GMO gel and results	Assignment	25
11/3/25	Quiz: GMO Lab	Quiz	28
11/6/25	GE Signature Assignment	Assignment	30
11/13/25	Lab: CRISPR transformation	Assignment	25
11/20/25	Lab: CRISPR results	Assignment	25

Grading Scale

A: 93% or more A-: 90 - 93% B+: 87 - 90%

B: 83 - 87% B-: 80 - 83% C+: 77 - 80%

C: 73 - 77% C-: 70 - 73% D+: 65 - 70%

D: 60 - 65% E: less than 60%

Academic Integrity

Student Code of Conduct: The student is expected to follow the SLCC Student Code of Rights and Responsibilities. You can find it at https://www.slcc.edu/policies/policies/student_affairs/8.1.050.aspx.

Generative artificial intelligence (AI) software is a rapidly emerging tool that students may be interested in using. If doing so, SLCC students are expected to adhere to the same

standards as the Code of Student Rights and Responsibilities statement on plagiarism. Presenting generative AI software content as your own is a violation of academic integrity. If you use generative AI in your work, you must indicate that you have done so.

Accessibility and Disability Services (ADS): SLCC values inclusive learning environments and strives to make all aspects of the College accessible to our students. If you have a disability and believe you need accommodations to improve access to learning materials or the learning environment, please contact the ADS: (phone) 801-957-4659; (email) ADS@slcc.edu; (website) www.slcc.edu/drc.

Discrimination of any kind is unacceptable. You may find the following resources helpful: Center for Health and Counseling (http://www.slcc.edu/chc/index.aspx) and Bruin Pantry (http://www.slcc.edu/thaynecenter/programs-services/bruinpantrygethelp.aspx)

How to Navigate to Canvas

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

For more information, navigate to the Institutional Policies tab on the Institutional Syllabus page.

Learning Support and Tutoring Services

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, visit the Institutional Syllabus page under the Tutoring and Learning Support tab. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

Advising and Counseling Support Services

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, visit the Institutional Syllabus page under the Advising and Counseling Support Services tab. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

Student Academic Calendar

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

SLCC Student Academic Calendar