

Biotech: Engineering Life

BTEC - 1000 700

Course Description

Biotechnology uses materials from living organisms to improve the quality of life: insulin saves lives, smallpox has been eradicated, and altered organisms can produce biofuel. In this course, students conduct experiments that are used in biotechnology, explore current global issues, and consider the ethical implications and conflicts inherent in altering living organisms to improve lives.

Semester: All

Course Student Learning Outcomes

- Explain how biotechnology can both benefit and harm members of the global population.
- Produce a genetically modified organism (GMO).
- Purify a useful protein from a genetically modified organism (GMO) in a process analogous to modern pharmaceutical production.
- Analyze their own DNA to predict a (non-medically relevant) trait.

Course Prerequisites

None

Engagement Plan

Example language:

- I will respond to email within 4 hours. The best way to contact me is via the Canvas Inbox, as I will prioritize this email over other modes of communication.
- In this course I will be posting interactive announcements which will offer specific opportunities for class questions and extra credit every other week.
- Additionally, I will be participating in the discussion forums with you to share my perspective within the discipline and to offer some nuances of interpretation that may not be present in your textbook.
- Lastly, we'll be holding small group Q & A sessions, where we can learn from our peers (and faculty) on some of the more difficult units within the course.

Additional Materials

GENERAL POLICIES

Syllabus: This syllabus represents an “agreement” between you the student and the instructor. It is designed to ensure course integrity and fairness as well as provide students with a clear understanding of course expectations. The instructor and students are expected to use the syllabus and schedule as a guide for the semester. There is a candy bar for you in the main office the first week of the semester. Tell the person at the front desk about the cheese you made and ask for the candy bar. Any deviation from the syllabus or schedule will be discussed and agreed upon by the instructor and students.

Attendance: Attendance is expected and necessary to successfully complete this course. You will be notified well in advance of due dates and exam dates and it is your responsibility to be aware of these dates. No exams will be made up if prior arrangements have not been made with the instructor.

Withdraw from Class: Incomplete grades are not an option for concurrent enrollment students. It is the responsibility of the student to drop/withdraw from this class, not the instructor. Please talk to the instructor if you are concerned about your performance.

Academic Dishonesty: Absolutely NOT tolerated and includes all forms of cheating and plagiarism as outlined in the Student Code. Cheating will be dealt with as harshly as allowed by the college on the first instance, which includes your being failed from the class. This includes cheating on exams, plagiarism, fabricating data, and collaborating on work that is to be done individually.

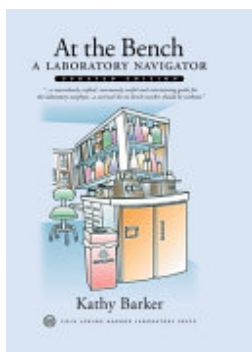
Cell Phones and Other Electronic Devices: NEW THIS YEAR! When not in use for instructional purposes, cell phones and other mobile devices should be stored away in the student's backpack, not on their person. It is the student's responsibility to ensure all devices are silenced. No calls should be taken during class. If your parents need to contact you then they can call the main office. The class expectation is that possession of a cellular telephone will not distract the student in any way during the class. The use of headphones and earbuds is a safety issue and prohibited in the laboratory classroom. Students and parents are advised that bringing personal electronic devices to school is done at their own risk. The school assumes no financial responsibility for replacing lost, stolen, or damaged devices, whether the loss occurs due to confiscation or under any other circumstances on school property or during school-sponsored activities.

Classroom recordings: Students may not record or publish information from the class without written authorization from the instructor. If used without authorization you have violated Privacy/Intellectual Property Rights.

Office Services: Don't tell anyone else about this so we can see who actually reads this thing. If you go to the office and tell Shawna that you are in the biotechnology class she will give you treat.

Student Code of Conduct: The student is expected to follow the Itineris Early College High School and the SLCC Student Code of Conduct found at http://www.slcc.edu/policies/docs/Student_Code_of_Conduct.pdf

Required Text or Materials



Title: At the Bench
ISBN: 9780879697082
Authors: Kathy Barker
Publisher: CSHL Press
Publication Date: 2005-01-01

Title: Biotechnology A Laboratory Skills Course
ISBN: 9780983239635
Authors: J. Kirk Brown
Publisher: Bio-Rad Laboratories Inc.
Publication Date: 2018
Edition: 1

For more information on textbook accessibility, contact Accessibility & Disability Services at ads@slcc.edu.

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	How to Make Cheese	Assignment	5
	Introduce Yourself	Discussion	0
	Unit 2 Teacher Discussion	Assignment	1
	Unit 3 Teacher Discussion	Assignment	1
8/15/25	Demonstration of Buffer Efficacy	Assignment	1
8/26/25	Chapter 1 Exam	Assignment	10
8/26/25	Ethics Activity	Assignment	1

Due Date	Assignment Name	Assignment Type	Points
8/28/25	Laboratory Safety Quiz	Assignment	5
11/4/25	DNA Mutations	Assignment	5
11/10/25	Codon Worksheet	Assignment	1
11/12/25	Case Study #1 - The Canadian Canola Controversy	Assignment	1
11/12/25	Lab Safety Agreement	Assignment	0
11/12/25	Making Solutions	Assignment	1
11/14/25	Gram Staining	Assignment	1
11/20/25	Peter's Pill Production Plant	Assignment	5
11/21/25	Final Course Grade	Assignment	100
12/1/25	CFTR Case Study	Assignment	1
12/5/25	Final Exam - UT CTE BTEC Skills Exam	Assignment	100

Brief Description of Assignments/Exams

Participation: Students are expected to attend class and be actively participating every day. This includes answering opening and/or closing questions. Every absence or no participation after the third instance will reduce your final grade by 1%. Every lab safety citation will result in a 1% deduction from your final grade also.

Assignments (40%): The assignments in this course are designed to help students refine their biotechnology skills and include presentations, reflection, and in class activities. Presentation - with your group prepare a 30-minute presentation about an assigned

chapter in the textbook. Students should complete a reflection each week of how they performed and what they learned. Your group should also create an activity to be completed by the class that reinforces what you have taught. The final presentation is to use the BioMRLs and outline a non-medical process for a product

Skill Proficiency (15%): There are 12 skills to be demonstrated for proficiency as part of the course. The skills include research and present biotechnology concepts using effective communication skills, demonstrate appropriate use of PPE and safe remove of gloves, maintain a laboratory notebook using GDP, demonstrate proper use of micropipette, prepare a solution of defined concentration and pH, demonstrate proper aseptic/sterilizing procedures, prepare bacterial growth media, perform a gram stain test to identify bacteria, perform and analyze the results of a restriction digest, demonstrate the ability to use PCR technology, perform a bacterial transformation and analyze results, and outline a bioindustrial manufacturing process for a product.

Laboratory Notebook (20%): Learning how to properly maintain a laboratory notebook is an important part of Biotechnology. Lab books are due at 3:30pm on Fridays when class is in session. Lab books will be graded 2 points for correct completion, 1 point for incomplete lab books, and 0 points for not doing it.

Final Exam (15%): A pre-test of the CTE certification exam will be given at the beginning of the semester. This test will not be graded other than participation. A CTE certification exam will be given at the end of the course to evaluate content knowledge. Students who successfully demonstrate all 10 skills and pass the certification exam with a minimum score of 80% will earn a certificate of proficiency in Biotechnology from the State of Utah. See the Utah State Strands and Standards in Biotechnology for details.

Signature Assignment (Eportfolio) (10%): This course fulfills the International and Global Learning requirement (with focus on Global Learning) for the General Education Program at Salt Lake Community College. Each student in General Education courses at SLCC maintains a General Education ePortfolio. Instructors in every Gen Ed course will ask you to put at least one assignment from the course into your ePortfolio, and accompany it with reflective writing. It is a requirement in this class for you to add to your ePortfolio, and this syllabus details the assignments and reflections you are to include. Your ePortfolio will allow you to include your educational goals, describe your extracurricular activities, and post your resume. When you finish your time at SLCC, your ePortfolio will then be a

multi-media showcase of your educational experience. For detailed information visit:
<http://www.slcc.edu/gened/eportfolio>.



How to Navigate to Canvas

Grading Scale

Grading Scale

A = 100-93 B - = 82-80 D+ = 69-67

A - = 92-90 C+ = 79-77 D = 66-63

B+ = 89-87 C = 76-73 D - = 62-60

B = 86-83 C - = 72-70 F = 59-0

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](#)

[Additional Policies](#)

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Electronic Devices: Cell Phones, pagers are to be turned off during class. Computers can be used for note-taking and course-related purposes ONLY but should not be used during class for working on other tasks (e.g. answer emails, Facebook, other classes etc.). You will be asked to leave if your electronic device disrupts the class in anyway. Cell phones MUST be turned completely OFF during exams.

Classroom recordings: Students may not record or publish information from the class without written authorization from the instructor. If used without authorization you have violated Privacy/Intellectual Property Rights.

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Lab Safety Agreement

BTEC 1000

For success in our laboratory, everyone must agree to respect the same laboratory rules, to obtain and use the proper safety equipment, and to take appropriate precautions during

a lab activity. I as your teacher will prepare you ahead of each lab on the safety issues, but it is up to you to remember good lab protocol and obey those warnings announced ahead of time.

Very Important things to remember:

1. ABSOLUTELY NO food or drink in the laboratory. Never eat or drink in the laboratory.
2. NEVER taste chemicals. NEVER directly touch chemicals.
3. No pipetting by mouth.
4. Never work alone in the laboratory.
5. Never perform any experiment not specifically assigned by your teacher.
6. Use lab equipment properly and only after training and instruction.
7. Do not apply cosmetics in the laboratory.
8. It is best not to wear contact lenses in the lab. Chemical vapors can get between the lenses and the eyes and cause permanent eye damage.
9. Know the location of all safety and emergency equipment used in the laboratory.
10. Become familiar with the specific hazards of an experiment before you begin.
11. Before beginning work: tie back long hair, roll up loose sleeves and put on any personal protective equipment required by your teacher.
12. Report any accidents, incidents, or hazards to the teacher immediately.
13. Keep your work area neat and uncluttered.
14. Clean your work area at the conclusion of a lab activity, disinfect your station with a 70% ethanol solution.
15. Follow the proper disposal of all reagents, sharps, and broken glass.
16. Wash your hands with antibacterial soap and water.
17. Never wear earbuds/headphones etc. in the lab.
18. Always respect lab work. Due to the amount of students that will utilize the biotech lab, there will be other experiments at or around the workstations. Please leave them alone.

Your commitment to the lab safety rules and your respect of the property in the laboratory are absolutely necessary. If intentional misuse or abuse of the lab and its property is

intended, you may be removed from the course.

I understand parameters of the course as outlined in the entire syllabus, the safety rules, and agree to conduct myself appropriately by adhering to safe laboratory practices as instructed. I also understand that there is a \$15 lab fee associated with this course.

Student's printed name _____

Student's Signature_____ Date_____

My student has discussed with me the entire syllabus not just the information on this form, the safety contract, and the importance of safety in the laboratory and I support my student in safe laboratory practices.

Parent/Guardian's Signature__