Applied Molecular Biology

BTEC - 1500 301

Course Description

This course teaches students practical aspects of DNA technology that includes restriction digestion, properties of plasmids, recombinant DNA cloning, gel electrophoresis, the polymerase chain reaction, protein expression and protein analysis. It is recommended students majoring in Biotechnology complete BIOL 1610 prior to taking this course.

Prerequisite(s): BTEC 1000 and BTEC 1200 with a grade of B or better; MATH 0980 or MATH 0990 w/C or better, or appropriate placement score, BIOL 1010 or 1610 w/C grade or better.
Semesters Taught: All

Course Student Learning Outcomes

- Understand and demonstrate various aspects of DNA Technology by completing a series of reactions to manipulate DNA.
- Learn how to express and purify a protein product from recombinant DNA by completing a series of lab experiments.
- Recall the central dogma of biology.
- Use bioinformatics to design DNA cloning strategies for recombinant DNA and analyze DNA sequence data.
- Required to keep a laboratory notebook.
- Use lab math to set up reactions and make chemical solutions.
- The project based, open lab format forces student to evaluate their own results, troubleshoot laboratory failures and optimize reactions.

- Work in an open lab format and is responsible for setting their own schedule and timetable to complete the project.
- Use online bioinformatic resources and software to work with DNA sequences.

Engagement Plan

Example language:

- I will respond to email within one day 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.
- 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.

Brief Description of Assignments/Exams

Exams and assignments are a combination of lab work, online exams and take home assignments.

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	Any Questions?	Discussion	0
	Any Questions? (optional)	Discussion	0

Due Date	Assignment Name	Assignment Type	Points
	Assignment: Designing Primers	Assignment	100
	Exam 1 Molecular Biology of the Central Dogma	Quiz	100
	Final Exam	Assignment	100
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Lab Notebook	Assignment	100
	Lab: Protein Expression and SDS-PAGE Analysis	Assignment	100
	Lab: Amplify bglA gene from Bacillus Halodurans genomic DNA by polymerase chain reaction (PCR)	Assignment	100
	Lab: Complete ligation independent cloning (LIC) of bglA gene into pLATE31 vector and transform competent cells	Assignment	100

Due Date	Assignment Name	Assignment Type	Points
	Lab: Isolate recombinant bglA-pLATE31 plasmid using miniprep kit	Assignment	100
	Lab: Purify bglA PCR reaction using PCR purification kit and verify using gel electrophoresis	Assignment	100
	Lab: Screen transformed colonies for bglA-pLATE31 recombinant DNA using PCR and gel electrophoresis	Assignment	100
	Lab: Verify recombinant bglA-pLATE31 plasmid using restriction digest and gel electrophoresis	Assignment	100

Grading Scale

As described by SLCC.

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