BCMB/BCHE 4030L/H & BCHE6030L - Bioprocess Technology
Credit Hours: 4.0
Semester: Spring 2022
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Course Description

The purpose of this class is to introduce the student to concepts in Biotechnology. There will be **assignments** given during the course that will help accomplish the **learning objectives**. In addition, students will be responsible for completing a **project** assigned to them. The **assignments** and **project** will be used to assess how well the student understands the key learning concepts in the class. Each week's assignments and progress on the projects will be reviewed in class.

Learning Modules

1. Aseptic Technique
2. Expression Systems
3. Specific Growth Rate
4. Batch Fermentation
5. Cell Lysis
6. Downstream Processing Techniques
7. Chromatography
8. Protein Analysis
9. Fed-Batch Fermentation
10. Advanced Chromatography
11. Tangential Flow Filtration
12. Cell Culture
13. Emerging Technologies
14. Design of Experiments

Supplies: You will need to purchase safety glasses and lab coat. A lab notebook will be provided to you and shall be returned at the end of the semester. Students are encouraged to seek out vendors for free samples that will enhance your experience and possibly lead to better results.

Textbook: No textbook is required, but you will be responsible for reading the articles assigned which will be discussed during class each week

Grading: Grades will be based on several criteria as shown below

Criteria	% of grade
Assignments and Quizzes	40
Project paper	25
Technology and Research Presentations	25 (12.5% each)
Rough Draft of paper	5
Documentation assessment	5

Honesty Policy

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." *A Culture of Honesty*, the University's policy and procedures for handling cases of suspected dishonesty, can be found at (https://ovpi.uga.edu/academic-honesty/academic-honesty-policy). All academic work must meet the standards contained in the UGA Student Honor Code. Students are responsible for informing themselves about those standards before performing any academic work. Students are allowed to study with each other in any way they find useful. During an in-class test situation, students must not use any notes nor any help other than direct questions addressed to the instructor. During the test students must have no communication with any other student, and they must read only what is on their individual tests or answer sheets. The consequences for academic dishonesty will be assessed on a case by case basis.

Projects

Students will be expected to use what they have learned during the semester to express and purify a protein target assigned to them. You will optimize expression parameters such as temperature and induction conditions then purify the protein and determine yield for the protein assigned to you. Projects will require work outside of class and we will be using Benchling and paper notebook checks to track progress. In addition, students will also present a summary of a technology assigned to them. **Each student will present a (1) summary of experiments and (2) the assigned technology near the end of the semester.**

Undergraduate/Graduate and Honors Requirements

Students will produce a final paper based on their research. The paper should resemble a brief scientific paper and be of at least 8-10 pages in length. The paper should use Times New Roman size 11 font with double spaced lines and 1" margins. Teams will work together to produce the paper. The paper should be sub-divided into a) Summary, b) Introduction, c) Experimental Methods, d) Results, e) Discussion and f) References. Undergraduates enrolled in BCMB4030L need to submit their paper to Dr. Adams and Dr. Blum. In addition, graduate students and students taking the classes as an honors course will independently author 1 new SOP on a process assigned to them during the course and any associated form(s). For the paper, a draft which will not be graded is due 1 week before the deadline for the final paper. **The paper and SOP (if applicable) are due on the last day of classes December 7th.**

Attendance Participation and Records

Class attendance is mandatory, and all students are expected to participate during the class sessions. Please contact the instructor if you will not be able to attend class. Unexcused absences will result in a decrease in grade. Students should expect to spend 12 hours combined either in class/lab, working on assignments, attending workshops or working independently in the lab. The exact schedule is to be determined by Dr. Blum and the student, but time outside of normal work hours and on weekends can be expected. All students shall maintain a lab notebook and complete all forms in Benchling. **Unexcused absences will result in a decrease in grade.**

Assignments and Quizzes

Assignments and quizzes are listed in eLC and are due on the date/time indicated. These formative exercises count for 40% of your grade. Another 5% is the rough draft of your paper and 5% is an assessment of how well you documented your work in notebooks and in Benchling.

The CDC adopted new guidelines for isolation and quarantine at the end of December 2021. Georgia Department of Public Health adopted these new guidelines along with the USG. In accordance with these updates, see below for updated suggested syllabus statements. UGA is continuing to monitor the Omicron variant and will update this language as needed.

[THE FOLLOWING INFORMATION MAY BE INCLUDED IN YOUR SYLLABUS]

CORONAVIRUS INFORMATION FOR STUDENTS

UGA adheres to guidance from the University System of Georgia and the recommendations from Georgia Department of Public Health (DPH) related to quarantine and isolation. Since this may be updated periodically, we encourage you to review the latest guidance here. The following information is based on guidance last updated on December 29, 2021.

Face coverings:
Following guidance from the University System of Georgia, face coverings are recommended for all individuals while inside campus facilities.

How can I obtain the COVID-19 vaccine?
University Health Center is scheduling appointments for students through the UHC Patient Portal (https://patientportal.uhs.uga.edu/login_dualauthentication.aspx). Learn more here – https://www.uhs.uga.edu/healthtopics/covid-vaccine.

The Georgia Department of Health, pharmacy chains and local providers also offer the COVID-19 vaccine at no cost to you. To find a COVID-19 vaccination location near you, please go to: https://georgia.gov/covid-vaccine.

In addition, the University System of Georgia has made COVID-19 vaccines available at 15 campuses statewide and you can locate one here: https://www.usg.edu/vaccination

What do I do if I have COVID-19 symptoms?
Students showing COVID-19 symptoms should self-isolate and get tested. You can schedule an appointment with the University Health Center by calling 706-542-1162 (Monday-Friday, 8 a.m.-5p.m.). Please DO NOT walk-in. For emergencies and after-hours care, see https://www.uhs.uga.edu/info/emergencies.

What do I do if I test positive for COVID-19? (Isolation guidance)
If you test positive for COVID-19 at any time, either through a PCR test, an Antigen test, or a home test kit, you are **required to report it** through the DawgCheck Test Reporting Survey. Follow the instructions provided to you when you report your positive test result in DawgCheck.

As of December 29, 2021, when an individual receive a positive COVID-19 test: Everyone, **regardless of vaccination status,** should:

- Stay home for 5 days.
- If you have symptoms or your symptoms are resolving after 5 days, you can leave your house and return to class.
- Continue to wear a mask around others for 5 additional days.

What do I do if I have been exposed to COVID-19? (Quarantine guidance)

If you have been exposed (within 6 feet for a cumulative total of 15 minutes or more over a 24-hour period – unmasked**) to someone with COVID-19 or to someone with a positive COVID-19 test and you are:

- Boosted, or have become fully vaccinated within the last 6 months (Moderna or Pfizer vaccine) or within the last 2 months (J&J vaccine)
    - You do not need to quarantine at home and may come to class.
    - You should wear a mask around others for 10 days.
    - If possible, get tested on day 5.
    - If you develop symptoms, get tested and isolate at home until test results are received, then proceed in accordance with the test results.
- Unvaccinated, or became fully vaccinated more than 6 months ago (Moderna or Pfizer vaccine) or more than 2 months ago (J&J vaccine) and have not received a booster:
    - You must quarantine at home for 5 days. After that you may return to class but continue to wear a mask around others for 5 additional days.
    - If possible, get tested on day 5.
    - If you develop symptoms, get tested and isolate at home until test results are received, then proceed in accordance with the test results.

** "Masked-to-masked" encounters are not currently considered an exposure; this type of interaction would not warrant quarantine.

You should report the need to quarantine on DawgCheck (https://dawgcheck.uga.edu/), and communicate directly with your faculty to coordinate your coursework while in quarantine. If you need additional help, reach out to Student Care and Outreach (sco@uga.edu) for assistance.

Well-being, mental health, and student support

If you or someone you know needs assistance, you are encouraged to contact Student Care & Outreach in the Division of Student Affairs at 706-542-7774 or visit https://sco.uga.edu/. They will help you navigate any difficult circumstances you may be facing by connecting you with the appropriate resources or services. UGA has several resources to support your well-being and mental health: https://well-being.uga.edu/

Counseling and Psychiatric Services (CAPS) is your go-to, on-campus resource for emotional, social and behavioral-health support: https://caps.uga.edu/, TAO Online Support (https://caps.uga.edu/tao/), 24/7 support at 706-542-2273. For crisis support: https://healthcenter.uga.edu/emergencies/.

The University Health Center offers FREE workshops, classes, mentoring and health coaching led by licensed clinicians or health educators: https://healthcenter.uga.edu/bewelluga/

Monitoring conditions:
Note that the guidance referenced in this syllabus is subject to change based on recommendations from the Georgia Department of Public Health, the University System of Georgia, or the Governor's Office. For the latest on UGA policy, you can visit coronavirus.uga.edu.