
BC 404-L01 Syllabus Spring 2020

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Schedule: Yates 307 & 308, Tuesday & Thursday 1:00 – 3:50 PM

Textbook: Laboratory Notebook (in the bookstore under BC404; \$13.50), means of transferring data

Course objectives: **Objective #1:** Students will be exposed to a laboratory that closely mimics a research laboratory setting and mentality.

Objective #2: Students will be able to plan, execute and problem solve by understanding both the experimental design theory of common molecular biology and protein chemistry techniques including: PCR, agarose and polyacrylamide electrophoresis, bacterial transformation, protein expression, protein purification, enzymatic characterization and site-directed mutagenesis.

Objective #3: Students will demonstrate proficiency in working with a partner to plan and direct a research project.

Objective #4: Students will perform hypothesis-driven research. This will require developing a well-constructed hypothesis, testing the hypothesis using the techniques listed above and arguing if the data collected support or disprove the hypothesis.

Canvas: Canvas address <http://info.canvas.colostate.edu/login.aspx>. I will post all the protocols, lectures and grades for this course on Canvas.

Class Structure: What can you expect in the next eight weeks?

1. Laboratory
 - a. You will design a mutant that will destroy, or enhance (if you're really good) some aspect of the protein's function. We will then assess your success using kinetics and possibly other biochemical techniques.
2. Lectures
 - a. A portion of the objectives is to teach you the theory of the biochemical techniques you will be performing. This will help you problem solve and ensure the success of your experiments. Some of the lectures will take an entire day, others will be presented during some down time. I will set the direction that we are going on these days and describe the theory behind the experiments we will be performing in the up and coming labs. These lectures will help you complete the problem-sets.

Assessment: Your grade will be derived as indicated below:

1. Primer Design 10 points
2. Problem Set #1 50 points
3. Problem Set #2 50 points
4. Notebook 60 points
 - a. Two unannounced notebook checks (15 points each) will be performed during the semester, so it is mandatory to bring your notebooks to class every day and keep them updated in order to receive full credit. A final notebook check worth 30 points will be performed at the end of the semester.
 - i. **Purpose:** three points for written purposes of all the labs from the last check up to the current lab (that day).
 - ii. **Methods:** three points for written methods of all the labs from the last check up to the current lab (that day).
 - iii. **Results:** three points for written results of all the labs from the last check up to the last lab fully executed.
 - iv. **Conclusions:** three points for written conclusions of all the labs from the last check up to the last lab fully executed.
 - v. **Legibility & Organization:** three points
 - vi. There will not be any partial credit for these points. Either you get the three points or you don't. For example if you have all the Purposes for the labs written except one then you lose three points.
5. Oral Report 50 points
 - a. Each group will present the results of their research in a five to 10 minute presentation.
6. Lab Participation 20 points
 - a. An unexcused absence will result in automatic deduction of 20 points.
 - b. Poor effort resulting in "lousy" data, slow progress or not cleaning up before leaving the lab will result in points being lost.
 - c. Poor organization resulting in loss of samples will result in points being lost.

To be Successful: Here is a short list of ways to be successful:

1. Come prepared knowing exactly what you are going to do and have your notebook prepared to record data.
 - a. **Listen** at the beginning of class for changes and additional instructions.
2. Be careful in the way you proceed; do not rush through experiments.
3. Carefully label your reagents and your products. Make sure you know where you have stored them.
 - a. Never throw away something unless you are sure you don't need it.
4. Talk to your fellow classmates about things you are confused about.
5. If you are still confused come and talk to me.

Class Schedule: I have given you a tentative class schedule detailing each day and the experiment we will be performing on that particular day.

Grades: Letter grades will be assigned based on the percentage of 240 total points possible:

<u>Grade</u>	<u>Percentage</u>
A+	96.67 – 100%
A	93.33 – <96.67%
A-	90.00 – <93.33%
B+	86.67 – <90.00%
B	83.33 – <86.67%
B-	80.0 – <83.33%
C+	76.67 – <80.00 %
C	70.00 – <76.67 %
D	60.00 – <70.00 %
F	below 60.00 %

Attendance: Attendance to every class is mandatory. There are obvious exceptions to this rule including a death in the family, extreme illness or a university-excused absence. If you need to miss a class, communicate with me and we can talk about whether it is a valid excuse. In the case of an emergency or a tragedy, deal with it first and then come see me.

Lab Safety: Some general policies regarding lab safety:

- 1) No open-toed shoes (shorts are fine).
- 2) No “horse-play” in the lab.
- 3) No eating or drinking in the lab.
- 4) Place backpacks on racks.

Academic Integrity: This course will adhere to the Academic Integrity Policy of the Colorado State University [General Catalog](#).