BIOT 5211L **Advanced Biotechniques LAB** **Credit Hours: 2**

Semester: Fall **Year:** 2013
Class Day/Time: TBA **Class Location:** TBA

Instructor of Record: Dr. Amy Tvinnereim Professor
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Office Hours: TBA

Course Description: Lab component. An introduction to standard molecular biology techniques such as: isolation and purification of proteins and nucleic acids, cloning and expression of recombinant proteins with lecture component.

Prerequisite: As per program entry. **Co-requisite:** BIOT 5211

Goals of Course & Course Objectives:

Course Objectives:

1. To understand and apply practical techniques used in fundamental biotechnology.
2. To understand the basic theory and background behind biotechnology techniques.
3. To be able to apply problem solving techniques in biotechnology.
4. To be able to make public presentations concerning current topics in biotechnology.
5. To be able to find and process scientific information.
6. To be able to communicate in scientific formats with both oral and written methods.

Student Learning Outcomes (Course Competencies):

1. The student will demonstrate the ability to correctly maintain an accurate record of laboratory procedures, techniques and exercises.
2. The student will demonstrate the ability to prepare a manual of protocols and recipes that can serve as a guide for future laboratory experiences.
3. The student will demonstrate the ability to perform fundamental biochemical calculations such as pH, molarity, concentrations and dilutions.
4. The student will demonstrate the ability to find and understand pertinent scientific information.
5. The student will demonstrate the ability to write in an appropriate technical scientific format.

Course Assessment/Methods of Evaluation:
Student skills will be evaluated with a laboratory notebook, graded subjectively, and pre- and post-written assignments.

1. *Laboratory Notebook*: A clear, complete, and concise record of all laboratory actions will be maintained within the lab. This lab notebook is worth a total of 25% of the laboratory grade and will be graded subjectively.
2. *Pre-lab Assignments*: Student preparation prior to every laboratory will be evaluated based on assignments turned in prior to the exercise. These assignments will be worth a total of 25% of the total lab grade.
3. *Post-lab Assignments*: Student understanding of all laboratory activities will be evaluated based on assignments turned in following the exercise. These assignments will be worth a total of 25% of the total lab grade.

4. *Calculation problem sets*: Student understanding and ability to perform routine calculations required for laboratory activities. These assignments will be worth a total of 25% of the total lab grade

Linked Program Learning Outcomes:
The student learning outcomes listed above address the following Biotechnology Program PLOs:

- PLO-1. The student will demonstrate English communication skills in both oral and written forms.
- PLO-2. The student will demonstrate mastery of basic and advanced biotechnology methods
- PLO-3. The student will demonstrate the ability to safely operate basic and advanced laboratory equipment, analytic devices and computers.
- PLO-4. The student will demonstrate independent and critical thinking skills integrated with the ability to utilize multiple informational resources.
- PLO-5. The student will explain the principles, mechanisms and interrelatedness of both in vivo and in vitro biochemical, molecular biological and genetic processes.

Textbook:
TBA

Course Content:

1. Getting Started and Staying Organized
2. Standardization of Pipetting Techniques
3. Quantification of Nucleic Acids and Proteins Using a Spectrophotometer
4. Making Buffer solutions and Measuring pH
5. Restriction Digestion of Lambda DNA and Plasmid DNA
6. Preparation of Agar Plates and Culture Media
7. Preparation and Transformation of Competent Cells
8. Plasmid Purification
9. Column Chromatography
10. SDS-Polyacrylamide Gel Electrophoresis
11. Western Blot
12. Agarose gel electrophoresis
13. 13. Polymerase Chain Reaction

Other Class Policies:

Attendance:
Regular or punctual attendance is expected. If a student misses a class or lab, the student is responsible for obtaining any information distributed during those times. Make-ups are possible only under certain instances (labs cannot be made up). Arrangements for any make-ups and/or missed labs should be discussed directly with the instructor for that day's class.

Academic Honesty:
Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Cheating
Dishonesty of any kind involving examinations, assignments, alteration of records, wrongful possession of examinations, and unpermitted submission of duplicate papers for multiple classes or unauthorized use of keys to examinations is considered cheating. Cheating includes but is not limited to:

- Using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class.
- Falsifying or inventing any information, including citations, on an assigned exercise.

- Helping or attempting to help another in an act of cheating or plagiarism.

Plagiarism

Plagiarism is presenting the words or ideas of another person as if they were your own. Materials, even ideas, borrowed from others necessitate full and complete acknowledgment of the original authors. Offering the work of another as one's own is plagiarism and is unacceptable in the academic community. A lack of adequate recognition constitutes plagiarism, whether it utilizes a few sentences, whole paragraphs, articles, books, audio-visual materials, or even the writing of a fellow student. In addition, the presentation of material gathered, assembled or formatted by others as one's own is also plagiarism. Because the university takes such misconduct very seriously, the student is urged to carefully read university policies on Misconduct in Research and Other Scholarly Activity 05.00. Examples of plagiarism are:

- Submitting an assignment as if it were one's own work when, in fact, it is at least partly the work of another.
- Submitting a work that has been purchased or otherwise obtained from an Internet source or another source.
- Incorporating the words or ideas of an author into one's paper without giving the author due credit.

Adding/Dropping:

The official deadline for adding and dropping courses is as published in the academic calendar and Graduate Bulletin (typically the day before Census Day). However, students are strongly encouraged to meet with their graduate advisor or the Program Coordinator prior to adding/dropping courses. Movement into and out of classes after the 4th class day requires approval of the Program Director. Students can drop until mid-semester without a WP or WF. Drops after mid-semester require approval of the Dean. Each student is responsible for their own enrollment status with the university.

Disability Accommodations:

UTHSCT abides by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act, which mandate reasonable accommodations be provided for students with documented disabilities. If you have a disability and may require some type of instructional and/or examination accommodations, please contact me early in the semester so that I can provide or facilitate provision of accommodations you may need. If you have not already done so, you will need to register with the Student Services Office (located on the UT Tyler Campus). You may call 903-566-7079 for more information.