UTTyler
MEDICAL BIOLOGICAL SCIENCES

BIOT 6335 Tissue Culture Credit Hours: 3

Semester:	Summer 9-week	**Year:**	2022
Class Day/Time:	Monday 9a-5p Thursday 9a-12p	**Class Location:**	BMR 116.1 and B4

Instructor of Record: Dr. Amy Tvinnereim
Office: BMR B2
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Office Hours: Monday and Thursday 8:00 – 9:00 or by appointment.

Course Description: Basic cell culture techniques with a focus on mammalian cell lines. The course will cover the basic requirements of cells grown in culture, sterile technique for handling cells, and methods for transforming and separating cells.

Prerequisite: None **Co-requisite:** None

Goals of Course:

1. Understand the basic requirements for growing mammalian cells in culture.
2. Understand sources of contamination, methods to prevent contamination, and identify contaminated cell cultures.
3. Understand methods to assess cell viability.
4. Demonstrate ability to grow and maintain adherent and suspension cell cultures without contamination.
5. Demonstrate ability to freeze viable cells and recover these cells for future use.
6. Demonstrate ability to prepare cells to be used in assays.
7. Transfect cells and select by antibiotic resistance.
8. Clone cells by limiting dilution and select transformed cells by flow cytometry.

Student Learning Outcomes (SLO or "course objectives"):

1. The student will be able to describe both orally and in writing the basic components of culture media and the conditions required to grow and maintain cells in culture.
2. The student will be able to explain and perform sterile technique required to grow and maintain cells in culture.
3. The student, will demonstrate the ability to prepare cells for assays and to perform assays such as immunohistochemistry on cells grown in culture.
4. The student will demonstrate the ability to apply basic knowledge of growing cells used during class to grow and maintain other cell types.
5. Student will demonstrate the ability to transform mammalian cells, clone transformed cell and assess transformation and cloning efficiency.

Subject-specific Skills:
See Marketable Skills list for this course.

Course Assessment/Methods of Evaluation:
Student skills and understanding of cell culture will be evaluated with a laboratory notebook, graded subjectively, and lab reports.

1. *Laboratory Notebook*: A clear, complete, and concise record of all laboratory actions will be maintained within the lab. The lab notebook is worth 15% of the grade and will be graded subjectively.

2. *Reports*: Reports written in correct scientific technical format will be scored based on content, clarity, and quality of writing. Each report will be worth 35% of grade.
3. *Participation*: Student attendance, participation and engagement in the course, and performance during the lab will be graded subjectively. This is worth 15% of the grade

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

- PLO1 - The student will demonstrate English communication skills in both oral and written forms.
- PLO2 - The student will demonstrate mastery of basic and advanced biotechnology methods.
- PLO4 - The student will demonstrate independent and critical thinking skills integrated with the ability to utilize multiple informational resources.
- PLO5 - The student will explain the principles, mechanisms, and interrelatedness of both in vivo and in vitro biochemical, molecular biological, and genetic processes.

Course Content:
Lecture Topical Outline (based on 170-minute class periods):

- Setting up a tissue culture room and media preparation (1 lecture/lab)
- Growing continuous cell lines adherent and suspension (1 lecture/lab)
- Preparing cells for assays (1 lecture/lab)
- Flow Cytometry (1 lecture/lab)
- Immunofluorescence (1 lecture/lab)
- Freezing cells (1 lecture/lab)
- Starting cultures from frozen stocks (1 lecture/lab)
- Transforming mammalian cells and selecting cells by antibiotic resistance and FACS (1
- lecture/lab)
- Cloning of cells (1 lecture/lab)

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 (Registrar Withdrawal webpage). 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. Each student is responsible for their own enrollment status with the university.

Disability Accommodations:

UT Tyler HSC 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 main campus). You may call 903-566-7079 for more information.