Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: BTEC
Course and Section #: 2030-201
Course Title: Cell Culture Techniques
Credits: 2

Course Description

The course objectives include learning the basic techniques of cell culture, to master sterile technique, and to grow, maintain and preserve cells. The course is roughly divided into two phases: skill acquisition and conducting experiments. Cells will be treated to change phenotype or to respond to metabolic or hormonal conditions. Students will learn to monitor cell growth, methods of transfection, cellular differentiation, and response to environmental conditions. Successful completion of the course will result in mastery of basic cell culture techniques. This course also provides experience in data analysis, writing of reports and record keeping. These also are highly valued skills that are valued in all working environments.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☐ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Eric Domyan

Student Learning Outcomes

1	Use sterile technique.
2	Propagate animal cells in the laboratory.
3	Distinguish between cell types in culture.
4	Distinguish between normal and abnormal cells in culture.
5	Design simple experiments in the laboratory.
6	Execute simple experiments in the laboratory.

Click here to enter text.

Course Materials and Texts

- Textbook: none required. Excerpts from different textbooks and relevant articles will be provided using Canvas.
- Bound Notebook, Lab Coat and ability to calculate large numbers.
- You will also require access to Microsoft Excel and Word or the equivalent.

Course Requirements

Course Assignments, Assessments, and Grading Policy

Assessment:

The following components will be assessed in this course:

Lab Math	10 %
Lab Notebook	15%
Laboratory Exercises	15 %
Lab Experiments	30 %
Final Project Experiment	30 %
Total	100%

Readings. These are on Canvas. Each reading will be the basis of the lectures in class.

Laboratory Exercises and Math are assessments that test practical knowledge and laboratory skills. They are handed in at the end of the relevant laboratory session. They will follow a template and will have spaces for data to be filled in. The exercises will focus on basic techniques. They include exercises on media preparation and testing, initiation of cell lines and splitting of cells, cell counting with both methods and measurement of cell viability.

Lab notebook: To encourage continual maintenance of notebooks, you must have the Title, Purpose, and Methods written out before beginning a given lab. In addition, lab notebooks will be collected and graded multiple times throughout the semester, with no advance notice given. Employers require that lab notebooks be kept up-to-date at all times, and this course will uphold that standard as well. Notebooks will be scored using a defined rubric.

Experimental Reports are the major assessment component of the course. They will report the aims of the experiment, the hypothesis, the methods used, along with the preparation of required materials. The data obtained (results) will be presented along with the steps you take to analyze it. Finally you need to write a conclusion (was the hypothesis proven or aims achieved), along with a discussion of what could be done to improve the experiment or further experiments that could be undertaken.

Required or Recommended Reading Assignments

Lab protocols and PDFs of cell culture techniques provided on Canvas webpage.

General Description of the Subject Matter of Each Lecture or Discussion

Date	Topic	Reading
Mon, 1/6	Introduction, Lab Safety	Lab Safety
Wed, 1/8	Orientation to Cell Culture, Hood Preparation, Aseptic Technique and Contamination	Orientation to Cell Culture
Fri, 1/10	Lab Math, Aliquoting of Reagents	Sterile Environment, Contamination

	Due Jan 12: Lab Math Assignment 1, Lab safety contract, Syllabus Quiz	
Mon, 1/13	Media Preparation Theory, Preparation and Testing of Media	
Wed, 1/15	Lecture Cell Behavior and Initiate cell lines	Culture Media
Fri, 1/17	Cell Counting and Passing	Cell Plating and Counting
	Due Jan 19: Exercise 1: Preparation and Testing of Media	
Mon, 1/20	No Class: MLK Day	
Wed, 1/22	Cell Counting and Passing	Cell Plating and Counting
Fri, 1/24	Cell Viability:Trypan Blue	
	Due Jan 26: Exercise 3: Passaging and Counting Cells **Due Jan 26: Exercise 4: Cell viability using Trypan Blue** **Due Jan 26: Lab Math Assignment 2**	
Mon, 1/27	Plating Efficiency and Colony Survival	
Wed, 1/29	Discuss Experiment Write-up Rubric	
Fri, 1/31	Plating Efficiency and Colony Survival	
	Due Feb 2: Experiment 1: Plating Efficiency and Colony Survival	
Mon, 2/3	Population Doubling Time	
Wed, 2/5	Population Doubling Time	
Fri, 2/7	Population Doubling Time	
	Due Feb 9: Experiment 2: Population Doubling Time	
Mon, 2/10	MTT Assay	
Wed, 2/12	MTT Assay	
Fri, 2/14	MTT Assay	
	Due Feb 16: Exercise 5: MTT Assay	
Mon, 2/17	No class: Presidents' Day	
Wed, 2/19	Cell Toxicity Assay	
Fri, 2/21	Cell Toxicity Assay	
	Due Feb 23: Lab Math Assignment 3	
Mon, 2/24	Cell Toxicity Assay	
Wed, 2/26	Discuss Final Project Proposal	
Fri, 2/28	No Class: UCUR	
	Due March 2: Experiment 3: Cell Toxicity Assay **Due March 2: Lab Math Assignment 4**	
Mon, 3/3	Cell Proliferation Assay and Immunofluorescence	
Wed, 3/5	Cryogenic Storage	Cryopreservation
Fri, 3/7	Cell Proliferation Assay and Immunofluorescence	
	Due March 9: Experiment 4: Cell Proliferation Assay and Immunofluorescence	

Mon, 3/10	Spring Break	
Wed, 3/12	Spring Break	
Fri, 3/14	Spring Break	
Mon, 3/17	Thaw Cells	
Wed, 3/19	Cell Transfection: Lipofection	
Fri, 3/21	Cell Transfection: Lipofection	
	Due March 23: Final Project Proposal **Due March 23: Exercise 6: Cryopreservation and cell viability**	
Mon, 3/24	Cell Transfection: Electroporation	
Wed, 3/26	Cell Transfection: Electroporation	
Fri, 3/28	Cell Transfection: Electroporation	
	Due March 30: Experiment 5: Cell Transfection	
Mon, 3/31	Work on Final Project	
Wed, 4/2	Work on Final Project	
Fri, 4/4	Work on Final Project	
	Due April 6: Final Project Poster First Draft	
Mon, 4/7	Work on Final Project	
Wed, 4/9	Work on Final Project	
Fri, 4/11	Work on Final Project	
	Due April 13: Final Project Poster Final Draft	
Mon, 4/14	Protein Trafficking and Colocalization	
Wed, 4/16	Protein Trafficking and Colocalization	
Fri, 4/18	Protein Trafficking and Colocalization	
Mon, 4/21	**Poster presentations**	
	Due April 27: Experiment 6: Protein Trafficking and Colocalization	

Click here to enter text.

Required Course Syllabus Statements

Generative AI

AI programs are not a replacement for your human creativity, originality, and critical thinking. Writing, thinking, and researching are crafts that you must develop over time to develop your own individual voice. At the same time, you should learn how to use AI and in what instances AI can be helpful to you.

The use of generative AI tools (e.g. ChatGPT, Google Bard, etc.) is permitted in this course for the following activities:

- Brainstorming and refining your ideas;
- Fine tuning your research questions;
- Finding information on your topic;
- Drafting an outline to organize your thoughts; and
- Checking grammar and style.

The use of generative AI tools is not permitted in this course for the following activities:

- Impersonating you in classroom contexts, such as by using the tool to compose discussion board prompts/responses assigned to you or content that you put into a Teams/Canvas chat.
- Completing group work that your group has assigned to you.

- Writing and submitting a rough draft of a writing assignment.
- Writing entire sentences, paragraphs, or papers to complete class assignments.

To be clear, copying the exact wording of an AI chatbot is considered plagiarism and means that a student will be held accountable for violating academic integrity. Also, you are responsible for the information you submit based on an AI query (for instance, that it does not violate intellectual property laws, or contain misinformation or unethical content). If any part of this is confusing or uncertain, please reach out to me for a conversation before submitting your work.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each

course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.

To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.