

BIOLOGY 3403

CELL BIOLOGY LECTURE AND LAB



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Office Hours: MW 10-12, T 10:30-12, W 1-2 pm and by appointment

Course Information

Course Description

Students will investigate the morphology, function, and biochemistry of cells and organelles through lecture, active learning activities, lab exercises, review of the primary literature and web-based inquiry.

Prerequisite and Co-requisite Courses

Biology 1306/1106 (Principles of Biology I), Biology 3301 (Genetics), and 2 semesters of Chemistry

Prerequisite Skills

Accessing Internet websites, using ASU Library resources, and proficiency with Microsoft Word, Excel and PowerPoint are expectations of the student entering Cell Biology.

Student Learning Outcomes

Upon completion of this course, students will be able to:

- Demonstrate a basic understanding of fundamental cell biology topics such as cell membranes and cell interactions, the flow of information in a cell, the flow of energy in a cell, and cell division
- Discuss current scientific issues related to cell biology
- Demonstrate basic laboratory techniques and work safely in a laboratory setting
- Demonstrate the ability to work as part of a lab team to collect and critically analyze data
- Learn to incorporate background research into scientific writing
- Communicate results of an investigation both graphically and in writing

Course Delivery

This is a face-to-face course (**lecture meets in Cavness 023, MWF 9-9:50am. Lab meets in Cavness 001, M or W sections**) with online components that students are expected to access in [Blackboard](#).¹ Exams will be in-person. Lab Quizzes will be administered as a hard copy most weeks. Lab assignments will be submitted as a hard copy. Lab Reports will be submitted as assignments via Blackboard.

Required Texts and Materials

Lecture: Required – *The Cell: A Molecular Approach, 8th edition*. 2019. G. M. Cooper (either hard copy or eBook). Sinauer Associates, Inc, publisher. *Lab:* No additional text. You will need a bound lab notebook and a calculator. We will use some readings from lecture text and handouts of lab procedures that will be available in class or from the course web page (Blackboard).

Technology Requirements

No specific publisher tools need to be purchased. If Blackboard Collaborate has to be used this semester, students will need a computer with a good internet connection and a web cam.

Communication

Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line.

Faculty will respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

Grading

Evaluation and Grades

Course grades will be assigned based on the percentage of all possible points that are earned by the student over the entire semester using the following scale – No exceptions — 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, below 60%=F.

Grading System

Course grades will depend on completing course requirements and meeting the student learning outcomes. Students will earn points on exams (400 pts) and LAB quizzes, LAB assignments, and LAB reports (approximately 350 pts). Additional bonus points may be offered in class for participation and preparedness throughout the semester. Bonus points may take the form of pop quizzes, in-class activities, or other assignments via E-mail/Blackboard. Note that lab experiences are a significant portion of your grade (around 45% of your course grade).

Each exam, including the comprehensive final, will be worth 100 points. The final exam will cover the last material in the course AND a comprehensive portion. All students are

required to take the final exam. If the grade on the final exam is higher than any of your exam scores, I will replace the lowest score with the grade you receive on the final (in other words, the final will count twice). The final exam score may only be used to replace ONE exam and may not be used to replace a zero.

EXAM DATES (mark them on your calendars now):

Exams will cover all of the material up to the last class day before the test. They will be in-person using multiple-choice (using Gradescope answer sheets) and short-answer/essay format.

Exam #1 11 February 2022, Fri

Exam #2 11 March 2022, Fri

Exam #3 15 April 2022, Fri

Final Exam 11 May 2022, Wed (8:00am - 10:00am)

Attendance

You are expected to attend all lecture and lab periods. If you encounter a problem attending classes, please contact me as soon as possible. There will be no lecture class on The last day of class is May 6th and the final exam is on May 11th.

Make-Up Policy

There will be no make-ups for in-class assignments, quizzes, or labs.

Make-up exams will be given as per the following:

- 1) If you miss an exam, you must notify me within 24 hours of the missed exam (by phone, e-mail or in person). Also, the absence must be a legitimate excuse, i.e. a death in your family, personal illness, or a university-sponsored event.
- 2) If the make-up exam is scheduled to be taken before the next class meeting you will be allowed to take the same exam as was given to the rest of the class.
- 3) If the make-up exam cannot be scheduled to be taken before graded exams are to be returned to the rest of the class, then the grade you earn on the final exam will be used to replace the missed exam score. The final exam may only be used to replace ONE exam.
- 4) If you do NOT have a legitimate excuse (see #1 above), you may not make up the missed exam. A missed exam will be recorded as a zero and may not be replaced.

Late Work Policy

Late work will not be accepted unless the student has received prior approval from the instructor. Once approval is granted, late work will be penalized by a 10% reduction per day in the grade. Work will not be accepted if it is more than 3 days past the original due date.

General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)²
- [Angelo State University Catalog](#)³

Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Science and Engineering adheres to the university's [Statement of Academic Integrity](#).⁴

Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).⁵ The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)⁶ for more information.

Drop Policy

The last day to drop the course is determined by the [university calendar](#)⁷ (Thursday, 28 April, 5:00pm). Please come talk with me if you are considering dropping the course.

Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)⁸ in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your lab report papers, it is unacceptable to copy word-for-word even when a source is cited. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list. Similarly, it is unacceptable for a student to use another student's written words and submit them for credit.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the [ASU Writing Center](#).⁹

Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 [Student Absence for Observance of Religious Holy Day](#)¹⁰ for more information.

Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)¹¹

Face to Face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).¹²

Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)¹³ web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification on potentially short notice based on developing circumstances.

Course Schedule- Tentative SEQUENCE OF LECTURE TOPICS

Topic	Chapter
CELLS AND CELL RESEARCH	1
MOLECULES AND MEMBRANES	2
THE PLASMA MEMBRANE	15
BIOENERGETICS AND METABOLISM	3
CELL WALLS, ECM, AND CELL INTERACTIONS	16
RNA SYNTHESIS	8 (partial)
PROTEIN SYNTHESIS	10 (partial)
THE NUCLEUS	11
PROTEIN SORTING AND TRANSPORT	12
MITOCHONDRIA, CHLOROPLASTS, PEROXISOMES	13
THE CYTOSKELETON AND CELL MOVEMENT	14
CELL SIGNALING	17
CELL CYCLE	18
CELL DEATH AND RENEWAL	19
CANCER	20

Please note that each chapter contains more information than will be presented in class. You should read and study those sections that are covered during lecture in detail.

Cell Biology Lab

The lab will comprise a substantial portion of your course grade (almost half). It is in your best interest to attend every lab. There are **TWO lab sections this semester (Monday (02Z) and Wednesday (03Z) afternoon)**. You must attend your assigned lab section - there are no make up labs. Please contact me ASAP if you must miss a lab day.

There is no lab manual. Most lab handouts will be available a few days before each lab ON BLACKBOARD. READING ASSIGNMENTS will also be posted on the Blackboard web site. You will need to purchase a bound lab notebook (no spirals) to record methods, calculations, observations, and results in each lab period. Lab notebooks will not be collected or graded. HOWEVER, it is important to keep every notebook entry current and complete because you will be allowed to use your lab notebooks for quizzes. Only lab notebooks will be allowed as a reference during the quizzes (no handouts or extra materials). Bring a calculator to each lab. Quizzes will be announced. Requirements for each assignment will be outlined during the lab. **Your first assignment is to** complete the safety trainings and quizzes on Blackboard.

There will be three lab report grades this semester. The best 2 grades out of 3 possible reports will be used when calculating your grades (you can do all 3 or you can decide to skip one). Reports generally are due the next lab period after completion of the lab. Lab reports will be an INDIVIDUAL EFFORT. You may discuss the results of a lab activity with your group but the work submitted must be your own. **You may NOT submit a lab report if you are absent from any part of the lab activity.**

Lab report guidelines are posted on the Blackboard Website for the Lab Course under "Weekly Lab Material". We will discuss specific requirements for lab reports during the first lab period and some examples of good lab reports will be provided in the lab room. Your reports will be submitted by uploading them to Blackboard as a Word document using the "Assignment" link and my feedback will be provided in the rubric sheet that accompanies the lab report. Your lab reports MUST HAVE not only YOUR name, but also the name of your LAB PARTNERS for that activity. Refer to the LAB REPORT GUIDELINES and LAB REPORT CHECKLIST of requirements and point values BEFORE YOU submit your lab report.

Most experiments will be completed within the scheduled lab time, however a *few* experiments will require time in the lab outside of scheduled class times. Each lab group should make arrangements to perform procedures outside of class time and distribute information to all group members. Every individual is responsible for cleaning their lab bench after lab, keeping track of supplies and equipment used by their table, and keeping the lab neat and orderly.

CELL BIOLOGY – Spring 2022 SEQUENCE OF LAB TOPICS

WEEK	DATE	TOPIC
1	Jan 24, 26	LAB INTRODUCTION, LAB REPORTS, AND SAFETY QUIZZES
2	Jan 31, Feb 2	MICROSCOPIC EXAMINATION OF CELLS
3*	Feb 7, 9	MEASUREMENT SKILLS/EXTRACTING DNA FROM CELLS
4	Feb 14, 16	CELL SPECIALIZATION AND ELECTROPHORETIC MOBILITY OF LACTATE DEHYDROGENASE ISOENZYMES
5	Feb 21, 23	I. MEASURING ACID PHOSPHATASE ACTIVITY USING SPECTROPHOTOMETRY: DATA COLLECTION
6	Feb 28, Mar 2	II. MEASURING ACID PHOSPHATASE ACTIVITY USING SPECTROPHOTOMETRY: DATA ANALYSIS
7	Mar 7, 9	SEPARATING MOLECULES BY AFFINITY CHROMATOGRAPHY
	Mar 14-18	Spring Break – no Cell labs this week
8*	Mar 21, 23	INHIBITING METABOLIC PATHWAYS IN THE CHLOROPLAST
9	Mar 28, 30	I. CRIME SCENE INVESTIGATION: POLYMERASE CHAIN REACTION
10	Apr 4, 6	II. CRIME SCENE INVESTIGATION: ELECTROPHORESIS
11	Apr 11, 13	ASSAYING FOR BEHAVIORAL EFFECTS IN CELL SIGNALING MUTANTS
12	Apr 18, 20	I. GENETIC ANALYSIS OF PTC TASTE RECEPTORS
13*	Apr 25, 27	II. GENETIC ANALYSIS OF PTC TASTE RECEPTORS
14	May 2, 4	TRACKING DISEASE TRANSMISSION USING ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA)

* Labs marked with an asterisk are to be written up as formal lab reports. The best 2 grades out of 3 possible reports will be used when calculating your grades (you can do all 3 or you can decide to skip one). Each lab report is worth 50 points and is due the following week. Guidelines and cover sheet are posted on BLACKBOARD.

LAB QUIZZES will cover material from the current lab activity and/or material up to 2 lab periods prior. **Quizzes (worth 10 points each) will be given most days except for lab 1.** Some quizzes might be administered using the Blackboard web site. Assignments from each lab will be due the following lab period or occasionally by the end of lab. Assignments are usually worth 10 or 20 points.

READING ASSIGNMENTS FROM THE TEXTBOOK FOR LAB TOPICS CAN BE FOUND ON THE BLACKBOARD WEB SITE

Any changes to the schedule will be at the discretion of the instructor and will be announced in lecture and/or on the class Blackboard web site.

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- 1 <https://blackboard.angelo.edu/>
 - 2 <https://www.angelo.edu/current-students/student-handbook/>
 - 3 <https://www.angelo.edu/academics/catalog/>
 - 4 <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>
 - 5 <https://www.angelo.edu/current-students/disability-services/>
 - 6 <https://angelo.policystat.com/policy/10659448/latest/>
 - 7 http://www.angelo.edu/services/registrar_office/academic_calendar.php
 - 8 <https://www.angelo.edu/live/files/27603-student-handbook-2020-21#page=96>
 - 9 https://www.angelo.edu/current-students/writing-center/academic_honesty.php
 - 10 <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>
 - 11 <https://www.angelo.edu/incident-form>
 - 12 <https://www.angelo.edu/title-ix>
 - 13 <https://www.angelo.edu/covid-19/>