Cell Biology (Biology 3403) Course Schedule
Spring 2020
Dr. Loren K. Ammerman

<table>
<thead>
<tr>
<th>Lecture: MWF 9:00-9:50am</th>
<th>Office hours: MW 10-12, M 2-5, T 9-12, or by appointment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab: W 2:00 - 4:50, CAV 001</td>
<td>Phone: 325-486-6643</td>
</tr>
<tr>
<td>E-mail: <a href="mailto:loren.ammerman@angelo.edu">loren.ammerman@angelo.edu</a></td>
<td>Office: CAV 003B</td>
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</tbody>
</table>

COURSE OBJECTIVE:
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.

STUDENT LEARNING OUTCOMES:
At the completion of this course a student 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

TEXTBOOK:
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. 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).

GRADING:
Students will earn a grade based on the percentage of points earned on all exams, quizzes, lab assignments, and lab reports. 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. Students are expected to use their Blackboard account and to check for e-mail messages on a regular basis. Note that lab experiences are a significant portion of your grade. Grades will be assigned based on the following scale – No exceptions — 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, below 60%=F.

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 multiple-choice and short-answer/essay format.

Exam #1  7 February 2020, Fri
Exam #2  6 March 2020, Fri
Exam #3  8 April 2020, Wed
Final Exam 6 May 2020, 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 Monday, Jan. 20 (MLK Day), March 9-13
(Spring Break), or Friday, April 10 (Spring Holiday). Labs will not meet on Mar. 11 because of Spring Break. The last day of class is May 1st and the final exam is on Wednesday, May 6th.

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.

Tentative SEQUENCE OF LECTURE TOPICS

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

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.

STUDY TIPS AND COURSE RESOURCES:
Materials for this course will be posted on BLACKBOARD. Visit this site periodically to look for announcements, lab handouts, power point files, or assignments. You are expected to read your textbook and use it to supplement your lecture notes. I encourage you to talk with other students about the material in study groups. The best way to learn the material is to effectively explain it to someone else. Please come
talk with me if you have any questions. I also would suggest that you use the review questions, chapter
synopses, and self-quizzes to review on the interactive textbook web site.

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.

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. The employee charged with the
responsibility of reviewing and authorizing accommodation requests is:

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 for more information.

PLAGIARISM: Plagiarism is a serious topic covered in ASU’s Academic Integrity policy 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 discussions and/or your papers, it is unacceptable to copy
word-for-word without quotation marks and the source of the quotation. 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. Papers are subject to be evaluated for originality. Resources to help you understand this
policy better are available at the ASU Writing Center.

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 Days for more information.

TITLE IX AT ANGELO STATE UNIVERSITY: The University prohibits discrimination based on sex, which
includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual
Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including:
sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency,
interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a
Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am
notified of to the Office of Title IX Compliance.
Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022
michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345. For more information about Title IX in general you may visit www.angelo.edu/title-ix.

DROP POLICY:
The last day to drop the course is determined by the university calendar (Thursday, 26 March, 5:00pm). Please come talk with me if you are considering dropping the course.

CELL BIOLOGY LAB:
The lab will comprise a substantial portion of your course grade. It is in your best interest to attend every lab. There is one lab section this semester (Wednesday afternoon). There are no makeup 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 training and quizzes on Blackboard.

There will be three lab report grades this semester. They generally are due the next lab period after completion of the lab. Lab reports will be an individual effort. You may NOT submit a lab report if you are absent from any part of the lab activity. You may discuss the results of a lab activity with your group but the work submitted must be your own.

Lab report guidelines are posted on the Blackboard Website under “Course Material”. We will discuss specific requirements for lab reports during the 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 and my feedback will be provided in the digital file. Your lab reports MUST HAVE the provided LAB REPORT COVER SHEET attached to it (with checklist of requirements and point values) and it should be filled out to show that all requirements have been met. This cover sheet is available on Blackboard.

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.
## SEQUENCE OF LAB TOPICS

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 15</td>
<td>MEASUREMENT SKILLS/EXTRACTING DNA FROM CELLS</td>
</tr>
<tr>
<td>2</td>
<td>Jan 22</td>
<td>MICROSCOPIC EXAMINATION OF CELLS</td>
</tr>
<tr>
<td>3</td>
<td>Jan 29</td>
<td>SCIENTIFIC WRITING: FIGURES, TABLES, AND LITERATURE REFERENCES</td>
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<tr>
<td>4*</td>
<td>Feb 5</td>
<td>CELL SPECIALIZATION AND ELECTROPHORETIC MOBILITY OF LACTATE DEHYDROGENASE ISOENZYMES</td>
</tr>
<tr>
<td>5</td>
<td>Feb 12</td>
<td>I. MEASURING ACID PHOSPHATASE ACTIVITY USING SPECTROPHOTOMETRY: DATA COLLECTION</td>
</tr>
<tr>
<td>6</td>
<td>Feb 19</td>
<td>II. MEASURING ACID PHOSPHATASE ACTIVITY USING SPECTROPHOTOMETRY: DATA ANALYSIS</td>
</tr>
<tr>
<td>7*</td>
<td>Feb 26</td>
<td>SEPARATING MOLECULES BY AFFINITY CHROMATOGRAPHY</td>
</tr>
<tr>
<td>8</td>
<td>Mar 4</td>
<td>INHIBITING METABOLIC PATHWAYS IN THE CHLOROPLAST</td>
</tr>
<tr>
<td>9</td>
<td>Mar 9-13</td>
<td><strong>SPRING BREAK</strong> (no lab)</td>
</tr>
<tr>
<td>10</td>
<td>Mar 18</td>
<td>CLONING EUKARYOTIC GENES USING PROKARYOTIC CELLS</td>
</tr>
<tr>
<td>11</td>
<td>Mar 25</td>
<td>I. CRIME SCENE INVESTIGATION: POLYMERASE CHAIN REACTION</td>
</tr>
<tr>
<td>12*</td>
<td>Apr 1</td>
<td>II. CRIME SCENE INVESTIGATION: ELECTROPHORESIS</td>
</tr>
<tr>
<td>13</td>
<td>Apr 8</td>
<td>ASSAYING FOR BEHAVIORAL EFFECTS IN CELL SIGNALING MUTANTS</td>
</tr>
<tr>
<td>14</td>
<td>Apr 15</td>
<td>I. GENETIC ANALYSIS OF PTC TASTE RECEPTORS</td>
</tr>
<tr>
<td>15</td>
<td>Apr 22</td>
<td>II. GENETIC ANALYSIS OF PTC TASTE RECEPTORS</td>
</tr>
<tr>
<td>16</td>
<td>Apr 29</td>
<td>TRACKING DISEASE TRANSMISSION USING ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA)</td>
</tr>
</tbody>
</table>

* Labs marked with an asterisk are to be written up as formal lab reports. 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 will be given most days except for lab 1.** Some quizzes might be administered using the Blackboard web site. Quizzes are worth 10 points each. Assignments from each lab will be due the following lab period or occasionally by the end of lab. Assignments are usually worth 10 points each (a few will be 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. [http://blackboard.angelo.edu/](http://blackboard.angelo.edu/)
2. [https://oup-arc.com/access/cooper8e-student-resources - all_resources](https://oup-arc.com/access/cooper8e-student-resources - all_resources)
4. [https://www.angelo.edu/services/disability-services/](https://www.angelo.edu/services/disability-services/)
5. [https://www.angelo.edu/content/files/14197-op-1011-grading-procedures](https://www.angelo.edu/content/files/14197-op-1011-grading-procedures)
7. [https://www.angelo.edu/dept/writing_center/academic_honesty.php](https://www.angelo.edu/dept/writing_center/academic_honesty.php)
8. [https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of](https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of)