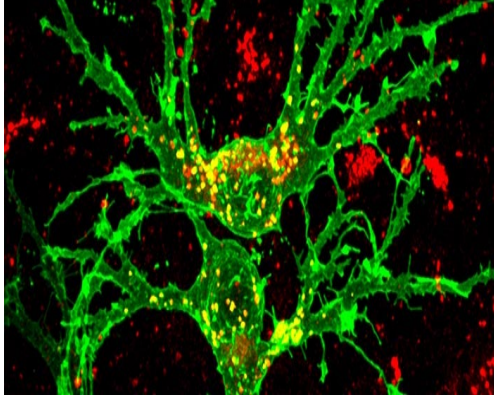


Lecture Syllabus

BIOL 4301 Cell Biology Spring 2024



Instructor: Dr. Thornton R Larson
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Lectures: Tues/Thurs 9:30 AM to 10:50 AM
Office Hours: Mon/Wed 9 AM to 11 AM
Tuesday 4 PM to 6 AM

Course Description:

The cell is the fundamental unit of life. I am consistently fascinated by the idea of cellular structure and how it equates to function. As such I am incredibly excited to take you into this detailed overview of the cell. This course will focus on the molecular aspects of cell structure and function. It will function as part review on topics covered in previous biology courses and then greatly expand on these topics. We will cover key metabolic pathways (glycolysis, aerobic respiration, and photosynthesis) in greater detail than previous courses to master important structures and how those structures relate to a functioning cell and then a functioning multicellular organism in the case of those organisms. If I don't say "structure relates to function" at least once a week then you should be thinking still about the structure of the various molecules, proteins, pathways, etc. because so much relates to these simple statement.

I look forward to taking you on this journey. It can be a lot of material and as such I will work to have supplementary videos found on places like YouTube to deepen your understanding. If you feel you need a refresher on material from previous courses, please don't hesitate to speak to me so we can arrange a better way to help you with the material. Again, in many instances for a simple review, I have found simple videos from Khan Academy or the Ameba Sisters on YouTube to be immensely helpful to students. Never forget as complicated as some topics can be I want you to find passion in the discovery of new information. This is part of the reason for the 5 lecture assignments, which are primarily peer-review research summary papers with some comparison.

I hope you find these topics fascinating as they are fundamental to deeper understanding of biological topics.

Required Textbook:

1. *The Cell: A Molecular Approach, 8th edition*. Cooper and Hausman.

Exams and Grading:

4 Lecture Exams (100 pts ea)	400 (~57%)
5 Lecture Assignments (20 pts ea)	100 (~14%)
Weekly Blackboard Discussions (~10pts ea)	150 (~21%)
Replies to peers in BB (~5 pts ea)	50 (~7%)
Total Credit	700 points

Course Objectives, Learning Outcomes, Marketable Skills, Policies, and University Services

Course Objectives: At the end of the semester, students will:

1. Understand the evolutionary origin of the cell and eukaryotic organelles.
2. Develop mastery of the basic organic macromolecules.
3. Understand in detail cell self-replication: the flow of genetic information, replication, transcription, and translation.
4. Master the processes of cell metabolism: glycolysis, aerobic respiration, and photosynthesis.
5. Understand and recognize cell and organelle structure.

Student Learning Outcomes (SLOs) for Biology:

1. Demonstrate an understanding of evolution by natural selection.
2. Demonstrate an integration of environmental awareness into everyday modern life.
3. Understanding how to incorporate molecular biology into the study of the whole organism.
4. Demonstrate utilization of various field techniques toward addressing scientific questions in the discipline.
5. Conduct basic laboratory experiments utilizing standard observational strategies.

Marketable Skills:

1. Ability to organize, analyze, and interpret data.
2. Proficiency in using presentation software.
3. Experience in managing time and meeting deadlines.
4. Ability to speak effectively and write concisely about scientific topics.
5. Experience in the development of professional email correspondence.

Attendance:

Mandatory. Roll will be by sign-in sheet at the front of the class. I am allowed to drop you from my class if you miss more than six times (that accounts for 3 full weeks of lectures). I generally do not drop you myself, so don't expect that I will. I do not wish to hear excuses for missing class and do not want to hear about it every time you are gone. Absences are excused only if you have a documented, university-approved excuse (hospitalization, funeral, etc.) **DO NOT MISS EXAMS** unless you have a documented, university-approved excuse. If you do not inform me of your approved absence before the exam, it will be a ZERO.

Summary Papers:

More specific instructions on summary papers will be provided on Blackboard. The purpose of these assignments is for you to read current research in genetics. When I announce the assignments, you will have one week to submit the paper you plan to review to me, upon which I will state if A) it is a research paper (many students still at this stage in their education are unfamiliar with what constitutes a peer-reviewed research paper), B) if the paper is something that I think you are able to understand in a thorough enough manner to review it. If you choose not to check the paper with me and it is not a peer-reviewed research paper, you will lose significant points on the assignment.

The review will then be submitted to Blackboard a week later and include a comparison paragraph to a **second** peer-reviewed paper. This second paper does not require a summary but just a comparison of ideas from the papers' discussion sections (the discussion section is the most important part of the paper). This paper will be 1.5 – 2 pages single-spaced, include citations in CSE format, and be written in a clear and concise manner expected of upper-level biology students. The paper is due by the beginning of class on the due date.

A special late policy will be in place for summary papers. The policy is as follows: if it is late 1 minute to 24 hours 10% will be taken off the assignment; from 24 to 48 hours 20% taken off; and from 48 to 72 hours 30% taken off. Anything after 72 hours (3 days) will be a zero. That is a daily grade level for papers that would receive 20/20 points.

Discussion Boards:

Each student will run a discussion topic chosen from a set at the beginning of the semester. The student will make an initial post regarding the subject and what they can discern at this stage of the semester.

Every week students will be expected to reply to at least one of the discussion board topics (never the same topic two weeks in a row). The reply will consist of information that the student may be familiar with or discuss how what the initial post helped them understand regarding a topic, or really anything as long as it is within the topic of the discussion board.

Students moderating that discussion board will reply to replies weekly and add more information on how their topic applies to lectures, readings (including their summary topics), or just learning interests. In this way, students interact with each other on various topics covered in detail

throughout the semester. Also, this acts to increase familiarity with the topics among all students participating.

Exit Notes:

Upon the conclusion of every class, students will fill out three notecards. One note card will express something they are totally lost on and should consider scheduling office hours to discuss for their understanding. The second is for things they mostly got. This will inform the instructor to consider reviewing that specific topic, likely at the beginning of the next class. The third is for topics that they completely understand. All of these allow the instructor to understand what areas may need more attention given to them in next lectures, reviews before exams, and even future courses.

Late Work Policy:

Late work is frowned upon for assignments to be turned in. All assignments will be due turned in to the appropriate assignment section (Blackboard or other online program) before class starts that day. That means if class starts at 11:00 AM the assignment is in Blackboard by 10:59.59 AM. After this time, you will lose 10% on the assignment. After 24–48 hours late it will be 20% off, and 48–72 hours late it will be 30% off. Beyond these times it will be a '0' on the assignment. These terms are meant to respect both timeliness and flexibility of deadlines and will be upheld.

SRSU Library Services:

The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. Off-campus access requires your LoboID and password. Check out materials using your photo ID. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or phone (432-837-8123).

SRSU Disability Services:

SRSU Disability Services. Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Alpine Students seeking accessibility/accommodations services must contact Mary Schwartz Grisham, LPC, SRSU's Accessibility Services Coordinator at 432-837-8203 or email mschwartz@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine, Texas, 79832.

Academic Dishonesty and Plagiarism:

The University expects all students to engage in all academic pursuits in a manner that is beyond reproach and to maintain complete honesty and integrity in the academic experiences both in and out of their classroom. The University may initiate disciplinary proceeding against a student accused of any form of academic dishonesty, including but not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials.

“Cheating” includes 1. Copying from another student’s test paper, laboratory report, other report, or computer files, data, listings, and/or programs, or allowing another student to copy from same. 2. Using, during a test, materials not authorized by the person giving the test. 3. Collaborating, without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of a non-administered test. 4. Substituting for another student; permitting any other person, or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit. 5. Bribing another person to obtain a non-administered test or information about a non-administered test. 6. Purchasing, or otherwise acquiring and submitting as one’s own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of a rough and/or final version of an assignment by a professional typist. 7. “Plagiarism” means the appropriation and the unacknowledged incorporation of another’s work or idea in one’s own written work offered for credit. 8. “Collusion” means the unauthorized collaboration with another person in preparing written work offered for credit. 9. “Abuse of resource materials” means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials. 10. “Academic work” means the preparation of an essay, dissertation, thesis, report, problem, assignment, or other project that the student submits as a course requirement or for a grade. 11. “Falsification of Data” means the representation, claim, or use of research, data, statistics, records, files, results, or information that is falsified, fabricated, fraudulently altered, or otherwise misappropriated or misrepresented. All academic dishonesty cases may be first considered and reviewed by the faculty member. If the faculty member believes that an academic penalty is necessary, he/she may assign a penalty but must notify the student of his/her right to appeal to the department chair, the dean and eventually, to the Provost and Vice President for Academic and Student Affairs before imposition of the penalty. At each step in the process, the student shall be entitled to written notice of the offence and/or of the administrative decision, an opportunity to respond, and an impartial disposition as to the merits of his/her case. The decision of the Provost and Vice President for Academic and Student Affairs shall be final.

I will reiterate here, I take academic dishonesty and plagiarism very seriously. Citations are your friend.

Classroom Climate of Respect:

Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.

SRSU Distance Education Statement:

Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.

Tentative Lecture Schedule

	TOPIC	Chapter
<i>Week 1</i> Jan 15		
	MLK, Jr. Day (No Class)	
Thursday, Jan 18 th	Syllabus; Origin of the Cell	1
<i>Week 2</i> Jan 22		
Tuesday, Jan 23 rd	Cell Composition	2
Thursday, Jan 25 th	Cell Metabolism	3
<i>Week 3</i> Jan 29		
Tuesday, Jan 30 th	Cell Metabolism Part 2	3
Thursday, Feb 1 st	Fundamentals of Molecular Biology	4
<i>Week 4</i> Feb 5		
Tuesday, Feb 6 th	Fundamentals of Molecular Biology Part 2	4
Thursday, Feb 8 th	Genomics, Proteomics, and Systems Biology	5
<i>Week 5</i> Feb 12		
Tuesday, Feb 13 th	Genomics, Proteomics, and Systems Biology	5
Thursday, Feb 15 th	EXAM 1	
<i>Week 6</i> Feb 19		
Tuesday, Feb 20 th	Genes and Genomes	6
Thursday, Feb 22 nd	Replication, Maintenance, and Rearrangement of Genomic DNA	7
<i>Week 7</i> Feb 26		
Tuesday, Feb 27 th	RNA Synthesis and Processing	8
Thursday, Feb 29 th	Transcriptional Regulation and Epigenetics	9
<i>Week 8</i> March 4		
Tuesday, March 5 th	Protein Synthesis, Processing, and Regulation	10
Thursday, March 7 th	EXAM 2	
<i>Week 9</i> March 11	SPRING BREAK	
<i>Week 10</i> March 18		

Tuesday, March 19 th	The Nucleus	11
Thursday, March 21 st	Protein Sorting and Transport	12
<i>Week 11</i> March 25		
Tuesday, March 26 th	Mitochondria, Chloroplasts, and Peroxisomes	13
Thursday, March 28 th	The Cytoskeleton and Cell Movement	14
<i>Week 12</i> April 1		
Tuesday, April 2 nd	The Plasma Membrane	15
Thursday, April 4 th	Cell Walls, Extracellular Matrix, and Cell Interactions	16
<i>Week 13</i> April 8		
Tuesday, April 9 th	EXAM 3	
Thursday, April 11 th	Cell Signaling	17
<i>Week 14</i> April 15		
Tuesday, April 16 th	Cell Signaling	17
Thursday, April 18 th	The Cell Cycle	18
<i>Week 15</i> April 22		
Tuesday, April 23 rd	The Cell Cycle	18
Thursday, April 25 th	Cell Death and Renewal	19
<i>Week 16</i> April 29		
Tuesday, April 30 th	Cancer	20
	No Class Wed/Thurs for Mental Health Day	
<i>Week 16</i>	FINALS	