BIOL 3306 - Genetics Fall 2022 Lecture Syllabus

INSTRUCTOR AND COURSE DESCRIPTION

Instructor: Dr. Thornton R. Larson **Office Hours:** W 2-4

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Lectures: TR 11 AM – 1215 PM WSB 101

Course Description

Genetics houses the secrets to organismal self-perpetuation. This will be a foundational overview of how genetics has evolved over the last 150 years or so. From Gregor Mendel and his study of pea plants to gene editing with CRSPR. The goal of this course is to provide you with a strong understanding of genetics building on topics that are typically covered in previous courses.

This course will require 16 weeks of work. It will contain two larger assignments meant to expose and create understanding of scientific reading and writing along with many weekly assignments. With topics that can get complex quickly, such as genetics, consistency of exposure to the material is the best course. Therefore, it is the goal of the weekly assignments to both familiarize you with the material and create a method in which you are able to work with the material regularly outside of class.

Required Materials

Genetics: From Genes to Genomes. Hartwell. 7th edition.

We will be using the connect course through McGraw Hill purchase ISBN:
Hartwell 7e: Genetics Connect Access Card – 9781260444025

All assignments excluding the two paper assignments are through McGraw Hill Connect so this is Required!!!

The Genetics Connect Access Card comes with an E-textbook, that has the ability to be read to you, so you can listen to it like a podcast. Though I do recommend at the very least following along for best understanding. You may buy a print version of the text if you are so inclined but that is not required

Exams and Grading

3 lecture exams (100 pts each) 300

2 paper Assignments (50 pts each) 100

Weekly Connect Assignments 100

Total Credit 500 points

A 90 – 100% B 80 – 89% C 70 – 79% D 60 – 69% F <60%

COURSE OBJECTIVES, LEARNING OUTCOMES,MARKETABLE SKILLS, POLICIES, AND UNIVERSITY SERVICES

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

1. Know and Understand the shape and molecules that make up DNA and how they combine.
2. Be able to complete complex hybrid crosses.
3. Know the difference between alleles on the same vs different chromosomes.

4. Understand how genetic information is used to relate to the full organism.
5. Understand and compare different reproductive means of genetic information.
6. Understand how genes are regulated.
7. Utilize databases to find primary literature to learn more about modern genetic techniques.

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. Experience in managing time and meeting deadlines.
3. Ability to speak effectively and write concisely about scientific topics.
4. Experience in the development of professional email correspondence.

Attendance:

Mandatory. No roll will be called, but this course is sized to where I will recognize when someone is not present. I am allowed to drop you from my class if you miss more than six times (that accounts for 2 full weeks of lecture). 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. For labs, DO NOT MISS LAB PRACTICALS!!! It is impossible to re-run them as they are setup with many lab components that take up space that is not guaranteed.

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:

ADA (Americans with Disabilities Act) 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. Students seeking accessibility/accommodations services must contact Rebecca Greathouse Wren, LPC-S, SRSU's Accessibility Services Coordinator at 432-837-8203

(please leave a message and we'll get back to you as soon as we can during working hours), or email rebecca.wren@sulross.edu. Our office is located on the first floor of Ferguson Hall (Suite 112), and our mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832

ACADEMIC HONESTY:

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 an non-administered test. 5. 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. 6. Bribing another person to obtain a non-administered test or information about a non-administered test. 7. 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. 8. "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea in one's own written work offered for credit. 9. "Collusion" means the unauthorized collaboration with another person in preparing written work offered for credit. 10. "Abuse of resource materials" means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials. 11. "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. 12. "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.

Diversity Statement

"I aim to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, socioeconomic class, age, nationality, etc.). I also understand that the crisis of COVID, economic disparity, and health concerns, or even unexpected life events could impact the conditions necessary for you to succeed. My commitment is to be there for you and help you meet the learning objectives of this course. I do this to demonstrate my commitment to you and to the mission of Sul Ross State University to create an inclusive environment and care for the whole student as part of the Sul Ross Familia. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you."

For Remote/Online Courses Only - 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 SCHEDULE

	DATE	TOPIC	CHAPTER
Week 1			
Lecture 1	8/23	Introduction; Mendel's Principles of Heredity	1
Lecture 2	8/25	Extensions of Mendel's Laws	2
Week 2			
Lecture 3	8/30	Extensions of Mendel's Laws	2
Lecture 4	9/1	Chromosomes and Inheritance	3
Week 3			
Lecture 5	9/6	Sex Chromosomes	4
Lecture 6	9/8	Linkage, Recombination, and Gene Mapping	5
Week 4			
Lecture 7	9/13	Linkage, Recombination, and Gene Mapping	5
Lecture 8	9/15	DNA Structure, Replication, and Recombination	6
Week 5			
Lecture 9	9/20	DNA Structure, Replication, and Recombination	6
EXAM 1	**9/22**		
Week 6			
Lecture 10	9/27	Mutation	7
Lecture 11	9/29	Using Mutations to Study Genes	8
Week 7			
Lecture 12	10/4	Gene Expression: The Flow of Information from DNA to RNA to Protein	9
Lecture 13	10/6	Gene Expression: The Flow of Information from DNA to RNA to Protein	9
Week 8			
Lecture 14	10/11	Digital Analysis of DNA	10
Lecture 15	10/13	Genome Annotation	11
Week 9			
Lecture 16	10/18	Analyzing Genomic Variation	12
Lecture 17	10/20	The Eukaryotic Chromosome	13
Week 10			
Lecture 18	10/25	Chromosomal Rearrangement	14
EXAM 2	**10/27**		
Week 11			
Lecture 19	11/1	Ploidy and Bacterial Genetics	15 & 16
Lecture 20	11/3	Organellar Inheritance	17
Week 12			
Lecture 21	11/8	Gene Regulation in Prokaryotes	18
Lecture 22	11/10	Gene Regulation in Eukaryotes	19

Week 13			
Lecture 23	11/15	Epigenetics	20
Lecture 24	11/17	Manipulating the Genomes of Eukaryotes	21
Week 14			
Lecture 25	11/22	Genetic Analysis of Development	22
No Class	11/24	**THANKSGIVING HOLIDAY**	
Week 15			
Lecture 26	11/29	Variation and Selection in Populations	24
No Class	12/1	**DEAD DAY – NO CLASSES**	
Week 16			
FINAL	12/5	**FINALS 10:15 AM - 12:15 PM ALPINE**	
	12/5	**FINALS 10 AM – NOON RGC (DISCUSS)**	