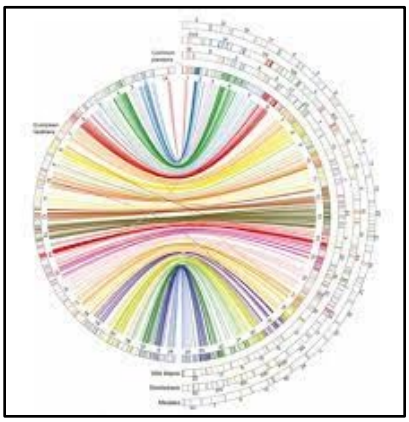
BIOL 3306 - Genetics Fall 2024 Lecture Syllabus



INSTRUCTOR AND COURSE DESCRIPTION

Instructor: Dr. Thornton R. Larson

Office: WSB 221

Office Hours: T 530 PM to 7 PM; W 2 PM to 4 PM; or by appt

Office Phone: (432)837-8084

Lectures: TR 11 AM – 1215 PM in WSB 101

Email: TRL21jz@sulross.edu

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

All homework and reading will be accessed through Codon Learning; an access code will be provided through Blackboard. Cost $40

This semester our class is using a courseware platform called Codon Learning, which is designed to help you practice concepts and skills for this class and use research-backed study strategies. You will use it to complete assignments and study for tests.

To get started using Codon Learning:

1. Go to https://app.codonlearning.com/ and click "Reset Password" to set your password. Your username is your school email address.
2. Complete the 'Welcome to Codon' assignment to introduce you to the platform.
3. Visit the Course Access tab to purchase your subscription. You have 21 days from the first day of class until you need to pay $40 for the subscription using a credit card unless signed up for Follet textbooks.

4. Get help from Codon Learning on their support page by creating a support ticket, or emailing support@codonlearning.com.

All assignments and reading excluding the two paper assignments are through Codon Learning so this is Required!!!

The reading is comprised of several different sources including open-source textbooks, biotechnology company websites, and scientific publications. These are meant to give you a strong background in genetics as the subject is today.

Exams and Grading

Weekly Assignments	100
2 paper Assignments (50 pts each)	100 (Assigned 10/10, 11/7; Paper due 10/24, 11/21)
6 lecture Quizzes (50 pts each)	300
1 Cumulative Final	200

Total Credit 700 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. Sign in sheet will be at the front of the class for you to sign yourself in. It is your responsibility to sign yourself in. If you fail to do so and miss a deadline and do not sign in there is no proof that you were in attendance. I am allowed to drop you from my class if you miss more than six times (that accounts for 3 full weeks of lecture). I do not typically drop people from the class however, so if you are absent consistently and expecting me to drop you, you will be in for a surprise F in the course. 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.

Homework:

Homeworks for this course are due through codon weekly. The deadline for submission is 11:59 PM, no late homework will be accepted as you have a whole week to complete it. As you work through the study path other study materials well be unlocked including practice quizzes and practice tests meant to prepare you for the near biweekly quizzes in the course.

Quizzes:

The dates of the quizzes have been posted below, these are given in person in class and meant to take up a good portion of class time. It is strongly recommended that you study consistently for the class, I highly recommend visiting the tutoring center for help or making use of my office hours. The quizzes make up a significant portion of the course grade, and the final makes up almost 30% of the class grade. Having a study plan is imperative to your success in this class. You will find, however, that in genetics much like any subject in biology builds upon itself so you may find your understanding of earlier topics growing with the introduction of more complex ones.

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. 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). All in all 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. 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 grade level per day for papers that would receive 50/50 points.

SRSU Library Services

The Bryan Wildenthal Memorial Library and Archives of the Big Bend in Alpine offer FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, https://library.sulross.edu/. Off-campus access requires logging in with your LoboID and password. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123).

No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services

and resources at various libraries across Texas. Learn more about the TexShare program by visiting library.sulross.edu/find-and-borrow/texshare/ or ask a librarian by emailing srsulibrary@sulross.edu.

Mike Fernandez, SRSU Librarian, is based in Eagle Pass (Building D-129) to offer specialized library services to students, faculty, and staff. Utilize free services such as InterLibrary Loan (ILL), ScanIt, and Direct Mail to get materials delivered to you at home or via email.

SRSU Disability Services:

SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the 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 Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director or Ronnie Harris, LPC, Counselor, at 432-837-8203 or email mschwartze@sulross.edu or ronnie.harris@sulross.edu. RGC students can also contact Alejandra Valdez, at 830-758-5006 or email alejandra.valdez@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 Integrity:

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. Students should submit work that is their own and avoid the temptation to engage in behaviors that violate academic integrity, such as turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources unless permission is expressly given for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

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.

Supportive Statement

I aim to create a learning environment for my students that supports various perspectives and experiences. I understand that the recent pandemic, economic disparity, and health concerns, or even unexpected life events may 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 a supportive 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
Week 1		
Lecture 1	8/27	Introduction; Syllabus; Class Structure
Lecture 2	8/29	DNA Structure and Replication
Week 2		
Lecture 3	9/3	DNA Visualization and Forensics
Lecture 4	9/5	Transcription and Translation
Week 3		
Lecture 5	9/10	RNA Processing
Quest 1	**9/12**	**Quest 1**
Week 4		
Lecture 6	9/17	Mutations
Lecture 7	9/19	Gene Expression
Week 5		
Lecture 8	9/24	DNA Structure, Replication, and Recombination
Quest 2	**9/26**	**Quest 2**
Week 6		
Lecture 9	10/1	Inheritance; Probability of Inheritance
Lecture 10	10/3	Probability of Inheritance; Pedigree Analysis
Week 7		
Lecture 11	10/8	Sex Chromosomes; Pedigree Analysis
Quest 3	**10/10**	**Quest 3**
Week 8		
Lecture 12	10/15	Chromosome Errors
Lecture 13	10/17	Linkage; Extensions to Dominant and Recessive traits
Week 9		
Lecture 14	10/22	Extensions to Dominant and Recessive traits; Gene Interactions

Quest 4	**10/24**	**Quest 4**
Week 10		
Lecture 15	10/29	Polygenic and Complex Traits
Lecture 16	10/31	Hardy-Weinberg Equilibrium; Evolution
Week 11		
Lecture 17	11/5	Disease Diagnosis; Evolution
Quest 5	**11/7**	**Quest 5**
Week 12		
Lecture 18	11/12	Epigenetics
Lecture 19	11/14	Genome Analysis
Week 13		
Quest 5	**11/19**	**Quest 6**
Lecture 20	11/21	Recombinant DNA
Week 14		
Lecture 21	11/26	Genetics of Cancer; Disease Diagnostics and Treatment
No Class	**11/28**	**THANKSGIVING HOLIDAY**
Week 15		
Lecture 22	12/3	Review
No Class	12/5	**MENTAL HEALTH DAY – NO CLASSES**
Week 16		
FINAL		**TO BE ANNOUNCED**