

# BIOL 3306 - Genetics Fall 2023 Lecture Syllabus

## INSTRUCTOR AND COURSE DESCRIPTION

**Instructor:** Dr. Thornton R.

Larson

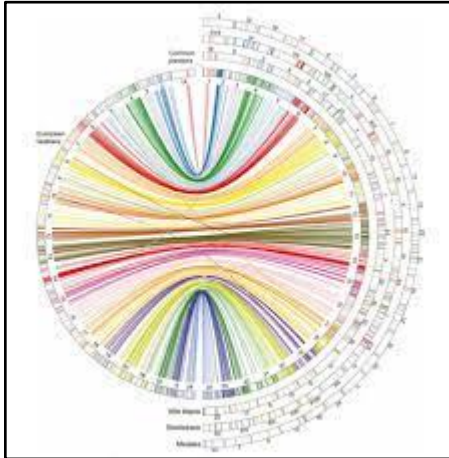
**Office:** WSB 221

**Office Hours:** M 9 AM to Noon; T 2 PM to 4 PM; or by

appt **Office Phone:** (432)837-8084

**Email:** [TRL21jz@sulross.edu](mailto:TRL21jz@sulross.edu)

**Lectures:** TR 11 AM – 1215 PM in 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 CRISPR. 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: access code will be provided through Blackboard. **Cost \$35**

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 \$35 for the subscription using a credit card.
4. Get help from Codon Learning on their support page by creating a support ticket, or emailing [support@codonlearning.com](mailto: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 will 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 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](http://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](mailto: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](mailto: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 a 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
<i>Week 1</i>		
Lecture 1	8/29	Introduction; Syllabus; Class Structure
Lecture 2	8/31	DNA Structure and Replication
<i>Week 2</i>		
Lecture 3	9/5	DNA Visualization and Forensics
Lecture 4	9/7	Transcription and Translation
<i>Week 3</i>		
Lecture 5	9/12	RNA Processing
<b>Quiz 1</b>	<b>9/14</b>	<b>Quiz 1</b>
<i>Week 4</i>		
Lecture 6	9/19	Mutations
Lecture 7	9/21	Gene Expression
<i>Week 5</i>		
Lecture 8	9/26	DNA Structure, Replication, and Recombination
<b>Quiz 2</b>	<b>9/28</b>	<b>Quiz 2</b>
<i>Week 6</i>		
Lecture 9	10/3	Inheritance; Probability of Inheritance
Lecture 10	10/5	Probability of Inheritance; Pedigree Analysis
<i>Week 7</i>		
Lecture 11	10/10	Sex Chromosomes; Pedigree Analysis
<b>Quiz 3</b>	<b>10/12</b>	<b>Quiz 3</b>
<i>Week 8</i>		
Lecture 12	10/17	Chromosome Errors
Lecture 13	10/19	Linkage; Extensions to Dominant and Recessive traits

<i>Week 9</i>		
Lecture 14	10/24	Extensions to Dominant and Recessive traits; Gene Interactions
<b>Quiz 4</b>	<b>10/26</b>	<b>Quiz 4</b>
<i>Week 10</i>		
Lecture 15	10/31	Polygenic and Complex Traits
Lecture 16	11/2	Hardy-Weinberg Equilibrium; Evolution
<i>Week 11</i>		
Lecture 17	11/7	Disease Diagnosis; Evolution
<b>Quiz 5</b>	<b>11/9</b>	<b>Quiz 5</b>
<i>Week 12</i>		
Lecture 18	11/14	Epigenetics
Lecture 19	11/16	Genome Analysis
<i>Week 13</i>		
<b>Quiz 5</b>	<b>11/21</b>	<b>Quiz 6</b>
<b>No Class</b>	<b>11/23</b>	<b>THANKSGIVING HOLIDAY</b>
<i>Week 14</i>		
Lecture 20	11/28	Recombinant DNA
Lecture 21	11/30	Genetics of Cancer; Disease Diagnostics and Treatment
<i>Week 15</i>		
Lecture 22	12/5	Review
<b>No Class</b>	<b>12/7</b>	<b>MENTAL HEALTH DAY – NO CLASSES</b>
<i>Week 16</i>		
<b>FINAL</b>	12/12	<b>COMPREHENSIVE FINAL 10:15 AM - 12:15 PM ALPINE</b>
	12/12	<b>COMPREHENSIVE FINAL 10 AM – NOON RGC</b>