BIOL 5326 – Conservation and Population Genomics SP 2023 Lecture Syllabus

INSTRUCTOR AND COURSE DESCRIPTION

Instructor: Dr. Thornton R. Larson **Office Hours:** MWF 11-1230; or by appointment

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Lectures: TR 930 PM – 1045 PM WSB 223

Course Description

Conservation and Population Genomics aims to build on previous knowledge of **Genetics** and the biology of organisms. This course will discuss organismal populations that have been affected by various environmental factors, exploitation, and change. Utilizing the knowledge learned to pivot toward protection of biodiversity and ecosystems.

The Genetics side of this course will review basics such as Hardy-Weinberg and go into further investigation of their genes and gene comparisons within populations.

Methodologies that discuss concerning population genomics and phylogenomics to look at conservation concerns across the world. The understanding that these applications are not solely directed at rare species but multiple aspects of the ecosystem makeup. The genetic aspect allows for targeting and monitoring specific populations for genetic diversity and health.

This course will be run as part **student run lecture and student run paper discussions**. Topics will be discussed in both formats to apply textbook knowledge to working research. In this way several gaps between discovery to dispensable knowledge aimed at different audiences can be explored.

Required Materials

- Allendorf, FW, WC Funk, SN Aitken, M Byrne, G Luikart. 2022. *Conservation and the Genomics of Populations*. 3rd edition. Wiley-Blackwell, Oxford, UK.
- Readings of recent literature

Exams and Grading

Lecture Leader	30% (approximately 10% per lecture lead)
In Class Participation	10%
Discussion Leader	10%
Research proposal	20%
Proposal presentation	10%
Exams (2)	20%

Total Credit 400 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. Understand the theory and methodology of current conservation genomics.
2. Identify current important topics in conservation genomics
3. Understand and discuss critically the current literature of conservation genetics
4. Know where to find data for genomic analysis and common methodologies used and why.
5. Develop research plan around basic knowledge of conservation genomics

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."

TENTATIVE SCHEDULE

	DATE	TOPIC	Chapter
Week 1			
Lecture 1	1/19	Syllabus, Welcome, Introduction	Ch 1
Week 2			
Lecture 2	1/24	Phenotypic and Genetic Variation in Nat Pops	Ch 2 and 3
	1/26	How to have a discussion about papers	
Week 3			
Lecture 3	1/31	Population Genomics	Ch 4
	2/2	Discussion	
Week 4			
Lecture 4	2/7	Random Mating Populations: Hardy-Weinberg	Ch 5
	2/9	Discussion	
Week 5			
Lecture 5	2/14	Small Pops and Genetic Drift	Ch 6
	2/16	Discussion	
Week 6			
Lecture 6	2/21	Effective Population Size	Ch 7
	2/23	Discussion	
Week 7			
Lecture 7	2/28	Natural Selection	Ch 8
	3/2	**Exam 1**	
Week 8			
Lecture 8	3/7	Population Subdivision	Ch 9
	3/9	Discussion	
Week 9			
	3/14	SPRING BREAK	
	3/16		
Week 10			
Lecture 9	3/21	Hybridization	Ch 13
	3/23	Discussion	
Week 11			
Lecture 10	3/28	Invasive Species	Ch 14
	3/30	Discussion	
Week 12			
Lecture 11	4/4	Exploited Populations and Climate Change	Ch 16 and 17

	4/6	Discussion	
Week 13			
Lecture 12	4/11	Demography and Extinction	Ch 18
	4/13	Discussion	
Week 14			
Lecture 13	4/18	Genetic Identification	Ch 22
	4/20	Discussion	
Week 15			
Lecture 14	4/25	Genetic Monitoring	Ch 23
	4/27	Discussion	
Week 16			
Lecture 15	5/2	Conservation Genetics in Practice	Ch 24
	5/4	Discussion	
Week 17			
	5/9	Presentations	
	5/11	DEAD DAY	
Final		**TBD**	