BSC 315.01E: Ecological Genetics – Spring 2026

Tuesday, Thursday - 9:30-10:45 am

Instructor Information:
Bjorn Schmidt
Office: STC 212
Email: bjorn.schmidt@tamuc.edu
Preferred contact: email
Office Hours: TR 1:00 pm – 3:00 pm, or by appointment

Textbook & materials (required):

No required textbook

Access to a computer and d2l (myleo online) is required; all course materials will be uploaded through d2l

Course Description
Ecological genetics is about how environmental and population-level processes affect the genetic structure of populations. The course begins with a basic overview Mendelian genetics followed by an in-depth study of population genetics and the intrinsic and extrinsic processes that influence the genetic composition of populations and metapopulations. Because the interaction between genes and the environment fundamentally affect the viability of populations, ecological genetics has broad relevance for understanding population stability and maintenance healthy populations.

Further Details
Ecological genetics is a hybrid field used to describe ecological influences on genetic properties within and between populations. Ecological genetics is composed of aspects from the fields of spatial ecology, population genetics, and evolution. The term has been used to describe research examining both environmental/ecological effects on population genetics within populations (e.g., adaptation, selection) and environmental/ecological effects on gene flow and genetic isolation between populations (e.g., metapopulations, population structure).

The course will encompass background reviews of Mendelian and population genetics, patterns of genetic variation, mutation processes, effects of genetic drift, gene flow, genetic differentiation and population structure, natural selection on genotypes, quantitative genetics, artificial selection, patterns and techniques of landscape genetics, and molecular analyses of behavioral ecology. Ecological genetics is primarily a research field, so a component of the class will be spent examining how concepts detailed in the course are applied in peer-reviewed literature provided by the instructor.

Student Learning Outcomes

- Students will understand the sources, implications of, and influences on genetic variability in natural populations
- Students will be able to conceptualize micro-evolutionary processes through a population genetics framework
- Students will understand the four micro-evolutionary forces that influence genetic change in populations and their effects
- Studies will understand patterns and differences in selection patterns on genotypes and quantitative phenotypic traits
- Students will know research applications of ecological genetics and know common genetic measurements of populations and measurements of gene flow between populations
- Students will understand how environmental properties and human effects influence the genetic characteristics of populations

Instructional Methods

Instruction will consist of online powerpoints, videos, and other materials, which will be presented asynchronously. Material for tests and quizzes will come entirely from online slides and videos. Papers for paper summary reports will be made available throughout the semester in d2l. Announcements for scheduling or other changes will be announced in d2l course announcements system. Gradebooks will be maintained in d2l.

Course Evaluations

Tests: There will be three exams and a comprehensive final exam
Quizzes: There will be eight quizzes spaced throughout the semester
Paper Reports: There will be 4 paper reports on scientific articles posted to d2l in applied population genetic topics covered in the course (dates for paper reports are posted in the schedule below). Each report should be approximately three pages long (times new roman, 12-point font). Specific instructions for the reports and grading criteria will be available in d2l before the posting of the first paper.

Evaluation Points

Three exams – 240 points (80 points each)

Final exam - 120 points
Eight quizzes - 160 points (20 points each)
Four paper reports - 80 points (20 points each)
Attendance – 25 points

Total points = 625

Grading
A: 89.96-100%
B: 79.96-89.95%
C: 69.96-79.95%
D: 59.96-69.95%
F: <59.96%

General Makeup Policy: The student is responsible for requesting a makeup when they are unable to submit the regularly scheduled assessment before the due date and must schedule the makeup by email within **2 days** after the class date. If the assessment is not made-up, the student will receive a zero for that item. Makeup requests based on illness will need documentation of illness. Please do not attend class when sick.

Syllabus Change Policy
The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

Course AI Statement: AI writing tools, including predictive text generators like ChatGPT, are **not allowed** in this course. This statement particularly applies to the paper report component of the course. Students are responsible for their own written work, and are subject to requirements and consequences of the TAMUC academic dishonesty policy and the student code of conduct for any violations of this policy:

https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

https://www.tamuc.edu/student-life/division-of-student-affairs/office-of-student-rights-and-responsibilities/student-code-of-conduct/

Tentative Course Schedule (subject to change)

Week of	Topics	Notable Assignments
1/12	Introduction, Topic 1) What is Ecological Genetics? Topic 2) Genetics overview (part one) – **Thursday = online video**; travelling for conference	
1/19	Topic 2) Genetics overview (part two) Topic 3) Phenotypic variation (part one)	**Thu: Quiz 1** (topics 1-2)
1/26	Topic 3) Phenotypic variation (part two) Topic 4) Genetic variation (part one)	
2/02	Topic 4) Genetic variation (part two) Topic 5) Working with DNA	**Thu: Quiz 2** (topics 3-4) **Fri (02/06):** paper report 1 papers posted (report due 2/20 at 11:59 pm**)**
2/09	**Tue**: * **exam 1*** - topics 1-5 Topic 6) Hardy Weinberg Equilibrium (part one)	**Tue**: Exam 1
2/16	Topic 6) Hardy Weinberg Equilibrium (part two) Topic 7) Non-random mating; Inbreeding Topic 8) Genetic change in populations	**2/20** – PR1 due

2/23	Topic 9) Genetic drift	**Tue: Quiz 3** (topics 6-8)
3/02	Topic 10) Mutation	**Thu Quiz 4** (topics 9-10)
3/09	***spring break – no class***	
3/16	**Tue**: * **exam 2*** - topics 6-10 Topic 11) Natural selection, single locus models	**Tue**: Exam 2 (topics 6-10) **Wed (03/18):** paper report 2 papers posted (report due 04/01 at 11:59 pm**)**
3/23	Topic 12) Genetic correlations; Indirect selection; Selective sweeps Topic 13) Balancing selection models; Historical contingency models	**Thu: Quiz 5** (topics 11-12)
3/30	Topic 14) Dispersal Topic 15) Gene flow Topic 16) Populations and metapopulations	**3/30** – PR2 due **Thu: Quiz 6** (topics 13-14)
4/06	Topic 17) microevolution synthesis; balance equations **Thu**: * **exam 3*** - topics 11-17	**Mon (04/06):** paper report 3 papers posted (report due 4/21 at 11:59 pm**)** **Thu**: Exam 3 (Topics 11-17)

4/13	Topic 18) Phenotypic selection models Topic 19) Quantitative Genetics	
4/20	Topic 20) Artificial Selection Topic 21) Landscape Genetics (part one)	**4/21** – PR3 due **Tue: Quiz 7** (topics 18-19) **Mon (04/20):** paper report 4 papers posted (report due 5/01 at 11:59 pm**)**
4/27	Topic 21) Landscape Genetics (part two) Topic 22) Landscape genetic patterns in terrestrial animals, plants, and aquatic animals	**Thu: Quiz 8** (topics 20-21) **5/01** – PR4 due
5/04	**Final Exam: Thu., May 9th 8:00 - 10:00 am**	**Thu**: Final exam (Topics 1-22; 50% of material from topics 18-22)

Technology Requirements:

LMS

All course sections offered by East Texas A&M University have a corresponding course shell in the *my*LEO Online Learning Management System (LMS). Below are technical requirements:

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

Zoom Video Conferencing Tool:
https://inside.tamuc.edu/campuslife/CampusServices/CITESupportCenter/Zoom_Account.aspx?source=universalmenu

Access and Navigation
You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, an ETAMU campus open computer lab, etc.

Communication and Support
If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of *Brightspace*, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Response time to any questions sent by email regarding the course will be answered within 72 hours. However, students are encouraged to interact with the instructor directly during the class time and office hours, if necessary. Exceptions such as widespread internet outage apply.

Course and University Procedures/Policies:

Course Specific Procedures/Policies:
You are expected to check your ETAMU email and d2l every day to check for any announcements. Additional information about all course assessment components is provided under "Course Evaluations". Please do not attend class if feeling ill, if an illness occurs during a course assessment, please see the "General Makeup Policy" section above for guidance.

University Specific Procedures:

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
https://inside.tamuc.edu/admissions/registrar/documents/studentGuidebook.pdf

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

ETAMU Attendance
For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity
Students at East Texas A&M University are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03
Undergraduate Student Academic Dishonesty Form

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10
Graduate Student Academic Dishonesty Form

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

AI Statement

East Texas A&M University acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesprocedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

13.99.99.R0.10 Graduate Student Academic Dishonesty
https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesprocedures/13students/graduate/13.99.99.R0.10.pdf

Students with Disabilities – ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that

provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
East Texas A&M University
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Student Disability Services
https://www.tamuc.edu/student-disability-services/

Nondiscrimination Notice

East Texas A&M University will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and East Texas A&M Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1. at 903-886-5868 or 9-1-1.

ETAMU Supports Students' Mental Health

The Counseling Center at East Texas A&M, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Mental Health and Well-Being

The university aims to provide students with essential knowledge and tools to understand and support mental health. As part of our commitment to your well-being, we offer access to Telus Health, a service available 24/7/365 via chat, phone, or webinar. Scan the QR code to download the app and explore the resources available to you for guidance and support whenever you need it.

http://telusproduction.com/app/5108.html