BSC 535: Evolution – Fall 2025

Web Based Course

Instructor Information:
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Preferred contact: email
Virtual office hours: available by appointment through email

Required Textbook

Evolution, 5th ed. 2023. Futuyma, Douglas J. & Kirkpatrick, Mark

ISBN:
978-0197619612 (hardcover)
978-0197619636 (ebook)

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

There will be a phylogeny assignment that requires access to a windows or mac computer for the assignment. This requires using a free software used for building phylogenetic trees from sequence data

Course Catalog Description

This course deals primarily with macroevolution. Topics include models of gene flow, agents of evolution, natural selection, isolating mechanisms, geographic variation, phylogenetics, the fossil record, the species concept and speciation, adaptation and the evolution of morphological traits.

Further Course Detail

Evolution is a fundamental theory in biology linking together many disciplines, famously summarized by Theodosius Dobzhanky in 1973, "nothing in biology makes sense except in the light of evolution". That said, the topic of evolution itself is very broad with several sub-disciplines, each of which could have their own course devoted to them. This course is designed in two parts to provide a broad overview of several core evolutionary concepts. The first section gives a general background and introduction to evolution, how selection acts to change populations over time, sexual selection, and the effect of life history strategies on fitness. The second section mainly looks at "big picture" evolutionary topics including: speciation, evaluating evolutionary relatedness among groups, the history and geography of evolutionary change on Earth, and evolutionary changes to biodiversity over geologic time scales.

Student Learning Outcomes

- Students will understand and know the history of evolutionary theory
- Students will know phylogenetic trees, including how they are constructed and how to interpret them
- Students will understand natural selection and adaptations in populations
- Students will understand sexual selection and how concepts of fitness are related to evolution
- Studies will know species concepts and mechanisms for speciation and lineage divergence over time
- Students will be familiar with the evolutionary history of life on earth and the fossil record
- Students will understand how geographic biodiversity patterns are related to long-term evolutionary change in groups
- Students will understand concepts of mass extinction, adaptive radiations, and how biodiversity patterns change over geologic time scales

Course Materials and Online Presentation

All course materials will be presented through d2l. The class format will be asynchronous, following the schedule that appears later in the syllabus. Lecture videos and corresponding powerpoint slides will be uploaded to d2l on indicated dates. Students will need to read along in the textbook as indicated. Students are highly encouraged to keep up with materials according to the schedule and to avoid falling behind in the asynchronous format. Virtual office

hours for the course are available by appointment through email. Questions will also be responded to promptly through email (generally within 24 hours).

Course Evaluations

Tests: There will be three exams during the semester; both exams are online in d2l and will consist of multiple choice and sort answer/essay questions.

Quizzes: There will be six quizzes spaced throughout the semester.

Review paper: There will be a semester long review paper (~6-10 pages long). The review paper will cover the topic of how human activities in the Anthropocene have potentially changed global biodiversity patterns through promoting both speciation and loss of species (ties in with Ch 19 and earlier concepts of the course). More details for the paper will be provided in d2l. Students will be given one initial reference for the paper, and will need to independently find a minimum of at least eight other peer-reviewed articles for the paper. While some time is given at the end of the course for working on the paper, it is better to start earlier to avoid writing the whole paper the last week of the semester.

Phylogeny Assignment: Students will use a free software program to construct a phylogenetic tree based on gene sequence data for a genus of their choosing. Students will need to select a genus of their choice that has >10 species within it and that has sequences available to the public in GenBank (instructions given in d2l for how to check this). Upon selecting a genus for the assignment, the instructor will prepare a data file for the assignment that contains the sequence data. For the assignment, students will need to answer questions about their generated trees and prepare a brief report, interpreting evolutionary relationships for this taxonomic group, and placement/relationship of "unknown" sequences. Further details for the assignment will be given later in the semester.

Discussion: There will be online discussions in d2l, roughly every two weeks, with question prompts submitted by the instructor that are relevant to that portion of the course. These question prompts may require reading a short article or other course materials which will be supplied in d2l. Students are required to have at least one meaningful response to the original questions prompt and at least one comment on a peer's response for each questions prompt. These discussion prompts will be open for one week, and discussion participation points will be given based on quantity and quality of the responses.

Grading

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

Evaluation Points

Three exams – 300 points (100 points each)

Final exam - 100 points
Review paper – 60 points
Phylogeny Assignment – 60 points
Quizzes – 90 points (15 points each)
Discussion participation – 49 points (7 points each)

Total points = 659 points

General Makeup Policy: The student is responsible for requesting a makeup when they are unable to submit the regularly scheduled assessment and must schedule the makeup within **3 days** after the due date. If the assessment is not made-up, the student will receive a zero for that item

General Course Outline

-Lecture slides/videos for the corresponding week's topics will be published on d2l under the content tab, generally on Mondays of that week.

-Quizzes and Exams will be posted on indicated dates under the activities: quizzes tab in d2l and will be due on the date indicated in the schedule, generally on Fridays.

-Discussion threads are available under activities: discussions, due dates for participation are indicated in the schedule, generally on Fridays.

- The phylogeny assignment and the review paper will need to be submitted by the due dates indicated in the schedule. Submissions should be made under the activities: assignments tab in d2l.

please use doc, docx, or pdf format for your assignment and review paper submissions; if using Apple pages software to write these, use the "save as pdf" or "save as word document" option to change the format during saving; I cannot easily open any files with the .pages extension for grading, which may result in delayed grade

*All students are expected to submit their own course materials and work on their own on exams; plagiarism on assignments and cheating on online exams are acts of serious academic misconduct (see the academic misconduct section later in syllabus). Examples of cheating include copying another student's test or assignment, collaborating with other students to provide advance knowledge of specific exam questions, or using large language models (AI) to answer exam questions or perform writing for the term paper. A

first offence of cheating or plagiarism will result in a score of zero for the assignment. A second offense will result in an F for the course or potentially other disciplinary actions.*

-Virtual office hours can be scheduled by appointment for 9am - 5pm M-F by email request; other specific questions or concerns can be answered by email, within 24 hours of the normal work week.

Tentative Course Schedule:

week 1 – 08/25

Ch1 – Evolutionary Biology

week 2 – 09/01

Mon: labor day; no class

Ch2 – The Tree of Life

Fri – Quiz 1 (Chs 1-2) – due Friday 09/12

Fri – Discussion Thread 1 – due Friday 09/12

week 3 – 09/08

Ch3 – Natural Selection and Adaptation

week 4 – 09/15

Ch4,5,6,7,8 – Microevolution overview (can focus on summary/main points of these chapters)

Fri – Quiz 2 (Chs 3, microevolution overview) – due Friday 09/26

Fri – Discussion Thread 2 – due Friday 09/26

week 5 – 09/22

Ch9 – Species and Speciation

Fri – Exam 1 (Chs 1-3, microevolution overview) – due Friday 10/03

week 6 – 09/29

Ch10 – The Evolution of Genes and Genomes

Fri – due date for selection of genus for phylogeny assignment

Fri – Quiz 3 (Chs 9-10) – due Friday 10/10

Fri – Discussion Thread 3 – due Friday 10/10

week 7 – 10/06

Ch11 – Evolution and Development

week 8 – 10/13

Ch12 – All About Sex

Fri – Quiz 4 (Chs 11-12) – due Friday 10/24

Fri – Discussion Thread 4 – due Friday 10/24

week 9 – 10/20

Ch13 – Cooperation and Conflict

Fri – Exam 2 (Chs 9-12) – due Friday 10/31

week 10 – 10/27

Ch14 – How to Be Fit

Fri – Quiz 5 (Chs 13-14) – due Friday 11/07

Fri – Discussion Thread 5 – due Friday 11/07

week 11 – 11/03

Ch15 – Interactions Among Species

week 12 – 11/10

Ch16 – Phylogeny: The Unity and Diversity of Life

Fri – Quiz 6 (Chs 15-16) – due Friday 11/21

Fri – Discussion Thread 6 – due Friday 11/21

Phylogeny assignment posted – due on Wednesday 12/03

week 13 – 11/17

Ch17 – The History of Life

Fri – Exam 3 (Chs 13-16) – due Monday 12/01

week 14 – 11/24

work on exam 3, phylogeny assignment, or review paper

Thursday-Friday: Thanksgiving break

week 15 – 12/01

Ch18 – The Evolution of Biological Diversity

Mon – Discussion Thread 7 – due Friday, 12/05

Finals week– 12/08

Mon – Final exam (50% from Ch 17-18, 50% review) – due Friday 12/12

Thu (12/11) – term paper due at 11:59 pm

Technology Requirements:

LMS

All course sections offered by Texas A&M University-Commerce 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, a 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 TAMUC 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

TAMUC 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 Texas A&M University-Commerce 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

Texas A&M University-Commerce 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
Texas A&M University-Commerce
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

Texas A&M University-Commerce 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 Texas A&M University-Commerce 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 A&MCommerce 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 A&M-Commerce, 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