

GRADUATE COUNCIL: NEW COURSE PROPOSAL

Originating Unit:

Type of action: New course Full online course**

Semester and year course will take effect:

New course title:

Appropriate computer abbreviation (30 spaces or less):

Course instructional methodology:

course component types: [ugradcouncil.tcu.edu/forms/Course Component Types.pdf](http://ugradcouncil.tcu.edu/forms/Course%20Component%20Types.pdf)

New course number:

Prerequisites for new course: *include an attachment if additional space is needed*

Description of new course (catalog copy): *include an attachment if additional space is needed*

attached files can be seen and managed in Acrobat Pro by clicking on
View > Show/Hide > Navigations Panes > Attachments

Fully Online Courses**

All online courses, and /or distance learning offerings must meet State Compliance regulations as defined by specific state legislation. TCU Distance Learning is any for-credit instruction provided to a TCU student outside the State of Texas. This includes internships, clinical, video conferencing, online, or any other delivery format that crosses state lines. Contact the Koehler Center for Teaching Excellence for guidelines. Include a letter of support from the Koehler Center with this proposal.

Supporting evidence or justification: (For a new course, attach proposed syllabus, including course objectives, course outline, and representative bibliography.)

Describe the intended outcomes of the course and how they will be assessed: *include an attachment if additional space is needed*

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Additional resources required:

Faculty:

Space:

Equipment:

Library:

Financial Aid:

Other:

Change in teaching load:

Does this change affect any other units of the University? Yes No

If yes, submit supporting statement signed by chair of affected unit.

If cross-listed, provide evidence of approval by all curriculum committees appropriate to both the originating and the cross-listed units.

Chair of Originating Unit:

Name:

Unit:

Signature:

Evolution, Disease, and Medicine

BIOL 50313, Fall 2025

Dr. Jing Jiao, WIN 426

jing.jiao@tcu.edu, 817-257-6181

Meeting Time & Office Hours:

Class Meetings: TR 11AM-12:20PM WIN 422

Office Hours: TR 12:20PM-1:20PM WIN 426

*Individual appointments are available for students needing to discuss private matters (email me for 3 potential meeting time at least one week in advance)

General Course Information:

Course Description: 2 hours 40 minutes lecture per week. Prerequisites: BIOL 30603, 40123, or permission of instructor. * *A grade C or above of BIOL 30603, 40123 is expected to enroll in this course.*

This course introduces the theory of evolution and its real-world applications to the practice of medicine and disease. Concepts of survival and reproduction defining evolutionary fitness, co-evolution, competition, natural selection, bottleneck effects, adaptation, and exaptation will be introduced and applied in the context of discussion of human and animal disease and the medical treatment thereof. This will include individual-level medicine to population-level public health using real-world cases.

Course Goals: Students should come out of this course with an increased understanding of the evolutionary underpinnings of disease and the effect those underpinnings have on medical strategies for intervention. Moreover, students should gain experience in forming logical and rigorous scientific arguments, applying theory to generate hypotheses consistent with observations, and applying and interpreting theory to predict the outcomes of experimental manipulations/interventions.

Student Learning Outcomes/Objectives:

- Students will be able to define and discuss concepts of evolutionary fitness as survival and reproduction, heritability with variation as the mechanism for adaptation, natural and sexual selection as a mechanism of speciation, and non-selection-based mechanisms of evolution.
- Students will be able to analyze disease and disease-related healthcare concepts from human medicine as evolutionary pressures.
- Students will be able to evaluate medical treatment strategies within the context of evolved responses and altered selective pressures.
- Students will be able to apply logic and formal argument to determine and explain whether or not particular conclusions are adequately supported by presented facts.

Learning Environment:

This class will rely mostly on discussions (both in class and online). Lecture slides will be presented as a starting point, but the goal is to spark questions and discussion of topics. If you aren't comfortable participating in in-class discussions, please be sure to participate actively in the weekly online conversations.

Course Communications:

I will communicate with you via the D2L and by individual TCU email (when appropriate). Please actively check your D2L or your TCU email regularly. Course slides will be posted on D2L before each class and your grade will also be posted on D2L.

Course Materials:

TCU students are prohibited from sharing any portion of course materials (including videos, PowerPoint slides, assignments, or notes) with others, including on social media, without written permission by the course instructor. Accessing, copying, transporting (to another person or location), modifying, or destroying programs, records, or data belonging to TCU or another user without authorization, whether such data is in transit or storage, is prohibited. The full policy can be found at:

<https://security.tcu.edu/polproc/usage-policy/>. Violating this policy is considered a violation of Section 3.2.15 of the Student Code of Conduct (this policy may be found in the Student Handbook at

<https://tcu.codes/code/index/>), and may also constitute Academic Misconduct or Disruptive Classroom Behavior (these policies may be found in the undergraduate catalog at

<https://tcu.smartcatalogiq.com/current/Undergraduate-Catalog/Student-Policies/Academic-Conduct-Policy-Details>). TCU encourages student debate and discourse; accordingly, TCU generally interprets and applies its policies, including the policies referenced above, consistent with the values of free expression and First Amendment principles.

How to Be Successful in This Course:

Student's Responsibility

- Be prepared for all classes: e.g., pre-class self-learning
- Be respectful of others and engage an effective learning environment
- Actively contribute to the learning activities in and outside of class – especially asking or answering questions and actively access online materials
- Abide by the TCU Honor Code
- If you do badly on an assessment, revisit the topic and figure out what you missed and why
- Think positively and stay motivated! If you feel a lack of motivation, attend office hours or seek positive environment or strategies to keep your head in the game.

Instructor's Responsibility

- Be prepared for all classes
- Evaluate all fairly and equally to the best of my abilities
- Be respectful of all students
- Create and facilitate meaningful learning activities
- Behave according to TCU codes of conduct

Texts/Resources/Materials:

Suggested: [Why We Get Sick](#) by Nesse and Williams

Required Equipment:

Regular Internet Access

Course Requirements, Assessments, and Evaluations:

Attendance Policy: Attendance is expected and active participation in course discussions is required (I will randomly do attendance check 10 times this entire semester and all ten-

attendance records will contribute to 5% of the final grade). I will not be willing to use email/office hours to purely go over everything we covered in class just because you weren't there. Please try to come or find a classmate to share notes with you.

Grading System:

5 short quizzes (out of 6 quizzes - lowest grade dropped; 10% each)

Midterm exam (15%)

Weekly assignment (online; described below) (10%)

Attendance (5%; 10 attendance checks will be counted; 0.5 each)

Final project (20%; Graduate students will have one more question in Final than undergraduate students; Note: this question will be a small essay)

Anticipated Grade Scales:

Undergraduate:

A: 95-100

A-: 90-94.99

B+: 85-89.99

B: 80-84.55

B-: 75-79.99

C+: 70-74.99

C: 65-69.99

C-: 60-64.99

D: 55-59.99

F: 0-54.99

Graduate:

A: 95-100

A-: 90-94.99

B+: 85-89.99

B: 80-84.55

B-: 75-79.99

C+: 70-74.99

C: 65-69.99

C-: 60-64.99

F: 0-59.99

Assignments and Exams

- There will be 6 quizzes throughout the course (see Course Outline below for dates).
 - i. Quizzes will be released via the D2L site on the dates given, due date is: 11am, one week after the released date
 - ii. Quizzes are open note, open discussion with peers, open internet search, open everything. **HOWEVER, you must write your answers independently and in your own words.**
 - iii. Only your top 5 quizzes will count towards your quiz grade (i.e. I will drop one quiz with the lowest score).
- There will be an in-class Midterm Exam (it will be like the quizzes). See Course Outline below for the date. It will be given during 1 class period, but if you want, you can continue working on it for 2 more days.
- Weekly homework assignment:

- i. Each week, you must find a news story or scientific article and post it to the online discussion (on the D2L site) for the class with an accompanying (brief) logical analysis of the topic covered, pointing out logical or scientific flaws (if any) and/or extending the conclusions to relate to a concept discussed that week in class.
- ii. You must also read and comment (briefly) on the contributions of at least two other students.
- iii. We will discuss some of these in class.

This assignment will be assessed on a 2 point scale: 1 point for completing the required 3 posts, 1 point for logic of the analysis provided in their own contribution.

Course Feedback:

Feedback will be given mostly via assessment of performance on quizzes and in discussion in class and online.

Course Policies:

Academic Integrity:

As stated in the TCU Official Student Handbook, “Each student is expected to be fully acquainted with all published policies, rules, and regulations of the University and will be held responsible for compliance with them.” You are expected to maintain high standards of personal and scholarly conduct. You are also expected to review “Syllabus Disclosures” portion of the syllabus.

Accommodations:

Texas Christian University affords students with disabilities reasonable accommodations in accordance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. To be eligible for disability-related academic accommodations, students are required to register with the TCU Office of Student Access and Accommodation and have their requested accommodations evaluated. Students are required to provide instructors an official TCU notification of accommodation approved through Student Access and Accommodation. More information on how to apply for accommodations can be found at <https://www.tcu.edu/access-accommodation/> or by calling Student Access and Accommodation at (817) 257-6567. Accommodations are not retroactive and require advance notice to implement. Students granted extended time for quizzes and exams must provide notice to the course instructor at ≥ 5 days in advance of the assessment so that suitable arrangements can be made.

Academic misconduct:

Cheating, plagiarism, collusion, etc. are not acceptable. Students cheating may be subject to a variety of sanctions at the discretion of the course instructor, including disenrollment from the course and a failing course grade. Unauthorized recording and/or distribution of lectures and class meetings violates course policy and may represent academic dishonesty. Student engaged in academic conduct will be reported to the appropriate administrators. Pre-health students are reminded that the course instructor is a member of HPAC and provides comments for inclusion in letters of evaluation. Be aware that engaging in academic misconduct may prevent you from being accepted to professional schools. Simply put, cheating is NOT worth it. A subpar grade is far less detrimental to your future than a record demonstrating a lack of integrity. Information regarding academic misconduct appears in the “Syllabus Disclosures” portion of the syllabus.

Assistance outside of class:

There will be up to 8 hours* available each week for students to seek help with course material. Students are strongly encouraged to attend office hours and/or tutoring to seek help as soon as questions related to course content arise as it is best to seek clarification of concepts soon after lectures are posted, rather than

waiting until just before an exam. Questions regarding course material will only receive responses if they are no later than 11am, one day prior to exam dates. As such, office hours and tutoring sessions scheduled after 11am one day before exams or on the day of exams will not be held. *Note that office hours and tutoring hours may change due to illness, emergencies, etc.

Email Etiquette and Expectations:

When you send an email to the course instructor, please remember to be professional and respectful. All emails should include: 1) a descriptive subject line, 2) brief, yet descriptive text describing the purpose of your email, 3) your full name. You can expect a response within 48 hours for emails sent Sunday to Thursday and within 72 hours for emails sent Friday-Saturday.

Important Dates:

Drop date: Nov. 6th, 2023. P/NC date: Nov. 27th, 2023. Final Exam due: 11am on Dec. 12th, 2023

Late and make-up work:

Make-up exams, quizzes, and in-class activities are given only for University-approved absences. Requests for University-absences are evaluated by Campus Life and typically cover only absences for athletics and other University-sanctioned events, but generally do not cover illness, family emergencies, vacations, flat tires, oversleeping, etc. Class activities, assignments, quizzes or exams that have clear due date must submit by the due date. Otherwise, you will have score penalty (20% off your final grade of the delayed materials) for each day delay. Late submissions over one week past the due date will not be accepted.

Syllabus Disclosures:



Please use this **link** or scan the QR code with a mobile device camera to access TCU policies and resources including support for TCU students, student access and accommodation, anti-discrimination and Title IX information, and other important information.

Course Outline and Schedule:

These are rough estimates – I expect some topics will take longer, others will be shorter. We may zoom ahead or slow down, as interest and discussion dictate throughout the semester.

Aug 22nd – Initial Survey (ungraded)

Course Introduction, Go over Syllabus Together, Reviewing Expectations, Mechanisms of evolution (genes, DNA, basics), Introduction to evolution.

Sept 7th – Quiz #1 released: **due 11am on Sept. 14th**

Reading: Nesse & Williams, Why We Get Sick, Chapters 1 & 2

Topics: Definitions and causes of disease & How to do quizzes in this class

Sept 12nd – Reading: Gould and Lewontin. "The spandrels of San Marco and the Panglossian paradigm: a critique of the adaptationist programme." Proceedings of the Royal Society of London. B. 205.1161 (1979): 581-598.

Topics: Natural selection, Exaptation, and Selective Transparency & Evolution of Behaviors & Fitness with Competition

Sept 14th – Quiz #2 released: **due 11am on Sept 21st**

Reading: Nesse & Williams, Why We Get Sick, Chapter 3

Topic: Co-evolution & Signs and symptoms of infectious disease

Sept 26th – Reading: Nesse & Williams, Why We Get Sick, Chapter 4
Topic: Co-evolution and infectious disease & Disease and Selection
Quiz #3 released: **due 1am on Oct 3rd**

Oct 10th – Midterm Exam: **due 11am on Oct 12th**

Oct 19th – Quiz #4 released: **due 11am on Oct 26th**
Reading: Nesse & Williams, Why We Get Sick, Chapters 5 & 6
Topic: Injury & Toxins

Oct 31st – Reading: Nesse & Williams, Why We Get Sick, Chapters 11 & 12
Topic: Allergy, Immunity, and Cancer

Nov 7th – Quiz #5 released: **due 11am on Nov 14th**
Reading: Nesse & Williams, Why We Get Sick, Chapter 14
Topic: Mental Illness

Nov 14th – Reading: Nesse & Williams, Why We Get Sick, Chapter 7
Topic: Genetic Disorders, Eugenics, Gene Therapy, and Evolution

Nov 28st – Quiz #6 released: **due 11am on Dec. 5th**
Reading: Nesse & Williams, Why We Get Sick, Chapter 13
Topic: Sex and Reproduction

Dec 5th – Topic: Review, Recap, and expectations for final projects
Final project released: **due 11am on Dec 12th**

Four Very Important Disclaimers for Entire Course:

If these things will bother you, you might want to switch to a different course

Distractions: I will go off-topic on purpose (e.g., introducing some new methodology). We will get distracted by conversations.

Class Slides: Some slides can be short and incomplete. They are not meant to capture everything we will talk about, nor be a complete list of concepts. They are there to get the conversation started. If you miss class, please get someone's notes.

Being Right: For some questions, I think it's much more important to be able to make good arguments than to get the right answer. An unsupported, poorly supported, or incorrectly supported "right answer" will be graded as wrong in this course.

Evidence-based Rationale: In this course, you will be expected to make logical, evidence-based arguments based upon current scientific principles and data. Arguments rooted outside of scientific evidence are beyond the scope of this course.

The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified in writing / email of any such changes.