

## Course Information

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| Course Number: | Math 469 (Section 501)                      |
| Course Title:  | <b>Introduction to Mathematical Biology</b> |
| Time:          | <b>MWF 12:40 pm - 1:30 pm</b>               |
| Location:      | Blocker 161                                 |
| Credit Hours:  | 3   |

## Instructor Details

|               |  |
|---------------|--|
| Instructor:   | Prof. Anne Shiu  |
| E-Mail:       | <a href="mailto:annejls@tamu.edu">annejls@tamu.edu</a>                     |
| Office:       | Blocker 601-E  |
| Office Hours: | Wednesdays (1:45 pm to 2:45 pm) OR by appointment (ask one day in advance) |

## Course Description

Introduction to mathematical modeling techniques for the biological sciences. Topics include: continuous versus discrete models, deterministic versus stochastic models, population dynamics and ecology, spread of infectious diseases, and phylogenetics.

## Course Prerequisites

Linear Algebra (MATH 304 or 323) and Differential Equations (MATH 308)

## Course Learning Outcomes

The aim of this course is for students to become familiar with mathematical modeling for applications in the life sciences. Upon successful completion of this course, students will be able to

1. formulate, analyze, and simulate mathematical models arising from applications in ecology, biology, and medicine,
2. critically assess mathematical models, and
3. communicate effectively about the mathematical and scientific topics in the class.

## Textbook

*An Introduction to Mathematical Biology*, L. Allen

## Websites

<https://people.tamu.edu/~annejls/teaching/469-spring-24.html> (Homework is posted here.)

Also, we will use [www.piazza.com](http://www.piazza.com).

## Student Expectations

Students are expected to read the textbook and complete homework. For exams, students will be expected to work with key mathematical concepts, write short proofs, and understand important definitions and statements of theorems.

## Homework

Homework will be due most weeks on **Friday at 11:30 am**. Most homework will be submitted via the online grading program Gradescope (link available through Canvas). *Homework solutions must be clear and well-organized; the grader will impose a 10% penalty for solutions that are lacking in clarity. There will also be a 100% penalty for any problem for which the student indicates the wrong page(s) in Gradescope.* Group work is encouraged, but please write up your solutions independently.

## Late Homework Policy

Late homework is *not* accepted (except with a University-approved absence; see Make-up Policy below). However, the lowest two homework scores will be dropped.

## Project

For the final project, students will read a scientific paper related to the course, and then explain, critique, and/or extend the results in:

1. a 20-minute in-class presentation (beginning around April 15), and
2. a final report (**due Tuesday, April 30**, by 5pm, to the instructor's office).

## Exams

There will be one in-class midterm and one final exam:

- Midterm Exam: **Friday, March 8** (Week 8) -- *this is the Friday before Spring Break*
- Final Exam: **Friday, May 3** (10:30 am – 12:30 pm)

## Grading Policy

- Homework: 25% (*This includes some partial drafts of your final report.*)
- Midterm Exam: 20%
- Final exam: 25%
- Project – in-class presentation: 10%
- Project – final report: 20%

## Final grades: *did you accomplish the learning outcomes?*

- **A:** 90%+
- **B:** 80–89%
- **C:** 70–79%
- **D:** 60–69%
- **F:** < 60%

*The precise cut-offs will be determined when final grades are assigned.*

## Attendance and Make-Up Policies

Attendance is essential if you wish to complete this course successfully.

- **Excused Absences:** University student rules concerning excused and unexcused absences, as well as makeups, can be found at <http://student-rules.tamu.edu/rule07>. In particular, make-up exams/quizzes or late homework/writing assignments will NOT be allowed unless a University approved reason is given to

me in writing. Notification before the absence is required when possible. Otherwise (e.g. accident, or emergency), you must *notify me within two business days* of the missed exam, quiz, or assignment to arrange a makeup.

### Use of Generative-AI Technology

According to the Texas A&M University Definitions of Academic Misconduct, **plagiarism** is the appropriation of another person's ideas, processes, results or words without giving appropriate credit ([aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)). *In this course, you must credit your use of anyone else's words, graphic images, or ideas (this mostly applies to homework and the project).* Artificial Intelligence (AI) text generators and natural language processing tools (colloquially, chatbots - such as ChatGPT), audio, computer code, video, and image generators should not be used for any work for this class without explicit permission of the instructor and appropriate attribution (in this case, state what prompt(s) you provided the AI text generator). However, the use of such tools for simply checking spelling and grammar (without attribution) is acceptable).

### Life

**If your performance in the class is negatively affected by your experiences outside of class, please talk to me!**

## University Policies

### Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments. Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines. **If you must miss class, please get notes from another student in the class.**

### Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor. Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

### Academic Integrity Statement and Policy

*"An Aggie does not lie, cheat or steal, or tolerate those who do."*

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an

academic misconduct case” (Section 20.1.2.3, Student Rule 20). You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

**Plagiarism** consists of passing off as one’s own the ideas, words, writings, etc., which belong to another. In accordance with this definition, *you are committing plagiarism if you copy the work of another person or a solutions manual* and turn it in as your own. Any student found guilty of cheating, plagiarism, or other dishonorable acts in academic work is subject to disciplinary action. If you are caught cheating, you will receive a grade of “0” and it could result in your failing the course.

### Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit [disability.tamu.edu](http://disability.tamu.edu). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. **All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.**

### Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University’s goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

- Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).
- Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University’s Title IX webpage.

### Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student’s academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org).