

MAT/MAT 4953/5983 003/003
SP: Mathematical Biology;
TopAppl: Mathematical
Biology
Course Syllabus Spring 2024



Course Information

Course Description: Cross-listed courses include MAT 4953.002, MAT 5983.002
Credit Hours: 3;3
Course Modality: Traditional in-person

Instructor Contact Information

Instructor Name: Zhuolin Qu
Pronouns: She/Her
Department
Mathematics
Office Location
FLN 4.01.58
Student Hours
By appointment
Email Address: zhuolin.qu@utsa.edu
CV Link
<https://zhuolinqu.github.io/>

Learning Goals

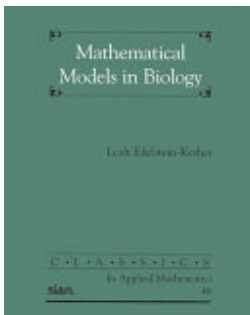
At the end of the course, you will be able to:

- Course description

Outcome

This course will explore the fascinating realm of mathematical biology, a field that leverages powerful mathematical tools and techniques to gain insights into complex biological phenomena. This course is designed for both undergraduate and graduate students with basic mathematics proficiency, and we will dive into modeling biological phenomena using ODE methods, describing the basic qualitative behavior of dynamical systems through population models. The topics will encompass ecology, epidemiology, biochemical kinetics, and more.

Course Materials



Mathematical Models in Biology

ISBN: 978-0-89871-554-5

Authors: Leah Edelstein-Keshet

Publisher: SIAM

Publication Date: 2005

Required/Recommended/Optional: Recommended

Assessments and Assignments

Homework: There will be 3~4 homework assignments. The assignments involve both theoretical analysis and computational experiments. For computational problem on computer, please include all your source codes, outputs, discussions, and graphs.

Homework assignments are due at the beginning of the class on the due date. You are encouraged to work with others on the assignments, but you must write and submit your own solutions. Problems will be posted at least one week in advance to the due date.

Midterm Exam and Final Project: There will be one written in-class midterm and one final project. The tentative exam dates can be found in the important dates (see Course Schedule). The final project will consist both a written report and a oral presentation. More details will be announced by the instructor before the exam dates.

Attendance and Participation: You are expected to attend class and participate in discussions. The student is responsible for ALL material covered in class and any assigned reading, and a student absent from class bears the full responsibility for all the information discussed in class.

Late/make-up work: Deadlines for homework are strictly enforced. There will be no make-up on exams, homework, or projects except in cases of illness or participation in a university-sponsored event.

Activities and Grading

Activity	Quantity	%
Homework	4 (estimated)	30
Total		100%

Activity	Quantity	%
Midterm Exam	1	20
Final Project	1	40
Attendance and Participation		10
Total		100%

Extra credit will be available for various class activities and performance; students can do up to 10% points worth (max grade capped at 100%).

Grade Distribution and Letter Grade

Letter Grade	Grade Range
A+	97 - 100%
A	93 - 96%
A-	90 - 92%
B+	87 - 89%
B	83 - 86%
B-	80 - 82%
C+	77 - 79%
C	73 - 76%
C-	68 - 72%
D	60 - 67%
F	0 - 59%

Course Schedule

For a list of important university-wide dates, review [One Stop's academic calendar](#).

Important Dates: (subject to change)

First day of classes: January 16

Midterm Grades: March 5 (Students may view midterm grades on *myUTSA* Account (formerly ASAP))

Midterm Exam: Before or after Spring Break

Spring Break: March 11-15 (Classes do not meet)

Last day to drop a course: March 25

Last day of classes: May 2

Final Exam: Tuesday, May 7, 2024 5:00 - 6:50 PM (assigned by Registration Office)
Final Grades: May 15 (Students may view midterm grades on *myUTSA* Account (formerly ASAP))

Communication Plan

There are several ways you can communicate with me:

Email, you may email me at zhuolin.qu@utsa.edu. Always use your UTSA email address. I will generally respond to you within 24 hours. Keep in mind, I cannot communicate detailed or sensitive information to any non-UTSA email account.

There is an “Inbox” tool on Canvas to send a message to me. However, I don't check that as often, so to avoid delay, email is the best way to reach me.

Office hours (Student Hours) are available by appointment only. Don't hesitate to reach out and make appointment with me for any questions you may have.

About Me

Here is my website: <https://zhuolinqu.github.io/>
USTA webpage: <https://math.utsa.edu/directory/zhuolin-qu/>

Education

- Ph.D., 2016, Applied Mathematics, Tulane University
- M.S., 2016, Statistics, Tulane University
- B.S., 2011, Mathematics and Computational Science, University of Science and Technology of China

Research Interests

Computational Biology, Infectious disease modeling, Population Dynamics, Numerical Methods for Nonlinear PDEs, Scientific Computing

I am an Applied Mathematician working in mathematical biology and have particular interests in the mathematical modeling of infectious diseases, computational epidemiology, dynamical systems, and numerical methods for PDEs.

I believe that epidemic modeling can foster knowledge of the disease transmission dynamics, forecast the spread, and optimize mitigation efforts. For these models to be useful, they must

(1) have a solid mathematical formulation from realistic biology and (2) be solved accurately using numerical methods.

These two themes are the core of my studies. I develop computational tools that advance the fields in both mathematics and biology.

My Teaching Philosophy

I am committed to improving my teaching pedagogy to better support students' learning experiences and career goals, and I have been taking efforts to consistently seek feedback from my students and meet where they are. If you have any questions or concerns regarding the course, just let me know!

I also like engaging students in my research and supported their career development. If you are interested in having research experience in mathematical modeling of infectious diseases, feel free to reach out!

Essential Student Information

- **Important:** Bookmark and visit the [Common Syllabus Information webpage](#) to find important and valuable resources about counseling services, transitory/minor medical issues, supplemental instruction, tutoring services, academic success coaching, sexual harassment and sexual misconduct, campus safety and emergency preparedness, and the Roadrunner Creed.
- For technical requirements, support, and academic resources, visit the [Student Support Gateway](#), where you can find all your tech and academic support resources in one place.
- Follow [Online Learning Netiquette](#) standards for your online communication activities. Please be mindful of the communication tools available in your course and use them for learning purposes. Class discussions take place in a respectful and safe environment, whether online or in person. UTSA encourages everyone to openly share their ideas and opinions without penalty or judgment, but learning should always be based on facts and research. It is possible to disagree without being disagreeable.
- UTSA provides reasonable accommodations to students via [Student Disability Services](#). For more details on eligibility, policies, and requirements, please visit www.utsa.edu/disability or call (210) 458-4157.
- **UTSA Wellbeing Resources:** your wellbeing is a priority for us. UTSA is proud to partner with [Wellness 360](#) and [TimelyCare](#) to provide students with access to quality health and mental health care. Visit the [UTSA Students Wellbeing Resources](#) to explore the services available.

Student Code of Conduct and Scholastic Dishonesty

The Student Code of Conduct is Section B of the Appendices in the Student Information Bulletin. Scholastic Dishonesty is listed in the Student Code of Conduct (Sec. B of the Appendices) under [Sec. 203](#).

Copyright and Fair Use

It is important to understand the issue of intellectual property rights. You may not use the images or thoughts of others for profit or gain without their written permission. The UTSA library has a [Copyright Laws and Public Performance Rights](#) (PPR) page.

UTSA Wellbeing Resources

Your wellbeing is a priority for us. UTSA is proud to partner with [Wellness 360](#) and [TimelyCare](#) to provide students with access to quality health and mental health care.

Students with Disabilities

The University of Texas at San Antonio, in compliance with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act, provides “reasonable accommodations” to students with disabilities. Only those students who have officially registered with Student Disability Services and requested accommodations for this course will be eligible for disability accommodations. Instructors at UTSA must be provided official notification of accommodation through Student Disability Services. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.utsa.edu/disability or by calling Student Disability Services at (210) 458-4157. Accommodations are not retroactive.

Family Educational Rights and Privacy Act (FERPA)

FERPA grants students the right to control certain disclosures of their educational records. For a full explanation of your rights and to grant access to FERPA educational records, go to [Student Catalog Annual FERPA Letter](#) and [One Stop Enrollment – FERPA Proxy Access](#). Without your consent or authorization of proxy access, UTSA may release Directory Information, such as but not limited to your name, email, phone, place of birth, and photograph, unless you have opted out of the release of [Directory Information](#). To opt out, go to [Restrict Directory Information Form](#).

Mandatory Reporting of Sexual Misconduct and Reporting of Health and Safety Information: If a student discloses an incident of sexual misconduct to any UTSA employee (other than to a designated confidential employee such as mental health counselor or PEACE advocate, a UTSA police officer using a pseudonym form or at a public awareness event), that information is not confidential, and the UTSA employee must report all known information to the UTSA Office of Equal Opportunity Services. Employees may also report any concerns about the health and safety of students or others to other school officials and/or law enforcement. For a complete list of exceptions to FERPA, please see [Student Catalog Annual FERPA Letter](#) and [HOP 5.01](#).

Changes

The syllabus is subject to change at the instructor's discretion. Any changes/corrections to the course materials, assignment dates, or other updates will be communicated to the students ahead of time. You are responsible for checking Canvas for corrections or updates to the syllabus.