Advanced Ordinary Differential Equations

MATH 3373.001 | SPRING 2026

Instructor: Dr. Deborah Koslover

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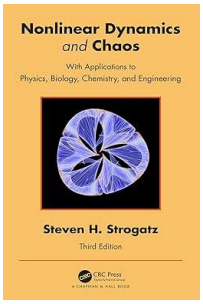
Classroom: RBN 4032

Meeting Time: MWF 11:15 – 12:10 PM

Office Hours: MW 3- 4 PM, TTh 3:30 – 4:30 PM, F 9:30 – 10: 30 AM or by appointment.

Course Description

This course explores topics in applied mathematics as they pertain to the physical sciences. Never fear, you will not be expected to have an extensive background in the physical sciences. As we learn new mathematical techniques, we will also cover the required background material from the sciences. We will study linear and nonlinear systems, phase plane analysis, study of bifurcations, transform methods, mechanics, and chaos, with a focus on theoretical development and physical application. This course has prerequisites, MATH 3425 Foundations of Mathematics. MATH 3305 Differential Equations, and MATH 3203 Matrix Methods or MATH 3315 Linear Algebra



Textbook

Nonlinear Dynamics and Chaos, 3rd edition, by Steven H. Strogatz, CRC Press, 2024. ISBN-13: 978-0367026509 ISBN-10: 1032707895 Any format.

Website

You will be using Canvas. Go to www.uttyler.edu/canvas to log into Canvas using your regular patriots account. If you have enrolled in the course, you should have access to the website. You will find important documents, grades, lecture notes, and announcements on Canvas.

Attendance is mandatory and attendance records will be kept. Notify Dr. Koslover in advance if you must miss a class, be late for a class or leave early. (Official University Policy: Class attendance is the responsibility of the student. When a student has a legitimate absence, the instructor may permit the student to complete missed assignments. In many cases class participation is a significant measure of performance, and non-attendance may adversely affect a student's grade. When a student's absences become excessive, the instructor may recommend that the student initiate a withdrawal.)

Learning Outcomes

At the conclusion of this course, you will be able to

1. Use phase diagrams, stability analysis and geometric thinking to solve and analyze problems arising in the physical sciences

2. Analyze a problem using bifurcation theory.

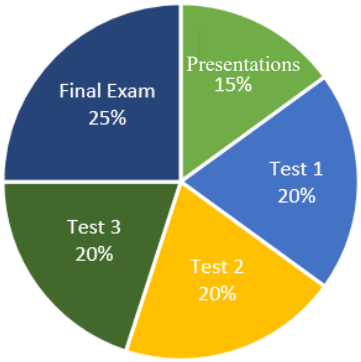
3. Piece together multiple ideas used in class to solve problems arising in the physical sciences.

Course Evaluation

At the end of the semester, you will find your final grade on my.uttyler.edu. It will also be posted on Canvas.
A final course grade of

90% is guaranteed to be at least an A
80% is guaranteed to be at least a B
70% is guaranteed to be at least a C
60% is guaranteed to be at least a D.

All grades below 60% will be F.



The Plan

Homework/Presentations (15%) Homework will be assigned daily. Assignments will appear on Canvas. All students will be expected to do every problem. However, each problem will have 2 students' names attached to it. Those students will treat these particular problems as projects. Solutions to these projects should include the statement of the problem (which can be abbreviated), and a very neat, complete solution. One of the two students will be asked to present their solution in class. You will show your paper on the overhead projector. You will be graded on correctness of work, clarity of presentation and your answers to questions asked. Presented problems will be worth 5 points. All other problems on an assignment will be graded for completion and will be worth 2 points.

Students watching the presentations will be awarded points for insightful questions or comments. Silly comments like "You have nice handwriting" will not get points. If you have done a project problem in a significantly different fashion than the presenter, you may ask to show your solutions for credit.

Solutions, which will be copies of correctly done student projects, will be posted on Canvas. Do not sell to Chegg or similar websites. Do not pass down to future generations of students.

Upload your entire homework assignment to Canvas as a pdf file. No photographs will be accepted.

TESTS

There will be three tests (20% each) and a final exam (25%). These exams will test your knowledge of the material taught in the class and practiced on the homework. Test problems will be similar to homework problems, but generally shorter. The final exam will be comprehensive.

The dates and times of these exams are as follows:

- **Test 1**: Wednesday, February 11, 2026
- **Test 2**: Wednesday, March 18, 2026
- **Test 3**: Wednesday, April 15, 2026

FINAL EXAM

Final Exam: Monday, April 27, 2026, 10:15 AM – 12:15 PM.

Make-ups

Make-ups for **documented** absences that are **required** as part of a UT Tyler obligation (e.g. athletes participating in an event, participating in a debate contest, etc.) or for religious observation will be granted. For all make-ups of this type, prior notification of at least one week and documentation are required. Other make-ups are granted only in extreme cases such as hospitalization and at the sole discretion of the instructor.

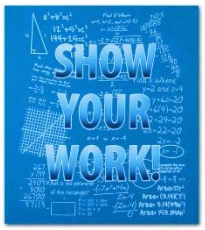
Make-ups will be allowed for the following excused absences.

1) Illnesses, with a doctor's note, no exceptions.
2) Your child's illness, with a doctor's note.
3) Court appearances, including citizenship court, with documentation
4) Weddings, funerals or military advancement with documentation **and** a photograph showing that you attended the event. (No photo needed for funeral.)

Doctor's notes must be dated either before you miss the class or within 2 days after you missed the class, unless you or your child are hospitalized. In case of hospitalization, bring evidence of hospitalization.

Make-ups for tests must be taken within 3 days after returning to class except for lengthy illnesses or hospitalizations.

Other Details



Calculator Policy: Non-graphing calculators may be used on tests. You may not use your phone. However, all work must be shown. When calculators are needed, I will have some available.

Cell phones, IPODs and other electronic devices: Please set your cell phones and pagers to silent mode. If you are expecting an emergency call, please notify the instructor in advance, sit near the door, and answer the phone outside. You will not be allowed to wear an IPOD or other electronic devices during an exam. During tests, cell phones must be turned off and placed in sight on your desk.

AI is not permitted in this course at all.: I expect that all work submitted by students for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without human or artificial intelligence assistance, is best for your efforts in mastering course learning objectives. For this course, I expressly forbid using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.

Calendar

JANUARY			FEBRUARY			MARCH			APRIL		
MON	WED	FRI	MON	WED	FRI	MON	WED	FRI	MON	WED	FRI
12	14	16	2	4	6	2	4	6	6	8	10
First Day			9	11	13	9	11	13	13	15	17
19	21	23		Test 1		Spring Break				Test 3	
MLK Day			16	18	20	16	18	20	20	22	24
26	28	30					Test 2				
Census Day			23	25	27	23	25	27	27	29	29
									Final Exam		
						30 Drop day	1	3	Final 10:15 AM – 12:15 AM		