

MATH 4336 (CRN 26335)

Applied Analysis II

Spring 2021

The University of Texas at El Paso

Xianyi Zeng, Instructor

This course covers series solutions of differential equations, Fourier series, Bessel functions, Legendre polynomials, the Sturm-Liouville theory and eigenfunction expansions, and an introduction to partial differential equations.

Course number:	MATH 4336 (CRN 26335)
Course title:	Applied Analysis II
Credit hours:	3
Term:	Spring 2021
Time & location:	1:00-2:20pm MW, online
Exam dates:	Midterm exam 1: online during the day 02/10/2021 (tentative) Midterm exam 2: online during the day 03/29/2021 (tentative) Final exam: some day in the final exam week. To be announced.
Drop deadline:	Thursday, April 1, 2021
Prerequisites:	MATH 2313 (Calculus III) with a grade "C" or better.
Course fee:	None
Instructor:	Xianyi Zeng Office hour: 4:00-5:30pm MW, send an email first to setup a Zoom meeting Office location: online Email: xzeng@utep.edu
Course website:	http://math.utep.edu/faculty/xzeng/2021spring_math4336
Textbook:	Erwin Kreyszig, Chapters 5,11,12, <i>Advanced Engineering Mathematics</i> , 10th Edition, Wiley 2011 The textbook is required at all class meetings

General course format and Covid-19 information

All of our lectures and office hours will be delivered online using Zoom. Live lectures will be held and recorded at the scheduled time unless otherwise announced; recorded videos will be made available in Blackboard after the live session. Students are not required to join the live sessions. Announcements will be made either via email or Blackboard; the students are required to check the emails and the course shell in Blackboard frequently to keep up-to-date. Course materials except the recorded lectures will be posted on the *course website*.

Technology requirements

Course content is delivered via the Internet through the Blackboard learning management system (announcement, grade distribution, and recorded lectures), the course website (other course materials), and Zoom (live sessions). The students need to ensure the UTEP e-mail account is working

and that they have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

The students need to have access to a computer/laptop as well as a scanner/scanning app; if you wish to join live session discussions and/or virtual office hours, make sure a microphone is available. A webcam is suggested but not required; the instructor would like to create live interactive sessions to know the students better and to provide an opportunity for the students to know their classmates. A Zoom client is required if the student plans to join a live session.

Important: The students are encouraged to contact the UTEP Help Desk (<https://www.utep.edu/irp/technologysupport>) when they encounter course-irrelevant technical difficulties beyond their scope of troubleshooting.

Network etiquette

As communication online can be challenging sometimes, it's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these network etiquette guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.
- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public Internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and instructor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

Course format and attendance

In general, each lecture covers one section of the textbook. These lectures will be delivered live using Zoom; and recorded lectures will be uploaded to Blackboard. Although this class follows an asynchronous schedule, the lectures will be generally delivered live at a pre-scheduled time; the students are encouraged to take part in the live sessions and participate in discussions. Attendance of the live lectures is not required.

Course objectives

Differential equations are the foundations of many applications in engineering, physics, and biology. In this class, the students will learn several powerful analytical approaches to solve ordinary or partial differential equations that frequently arise in practical problems. The first part of the course (Chapter 5 and Chapter 11) focuses on series solutions of various ordinary differential equations; topics include special functions such as Legendre polynomials, Bessel functions, Fourier series, and the general Sturm-Liouville theory for eigenfunctions. In the second part, we discuss a few basic partial differential equations their analytical solutions.

Upon successful completion of the course, the students are expected to understand the structure of solutions to various ordinary and partial differential equations, as well as apply analytical tools to solve problems represented by the model equations discussed in class.

Grading

The final grade for the course will be based on the following:

- 30% homework.
- 20% midterm exam 1 (Chapter 5).
- 20% midterm exam 2 (Chapter 11).
- 30% final exam (comprehensive, but with emphasis on Chapter 12).

Homework will be assigned generally every Thursday and due by the end of the next Thursday; specific due date will be indicated clearly on the course website as well as via Blackboard announcements. Missed homework **cannot** be made up; but the **two** lowest homework scores will be dropped automatically towards calculating the final grade.

Missed exams **cannot** be made up, either. Again, exceptions can be given only in extraordinary and unavoidable circumstances with reasonable proofs, and with advance notice in written.

The letter grade will be guaranteed at the following levels: A (90 – 100%), B (80 – 89%), C (70 – 79%), D (60 – 69%). Depending on circumstances, the thresholds for each of the four letter grades could be lowered, but will be equal among all students. The letter grade F will be given if the final score does not reach the D threshold.

Scheduling of the final exam

The final exam will take place on a certain day during the week 05/10-05/14; the exact date will be determined with the help of a Blackboard survey and announced prior to the week. The 165-minute exam will contain randomized problems. Each student will have the flexibility to start the exam anytime during the day; but the exam must be completed in one sitting.

Accommodations for students with disabilities

If a student has a disability and needs classroom/exam/homework accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at <http://www.sa.utep.edu/cass>.

Academic honesty policy

The students are required to understand the UTEP academic honesty policy. Sharing ideas are encouraged among the students; but collaboration of any form during quizzes and exams is strictly prohibited. If the instructor has reason to believe that the students have cheated on homework or exam, including clearly duplicated or copied quizzes or exams, the case will be referred to the Dean of Students for adjudication.

Military statement

A military student with the potential of being called to military service and/or training during the course of the semester is encouraged to contact as soon as possible.

Course drop deadline

April 1 is the university fall drop/withdrawal deadline.

The college of science will not accept drop/withdrawal requests of any form after **April 1**.

Course schedule

Below is a tentative schedule for this course.

Week 01 (01/20)	5.1
Week 02 (01/25, 01/27)	5.2, 5.3
Week 03 (02/01, 02/03)	5.4, 5.5 Chapter 5 review
Week 04 (02/08, 02/10)	Chapter 5 review, Midterm exam 1
Week 05 (02/15, 02/17)	11.1, 11.2
Week 06 (02/22, 02/24)	11.3, 11.4
Week 07 (03/01, 03/03)	11.5, 11.6
Week 08 (03/08, 03/10)	11.7, 11.8
Week 09 Spring Break	No class
Week 10 (03/22, 03/24)	11.9, Chapter 11 review
Week 11 (03/29, 03/31)	Midterm exam 2, 12.1, 12.2
Week 12 (04/05, 04/07)	12.3, 12.4
Week 13 (04/12, 04/14)	12.5, 12.6, 12.7
Week 14 (04/19, 04/21)	12.8, 12.9
Week 15 (04/26, 04/28)	12.10, 12.11
Week 16 (05/03, 05/05)	12.12, Comprehensive review
Week 17 (05/10-05/14)	Final exam