MATH 4336 (CRN 27342)

Applied Analysis II

Spring 2020
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 28556)
Course title:	Applied Analysis II
Credit hours:	3
Term:	Spring 2020
Time & location:	3:00–4:20pm MW, LART 207
Exam dates	Midterm exam 1: in class Wednesday, 02/12/2020 (tentative) Midterm exam 2: in class Monday, 03/30/2020 (tentative) Final exam: 1:00pm–3:45pm Monday, May 11, 2020
Drop deadline	Friday, April 3, 2019
Prerequisites:	MATH 2326 (Differential Equations).
Course fee:	None
Instructor:	Xianyi Zeng
	Office hour: 4:30pm–5:50pm MW, or by appointment Office location: Bell Hall 202 Office phone: 915-747-6759 Email: xzeng@utep.edu
Course website:	http://math.utep.edu/faculty/xzeng/2020spring_math4336
Textbook:	Erwin Kreyszig, Chapters 5,11,12, *Advanced Engineering Mathematics*, 10th Edition, Wiley 2011 The textbook is required at all class meetings

Important

The course website will be updated throughout the semester according to the progress in class. The instructor will send emails regarding class announcements. It is the students' responsibility to check the emails and the course website frequently to keep up to date.

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% quizzes.
- 20% midterm exam 1 (Chapter 5).
- 20% midterm exam 2 (Chapter 11).
- 30% final exam (comprehensive, but with emphasis on Chapter 12).
- 10% (Optional). In-class performance.

At the end of each lecture, the instructor will assign suggested homework problems and discuss them selectively the next lecture. There will be in-class quizzes, which generally take place weekly or biweekly, depending on the subject. The quiz problems are chosen from the suggested homework, and will not be disclosed in advance. Missed quizzes **cannot** be made up unless approved by the instructor no later than the day *prior to* the actual quiz date; approval will only be granted on the basis of extraordinary and compelling circumstances, and written proof may be required. The **two** lowest quiz scores, however, will be automatically dropped 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 in-class performance credits are optional – these are additional points that can be earned by volunteering to or being selected by the instructor to answer questions in class. The total credit can be accumulated to up to 10 points towards the final grade on a 100 point basis. The final score, however, will not be greater than 100.

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.

Attendance policy

Attendance to every class is strongly encouraged; the lectures will complement rather than simply echoing the textbook materials. Absent students are responsible to find out the material and homework that need to be made up. Suggested homework problems, supplemental materials, and announcements will be notified by email and course website; it is the students' responsibility to read emails and regularly check the course website for updates.

Accommodations for students with disabilities

If a student has a disability and need classroom 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 a quiz 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 3 is the university spring drop/withdrawal deadline.
The college of science will not accept drop/withdrawal requests of any form after **April 3**.

Course format and participation

The course is composed of lectures and after-lecture office hours. The selected three chapters of the textbook will be covered in this class; some sections/sub-sections may be skipped as will be announced in class. Collaborative projects including those involving Matlab programs will not be discussed in class; however, the students are welcome to discuss these problems in the office hour.

Course schedule

Below is a tentative schedule for this course.

Week 01 (01/22)	5.1
Week 02 (01/27, 01/29)	5.2, 5.3
Week 03 (02/03, 02/05)	5.4, 5.5
Week 04 (02/10, 02/12)	Chapter 5 review, Midterm exam 1
Week 05 (02/17, 02/19)	11.1, 11.2
Week 06 (02/24, 02/26)	11.3, 11.4
Week 07 (03/02, 03/04)	11.5, 11.6
Week 08 (03/09, 03/11)	11.7, 11.8
Week 09 Spring Break	No class
Week 10 (03/23, 03/25)	11.9, Chapter 11 review
Week 11 (03/30, 04/01)	Midterm exam 2, 12.1, 12.2
Week 12 (04/06, 04/08)	12.3, 12.4
Week 13 (04/13, 04/15)	12.5, 12.6, 12.7
Week 14 (04/20, 04/22)	12.8, 12.9, 12.10
Week 15 (04/27, 04/29)	12.11, 12.12
Week 16 (05/04, 05/06)	Flexible, and comprehensive review
Week 17 (05/11)	Final exam