MATH 3335 (CRN 11377)

Applied Analysis I

Fall 2019
The University of Texas at El Paso

Xianyi Zeng, Instructor

This course covers multiple integrals, including line and surface integrals, change of variables, and vector analysis. It also provides an introduction to complex analysis.

Course number:	MATH 3335 (CRN 11377)
Course title:	Applied Analysis I
Credit hours:	3
Term:	Fall 2019
Time & location:	1:30–2:50pm TR, LART 206
Exam dates	Midterm exam 1: in class Tuesday, October 1, 2019 Midterm exam 2: in class Tuesday, November 5, 2019 Final exam: 1:00pm–3:45pm Thursday, December 12, 2019
Drop deadline	Friday, November 1, 2019
Prerequisites:	MATH 2313 (Calculus III) with a grade "C" or better.
Course fee:	None
Instructor:	Xianyi Zeng
	Office hour: 15:00pm–16:00pm T, 15:00pm–16:50pm R, 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/2019fall_math3335
Textbook:	Erwin Kreyszig, Chapters 9,10,13, *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

Vector calculus and complex analysis are the foundations of many engineering, physics, and computer sciences applications. In this class, the students will learn mathematical concepts in these subjects that frequently appear in practical problems. The first part of the course focuses on vector calculus, especially in three dimensional space, with topics covering vector fields, derivatives, the gradient, curl, and divergence, line and surface integrals, the Green's theorem, the divergence theorem by Gauss, and the Stokes' theorem. The second part provides an introduction to complex analysis, particularly on the difference between complex derivatives and the derivatives of a function of two real variables, which eventually leads to the Cauchy-Riemann equations.

Upon successful completion of the course, the students will be able to: perform integration along a path or on a surface, convert domain integral to equal boundary integral, decide whether a complex-valued function is differentiable or not, and apply these techniques to analyze representative examples in continuum mechanics.

Grading

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

- 30% quizzes.
- 20% midterm exam 1 (Chapter 9).
- 20% midterm exam 2 (Chapter 10).
- 30% final exam (comprehensive, but with emphasis on Chapter 13).
- 10% (Optional). In-class performance.

At the end of each lecture, the instructor will assign suggested homework problems and discuss them the next lecture. There will be in-class quizzes, which generally take place weekly or biweekly, depending on the subject. The quiz problems are taken 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. For example, if the student requests a makeup for the 2019-09-24 quiz, approval must be obtained by the end of 2019-09-23. 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 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 by 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 needs to be made up. Suggested homework problems, supplemental materials, and announcements will be notified by email or 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 needs 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

November 1 is the university fall drop/withdrawal deadline. After the deadline, student-initiated drops will not guarantee a grade of W; and the instructor will issue a grade of either W or F.

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 (08/27, 08/29)	9.1, 9.2
Week 02 (09/03, 09/05)	9.3, 9.4
Week 03 (09/10, 09/12)	9.5, 9.6
Week 04 (09/17, 09/19)	9.7, 9.8
Week 05 (09/24, 09/26)	9.9, Chapter 9 review
Week 06 (10/01, 10/03)	Midterm exam 1, 10.1
Week 07 (10/08, 10/10)	10.2, 10.3
Week 08 (10/15, 10/17)	10.4, 10.5
Week 09 (10/22, 10/24)	10.6, 10.7, 10.8
Week 10 (10/29, 10/31)	10.9, Chapter 10 review
Week 11 (11/05, 11/07)	Midterm exam 2, 13.1
Week 12 (11/12, 11/14)	13.2, 13.3
Week 13 (11/19, 11/21)	13.4, 13.5
Week 14 (11/26)	13.6
Week 15 (12/03, 12/05)	13.7, comprehensive review
Week 16 (12/12)	Final exam