# MATH 3335 (CRN 11479)

## Applied Analysis I

### Fall 2018
### 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.

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| Course number: | MATH 3335 (CRN 11479) |
| Course title: | Applied Analysis I |
| Credit hours: | 3 |
| Term: | Fall 2018 |
| Time & location: | 1:30–2:50pm TR, Education 309 |
| Exam dates | Midterm exam 1: in class Tuesday, October 2, 2018<br>Midterm exam 2: in class Tuesday, November 6, 2018<br>Final exam: 1:00pm–3:45pm Thursday, December 13, 2018 |
| Drop deadline | Friday, November 2, 2018 |
| 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<br>Office location: Bell Hall 202<br>Office phone: 915-747-6759<br>Email: xzeng@utep.edu |
| Teaching assistant: | Osei Tweneboah |
| | Office hour: TBA<br>Office location: TBA<br>Office phone: TBA<br>Email: oktweneboah@miners.utep.edu |
| Course website: | http://math.utep.edu/faculty/xzeng/2018fall_math3335 |
| Textbook: | Erwin Kreyszig, Chapters 9,10,13, *Advanced Engineering Mathematics*, 10th Edition, Wiley 2011<br>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 and the TA will send emails regarding class annoucements. It is your 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 Stoke's 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

Your 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, I 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 ones, and will not be disclosed in advance. Missed quizzes **cannot** be made up, but I will drop **two** lowest quiz scores towards calculating your final grade.

In general, missed exams **cannot** be made up, either. 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 you can earn by volunteering to or being selected by me 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. Your 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; my lectures will complement rather than simply echo the textbook materials. If you are absent, you 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 and course website; it is your responsibility to read emails and regularly check the course website for updates.

## Accommodations for students with disabilities

If you have 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

Make sure you understand the UTEP academic honesty policy. Students are encouraged to share ideas, but you must do your own homework and you must write your own code for the projects (you may copy code that is on the course website). If homework or program code is suspected of being duplicated or copied, you will receive an incomplete for the assignment, and your case will be referred to the Dean of Students for adjudication. If the instructor has reason to believe that you have cheated on a quiz or exam, your case will be referred to the Dean of Students for adjudication.

## Military statement

If you are a military student with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact as soon as possible.

## Course format and participation

The course is composed of lectures and after-lecture office hours. We cover mainly the first four chapters of the textbook; some sections may be skipped as will be announced in class. Some sections in the latter three chapters may also be discussed, when they are related to the materials in the first four chapters. We will not cover Matlab in class; however, the students are welcome to discuss Matlab exercises in my office hour.

## Course schedule

Below is a tentative schedule for this course.

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| Week 01 (08/28, 08/30) | 9.1, 9.2 |
| Week 02 (09/04, 09/06) | 9.3, 9.4 |
| Week 03 (09/11, 09/13) | 9.5, 9.6 |
| Week 04 (09/18, 09/20) | 9.7, 9.8 |
| Week 05 (09/25, 09/27) | 9.9, Chapter 9 review |
| Week 06 (10/02, 10/04) | Midterm exam 1, 10.1 |
| Week 07 (10/09, 10/11) | 10.2, 10.3 |
| Week 08 (10/16, 10/18) | 10.4, 10.5 |
| Week 09 (10/23, 10/25) | 10.6, 10.7, 10.8 |
| Week 10 (10/30, 11/01) | 10.9, Chapter 10 review |
| Week 11 (11/06, 11/08) | Midterm exam 2, 13.1 |
| Week 12 (11/13, 11/15) | 13.2, 13.3 |
| Week 13 (11/20) | 13.4 |
| Week 14 (11/27, 11/29) | 13.5, 13.6 |
| Week 15 (12/04, 12/06) | 13.7, comprehensive review |
| Week 16 (12/13) | Final exam |