ENGR3300.004 Advanced Engineering Mathematics
Fall 2024

Classes: F 10:00 pm – 12:45 pm Room: ECSW 3.250
Lab: F 9:00 am –9:50 am Room: ECSW 3.250

Instructor Contact Information
Dr. Ricardo Saad
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Office hours: TBD

TAs Contact Information

Belal Mohammed Belal
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Vahid Rafiei
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Course Pre-requisites, Co-requisites, and/or Other Restrictions
Prerequisites: (MATH 2415 or MATH 2419) and ENGR 2300 Corequisite: MATH 2420.

Course Description
Survey of advanced mathematics topics needed in the study of engineering. Topics include use of complex numbers, properties of complex-valued functions, scalar and vector fields, introduction to partial differential equations, and Fourier series. Examples are provided from electromagnetics, fluid mechanics, thermodynamics, and engineered systems. This course includes a required laboratory.

Student Learning Objectives/Outcomes

CLO 1: Demonstrate the ability to solve advanced vector calculus problems

CLO2: Demonstrate the ability to solve Fourier Analysis problems.

CLO3: Demonstrate the ability to solve partial differential equation problems.

CLO4: Demonstrate the ability to solve complex variable problems.

Required Textbooks and Materials

1. Erwin Kreyszig, *Advanced Engineering Mathematics*, 10th Edition (Wiley, 2011).
2. Class-notes will be posted in eLearning. Students must have access to eLearning.

3.

Textbooks for extra-exercises (not required)

1. Vector Analysis (2nd edition) Murray Spiegel, Seymour Lipschutz, and Dennis Spellman, Schaum's outlines, ISBN-13: 978-0071615457 ISBN-10: 0071615458
2. Schaum's Outline of Advanced Calculus, Third Edition (Schaum's Outlines) Robert Wrede and Murray Spiegel ISBN-13: 978-0071623667 ISBN-10: 0071623663

Assignments & Academic Calendar*

Class Notes #	Topic	Sections in Textbook	Tentative Class Dates
	Syllabus		Jan. 24
0	Vectors (Review- Self Study)	Sections 9.1, 9.2, and 9.3	Self Study
1	Complex Numbers	Sections 13.1 and 13.2	Jan. 24
2	Cylindrical and Spherical Coordinates		Jan. 31
3	Line Integrals (Review)	Section 10.1	Feb. 7
4	Triple Integrals in Cylindrical and Spherical Coordinates		Feb. 14
5	Surface Integrals (Review)	Section 10.6	Feb. 21
6	Operators	Sections 9.7, 9.8, and 9.9	Feb.21
7	Stokes' Theorem	Section 10.9	Feb. 21/28
8	Divergence Theorem	Sections 10.7 and 10.8	Feb. 28
9	Fourier Analysis	Sections 11.1 and 11.2	Mar. 7/14
10	PDE/Wave Equation	Sections 12.1, 12.2, and 12.3	Mar. 28
11	Heat Equation	Sections 12.5 and 12.6	Apr. 4
12	Complex Functions, Limit, and Derivatives	Sections 13.3, 13.4, 13.5, and 13.6	Apr. 11
13	Complex Integration	Sections 14.1, 14.2, 14.3, and 14.4	Apr. 18
14	Power Series, Taylor Series	Sections 15.1, 15.2, 15.3, and 15.4	Apr. 25
15	Laurent Series, Residues	Sections 16.1, 16.2, and 16.3	May 2

***Note:** Material covered in each class date is tentative. Changes may occur at the discretion of the instructor.

Grading Policy

Quiz 20% Date: Saturday, March. 1st at 10 am Duration: 2 hours Room: ECSN 2.110/ 2.120

Exam 1: 30% Date: Saturday, April . 12th at 10 am Duration: 2 hours Room: ECSN 2.110/2.120

Exam 2: 30% Date: Friday, May 9th at 9:00 am Duration: 2 hours. Room ECSW 3.250

Assignments 8% Weekly

Short Quiz 12% TBD Duration: 15 mi Room: ECSW 3.250

Grading range:

A+: >96, A: 94-96, A-: 90-93: B+: 87-89, B: 84-86, B-: 80-83 ; C+: 77-79, C: 74-76, C-: 70-73

D+: 67-69, D: 64-66, D-: 60-63; F: <60

- Bonus points: Each quiz or exam will have a minimum of **10 bonus points**. Short quizzes will not have extra points. Assignments will not have bonus points.
- Short quizzes will last 10 to 15 minutes and they will be offered during the Lab section.
- **All dates for exams and the quiz are tentative.** The instructor reserves the right to change the dates of exams or the quiz at his discretion. Any changes in the exams or quiz schedule will be announced in eLearning.
- **Grades are final one week after the grades are posted in eLearning**
- **There will be no grade review after that period.**
- The two worst assignment grades will be disregarded when calculating the average grade for assignments.
- The two worst short-quiz grades will be disregarded when calculating the average grade for short quizzes.

- No quiz or exam grade will be disregarded.
- Makeup quizzes or exams will be given to students that document the reasons for not taking exams/quiz to the satisfaction of the instructor or UTD regulations.
- There will be no makeup short quizzes under no circumstances. If you miss more than two short quizzes for valid reasons contact the instructor.
- No makeup quizzes or exams will be given to improve the grade. No extra assignment will be given to improve the grade.

Course & Instructor Policies

- Students must have access to eLearning.
- Class attendance is mandatory
- Students can miss 2 classes without penalty. Students that do not attend classes without justification to the satisfaction of the instructor or UTD regulations may lose up to 10 points of the overall course grade.
- Lab attendance is mandatory.
- Students can miss 2 labs without penalty. Students that do not attend labs without justification to the satisfaction of the instructor or UTD regulations may lose up to 10 points of the overall course.
- Submissions of assignments are mandatory.
- Assignments not submitted on time will not be graded (the grade will be zero).
- Assignments must be submitted in **Engineering Paper or Graph Paper.** Please check Google to find out what Engineering Paper is.
- Assignments must be submitted in eLearning by the due date and time. Submission by email is not acceptable.
- Students are required to have pencil, pen, compass, ruler, and a scientific calculator. All these elements will be required for the quiz and the exams.
- Classroom Citizenship: General good behavior with **cell phones silenced** required. **Questions are encouraged!**

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Off-campus Instruction and Course Activities

There will be no off-campus activities for this course

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the instructor.

THIS IS A PRELIMINARY SYLLABUS AND IT IS SUBJECT TO CHANGE