

ENGR 3300.006.23S Course Syllabus

Course Information

<i>Course Number/Section</i>	ENGR 3300.006.23S
<i>Course Title</i>	Advanced Engineering Mathematics
<i>Term</i>	Spring 2023
<i>Days & Times</i>	Monday and Wednesday: 4:00pm-5:15pm
<i>Meeting Place</i>	SCI 2.230
<i>Recitation Session</i>	Monday 7:00pm-7:50pm
<i>Meeting Place</i>	GR 3.606

Professor Contact Information

<i>Professor</i>	James M. Florence, Ph.D.
<i>Office Phone</i>	972-883-4968
<i>Email Address</i>	James.Florence@utdallas.edu
<i>Office Location</i>	ECSN 4.320
<i>Office Hours</i>	Monday thru Thursday 1:30pm to 3:00pm Or by appointment

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisites: MATH 2415 or MATH 2419.

Course Description:

Survey of advanced mathematics topics needed in the study of engineering. Topics include review 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.

Required Textbooks and Materials:

Required Texts

Advanced Engineering Mathematics by Erwin Kreyszig, Tenth Edition (John Wiley & Sons, 2011) ISBN: 978-0-470-45836-5

Required Materials

Software that will be used for this course includes Microsoft Office (Word, Excel, Power Point) and Matlab. If you do not have Matlab already, there are instructions on how to download the software posted in the Notes and Handouts folder on eLearning. Laptops and software can be purchased from the UTD Technology Store (<http://www.utdtechstore.com/>).

Recommended Material

CRC Standard Mathematical Tables and Formulae, by Daniel Zwillinger, 32nd Edition (CRC Press, 2012) ISBN: 978-1-4398-3548-7

Matlab: A Practical Introduction to Programming and Problem Solving 4th Edition, Stormy Attaway, (Butterworth-Heinemann) ISBN: 978-0128045251

Course Learning Objectives:

1. Demonstrate the ability to solve advanced engineering problems formulated in physical space and time.
2. Demonstrate the ability to solve advanced engineering problems formulated in frequency space and the complex domain.
3. Demonstrate the ability to formulate an engineering problem in terms of advanced engineering mathematics.
4. Demonstrate the ability to use automatic computation to evaluate the solutions to problems in advanced engineering mathematics.

Detailed Course Content:

Topic Schedule for ENGR3300.006 Spring 2023			
Date	Topic	Text Chapter	Recitation
Monday, January 16, 2023	MLK Day - No Class		
Wednesday, January 18, 2023	Vector Analysis	9.1,9.2,9.3	
Monday, January 23, 2023	Coordinate Systems	Handout	Recitation #1
Wednesday, January 25, 2023	Vector Calculus - Derivatives	9.4,9.7	
Monday, January 30, 2023	The Divergence	9.8	Recitation #2
Wednesday, February 1, 2023	The Curl	9.9	
Monday, February 6, 2023	Vector Calculus - Integrals	10.1,10.2	Recitation #3
Wednesday, February 8, 2023	Divergence Theorem	10.4,10.5,10.6	
Monday, February 13, 2023	Stokes Theorem	10.7,10.8, 10.9	Recitation #4
Wednesday, February 15, 2023	Review for Exam #1		
Monday, February 20, 2023	Exam #1		No Recitation Session
Wednesday, February 22, 2023	Fourier Series	11.1,11.2,11.3	
Monday, February 27, 2023	Fourier Integrals	11.5,11.6	Recitation #5
Wednesday, March 1, 2023	Fourier Transforms	11.7,11.9	
Monday, March 6, 2023	Partial Differential Equations	12.1,12.2,12.3	Recitation #5
Wednesday, March 8, 2023	Wave Equations	12.4,12.5,12.6	
Monday, March 13, 2023	Spring Break - No Class		
Wednesday, March 15, 2023	Spring Break - No Class		
Monday, March 20, 2023	Heat Equation	12.8,12.9,12.10	Recitation #6
Wednesday, March 22, 2023	PDEs	12.11,12.12	
Monday, March 27, 2023	PDEs		Recitation #7
Wednesday, March 29, 2023	Review for Exam #2		
Monday, April 3, 2023	Exam #2		No Recitation Session
Wednesday, April 5, 2023	Complex Analysis	13.1,13.2,13.3	
Monday, April 10, 2023	Complex Derivatives	13.4,13.5,13.6	Recitation #8
Wednesday, April 12, 2023	Trig and Hyperbolic Functions	13.7	
Monday, April 17, 2023	Complex Integration	14.1,14.2,14.3	Recitation #9
Wednesday, April 19, 2023	Power Series	15.2,15.3,15.4	
Monday, April 24, 2023	Residue Integration	16.1,16.2	Recitation #10
Wednesday, April 26, 2023	Residue Integration	16.3,16.4	
Monday, May 1, 2023	Complex Analysis		No Recitation Session
Wednesday, May 3, 2023	Review for Final Exam		

Important Dates

No Classes: Monday, Jan 16th – Martin Luther King, Jr. Day
Monday, Mar 13th through Saturday, Mar 18th – Spring Break

Classes Begin: Tuesday, Jan 17th

Classes End: Friday, May 5th

Exam Dates: Exam #1 Monday, February 20th
Exam #2 Monday, April 3rd
Final Exam TBD

Homework and Exams

Homework will be assigned regularly and due dates will be specified. Assignments will be posted on eLearning and all submissions will be through eLearning. Homework submissions MUST be in pdf file format – no other file format will be accepted. Homework due dates will be clearly specified – late submissions will be penalized: 10 point penalty for 1 day late; 20 point penalty for 2 days late; after 2 days homework will not be accepted. No exceptions unless you receive prior permission from Dr. Florence

Recitation sessions are problem working sessions and 2 or 3 problems will be assigned each session. Due dates and times for these problems will be specified at the time of assignment, some will be due at the end of the recitation session – these will be hard copy submissions; others will be given extra time – typically due within 24 hours of the end of the recitation session – these submissions again MUST be in pdf file format on eLearning – no other file format will be accepted. Late submissions or non-pdf file submissions will not be accepted.

An Engineering Project report will be assigned later in the semester in the Recitation session that will involve setting up and solving a detailed engineering problem using Matlab. The assignment date for that project report is TBD, but the due date will be Monday, May 1st. Submission will be via eLearning and MUST be in pdf file format – no other file format will be accepted. Late submissions of this Project report will not be accepted.

Exams will be in-person on the dates specified above. Exams will be closed book; one sheet of notes will be allowed for each regular exam; two sheets of notes will be allowed for the final exam. The final exam will be comprehensive.

Weights for Final Course Average

Homework:	10%
Recitation Problems:	10%
Engineering Project:	10%
Exams (2):	20% each
Final Exam:	30%

Supplemental Instruction

Supplemental Instruction (SI) is offered for this course. SI sessions are free peer-facilitated study sessions, scheduled two times per week. Sessions are facilitated by an SI Leader, who has taken the course and received a high final grade. Attendance is voluntary. For information about the days, times, and locations for SI sessions, refer to

<http://www.utdallas.edu/studentssuccess/help-with-courses/supplemental-instruction/>.

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 Professor.