ENGR 3300.503.19F Course Syllabus

Course Information

Course Number/Section	ENGR 3300.503.19F
Course Title	Advanced Engineering Mathematics
Term	Fall 2019
Class Days & Times	Tuesday & Thursday: 7:00-8:15 pm
Class Meeting Place	CR 1.202

Professor Contact Information

Professor	Mofid Nakhaei, Ph.D., P.E.
Email Address	Mofid.Nakhaei@utdallas.edu

TA Contact Information

TA	Jingchen Liang
Email Address	Jingchen.Liang@utdallas.edu
Office Location	ECSN 3.324
Office Hours	Friday: 3:00-5:00 pm

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

MATH 2415 or MATH 2419 or equivalent and ENGR 2300.

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.

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.

Textbooks and Materials

Required Textbook

Advanced Engineering Mathematics by Erwin Kreyszig, 10th Edition (Wiley, 2011) IBSN: 978-0-470-45836-5

Recommended Material

CRC Standard Mathematical Tables and Formulas (Advances in Applied Mathematics) by Daniel Zwillinger, 33rd Edition (Chapman and Hall/CRC, 2018) IBSN: 978-1-4987-7780-3

Course Content

1. Vector Analysis and Vector Calculus (Chapters 9 and 10)
    a. Vector Fields and Vector Algebra
    b. Coordinate Systems
    c. Vector Calculus
    d. Gradient
    e. Divergence and Divergence Theorem
    f. Curl and Stoke's Theorem
    g. Green's Theorem
2. Fourier Analysis (Chapter 11)
    a. Fourier Series for Periodic Functions
    b. Complex Fourier Series
    c. Fourier Transform
    d. Convolutions and System Transfer Functions
3. Partial Differential Equations (Chapter 12)
    a. Basic Concepts of PDEs
    b. Wave Equation
    c. Solutions using Fourier Series
    d. Heat Equations
    e. Laplace Equations
4. Complex Analysis (Chapters 13, 14, 15, and 16)
    a. Complex Numbers and Functions
    b. Complex Derivatives; Analytic Functions
    c. Complex Integrals and Cauchy's Integral Theorem
    d. Complex Power Series and Laurent Series
    e. Residue Theorem
    f. Applications of Residue Theorem

Academic Calendar

No Classes: Tuesday, Nov 26, Fall Break
Thursday, Nov 28, Thanksgiving Day

Exam Dates:		
	Exam #1	Thursday, October 3
	Exam #2	Thursday, December 5

Grading Policy

Homework	20%
Exam 1	35%
Exam 2	45%

Course Policies

Class Attendance

Class attendance is not mandatory but is highly recommended. Looking at previous experiences with this and other classes, tardiness and absence are the main contributing factors to substandard performance.

Exam
The exams will be closed book; however, one sheet of notes will be allowed for each exam.

Make-up Exam
No make-up exam will be offered, except under special circumstances and ONLY by permission of the instructor in advance.

Homework
Homework assignments will be usually posted a week in advance of the due date. You can work together on homework but develop your own solution. All homework should be submitted by the due date on eLearning. Late submissions will not be accepted without a valid excuse. No make-up homework will be given, so plan ahead. A single pdf file is the only acceptable format for homework submittal.

Extra Credit
None

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.