ENGR 3300.501.17S Course Syllabus

Course Information

Course Number/Section	ENGR 3300.501.17S
Course Title	Advanced Engineering Mathematics
Term	2017 Spring
Days & Times	Monday and Wednesday: 5:30pm-6:45pm
Meeting Place	FO 2.208

Professor Contact Information

Professor	James M. Florence, Ph.D.
Office Phone	972-883-4968
Email Address	James.Florence@utdallas.edu
Office Location	ECSN 4.320
Office Hours	Mondays through Thursday 12:30pm to 2:00pm

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, multivariate calculus and analytic geometry. Study of polar, cylindrical, and spherical coordinates, vector differential calculus, vector integral calculus, and vector integral theorems. Examples are provided from electromagnetic, fluid mechanics, physics and geometry.

Course Learning Objectives:

1. Solve Problems in Multivariable Calculus
2. Compute surface integrals and line integrals
3. Understand gradient, divergence and curl
4. Use Green's Theorem, the Divergence Theorem, and Stokes' Theorem
5. Work with complex numbers

Required Textbooks and Materials:

Required Texts

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

Recommended Material

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

Detailed Course Content:

1. Vector Analysis and Vector Calculus (Chapters 9 and 10 and supplemental material)
    a. Vector fields and vector algebra
    b. Coordinate Systems
    c. Vector Calculus
    d. The Gradient
    e. Divergence and the divergence theorem
    f. Curl and Stoke's theorem
    g. Green's theorem
2. Power Series and Fourier Series (Chapter 11 and supplemental material)
    a. Power Series
    b. Fourier Series for Periodic Functions
    c. Complex Fourier Series
    d. The Fourier Transform
    e. Convolutions and System Transfer Functions
3. 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 the residue theorem
4. The Calculus of Variations (Supplemental material)
    a. Variational Problems
    b. The Euler Equation
    c. Using the Euler Equation
5. Ordinary Differential Equations (Chapters 1 and 2)
    a. First Order differential equations
    b. Separable equations, linear equations
    c. Second order differential equations
6. Partial Differential Equations (Chapter 12)

Assignments & Academic Calendar

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

Exam Dates:		
	Exam #1	Wednesday, February 15th
	Exam #2	Wednesday, March 29th
	Final Exam	TBD

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.

Grading Policy

Homework:	10%
Exams (2):	30%
Final Exam:	30%

Course Policies

Make-up exams

Only by permission of the instructor in advance

Extra Credit

None

Late Work

Homework will be due at the beginning of the class period on the assigned due date; late homework will not be graded without a valid excuse (preferably arranged in advance).

Supplemental Instruction

Supplemental Instruction (SI) is offered for this course. SI sessions are free group study opportunities, scheduled two times per week. Sessions are facilitated by an SI Leader, who has recently 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 www.utdallas.edu/studentsuccess/leaders/si.html.

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.