# ENGR3300.006 Advanced Engineering Mathematics
# Fall 2016
# Fridays 1:00 p.m. – 3:45 pm Room: GR 3.606

**Professor Contact Information**
Dr. Ricardo Saad
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Office hours: Fridays 8:45 am 9:45 am or by appointment

**TA Contact Information**
Mr. Hussein Metwaly Saad
Office Hours: Tuesday and Wednesday from 3-4 pm o0r by appointment. Room ECSN 4.202
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Problem sessions: Fridays 4 pm - 6 pm Room ECSN 2.112

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

**Student Learning Objectives/Outcomes**
-Solve problems in multivariable calculus
-Compute surface integrals and line integrals
-Understand gradient, divergence, and curl
-Ability to use Greens, divergence and Stokes Theorem
-Ability to work with complex numbers.

**Required Textbooks and Materials**

1. **Calculus 9e** , Larson, Hostetler and Edwards
   Houghton Mifflin Company- Custom Publishing-Boston ISBN-13 9780547167022
2. **Complex variables and applications**, 8th edition, Brown and Churchil ISBN 978–0–07–305194–9
3. **Class-notes** will be posted in eLearning.. Students must have access to eLearning.

**Suggested Course Materials**

1. A Guide to Complex Variables, Steven G. Krantz, 2007
2. Murray R. Spiegel, "Advanced Mathematics for Engineers and Scientists", McGraw-Hill (Spiegel's Outlines), 1971 [ISBN 0-07-060216-6].
3. H. M. Schey, *div grad curl and all that, an informal text on vector calculus*, 3rd Ed., W.W. Norton, 1997 (ISBN 0-393-96997-5).

**Assignments & Academic Calendar**

1. Complex numbers.
2. Infinite Series.
3. Complex functions, limits and continuity
4. Complex Differentiation
5. Complex Integration
6. Cauchy's Integral Formulas and Related Theorems
7. Infinite series: Taylor's series and Laurent Series
8. Surfaces in Space.
9. Multiple integration
   - Cartesian coordinate Integration (Review)
   - Change of variables (Polar, cylindrical and spherical coordinates)
10. Line Integrals
11. Surface Integrals
12. Gradient, Divergence, and Curl
13. Green's, Divergence, and Stokes' Theorems

**Grading Policy**

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|---|---|
| Assignments/Quizzes/Re-write class notes: | 10% |
| Exam 1: | 20% |
| Exam 2: | 20% |
| Exam 3: | 20% |
| Exam 4: | 10% |
| Exam 5: | 20% |

The dates for Exams will be posted in eLearning.
Quizzes maybe taken at any time during class. You should assume that we will have a quiz every class. Class notes (re-write) and Assignments have to be submitted together to receive points. No points will be given if any of the two are not submitted.

Grades are final one week after the grades are given in class or posted, whatever happens first.

**Course & Instructor Policies**

Homework problems will be assigned approximately weekly. **Late homework will not be accepted.**

Homework will be collected at the **beginning** of the class period on the date it is due. Students should keep a copy of their homework in case they need it for reference (or in preparing for exams) before they can be graded and returned

**No exam grades will be dropped.** Make-up exams will be given **only in very special circumstances and at the discretion of the instructor**.

Supplemental Instruction (SI) is offered for this course. For information about the days, times, and locations for SI sessions, refer to www.utdallas.edu/studentsuccess/leaders/si.html

Problem sessions are offered in weekly basis by the TA of the course

Classroom Citizenship: General good behavior with **cell phones silenced** required. **Questions are encouraged!**

**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 Professor.***