

Welcome to Mece 3449 - Mechanical Engineering Analysis I  
At The University of Texas in the Rio Grande Valley, Summer II 2017

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<b>Instructor:</b>	Dr. Josef Sifuentes
<b>Email:</b>	josef.sifuentes@utrgv.edu
	<b>Please include MECE3449 in the subject line and your full name somewhere in the text.</b>
<b>Office:</b>	MAGC 3.614
<b>Office hours:</b>	Tuesday, Wednesday, Thursday 3:45 – 4:45 pm <b>or by appointment</b> , office hours are subject to change, notification will be made by email.
<b>Class Time</b>	Every Weekday 11:20 – 12:50 pm
<b>Class Location</b>	ENGR 1.242
<b>Lab Instructor:</b>	Still Me – Dr. Josef Sifuentes
<b>Lab Time</b>	Every Weekday 1:00 – 2:30 pm
<b>Lab Location</b>	Academic Services Building (ACSB) 2.146

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### Calendar

<b>Thursday</b>	<b>July 13</b>	Classes at UTRGV begin, this one especially
<b>Tuesday</b>	<b>July 18</b>	Census day (Last day to Drop without it appearing on the transcript)
<b>Tuesday</b>	<b>July 25</b>	<b>First Midterm Exam</b>
<b>Friday</b>	<b>Aug. 4</b>	<b>Second Midterm Exam</b>
<b>Tuesday</b>	<b>Aug. 8</b>	Drop / Withdrawal Deadline
<b>Wednesday</b>	<b>Aug. 16</b>	<b>Third Midterm Exam</b>
<b>Friday</b>	<b>Aug. 18</b>	<b>Final Exam (11:50 – 1:35 p.m.)</b>

**Course Description:** This course offers engineering students an in-depth look into the following topics: linear algebra including matrices, vectors, determinants, linear systems, and matrix eigenvalue problems; vector differential calculus and vector integral calculus, including integral theorems; complex numbers and functions including complex integration; and an introduction to constrained and unconstrained optimization.

### Required Text:

- *Advanced Engineering Mathematics, 10th Edition* by Erwin Kreyszig (This text will also be used by subsequent courses in the MECE track, however it is permissible to purchase the 9th edition for this course).

**Prerequisite:** Calculus II (e.g. MATH 2414)

**Corequisite:** Numerical Methods for Engineers (MECE 2350)

**Class Objectives:** The successful student will be able to

1. analyze whether a system of linear equations can be solved uniquely as well as compute the solution set to such equations;
2. compute eigenvalues and eigenvectors of matrices and use them to analyze damped vibration systems;
3. understand and utilize vector differential calculus to model engineering applications, e.g. thermofluid systems;
4. understand and utilize vector integral calculus to model engineering applications, including surface and volume integrals in applications of fluid and solid mechanics;
5. understand and utilize complex numbers and complex valued functions in the way they describe damping and frequency behavior as well as analysis of dynamic responses;
6. set up and solve constrained and unconstrained optimization problems that commonly arise in engineering applications;
7. use MATLAB to aid in solving engineering problems using the mathematical methods presented in this course.

**Grading policy:** The grade cutoffs **may** be adjusted to reflect the mean of the final averages. The lower bound of the cutoffs will not be curved upward.

Homework Aggregate	10%	$90\% \leq A$
Lab Assignments	25%	$80\% \leq B < 90\%$
Midterm Aggregate	45%	$70\% \leq C < 80\%$
Final Exam	20%	$60\% \leq D < 70\%$
		F < 60%

**Due to Federal Laws protecting student privacy rights, I cannot discuss grades over unsecured email or telephone.**

**Homework:** A problem set will be assigned to be due one class day prior to the exam. The homework will be submitted in writing at the beginning of the lecture period. The homework will not be graded for correctness, but rather by submission. Full work and solutions must be presented neatly and in a way that is meant to be read and understood by someone else to receive full credit. The homework solutions will be made available to you on the day prior to the exam. **Mastery of the homework problem sets is crucial to being successful on the exam** Late homework is not generally accepted and is at the discretion of the instructor. Viewing past homework or homework solutions is **not allowed**.

**Exams:** There will be three midterms and a comprehensive final exam. Viewing past exams or exam solutions is **not allowed**.

**Lab:** You will be required to work in a group of 2 or 3 and will be tasked with either completing a set of engineering and/or mathematical challenges together or implementing your learning from lecture through problem sets. You will be required to submit all work at the end of each lab period. Periodically your group will be asked to present to the class your findings and reasoning behind

your work. Lab attendance is mandatory. Your Lab Assignment grade will consist of your lab work (50%), your presentations (25%), attendance and participation (25%).

**Attendance and Making up Work** Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations. If there is an emergency precluding advance notice, please notify me as soon as possible and provide written documentation as soon as you are able. If you are ill or injured, please submit a note from a health care professional excusing you from work or school. It is your responsibility to schedule a make-up exam, which can only be given if written evidence of an excused absence is provided in a timely manner.

**Scholastic Integrity** As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**Sexual Harassment, Discrimination, and Violence** In accordance with UT System regulations, your instructor is a "responsible employee" for reporting purposes under Title IX regulations and so must report any instance, occurring during a student's time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at [www.utrgv.edu/equity](http://www.utrgv.edu/equity), including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

**Students with Disabilities** If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at [ability@utrgv.edu](mailto:ability@utrgv.edu). Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at [ability@utrgv.edu](mailto:ability@utrgv.edu).

**Course Drops** According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of

the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

**Mandatory Course Evaluation Period** Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu/home>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades.

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