### Course Information

**2022 Fall – MECH – 3352 Engineering Analysis II**

<table>
<thead>
<tr>
<th>Credits</th>
<th>Required</th>
<th>Fall 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Required</td>
<td></td>
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</tbody>
</table>

**INSTRUCTOR:**

Dr. Ahmed Kanaan

**CLASS SCHEDULE:**

TR 3:00 PM – 4:20 PM, Liberal Arts Building 107

**INSTRUCTOR’S OFFICE HOURS:**

TR 11:00 AM – 12:00 PM by appointment or (zoom meeting)

**TEXTBOOK:**


**TOPICS:**

- Mathematical Modeling and MATLAB Fundamentals
- Programming with MATLAB and Roots Bracketing Methods
- Roots Open Methods and Optimization
- Linear Algebraic Equations and Matrices
- Gauss Elimination and LU Factorization
- Matrix Inverse and Condition
- Iterative Methods and Eigenvalues
- Linear Regression
- General Linear Least-Squares and Nonlinear Regression

**COURSE OBJECTIVES:**

The primary goal is to provide engineering majors with a basic knowledge of numerical methods including root-finding, elementary numerical linear algebra, solving systems of linear equations, curve fitting, and numerical solution to ordinary differential equations, and numerical integration. An advanced programming tool (e.g., MATLAB) will be used for the implementation and application of these numerical methods. The numerical techniques learned in this course enable students to work with mathematical models of technology and systems. After completing this course, a student should be able to:

- Structured programming: Understand basic structured programming concepts involving decision making, loops, functions, and parameter passing implemented within the MATLAB programming environment.
- Numerical methods: Understand the most common numerical methods used in engineering analysis, when to use each method, and how to implement basic methods in a structured manner using MATLAB’s programming language.
- Numerical accuracy: Estimate the amount of error inherent in different numerical methods.
- Numerical efficiency: Assess the efficiency of a selected numerical method when more than one option is available to solve a certain class of problem.

**Attendance:**

Students are expected to attend all lectures on time (iClicker is used for the attendance). If a class is already in progress, students shall enter quietly and take the nearest seat without distracting others.

**Academic dishonesty:**

All graded materials must represent the student’s individual work. Scholastic dishonesty is the attempt of any student to present as his or her own work of another, or any work which he has not honestly performed, or attempting to pass any examination by improper means. Scholastic dishonesty is a serious offense and will not be accepted. Academic misconducts will be handled according to the current university policy.
### Reasonable Accommodation Policy:

If you need classroom accommodation, please contact The Center for Accommodations and Support Services (CASS) at 915-747-5148, or by email to cass@utep.edu, or visit the office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

### Department of Aerospace Mechanical Engineering Safety Statement

The Department of Aerospace and Mechanical Engineering at the University of Texas at El Paso is committed to a model of excellence in education that includes providing a safe and healthy environment for its students, staff, faculty, and the public. Our goal is to maximize education and research training that can only occur if you, the individual, minimize hazards and risks. This can be done by:

- Providing adequate control of the health and safety risks arising from all activities.
- Consulting with employees on matters affecting their health and safety.
- Providing and maintaining safe laboratories and equipment.
- Ensuring safe handling and use of substances.
- Ensuring all employees are competent to do their task and have adequate training and
- Maintaining clean, safe, and healthy working conditions.

The principal investigator or individual in charge of each laboratory is ultimately responsible for safety in that respective lab. This includes training and ultimate release of the laboratory. Within the Department, we hold every employee (staff, faculty, student) responsible for implementing our safety practices and our departmental safety policy. We hold every employee (staff, faculty, student) responsible for providing leadership within our department to establish effective environmental safety and occupational health standards.

### MAKEUP EXAMS/QUIZZES:

As a rule, makeup exams and quizzes WILL NOT be allowed. However, if you have a legitimate exception and a valid document(s), it needs to be approved by the instructor before the due date, and the makeup date needs to be scheduled either preferably prior to the event date or within one week from the student's first return date.

No cellphones or electrical devices are allowed during exams. Anyone with such devices during an exam will receive zero for the exam and be reported as academic misconduct.

### GRADING CRITERIA:

- Exam (3)  45%
- Final Exam  25%
- Homework  15%
- In Class Exercises  10%
- Attendance  5%

### FINAL EXAM:

The Final counts as much as each of the other exams but cannot be dropped. Anyone caught cheating (giving or receiving answers) will be withdrawn from the course. The final exam is an individual effort; do your own work. **Powered off or not, mobile devices are not allowed in your workspace, not on the desk or anywhere else visible. Violation of this rule could result in an automatic F.**

### Incomplete Grades:

The grade of "I" may only be assigned if the student is unable to complete the course due to circumstances beyond the student's control that develop after the last day to withdraw from the course.
Plagiarism Statement:

Plagiarism is using another person's work without acknowledgment, making it appear to be one's own. Any ideas, words, pictures, or other intellectual content, taken from another source must be acknowledged in a citation that gives credit to the source. This is true no matter where the material comes from, including the Internet, other students' work, unpublished materials, or oral sources. Intentional and unintentional instances of plagiarism are considered cases of academic misconduct. It is the responsibility of the student submitting the work in question to know, understand, and comply with this policy. It is the policy of the School of Teacher Preparation, Administration and Leadership that students found to have committed an act of plagiarism, one or more of the following consequences will occur; and a written statement outlining the offense and consequences will be placed in the student's permanent file by the Department Head/Hearing Officer.

- Failure of the course assignment.
- Failure of the course.
- Academic suspension for one or two semesters.
- Dismissal or expulsion from the program.

There is no statute of limitations for an act of plagiarism. Once committed, a student can be held accountable at any time even after the semester has ended. All students and instructors are obliged to follow the procedures for documenting the offense as described in the Student Handbook under Section II: Academic Misconduct.

Accommodation

Any student in this course who has a disability that may prevent him or her from demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodation necessary to ensure full participation and facilitate your educational opportunities.

External Resources

- Dynamic Learning Framework - dlf.utep.edu/
- Engineering Technology Center - http://etc.utep.edu/
- Vanderbilt University Online Course
  https://www.youtube.com/watch?v=VheLmG7rh9w

A curved grading scale applies: A 100-90; B 89-80; C 79-70, D 69-60, etc.