Course Information

Course Number: Math 152
Course Title: Engineering Mathematics II
Section: 512
Time/Location: Lecture: MWF 11:30 am -12:20 pm in HELD 111
  • Lab/Recitation (conducted by Erik Davis) : T 5:05-5:55 pm in HEB 136, R 5:05-5:55 pm in BLOC 121
Credit Hours: 4 hours
Course Page: https://www.math.tamu.edu/courses/math152/
Lecture Notes: https://www.math.tamu.edu/~tamas.erdelyi/teaching-online/lectures.html

Instructor Details

Instructor: Tamas Erdelyi
Office: Blocker 623c
Phone: Math Department: 979-845-3261  (There is no phone in my office, so email is a better way to reach me.)
E-Mail: terdelyi@math.tamu.edu
Office Hours: T 10-00-11:30 am, R 10:00-11:30 am

Course Description

Engineering Mathematics II (Math 2414) Differentiation and integration techniques and their applications (area, volume, work), improper integrals, approximate integration, analytic geometry, vectors, infinite series, power series, Taylor series, computer algebra. MATH 172 designed to be a
more demanding version of this course. Only one of the following will satisfy the requirements for a
degree: MATH 148, MATH 152 and MATH 172.

Course Prerequisites
MATH 151 or equivalent.

Special Course Designation
This is a CORE curriculum course in Mathematics equivalent to Math 2414.

Course Learning Outcomes
This course is focused on quantitative literacy in mathematics as applied to Engineering and Physics. Upon successful completion of this course, students will be able to:

- Use the concepts of definite integrals to solve problems involving area, volume, work, and other physical applications.
- Use substitution, integration by parts, trigonometric substitution, and partial fractions to evaluate definite and indefinite integrals.
- Apply the concepts of limits, convergence, and divergence to evaluate different types of improper integrals.
- Determine convergence or divergence of sequences and series.
- Use Taylor and Maclaurin series to represent functions and to integrate functions not integrable by conventional methods.
- Use parametric representations of curves to find arc length and surface area.
- Understand and use polar coordinates to represent curves and to find areas of polar regions.

Core Objectives

**Critical Thinking:** The following critical thinking skills will be assessed on in-class quizzes and exams:

- Students will use graphs and visual skills to formulate and evaluate definite integrals to calculate areas, volumes, work, and surface areas of revolution.
- Students will analyze definite and indefinite integrals to determine and apply appropriate methods of evaluation of these integrals.
- Students will apply logical reasoning to determine the convergence or divergence of improper integrals and evaluate convergent improper integrals where appropriate.
Students will apply logical reasoning to determine the convergence or divergence of sequences and series and evaluate convergent sequences and series where appropriate. Students will use Taylor and Maclaurin series to represent functions which cannot be integrated conventionally.

**Integrative Learning:** The following integrative learning skill will be assessed on computer lab assignments:

- Students will apply mathematical and logical reasoning skills to use Computer Algebra Systems such as Python to solve problems in Physics and a variety of Engineering fields.

**Problem Solving:** The following problem solving skills will be assessed on in-class quizzes and exams:

- Students will formulate and evaluate definite integrals to solve practical problems involving work and volume.
- Students will use geometric series to model and solve numerical and practical problems.
- Students will set up integrals using polar coordinates to find areas and lengths of polar curves.

**Communication:** The following written communication skills will be assessed on in-class quizzes and exams:

- Students will clearly explain problem-solving strategies and analysis used to answer questions concerning topics discussed in class.
- Students will use appropriate theorems to present clear written arguments in support of the convergence or divergence of improper integrals, sequences, and series.

**Quantitative Literacy:** The following quantitative literacy skills will be assessed on in-class quizzes and exams:

- Students will interpret a given integral as the area of an appropriate 2-dimensional region, volume of an appropriate solid, or area of an appropriate 3-dimensional surface.
- Students will use appropriate calculations to analyze the convergence or divergence of series.

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**Textbook and/or Resource Materials**

**Textbooks:** *Calculus: Early Transcendentals* by Stewart, 8th Edition; Cengage Learning

Note: You will be required to purchase access to the online homework system, WebAssign, but doing so will automatically give you access to the eBook version of the text. The textbook is available in different formats, and there are a variety of purchasing options available (course specific access or Cengage Unlimited). Purchase can be made through the local bookstores or directly in WebAssign. Starting on the first day of classes, you will be granted access for a trial period while you determine the appropriate purchasing option for you.
**WebAssign Access:** WebAssign will be used for homework in this class. In order to use WebAssign, you must purchase access. For access purchasing information and options, please visit [http://www.math.tamu.edu/courses/eHomework/](http://www.math.tamu.edu/courses/eHomework/)

**Calculator Policy:** Calculators are not allowed on Quizzes or Exams.

**Texas A&M Student ID:** Bring your student ID to each class.

### Course Schedule

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
<th>Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 1:</strong> 8/31, 9/2</td>
<td>The Substitution Rule; Area Between Curves</td>
<td>5.1, 6.1</td>
</tr>
<tr>
<td><strong>Week 2:</strong> 9/7, 9</td>
<td>Area cont.; Volumes by Disks, Washers, and Slicing</td>
<td>6.1, 6.2</td>
</tr>
<tr>
<td><strong>Week 3:</strong> 9/14, 16</td>
<td>Volume by Cylindrical Shells; Work</td>
<td>6.3, 6.4</td>
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<tr>
<td><strong>Week 4:</strong> 9/21, 23</td>
<td>Integration by Parts; Trigonometric Integrals</td>
<td>7.1, 7.2</td>
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<tr>
<td><strong>Week 5:</strong> 9/28, 30</td>
<td>Trigonometric Substitution; <em>EXAM I (9/28, 5.5 through 7.2)</em></td>
<td>7.3, EXAM I</td>
</tr>
<tr>
<td><strong>Week 6:</strong> 10/5, 7</td>
<td>Integration by Partial Fractions; Improper Integrals</td>
<td>7.4, 7.8</td>
</tr>
<tr>
<td><strong>Week 7:</strong> 10/12, 14</td>
<td>Improper Integrals cont.; Sequences; Series</td>
<td>7.8, 11.1, 11.2</td>
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<tr>
<td><strong>Week 8:</strong> 10/19, 21</td>
<td>Series cont.; The Integral Test</td>
<td>11.2, 11.3</td>
</tr>
<tr>
<td><strong>Week 9:</strong> 10/26, 28</td>
<td>The Comparison Tests; <em>EXAM II (10/26, 7.3 through 11.3)</em></td>
<td>11.4, EXAM II</td>
</tr>
<tr>
<td><strong>Week 10:</strong> 11/2, 4</td>
<td>Alternating Series; Absolute Convergence and the Ratio Test; Power Series</td>
<td>11.5, 11.6, 11.8</td>
</tr>
<tr>
<td><strong>Week 11:</strong> 11/9, 11</td>
<td>Power Series cont.; Representations of Functions as Power Series</td>
<td>11.8, 11.9</td>
</tr>
<tr>
<td><strong>Week 12:</strong> 11/16, 18</td>
<td>Taylor and Maclaurin Series; Taylor Polynomials</td>
<td>11.10, 11.11</td>
</tr>
<tr>
<td><strong>Week 13:</strong> 11/23, 25</td>
<td>Review of Parametric Equations; Arc Length and Surface Area of Parametric Curves; <em>EXAM III (11/23, 11.4 through 11.11), Thanksgiving Holiday (11/25-26)</em></td>
<td>10.1, 10.2, EXAM III</td>
</tr>
<tr>
<td><strong>Week 14:</strong> 11/30, 12/2</td>
<td>Polar Coordinates; Areas and Lengths in Polar Coordinates; Conic Sections, Thanksgiving</td>
<td>10.3, 10.4, 10.5</td>
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<tr>
<td><strong>Week 15:</strong> 12/7</td>
<td>Conic Sections in Polar Coordinates; Review for Final Exam</td>
<td>10.6</td>
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## Grading Policy

The course grading will be based on the tables below. At the end of the semester you will receive the grade you earned, according to the scale given. Due to FERPA privacy issues, I cannot discuss grades over email or phone. If you have a question about your grade, please come see me in person.

### Grading Breakdown

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Homework</td>
<td>Weekly</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>Weekly</td>
<td>5%</td>
</tr>
<tr>
<td>Python Labs</td>
<td>See Lab Schedule*</td>
<td>5%</td>
</tr>
<tr>
<td>Common Exam1</td>
<td>9/28</td>
<td>20%</td>
</tr>
<tr>
<td>Common Exam2</td>
<td>10/26</td>
<td>20%</td>
</tr>
<tr>
<td>Common Exam3</td>
<td>11/23</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>See below</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
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*(Lab Schedule: [https://calclab.math.tamu.edu/Python/LabSched152.html](https://calclab.math.tamu.edu/Python/LabSched152.html))

### Grading Scale

<table>
<thead>
<tr>
<th>Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90 ≤ Average ≤ 100</td>
<td>A</td>
</tr>
<tr>
<td>80 ≤ Average &lt; 90</td>
<td>B</td>
</tr>
<tr>
<td>67 ≤ Average &lt; 80</td>
<td>C</td>
</tr>
<tr>
<td>57 ≤ Average &lt; 67</td>
<td>D</td>
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<tr>
<td>Average &lt; 57</td>
<td>F</td>
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</tbody>
</table>

## Grading Appeal Policy

- Students have one week upon the return of a lab, quiz, or exam to notify their instructor of any inaccuracies in their graded work. No changes will be made after this one-week period and the grade will stand. You must present the actual, original assignment or assessment to your instructor before any consideration is made. For labs or quizzes, please consult your recitation instructor.

## Online Homework

Homework assignments will be done online in WebAssign. For important information such as how to purchase access, how to log in and take assignments, the Student Help Request Form, and other WebAssign issues, please see [http://www.math.tamu.edu/courses/eHomework](http://www.math.tamu.edu/courses/eHomework)
I suggest you bookmark this page and visit it before you log in to WebAssign each time. You must log in to WebAssign through the TAMU WebAssign login page at [http://www.webassign.net/tamu/login.html](http://www.webassign.net/tamu/login.html).

Do not wait until the last minute to complete your WebAssign homework as technical difficulties will not be an excuse for missing a WebAssign deadline. Pay close attention to the due dates inside of WebAssign.

**Quizzes and Labs**

Each section will meet twice weekly for lab and recitation. You will have weekly quizzes for a grade and will work in groups to complete Python assignments. Lab assignments and due dates will be posted online. Find the lab schedule here: [https://calclab.math.tamu.edu/Python/LabSched152.html](https://calclab.math.tamu.edu/Python/LabSched152.html).

**Exams**

There will be three common exams during the semester. These exams are evening exams taken by all Math 152 students at the same time. Bring your Texas A&M student ID and a pencil to all exams. The location of the common exams will be determined later. The tentative exam schedule is as follows:

- **Common Exam I**: Tuesday September 28, 7:30-9:30 pm
- **Common Exam II**: Tuesday October 26, 7:30-9:30 pm
- **Common Exam III**: Tuesday November 23, 7:30-9:30 pm

**Final Exam**: *Wednesday, December 15, 10:30 am -12:30 pm in HELD 111*

The final exam will be comprehensive and is required for all students. *If your final exam grade is higher than your lowest test grade, the grade on your final will replace that test grade in the final grade calculation.*

**Attendance and Make-up Policy**

Attendance is essential to complete this course successfully.

**Excused Absences**: University student rules concerning excused and unexcused absences, as well as makeups, can be found at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07). In particular, make-up exams and quizzes or late homework/labs/activities will NOT be allowed unless a University approved reason is given to me in writing. Notification before the absence is required when possible. Otherwise (e.g. accident, or emergency), you must notify me within 2 working days of the missed exam, quiz, or assignment to arrange a makeup. In all cases
where an exam/quiz/assignment is missed due to an injury or illness, whether it be more or less than 3 days, I require a doctor’s note. I will not accept the “University Explanatory Statement for Absence from Class” form. Further, an absence due to a non-acute medical service or appointment (such as a regular checkup) is not an excused absence.

**Makeup Policy:** Make up assignments will only be allowed provided the above guidelines are met. According to Student Rule 7, a missed exam must be made up during one of the scheduled makeup times provided by the Math Department unless there is a University-approved excuse for missing the makeup time as well. If there are multiple makeup exam times, the make up exam should be taken at the earliest makeup time for which there is no University-approved excuse. The list of makeup exam times will be available at [http://www.math.tamu.edu/courses/makeupexams.html](http://www.math.tamu.edu/courses/makeupexams.html).

### Additional Help & Preparing for Exams

**Technology Support**

As much of our learning experience relies on technology, many students can get overwhelmed when something goes wrong or things get overwhelming. If you’re looking for a curation of online learning resources, consider checking out [https://keeplearning.tamu.edu/](https://keeplearning.tamu.edu/). If your need is specific to a course-related technology issue, consider seeking help from the 24/7 TAMU IT Help Desk. [https://it.tamu.edu/help/](https://it.tamu.edu/help/).

**Learning Resources**

**Week-in-Review (WIR)**

There will be Week-in-Review sessions starting the second week of classes. Each review is open to all Math 152 students to review the topics of the previous week and to provide additional examples. I highly recommend attending them. The schedule and problem sets that will be worked during these sessions can be found at [http://mlc.tamu.edu/Online-Help-Services/Week-in-Review-(A)](http://mlc.tamu.edu/Online-Help-Services/Week-in-Review-(A)).

**Help Sessions**

Help sessions are an opportunity for you to ask questions and get help with your homework. These sessions are led by students, where you may come and go, as your schedule allows. The schedule can be found at [http://mlc.tamu.edu/Online-Help-Services/MLC-Help-Sessions](http://mlc.tamu.edu/Online-Help-Services/MLC-Help-Sessions).
**Attendance Policy**

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](https://student-rules.tamu.edu/rule07/) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

**Makeup Work Policy**

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student’s grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](https://student-rules.tamu.edu/rule07/) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor” ([Student Rule 7, Section 7.4.1](https://student-rules.tamu.edu/rule07/)).

“The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence” ([Student Rule 7, Section 7.4.2](https://student-rules.tamu.edu/rule07/)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. ([See Student Rule 24](https://student-rules.tamu.edu/rule24/)).

**Academic Integrity Statement and Policy**

“An Aggie does not lie, cheat or steal, or tolerate those who do.”

“Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one’s work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case” ([Section 20.1.2.3, Student Rule 20](https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](https://aggiehonor.tamu.edu).
Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1): (https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf).

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS) (https://caps.tamu.edu).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage (https://titleix.tamu.edu).
Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student’s academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Students who need someone to talk to can contact Counseling & Psychological Services (https://caps.tamu.edu/) (CAPS) or call the TAMU Helpline (https://caps.tamu.edu/helpline/) (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org (https://suicidepreventionlifeline.org).

Classroom Facial Mask

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.