Math 152: Engineering Mathematics II

Course Information

Course Number: Math 152
Course Title: Engineering Mathematics II
Section: 537-554
Time/Location:

Lecture by Section:

- Sections 537-545: TR 8:00-9:15 AM in ILCB 111
- Sections 546-554: TR 9:35-10:50 AM in ILCB 111

Lab and Recitation Schedule by Section:

- 537: M 8:00-8:50 AM, Lab in BLOC 124; W 8:00-8:50 AM, Recitation in HEB 222
- 538: M 9:10-10:00 AM, Lab in BLOC 124; W 9:10-10:00 AM, Recitation in HEB 222
- 539: M 10:20-11:10 AM, Lab in BLOC 124; W 10:20-11:10 AM, Recitation in HEB 222
- 540: M 11:30 AM-12:20 PM, Lab in BLOC 123; W 11:30 AM-12:20 PM, Recitation in HEB 134
- 541: M 12:40-1:30 PM, Lab in BLOC 124; W 12:40-1:30 PM, Recitation in HEB 222
- 542: M 1:50-2:40 PM, Lab in BLOC 124; W 1:50-2:40 PM, Recitation in HEB 222
- 543: M 3:00-3:50 PM, Lab in BLOC 117; W 3:00-3:50 PM, Recitation in BLOC 117
- 544: M 4:10-5:00 PM, Lab in BLOC 123; W 4:10-5:00 PM, Recitation in HEB 134
- 545: M 1:50-2:40 PM, Lab in BLOC 117; W 1:50-2:40 PM, Recitation in BLOC 117
- 546: M 8:00-8:50 AM, Lab in BLOC 123; W 8:00-8:50 AM, Recitation in HEB 134
- 547: M 9:10-10:00 AM, Lab in BLOC 123; W 9:10-10:00 AM, Recitation in HEB 134
- 548: M 10:20-11:10 AM, Lab in BLOC 126; W 10:20-11:10 AM, Recitation in HEB 223
- 549: M 11:30 AM-12:20 PM, Lab in BLOC 124; W 11:30 AM-12:20 PM, Recitation in HEB 222
- 550: M 12:40-1:30 PM, Lab in BLOC 117; W 12:40-1:30 PM, Recitation in BLOC 117
- 551: M 1:50-2:40 PM, Lab in BLOC 126; W 1:50-2:40 PM, Recitation in HEB 223
- 552: M 3:00-3:50 PM, Lab in BLOC 124; W 3:00-3:50 PM, Recitation in HEB 222
- 553: M 4:10-5:00 PM, Lab in BLOC 124; W 4:10-5:00 PM, Recitation in HEB 222
- 554: M 5:20-6:10 PM, Lab in BLOC 126; W 5:20-6:10 PM, Recitation in HEB 223

Credit Hours: 4

Instructor Details

Instructor: Todd Schrader
Office: Blocker 328A
Phone: Math Department: 979-845-3261 (No phone in my office, email is a better way to reach me.)
E-Mail: todd.schrader@tamu.edu
Course Webpage: https://www.math.tamu.edu/courses/math152/
Office Hours: MTWR 3:00-5:00 PM in BLOC 306

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 is 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.

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Course Prerequisites

Prerequisite: 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 that 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 communication skills will be assessed on quizzes and exams:

- Students use written and oral communication to 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 and oral arguments in support of the convergence or divergence of improper integrals, sequences, and series.
- Students will create graphs and curves to visualize the transition of coordinates.

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, the volume of an appropriate solid, or the area of an appropriate 3-dimensional surface.
- Students will use appropriate calculations to analyze the convergence or divergence of series.

Textbook and/or Resource Materials

Textbooks:

Calculus: Early Transcendentals by Stewart, 8th Edition; Cengage Learning (custom edition).

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 (specific access or Cengage Unlimited). You can purchase the book 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. A link to the assignments will be available in Canvas Modules. The first time you access the homework MUST be done through Canvas. Future access may be possible through your Cengage account. In order to use WebAssign, you must purchase access. For access purchasing information and options, please visit

http://www.math.tamu.edu/courses/eHomework/

Gradescope Access: Gradescope is a web-based application that may be used to grade lab assignments, quizzes as well as the workout portions of the exams. Gradescope may be accessed through Canvas. Students may access graded work through the Gradescope link in Canvas to review and print if desired. Any grade appeals may be submitted directly through Gradescope.

Computer Resources:

You need the appropriate technology so that you can access Canvas, WebAssign , Gradescope, and various resources found on webpages. This can include:

- Appropriate hardware (laptop or desktop computer, high-speed internet connection)
- Appropriate software (PDF reader, Zoom on phone and computer, the latest update on an internet browser-Chrome or Firefox are recommended)

Calculator Policy: Calculators are not allowed on Exams.

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 schedule a meeting with me.

Grading Breakdown

Activity	Date	Percentage

Homework	Due Monday Nights	10%
Quizzes	Wednesdays	5%
Python Labs	See Lab Schedule*	5%
Common Exam1	2/14/23	20%
Common Exam2	3/21/23	20%
Common Exam3	4/18/23	20%
Final Exam	See Below	20%
Total		100%

Grading Scale

Range	Grade
$90 \leq$ Average ≤ 100	A
$80 \leq$ Average < 90	B
$67 \leq$ Average < 80	C
$57 \leq$ Average < 67	D
Average < 57	F

Grade 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.

Homework

Homework assignments will be completed online in WebAssign. A link to each assignment can be found in a Canvas Module. The first time you access the homework MUST be done through Canvas. Starting on the first day of classes, you will be granted access for a 14-day trial period.

The department has a Student Help Page, at the link given below, that has various information as well as a Student Help Request Form. This form is for technical issues, not help with solving the mathematical problem.

http://www.math.tamu.edu/courses/eHomework

Quizzes and Labs

Each section will meet twice weekly for lab and recitation. You will take weekly quizzes for a grade and will work in groups to complete Python assignments. Lab assignments and due dates will be posted online.

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. No calculators, cellphones, or other electronic devices are allowed.

The tentative exam schedule is as follows:

Common Exam I (through section 7.1): Tuesday February 14, 7:30-9:30pm

Common Exam II (through section 11.2): Tuesday March 21, 7:30-9:30pm

Common Exam III (through section 11.11): Tuesday April 18, 7:30-9:30pm

Final Exam

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. The final exam schedule is as follows:

Section	Lecture Time	Final Exam Date, Time, and Location
537-545	TR 8:00-9:15 AM	Friday, May 5, 1:00 - 3:00 PM in ILCB 111
546-554	TR 9:35-10:50 AM	Thursday, May 4, 12:30 - 2:30 PM in ILCB 111

(You can refer to https://aggie.tamu.edu/registration-and-records/classes/final-examination-schedules the University final exam schedule.)

Late Work Policy

- Late work will NOT be accepted unless you have a University approved reason and contact me or your recitation instructor within two working days of the missed assignment.

Course Schedule

Weeks	Topic	Sections
Week 1: 1/17 - 1/20	The Substitution Rule; Area Between Curves	5.5, 6.1
Week 2: 1/23 - 1/27	Area cont.; Volumes by Disks, Washers, and Slicing	6.1, 6.2
Week 3: 1/30 - 2/3	Volume by Cylindrical Shells; Work	6.3, 6.4
Week 4: 2/6 - 2/10	Integration by Parts; Trigonometric Integrals	7.1, 7.2
Week 5: 2/13 - 2/17	Trigonometric Substitution; ***EXAM I (2/14, 5.5 through 7.1)***	7.3, ***EXAM I***
Week 6: 2/20 - 2/24	Integration by Partial Fractions; Improper Integrals	7.4, 7.8
Week 7: 2/27 - 3/3	Sequences; Series	11.1, 11.2
Week 8: 3/6 - 3/10	The Integral Test; The Comparison Tests	11.3, 11.4
Week 9: 3/13 - 3/17	**Spring Break**	
Week 10: 3/20 - 3/24	Alternating Series; ***EXAM II (3/21, 7.2 through 11.2)***	11.5, ***EXAM II***
Week 11: 3/27 - 3/31	Absolute Convergence and the Ratio Test; Power Series	11.6, 11.8
Week 12: 4/3 - 4/7	Representations of Functions as Power Series; Taylor and Maclaurin Series;	11.9, 11.10
Week 13: 4/10 - 4/14	Taylor Polynomials (exclude Taylor's Inequality and Binomial Series); Review of Parametric Equations	11.11, 10.1

Week 14: 4/17 - 4/21	Arc Length and Surface Area of Parametric Curves; ***EXAM III (4/18, 11.3 through 11.11)***	10.2, ***Exam III***
Week 15: 4/24 - 4/28	Polar Coordinates; Areas and Lengths in Polar Coordinates	10.3, 10.4
Week 16: 5/1 - 5/9	Final Exams	

Other Important Dates:

Date	
January 23 (Mon)	Last day for adding/dropping courses for the Spring semester
March 13 - 17	Spring Break
April 7	Reading Day, No Classes
April 18	Last day to Q-Drop
May 3	Reading Day, No Classes

Additional Course Information

Class Announcements, E-Mail Policy and Communications:

Class announcements will be sent to your university e-mail account. If you send me an e-mail, please include your name and course information (i.e. class and section) as well as any additional information that I might need to help respond to your e-mail.

Electronic Device Policy

- Electronic devices can only be used for educational purposes that relate to activities done in class.
- See your instructor if you have other circumstances where a device is needed daily for non-class related items (i.e., medical, first responder, etc.).

Technology Support

If your need is specific to a technology issue, consider seeking help from the 24/7 TAMU IT Help Desk. https://it.tamu.edu/help/

If your need is a WebAssign technology issue, check the Math Department's electronic homework page for common problem list. You can submit a Student Help Request Form for more assistance. https://www.math.tamu.edu/courses/eHomework/

Learning Resources

Week-in-Review (WIR)
There will be Week-in-Review sessions conducted each week, 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. 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)

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. Once determined, the schedule will be announced in class, posted on our course webpage, and additionally posted at

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 complete all assignments.

Please refer to Student Rule 7 in its entirety for information about **excused absences**, including definitions, and related documentation and timelines.

Attendance is essential to complete this course successfully.

- For an absence to be considered **excused**, the student must notify the instructor in writing (e-mail is acceptable) prior to the day of absence. In cases where advanced notification is not possible (e.g. accident, or emergency), the student must provide notification by the end of the second business day after the last date of the absence. This notification must include an explanation of why notice could not be sent.

- An absence due to a non-acute medical service or appointment (such as a regular checkup) is not an excused absence.

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 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

- Make-up work will NOT be allowed unless a **University approved reason is provided in writing.** You must notify me **within 2 working days** of the missed assignment to arrange a makeup.
- Makeup exams will only be allowed provided the absence is excused and the makeup must be taken as soon as possible after the missed exam.
- If you know ahead of time you will be absent during an exam, you must notify me in advance.

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).

"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).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

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).

Instances of Academic dishonesty will be reported to the Aggie Honor Council. The punishment for cheating may be increased if the student has been found to have committed academic dishonesty in other courses.

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at 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 the 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):

- 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, you 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).

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.

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.

Texas A&M College Station
Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or call the TAMU 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 988 Suicide & Crisis Lifeline (988) or at 988lifeline.org