Course Information

Course Number: Math 152
Course Title: Engineering Mathematics II
Sections: 301, 302
Lecture Times: MWF 10:00 – 11:25
Location: Blocker 149
Lab/Recitation Times: Section 301: TR 10:00-10:50 in Blocker 149
                        Section 302: TR 11:00-11:50 in Blocker 149
Credit Hours: 4

Instructor Details

Instructor: Joe Kahlig
Office: Blocker 328D
Phone: Math Department: 979-845-3261 (There is no phone in my office, so email is a better way to reach me.)
E-Mail: kahlig@math.tamu.edu
Course Webpage: https://people.tamu.edu/~kahlig/
Office Hours: Monday, Wednesday, Friday: 1pm-3pm.
                        Other times by appointment.

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. Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experiences.

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: creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

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: effective development, interpretation and expression of ideas through written, oral and visual 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.
- Students will create a recording in which they explain a mathematical topic."

Quantitative Literacy: manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

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.

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:

Online homework will be completed in WebAssign. A link to the assignments will be available in Canvas Modules. The first time you access the homework MUST be done through Canvas.

Gradescope Access:

Gradescope is a web-based application that will be used to grade python labs, quizzes as well as the exams. Gradescope may be accessed through Canvas.

Calculator Policy

Calculators are not allowed on in-class quizzes or exams.

Computer Resources

You need the appropriate technology so that you can access Canvas, Webassign, Gradescope, and the lecture notes/videos that are on my webpage. This can include:

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

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 one-on-one Zoom meeting with me.

GRADE BREAKDOWN

Activity	Date	Percentage
Homework	Weekly	7.5%
Quizzes	Weekly	7.5%
Labs	See Lab Schedule	5%
Common Exam I	6/16/23	20%
Common Exam II	7/10/23	20%
Common Exam III	7/28/23	20%
Final Exam	See below	20%
TOTAL		100%

GRADING SCALE

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

Grade Appeal Policy

If you believe an error has been made in grading of an exam, you have one week from the return of the assignment to let me know. After that one-week period, no change to the grade will be made. The only exception to this is if the points on the exam were totaled incorrectly.

If you believe an error was made in the grading of a lab or a quiz, you have one week from the return of the assignment to contact the TA about a regrading.

If a grade has been recorded incorrectly, you may talk to me anytime during the semester about fixing the grade. I may need to see the actual assignment before the grade will be changed.

Homework

Electronic homework assignments will be completed online in WebAssign. Please note that this homework may NOT be a comprehensive set of problems in terms of preparing for exams and quizzes. Some additional practice problems can be found on my webpage and in the suggested resources.

A link to each assignment can be found in a Canvas Module. The first time you access the homework, you must log into WebAssign through Canvas. Do not wait until the last minute to complete your online homework as last-minute technical difficulties will not be an excuse for missing a deadline.

- The homework for a section will be due approximately 2 - 3 days after the lecture over that material is completed.
- For every assignment, you may request an extension that will extend the original due date by two days. Any problem submitted during the extension period will only receive half credit. An extension will not be granted if it is requested more than two days after the original due date unless there are very special circumstances. Directions on how to use the WebAssign system can be found on my web page.
- Two homework assignment will be dropped when computing the homework average.
- WebAssign also will contain practice assignments that are NOT for a grade.
- My webpage has a link to suggested homework from the textbook. These suggested problems from the textbook are not for a grade.

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. In at least one of these assignments, you will be expected to explain your reasoning in a written format. Lab assignments and due dates will be posted online.

- **Tuesday: Weekly Quiz and Lab meetings.**
  - With the exception of the week of July 4, quizzes will be given during lab on Tuesday.
  - Lab meetings will also be used for working on Python assignments. These lab assignments are group assignments. Group members who do not participate in the lab assignment will not receive any credit for the assignment.
- **Thursday: Recitation meetings** are question/answer sessions with your Teaching Assistant.
- At least one quiz will be dropped when computing the quiz average.

Exams

There will be **three exams** during the semester. These exams are taken during the scheduled class time. No calculators or other non-approved electronic devices are allowed.

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:

Sections	Class Time	Final Exam Date, Time, and Location
301-302	MWF 10:00 − 11:25	Wednesday, August 9: 10:30am − 12:30pm

(You can refer to **http://registrar.tamu.edu//General/FinalSchedule.aspx** for the University final exam schedule.)

Late Work Policy

- On-line homework assignments will be accepted late (up to two days from the original due date) for a penalty for any problems submitted during the extension period. Any problem submitted during the extension period will only receive half credit. An extension will not be granted if it is requested more than two days after the original due date.
- Any other late work will NOT be accepted unless you have a University approved reason and contact me within 2 working days of the missed assignment.
- Unless prior arrangements have been made, the last day to complete makeup work is the last day of classes.

Tentative Course Schedule

	Topic	Sections
Week 1: 5/30 − 6/2	The Substitution Rule; Area Between Curves; Volumes by Disks, Washers, and Slicing	5.5, 6.1, 6.2
Week 2: 6/5 − 6/9	Volumes by Disks, Washers, and Slicing; Volume by Cylindrical Shells; Work; Integration by Parts	6.2, 6.3, 6.4, 7.1
Week 3: 6/12 − 6/16	Trigonometric Integrals **EXAM I (5.5 through 7.2)**	7.2
Week 4: 6/19 − 6/23	Trigonometric Substitution; Integration by Partial Fractions; Improper Integrals;	7.3, 7.4, 7.8

	Topic	Sections
Week 5: 6/26 – 6/30	Improper Integrals cont.; Sequences; Series; The Integral Test	7.8, 11.1, 11.2, 11.3
Week 6: 7/3 – 7/7	The Integral Test cont.; The Comparison Tests; Alternating Series;	11.3, 11.4, 11.5
Week 7: 7/10 – 7/14	Alternating Series cont.; Absolute Convergence and the Ratio Test; Power Series; **EXAM II (7.3 through 11.3)**	11.5, 11.6, 11.8
Week 8: 7/17 – 7/21	Power Series cont.; Representations of Functions as Power Series; Taylor and Maclaurin Series;	11.8, 11.9, 11.10
Week 9: 7/24 – 7/28	Taylor and Maclaurin Series; Taylor Polynomials **EXAM III (11.4 through 11.11)**	11.10, 11.11
Week 10: 7/31 – 8/4	Review of Parametric Equations; Arc Length and Surface Area of Parametric Curves; Areas and Lengths in Polar Coordinates;	10.1, 10.2,10.3, 10.4
Week 11: 8/7 – 8/9	Areas and Lengths in Polar Coordinates cont.; **Final Exam (comprehensive)**	10.4

Other Important Dates:
May 29:   No classes
June 19:   No classes
July 5:   Final exams for Summer I (no 10-week classes)
July 20:   Last day to Q-Drop
August 9:   Final Exam

Additional Course Information Items

Class Announcements, E-Mail Policy and Communications:

Class announcements will be posted to my class web page and 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.

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 on-line learning resources, consider checking out https://keeplearning.tamu.edu/

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/*

Math Learning Center

The Math Learning Center(MLC) is offers various forms of support both online and face-to-face, including drop-in Help-Sessions, Tutoring by Appointment, Week-in-Review Sessions and other activities

Week-in-Review (WIR)

On my webpage are links to the week in review from previous semesters. The problem sets as well as solutions can be found on my webpage.

The Math Learning center may offer a Week-in-Review.   Be sure to check the following link to see is one has been scheduled. The Math Learning center does have links to a week in review offered last summer. It is under the supplemental material tab on the webpage.

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 is posted at
http://mlc.tamu.edu/Online-Help-Services/MLC-Help-Sessions

University Policies

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 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).

- Providing a fake or falsified doctor's note or other falsified documentation will result in an F* in the course.
- Using a calculator/other non-approved technology or additional resources (note sheet, classmate's exam, non-approved internet sites, ...) on an exam may result in an F* in the course.
- Using a calculator/other non-approved technology or additional resources (note sheet, classmate's exam, non-approved internet sites, ...) on a quiz will result in at a minimum a zero on the assignment. A zero on a quiz for cheating will not be dropped when computing your quiz average.
- Copying solutions from other sources (i.e. the internet, other groups, friends in other classes or past classes, ...) is considered academic dishonesty.
- **Academic dishonesty on a python lab by an individual student will result in sanctions against all members whose name is on the assignment.**

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

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, 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).

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 the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can 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 National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.