

# Syllabus

## Engineering Mathematics III

### Course Information

Course Number: Math 251

Course Title: Engineering Mathematics III

Section: 517, 518, 519

Time based on section:

Section 517: TR 12:45-2 BLOC 166

Section 518: TR 2:20-3:35 BLOC 166

Section 519: 3:55-5:10 BLOC 166

Credit Hours: 3

### Instructor Details

Instructor: Amy Austin

Office: BLOC 322 DB (Note: Scheduled office hours will be in BLOC 306 MW 1:30-3)

Phone: Math Department: 979-845-3261 (*There is no phone in my office; email is the best method of correspondence.*)

E-Mail: a-austin@tamu.edu **Please include your section number on all correspondence via e-mail. Avoid emailing me through Canvas.**

Office Hours: MW 1:30-3 PM BLOC 306 Note: This is a different room than my office!

### Course Description

MATH 251 Vector algebra, calculus of functions of several variables, partial derivatives, directional derivatives, gradient, multiple integration, line and surface integrals, Green's and Stokes' theorems.

### Course Prerequisites

**Prerequisite:** MATH 148/152/172, or equivalent

### Course Learning Outcomes

We will cover Chapter 12 to Chapter 16 of the book. We will generalize notations already seen in two dimensional calculus to three dimensional space as vectors and we will cover different electronics. At the end of this course, students should be able to manipulate these concepts correctly in order to apply techniques seen in this course to engineering applications. In particular, students should be able to:

- Perform Calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity, acceleration, and torsion.
- Perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals.
- Find extrema and tangent planes
- Solve problems using the Fundamental Theorem of Line Integrals, Green's Theorem, The Divergence Theorem, and Stokes' Theorem.
- Apply the computational and conceptual principles of calculus to the solutions of real-world problems.

## Textbook and/or Resource Materials

*TEXTBOOK: Calculus: Early Transcendentals (Custom Edition)* by Stewart; Cengage Learning

Texas A&M has a contract with Barnes and Noble Bookstore and course materials may be purchased from the TAMU bookstore.

**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.

For access purchasing information and options, please visit

<http://www.math.tamu.edu/courses/eHomework> [\(http://www.math.tamu.edu/courses/eHomework\)](http://www.math.tamu.edu/courses/eHomework)

Calculator: Calculators are not allowed on quizzes or exams.

## Grading Policy

The course grading will be based on the tables below. 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.

### Grade Breakdown

## Graded Assignments

Activity	Date	Percent
Homework	Weekly	10%
Quizzes	Weekly (Take home)	10%
Exam I (chapters 12, 13)	Thursday September 15 (during class)	20%
Exam II (chapter 14)	Thursday October 13 (during class)	20%
Exam III (chapter 15)	Thursday November 10 (during class)	20%
Exam IV (Final) (chapter 16)	See dates below; set by office of registrar	20%
TOTAL		100%

## Grading Scale

## Course Grade

Range	Grade
$90 \leq \text{Average} \leq 100$	A
$80 \leq \text{Average} < 90$	B
$70 \leq \text{Average} < 80$	C
$60 \leq \text{Average} < 70$	D
$\text{Average} < 60$	F

## Additional Course Information and Policies

**Exams:** There will be 3 exams and a final exam administered. Bring your Texas A&M student ID, the TAMU 8.5x11 (grey) scantron, and a pencil to all exams. Note: All exams are administered during the lecture period. The dates for the exams are as follows.

**Exam 1:** Thursday, Sept 15 (Ch 12 and 13)

**Exam 2:** Thursday, October 13 (Ch 14)

**Exam 3:** Thursday, November 10 (Ch 15)

**Final Exam:** (Ch 16, see dates below)

- **Section 517: Wednesday, Dec 14, 8-10 AM (Ch 16)**
- **Section 518: Wednesday, Dec 14, 1-3 PM (Ch 16)**
- **Section 519: Tuesday, Dec 13, 1-3 PM (Ch 16)**

**Note:** If your final exam grade is higher than your lowest taken exam 1-3 score, the grade on your final will replace that lowest exam grade in the course grade calculation. In order for you to be eligible for this, you must have taken the first three exams.

**Quizzes:** Quizzes will be assigned every week and will be due the **beginning** of the next class period. Students can use their notes on the quizzes, but no other source can be used. If time permits in lecture, I may assign an unannounced quiz, so always bring completed notes to class. NO student collaboration on quizzes. All work should be yours and yours alone. Do not use any technology on quizzes. The quiz will be due at the **beginning** of the next class period, no exceptions. Once I begin class, you may bring your quiz at the **end of the class period** for a **5%** deduction. Anything after the end of the class period, an extra **5% is deducted per day it is late**. The lowest quiz grade will be dropped at the end of the semester.

**Graded Homework:** WebAssign will be used for graded homework in this class. In order to use WebAssign, you must purchase access. For access purchasing information and options, please use the Cengage link inside Canvas. Online homework will be completed in WebAssign. A link to each WebAssign homework assignment will be available in Canvas Modules. Students will be able to access WebAssign through these links. Online homework assignments will normally be due Thursday's at 11:55 PM, but there may be exceptions. All due dates can be found in both WebAssign and Canvas. Students will have three attempts at each question before the question is counted incorrect. For every homework 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. Directions on how to use the WebAssign system can be found on my canvas webpage. I will drop the two lowest WebAssign grades at the end of the term. I encourage students to collaborate on WebAssign homework. Explaining concepts to other students is one of the best ways to really understand it!

If a student transfers from one section of Math 251 to another, it is the student's responsibility to inform the new instructor that they have transferred from another section **AND** fill out the Student Help Request Form which can be found at: <http://www.math.tamu.edu/courses/eHomework/> (<http://www.math.tamu.edu/courses/eHomework/>). Please do not attempt to access any online

homework assignments in the new Canvas course until after you have been transferred by the department to the new section of WebAssign, as this could cause you to have to pay for access again. 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.

**Suggested Homework:** Selected problems from your textbook will be assigned but NOT graded. You are strongly recommended to do all of them which will provide a valuable practice for both on-line HWs and exams. For list of suggested HWs see:

[https://www.math.tamu.edu/courses/math251/251\\_suggested\\_homework.pdf](https://www.math.tamu.edu/courses/math251/251_suggested_homework.pdf)

**Week-in-Review and Help Sessions:** will be conducted by the Math Learning Center. All information can be found here: <https://mlc.tamu.edu/> [\(https://mlc.tamu.edu/\)](https://mlc.tamu.edu/)

**Hands on Grades Up:** In addition to Help Sessions, the Math Learning Center will be piloting the “Hands On, Grades Up” program for Math 251. This is a weekly activity where students come in and work in groups on problem sets provided by the course instructors. This active learning drill will be supported by trained tutors supervised by the course coordinator, who will be answering question and coaching the groups to solve the problems. Students will learn by doing! All information can be found here: <https://mlc.tamu.edu/> [\(https://mlc.tamu.edu/\)](https://mlc.tamu.edu/)

**Grade Appeals:** If you believe an error has been made in grading, you have until the next class period after the exam is handed back to let me know. Otherwise, you must accept the grade you received.

## Late Work Policy

Late work will NOT be accepted unless you have a university-approved reason and contact me within 2 working days of the missed assignment.

*Work submitted by a student as makeup work for an excused absence is not considered late work and is exempted from the late work policy (**Student Rule 7** [\(https://student-rules.tamu.edu/rule07/\)](https://student-rules.tamu.edu/rule07/)).*

## Course Schedule

Course Schedule by Week

Week	Topic	Sections
Week 1: Week of 8/22	Three-Dimensional Coordinate Systems; Vectors; The Dot Product	12.1, 12.2, 12.3

Week	Topic	Sections
Week 2: Week of 8/29	The Dot Product (continued); The Cross Product; Equations of Lines and Planes; Cylinders and Quadric Surfaces (briefly)	12.3 (continued), 12.4, 12.5, 12.6
Week 3: Week of 9/5	Vector Functions and Space Curves; Derivatives and Integrals of Vector Functions; Arc Length and Curvature	13.1, 13.2, 13.3
Week 4: Week of 9/12	Motion in Space: Velocity and Acceleration; Functions of Several Variables; <b>EXAM I Thursday Sept 15 (12.1-12.6, 13.1-13.4)</b>	13.4, 14.1
Week 5: Week of 9/19	Partial Derivatives; Tangent Planes and Linear Approximations; The Chain Rule	14.3, 14.4, 14.5
Week 6: Week of 9/26	Directional Derivatives and the Gradient Vector; Maximum and Minimum Values;	14.6, 14.7
Week 7: Week of 10/3	Lagrange Multipliers; Double Integrals over Rectangles;	14.7 (continued) 14.8, 15.1
Week 8: Week of 10/10	Double Integrals over General Regions; <b>EXAM II Thursday October 13 (14.1 - 14.8)</b>	15.2 (Note: MWF has 2 class days this week, so for the TR group, we cannot begin 15.2 this week)
Week 9: Week of 10/17	Double Integrals over General Regions; Double Integrals in Polar Coordinates; Applications of Double Integrals ( <b>optional</b> );	15.2, 15.3, 15.4 ( <b>optional</b> )

Week	Topic	Sections
Week 10: Week of 10/24	Surface Area; Triple Integrals; Triple Integrals in Cylindrical Coordinates.	15.5, 15.6, 15.7
Week 11: Week of 10/31	Triple Integrals in Spherical Coordinates; Change of Variables in Multiple Integrals	15.7 (continued), 15.8, 15.9
Week 12: Week of 11/7	Vector Fields; <b>EXAM III Thursday November 10 (15.1 - 15.9)</b>	16.1
Week 13: Week of 11/14	Line Integrals; The Fundamental Theorem for Line Integrals; Green's Theorem	16.2, 16.3, 16.4
Week 14: Week of 11/21	Curl and Divergence; Parametric Surfaces and Their Areas;	16.5, 16.6
Week 15: Week of 11/28	Surface Integrals; Stokes' Theorem;	16.7, 16.8
Week 16: Week of 12/5	The Divergence Theorem,; <b>Final Exam (16.1-16.9)</b>	16.9

## Additional Helpful Links

- Math Learning Center <https://mlc.tamu.edu/>
- Academic Calendar <http://registrar.tamu.edu/General/Calendar.aspx>  
(<http://registrar.tamu.edu/General/Calendar.aspx>)
- Final Exam Schedule <http://registrar.tamu.edu/General/finalschedule.aspx>  
(<http://registrar.tamu.edu/General/FinalSchedule.aspx>)

**Note:** As with any math class, it is very important that you keep up with the suggested homework and that you do not fall behind. Please don't hesitate to ask questions in class, to come to my office

hours, or to send me an e-mail.

## Classroom 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.).

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## University Policies

This section outlines the university level policies. The TAMU Faculty Senate established the wording of these policies.

**NOTE:** Faculty members should not change the written statements. A faculty member may add separate paragraphs if additional information is needed.

## Attendance Policy

**Attendance Policy:** Students experiencing personal injury or illness that is too severe for the student to attend class (including students isolating or quarantining due to COVID-19 protocols) qualify for an excused absence (See **Student Rule 7, Section 7.2.2.** [\(http://trk.tamu.edu/trk/click?ref=ztotana6v\\_2-b64cx3d406x04896&\)](http://trk.tamu.edu/trk/click?ref=ztotana6v_2-b64cx3d406x04896&).) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7.

## Makeup Work Policy

**Make up exams** will only be allowed provided the above guidelines are met. You will be allowed to make up a missed exam during one of the scheduled makeup times provided by the Math Department. According to Student Rule 7, you are expected to attend the scheduled makeup unless you have a university-approved excuse for missing the makeup time as well. If there are multiple makeup exam times, you must attend the **earliest** makeup time for which you do not have a university-approved excuse. The list of makeup times will be available at <http://www.math.tamu.edu/courses/makeupexams.html> (<http://www.math.tamu.edu/courses/makeupexams.html>)

Students will be excused from attending class on the day of a graded quiz 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** [\(https://student-rules.tamu.edu/rule07/\)](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** [\\_ \(https://student-rules.tamu.edu/rule07/\)\\_](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** [\\_ \(https://student-rules.tamu.edu/rule07/\)\\_](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** [\\_ \(https://student-rules.tamu.edu/rule24/\)\\_](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** [\\_ \(https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules/\)\\_](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) [\\_ \(https://aggiehonor.tamu.edu/\)\\_](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](https://disability.tamu.edu) [\\_ \(https://disability.tamu.edu/\)\\_](https://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** (<https://caps.tamu.edu/>) (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** (<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/>).*

## Campus-Specific Policies

### Classroom Access and Inclusion Statement

Texas A&M University is committed to engaged student participation in all of its programs and courses and provides an accessible academic environment for all students. This means that our

classrooms, our virtual spaces, our practices and our interactions are as inclusive as possible and we work to provide a welcoming instructional climate and equal learning opportunities for everyone. If you have an instructional need, please notify me as soon as possible.

The Aggie Core values of respect, excellence, leadership, loyalty, integrity and selfless service in addition to civility, and the ability to listen and to observe others are the foundation of a welcoming instructional climate. Active, thoughtful and respectful participation in all aspects of the course supports a more inclusive classroom environment as well as **our mutual** ([https://www.tamug.edu/studentrules/Students\\_Rights\\_Responsibilities.html](https://www.tamug.edu/studentrules/Students_Rights_Responsibilities.html)) responsibilities to the campus community.

***The following statements below are optional. Leave as is to include, or delete if preferred. Either way, delete this note.***

### **Statement on the Family Educational Rights and Privacy Act (FERPA)**

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to **howdy.tamu.edu** (<https://howdy.tamu.edu/>) and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete **FERPA Notice to Students** (<http://registrar.tamu.edu/Catalogs%2C-Policies-Procedures/FERPA/FERPA-Notice-to-Students#0-StatementofRights>) and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.

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Click **here** (<https://facultysenate.tamu.edu/Quick-Links/Minimum-Syllabus-Requirements>) for more information on Texas A&M University's syllabus requirements.

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