

Calculus

MATH 172, Section 501 FALL 2017

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Meetings-Location

Lectures: MWF 10:20-11:10 a.m. BLOC 164

Office hours: TR 8:30-10:30 a.m. or by appointment

Recitation: T 3:55-4:45 p.m. BLOC 160

TA: Cameron Beiseigel

Global Course Description

Name: Calculus

Course http://www.math.tamu.edu/~florent/teaching/172fall117_501.html

Webpage:

Course Description: Techniques of integration, applications of integrals, improper integrals, sequences, infinite series, vector algebra and solid analytic geometry. Math 172 is the second of a three semester beginning calculus sequence, which is taken, for the most part, by math, chemistry, and physics majors. Designed to be more demanding than MATH 152. No credit will be given for more than one of MATH 148, MATH 152 and MATH 172.

The priorities of this course are:

1. Ability to correctly solve problems, and write the solutions in a coherent fashion.
2. Conceptual understanding of material.

Textbooks: Stewart, *Calculus: Early Transcendentals*, 8th edition, Cengage Learning (Brooks/Cole)

Prerequisites: MATH 147, MATH 151 or MATH 171 or equivalent with a grade of C or better.

Learning Objectives: Students passing Math 172 are expected to be able to set up an appropriate definite integral to solve the applied problems (areas, volumes, arclength, work, and force) discussed in the course.

Students must understand the relationship between definite integrals and Riemann sums, and be able to clearly state (write) this relationship.

Regarding infinite series: students are expected to know what an infinite series is, how to use the convergence tests, be able to clearly state them, and explain (prove) why they work. Students are expected to know the alternating series test, including the error estimate for this test and the error estimate from the integral test for positive term series.

Students can be tested over topics which were covered in 171. For example, the Mean Value Theorem can be used to derive error estimates for some numerical integration techniques. Students can be asked to state this theorem, and perhaps apply it in a simple manner is entirely appropriate.

Students should become familiar with the standard notations of logic and set theory. Students will be required to demonstrate that they have learned the appropriate definitions and theorems.

- Tentative Schedule: **Week 1:** Review of sections 5.1, 5.2, 5.3: areas and distances, the definite integral, the fundamental theorem of calculus, Section 5.5: the substitution rule (formerly Sections 6.1-6.5).
- Week 2:** Sections 6.1-6.3: area between curves, volumes, volumes by cylindrical shells (formerly Sections 6.6, 7.1-7.3).
- Week 3:** Sections 6.4-6.5, 7.1: work, average value of a function, integration by part (formerly Sections 7.4-7.5, 8.1).
- Week 4:** Sections 7.2-7.4: trigonometric integrals, trigonometric substitution, integration of rational functions by partial fractions (formerly Section 8.2-8.4). Students will be asked to derive the integration by parts formula.
- Week 5:** Sections 7.7-7.8: approximate integration (midpoint rule, trapezoidal rule, error bounds), improper integrals (formerly Sections 8.8-8.9).
- Week 6:** Exam 1 (Section 5.1 through Section 7.8), Sections 8.1-8.2: arc length, area of a surface of revolution.
- Week 7:** Sections 10.1-10.2: curves defined by parametric equations, calculus with parametric curves.
- Week 8:** Sections 10.3-10.4: polar coordinates, area and lengths in polar coordinates.
- Week 9:** Sections 11.1-11.2: sequences, series (formerly Sections 10.1-10.2). The limit theorems will be proven, and we will show how the monotone convergence theorem is used. Students are expected to be able to state this theorem. The summation formulas, e.g., the series of a sum is the sum of the series, and similar algebraic properties of convergent series will be proven, and students held accountable for these proofs. Students are expected to know the summation formula for a geometric series, be able to derive it, and know where it is valid.
- Week 10:** Sections 11.3, 11.4, 11.5: integral test, comparison test, alternating series (formerly Sections 10.3-10.4). The text discusses four tests for the convergence of a positive term series, comparison and limit comparison, integral, and ratio. Students should be able to state these tests in writing, and be able to use them. The same comments apply to the Alternating Series test. Students should know that the harmonic series diverges, and the alternating harmonic series converges, and be able to explain why.
- Week 11:** Exam 2 (Sections 8.1 through 11.5), Sections 11.6: absolute convergence and the ratio and root tests.
- Week 12:** Sections 11.8-11.9: power series, representations of functions as power series (formerly Sections 10.5-10.6).
- Week 13:** Thanksgiving Holiday, Section 11.10: applications of Taylor polynomials (formerly Section 10.9). Students should be able to use Lagrange's formulas for the remainder (error) term when approximating a function with its nth order Taylor polynomial. The integral form for the remainder term could also be derived.
- Week 14:** Section 11.11: applications of Taylor polynomials.
- Week 15:** review.

Calculator Policy: Calculators are not allowed on exams or quizzes, although they may be used, and are often necessary, on homework assignments. Use of a calculator on a quiz or exam is considered academic dishonesty and will be reported to the Aggie Honor Council.

Electronic Device Policy: Cell phones, laptops, and other electronic devices must be silent and put away during class. If you are unable to comply with this policy, you might be asked to leave class and will not be allowed to make-up any assignments missed in class that day.

Exams Policy

Exams: There will be 2 midterm exams during the semester that will be administered outside of class. Bring your Texas A&M student ID and a pencil to all exams. The dates for the exams and the tentative content are as follows:

- Midterm Exam #1: Tuesday, October 3, 7:30-9:30 p.m. Room: TBA (Section 6.1 through 8.9)
- Midterm Exam #2: Tuesday, November 7, 7:30-9:30 p.m. Room: TBA (9.1 through 10.6)

Final exam: The final exam will be a cumulative (comprehensive) exam and is required for all students. The day and time of the final exam are determined by the University.

- Final Exam: Tuesday, December 12, 2017 8:00-10:00 a.m., in the regular classroom.

Homework: It will be assigned once per week. Homework is not to be turned in but you must be able to solve all of the problems since one of them will be asked to be solved during the weekly quiz.

Quizzes You will have to take a weekly quiz during recitation. The quizzes will typically consist in stating one definition, or a theorem, and solving a short problem taken from the homework set. Quizzes are excellent indicators on how well you keep up with the pace of the class.

Final Grade: The final grade will be computed as follows: final grade = 25% final exam + 25% midterm exam #1 + 25% midterm exam #2 + 25% quizzes.

Grading: A 90-100% B 80-89% C 70-79% D 60-69% F 0-59%

Appeal: 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. If you believe an error has been made in grading, you have until the next class period after the exam, quiz, or assignment has been handed back to let me know. Otherwise, you must accept the grade you received. You have the possibility to check your grades via the eCampus website. It is your responsibility to verify that the grades reported online correspond to your actual grades.

Attendance and Make-up Exam Policies

- Excused absences: The University views class attendance as an individual student responsibility. It is essential that students attend class and complete all assignments to succeed in the course. University student rules concerning excused and unexcused absences as well as makeups can be found at <http://student-rules.tamu.edu/rule07>. In particular, make-up exams or make-up quizzes will NOT be allowed unless a University approved reason is given to me in writing. Notification before the absence is required when possible. Otherwise, you must notify me within 2 working days of the missed exam or quiz 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. Providing a fake or falsified doctor's note or other falsified documentation is considered academic dishonesty, will be reported to the Aggie Honor Council, and will result in an F in the course.
- You will be allowed to make up a missed exam during one of the scheduled make-up times provided by the Math Department. According to Student Rule 7, you are expected to attend the scheduled

make-up unless you have a University-approved excuse for missing the make-up time as well. If there are multiple make-up exam times, you must attend the earliest make-up time for which you do not have a University-approved excuse. The list of make-up times will be available at <http://www.math.tamu.edu/courses/makeupexams.html>

Miscellaneous

Academic Integrity Statement

Cheating and other forms of academic dishonesty will not be tolerated.

Aggie Honor Code: “An Aggie does not lie, cheat, or steal, or tolerate those who do”

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information please visit: <http://aggiehonor.tamu.edu>

Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

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