MAT 271: Calculus w/Analytic Geometry II
Spring 2025 Course Syllabus

Contact Information

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Course Information

Course Description

Welcome to Calculus I! This course will cover topics as it relates to methods of integration; applied calculus, elements of analytic geometry, improper integrals, sequences and series.

General Studies Gold Statement

This course fulfills the ASU **Mathematics** General Studies requirement. Students completing a Mathematics course will be able to:

1. Demonstrate an understanding of mathematical relationships from multiple perspectives, such as functions from graphical, numerical, and analytic points of view.
2. Apply mathematical skills in the solution of real-life problems.

Prerequisites

MAT 265 or 270 with C or better. Credit is allowed for only MAT 266 or MAT 271

Course Materials & Structure

Open Source Math

This course uses open source math materials that are available at no cost to the student. All content for the course can be accessed at MyOpenMath.com. Instructions on accessing the material will be provided in class.

Textbook

You are not required to purchase a textbook for this course. The textbook used is an open-source textbook. It is Calculus Volume 2 by Open Stax and instructions will be given in class on how to access the text online for free. If you would like to purchase a physical full text, a link is available in the course system.

Course Objectives and Outcomes

Objectives: Students will study methods of integration, applications of integration, sequences, infinite series, parametric equations, and polar coordinates.

Learning Outcomes: At the completion of the course, students will be able to

- Apply the substitution rule to evaluate certain integrals.
- Evaluate certain integrals using integration by parts.
- Evaluate integrals involving trigonometric functions
- Perform trig substitutions where applicable and then evaluate such integrals.
- Rewrite a rational function in terms of a partial fraction decomposition and then evaluate such integrals.
- Identify improper integrals of various types and evaluate.
- Given a position function, be able to find velocity, acceleration, and, over time, a net change.
- Be able to sketch regions between curves, find points of intersection if need be, and compute the area between those curves.
- Find the volume of a solid using slices and Riemann sums to get integrals representing said volume and compute it. Especially be able to find the volume of solids of revolution.
- Find the volume of certain solids of revolution specifically using cylindrical shells.
- Find the arc length of a curve from one point to another. Compute arc lengths exactly when possible (and via calculator or computer software if impossible to integrate without).
- Find the mass of a one-dimensional object given a density function.
- Find work given a force applied to an object moving along a line.
- Find work stretching a spring using Hookes Law
- Find work required to pump water or another fluid out of a tank.
- Find terms of a sequence by a pattern, a specified function or a recurrence relation.
- Find the limit of a sequence if it exists.
- Find the sum of Geometric Series and Telescoping Series

- Apply the divergence and integral tests to determine convergence of a given series.
- Also be able to estimate the error.
- Compute p-series that converge.
- Apply the ratio, root and comparisons tests to test if a given series converges or not.
- Apply the alternating series test to alternating series to test for converge.
- Also be able to estimate the error of a partial sum.
- Approximate functions with linear functions, quadratic polynomials etc.
- Approximate the error when using Taylor polynomials to approximate a function.
- Determine convergence of power series when possible
- Combine power series to get new ones.
- Differentiate and integrate power series and corresponding functions.
- Compute Taylor and Maclauren series for a given function including binomial series.
- Differentiate and integrate Taylor series to get new ones.
- Work with parameterized curves. Also be able to find derivatives and arc length of such.
- Be able to convert equations and points in Cartesian coordinates back and forth to polar coordinates.
- Find derivatives, areas and arc lengths of polar curves or regions bounded by them.

Format of the Class

This course has both Lecture and Recitation days. Students will be required to prepare for lecture periods by completing preparatory reading and video assignments in MyOpenMath. Lecture periods are where more instruction and activities will be given to augment the book, videos, and homework assignments. Unit Quizzes will also be given on Lecture days in class. Recitation days are help days where students can get individualized help to complete assignments in the course.

Attendance and participation in class activities is an essential part of the learning process, and students are expected to attend class regularly. Some absences are, however, unavoidable. Excused absences for classes will be given without penalty to the grade in the case of (1) a university-sanctioned event [ACD 304-02]; (2) religious holidays [ACD 304-04; a list can be found here https://eoss.asu.edu/cora/holidays]; (3) work performed in the line-of-duty according [SSM 201-18]; and (4) illness, quarantine or self-isolation related to illness as documented by a health professional.

Anticipated absences for university-sanctioned events, religious holidays, or line-of-duty activity should be communicated to the instructor by email at least 1 week before the expected absence.

Absences for illness, quarantine or self-isolation related to illness should be documented by a health professional and communicated to the instructor as soon as possible by email.

Excused absences do not relieve students from responsibility for any part of the course work required during the period of absence. Faculty will provide accommodations that may include participation in classes remotely, access to recordings of class activities, and make-up work.

If there is a disagreement as to whether an absence should be accommodated, the instructor and student should contact the academic unit chair immediately for resolution.

How to Succeed in this Course

- Make time for math every day.
- Staying "on track" is a critical component of student success in this course. Stay ahead of schedule and make sure you are aware of all the resources available to you that are listed in the syllabus and on the course site so you don't fall behind.
- Check your ASU e-mail regularly, log in to the course site every day.

Calculator

A graphing calculator (such as the TI-83/84) is required. You are expected to bring your calculator to class daily. An online calculator that can be used for homework and exams can be found at desmos.com if you do not have the means to purchase a calculator. No phone calculators will be permitted on exams. **The sharing of calculators is not permitted during exams. Calculators with QWERTY keyboards or those that do symbolic algebra, such as the Casio FX2, Casio 9970Gs, TI-89,TI-inspire or TI-92 *cannot* be used during an exam**.

Pre-Lecture Assignments – 5 % of your grade

Each unit has pre-lecture assignment(s) included. These are to help you to understand and be ready for the activities that will be done in class to supplement the materials in My Open Math. They are due before class starts on the given date. No late work will be granted.

Pre-Lecture Assignment	***Due before class on date:***
Unit 1	Wed 1/15
Unit 2a	Fri 1/24
Unit 2b	Wed 1/29
Unit 3a	Fri 2/7
Unit 3b	Wed 2/12
Unit 4a	Fri 2/21
Unit 4b	Wed 2/26
Unit 5	Fri 3/7
Unit 6	Fri 3/21
Unit 7	Fri 3/28
Unit 8a	Fri 4/4
Unit 8b	Wed 4/9
Unit 9	Fri 4/18

Assignments – 45 % of your grade

The assignments listed are the homework for the course and give you multiple opportunities to work on problems to understand them. Each assignment is due after a recitation help session (with a couple of exceptions) at 11:59 pm AZ time on the day indicated. No late work exceptions will be given.

Assignment	***Due at 11:59 pm AZ time on Date***
Unit 1	Tues 1/21
Unit 2a	Tues 1/28
Unit 2b	Tues 2/4
Unit 3a	Tues 2/11
Unit 3b	Tues 2/18
Unit 4a	Tues 2/25
Unit 4b	Tues 3/4
Unit 5	Tues 3/18
Unit 6	Tues 3/25
Unit 7	Tues 4/1
Unit 8a	Tues 4/8

Unit 8b	Tues 4/15
Unit 9	Tues 4/22

Unit Quizzes – 25% of your grade

Each Unit will have a unit quiz associated with it that will be given in class on the class date following the homework is due. Your lowest quiz grade will be dropped to get your final average. There are no make-up quizzes.

Quiz	***Date***
Unit 1	Wed 1/22
Unit 2	Wed 2/5
Unit 3	Wed 2/19
Unit 4	Wed 3/5
Unit 5	Wed 3/19
Unit 6	Wed 3/26
Unit 7	Wed 4/2
Unit 8	Wed 4/16
Unit 9	Wed 4/23

Final Exam – 25% of your grade

You will take a cumulative final exam at the end of the course on the day given below.

Final Exam	***Date***
Final Exam (Cumulative)	Mon 5/5

Grading Policy

Point Distribution	***Percentage***
Pre-Lecture Assignments	5%
Unit Assignments	45%
Unit Quizzes	25%
Final Exam	25%
Total	100%

Grade	Grading Scale
A+	97% or above
A	90% - 96.99%
A-	89.5% - 89.99%
B+	87% - 89.49%
B	80% - 86.99%
B-	79.5% - 79.99%
C+	77% - 79.49%
C	70% - 76.99%
D	60% - 69.99%
E	< 60%

Key Semester Dates

Please refer to the ASU Academic Calendar for specific dates for your session.

Drop/Add Deadline:	Jan 19, 2025
Course Withdrawal Deadline:	April 6, 2025, complete withdrawal May 2, 2025

Additional Information

- The highest standards of academic integrity are expected of all students at all times. Violations of academic integrity include, but are not limited to, cheating, fabrication, tampering, plagiarism, or facilitating such activities. We will act very harshly against any acts of academic dishonesty.
- Students with disabilities should arrange to meet with me as soon as possible to arrange for reasonable accommodations for their learning needs. Students registered with DRC must notify the instructor at least two weeks prior to any exam close date.
- Alternative arrangements for any religious observances, ASU sanctioned activity, or ASU student athlete obligations must be arranged with the instructor at least two weeks prior to the event. As a reminder, there are no extensions or makeups for exams after the exam close date.
- No individual extra credit assignments will be offered.
- Counseling and Mental Health: ASU Counseling Services is fully committed to the emotional health and wellness of ASU students at this unprecedented time. They will provide same day access to a clinician, 7 days a week, through tele-health sessions. If you would like to speak with an ASU counselor, call them at (480) 965-6146 or click on this link: https://eoss.asu.edu/counseling

Academic Integrity

ASU expects and requires all its students to act with honesty and integrity, and respect the rights of others in carrying out all academic assignments. For more information on academic integrity, including the policy and appeal procedures, please visit http://provost.asu.edu/academicintegrity and the *Student Conduct Statement* below.

Conduct

Students are required to adhere to the behavior standards listed in the

- Arizona Board of Regents Policy Manual Chapter V – Campus and Student Affairs: Code of Conduct
- ACD 125: Computer, Internet, and Electronic Communications

- ASU Student Academic Integrity Policy.

Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process under USI 201-10.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, https://goto.asuonline.asu.edu/success/online-resources.html.

Note: This syllabus is tentative and should not be considered definitive. The instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student's responsibility to attend class regularly and to make note of any changes.

Schedule for Spring 2025 MAT 271

Week	Dates	Deadlines	Comments
1	Week of 1/13	Pre-Lecture unit 1 Due 1/15	Drop/Add deadline 1/19
2	Week of 1/20	Unit 1 Homework Due 1/21 Unit 1 Quiz 1/22 Pre-Lecture unit 2a Due 1/24	MLK Day 1/20 – No class
3	Week of 1/27	Unit 2a Homework Due 1/28 Pre-Lecture unit 2b Due 1/29	
4	Week of 2/3	Unit 2b Homework Due 2/4 Unit 2 Quiz 2/5 Pre-Lecture unit 3a Due 2/7	
5	Week of 2/10	Unit 3a Homework Due 2/11 Pre-Lecture unit 3b Due 2/12	

6	Week of 2/17	Unit 3b Homework Due 2/18 Unit 3 Quiz 2/19 Pre-Lecture Unit 4a Due 2/21	
7	Week of 2/24	Unit 4a Homework Due 2/25 Pre-Lecture unit 4b Due 2/26	
8	Week of 3/3	Unit 4b Homework Due 3/4 Unit 4 Quiz 3/5 Pre-Lecture unit 5 Due 3/7	
	Week of 3/10	No classes	Fall Break 3/10 – 3/14
9	Week of 3/17	Unit 5 Homework Due 3/18 Unit 5 Quiz 3/19 Pre-Lecture unit 6 Due 3/21	
10	Week of 3/24	Unit 6 Homework Due 3/25 Unit 6 Quiz 3/26 Pre-Lecture unit 7 Due 3/28	
11	Week of 3/31	Unit 7 Homework Due 4/1 Unit 7 Quiz 4/2 Pre-Lecture unit 8a Due 4/4	Last Day to withdraw from course – 4/6
12	Week of 4/7	Unit 8a Homework Due 4/8 Pre-Lecture unit 8b Due 4/9	
13	Week of 4/14	Unit 8b Homework Due 4/15 Unit 8 Quiz 4/16 Pre-Lecture unit 9 Due 4/18	
14	Week of 4/21	Unit 9 Homework Due 4/22 Unit 9 Quiz 4/23	
15	Week of 4/28	Review for final exam	
16	5/5 (Mon)	Final Exam 12:30 pm – 2:20 pm	