Calculus 2
Math 163

Mychael Smith

Instructor Information
Academics 142-A
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Office Hours
TW 9:00AM to 12:00PM
In STEM: W 12:00PM to 1:00PM
Or by appointment

1 Overview

Welcome to Math 163. Here is the UNM course description.

> Transcendental functions, techniques of integration, numerical integration, improper integrals, sequences and series, Taylor series with applications, complex variables, differential equations. (I)
>
> Prerequisite: 162.

2 Course Learning Outcomes

1. Know the definitions, graphs, special values, derivatives and integrals (when possible) of transcendental functions, including exponential, logarithmic, inverse trigonometric and hyperbolic functions.
2. Use the methods of substitution, integration by parts, partial fractions and trigonometric substitution to compute proper and improper integrals. Evaluate improper integrals using correct mathematical limit notation.
3. Use rectangles or trapezoids to approximate integrals.
4. Solve separable differential equations. Plot direction fields and solution curves. Find equilibrium solutions.
5. State the definition of the value of a series, as well as necessary conditions for convergence. Use the definition to determine the value of a series. Determine the value of known Taylor series at particular points. State various tests for convergence, including all conditions, and apply them. Approximate alternating series and estimate the error.
6. Determine the asymptotic behaviour of functions $f(x)$ as $x \to \infty$ and the limit of indeterminate forms.
7. State the definition of the Taylor series of a function and describe its properties. Find Taylor series using the definition, or by substitution into, or differentiation or integration of known series, and determine their interval/radius of convergence. Approximate functions by Taylor polynomials within the interval of convergence and estimate the error. Include approximations of definite integrals or quantities depending on parameters, such as arise in applications in physics, chemistry, biology and engineering.
8. Use Taylor series to derive Euler´s formula for the exponential of a complex number. Evaluate sums, products, powers, roots, and exponentials of complex numbers. Evaluate integrals of complex functions.

3 Required Text

The required text for this course is:

- Calculus, by Thomas, 14th edition.

4 Attendance Policy

Attendance in the course is required. If a student misses two classes in the first two weeks of the semester, three consecutive class periods or five total, I reserve the right (but not the obligation) to drop the student from the class. If you stop attending class for any reason, it is your responsibility to make sure you dropped the class, or risk getting a failing grade.

5 Course Structure

Homework will be based on the following.

- In-class worksheets and written homework (50 points)
  - We will be doing in-class worksheets this semester in groups. I will be grading these based off of participation and completion. This means interacting with your group members and having positive discussions.
- Written homework (50 points)
  - Keep your written homework neatly organized in a notebook or folder. I will be checking it on exam days for organization and effort.
- Quizzes (100 points)
  - We will be doing 12 quizzes in class for 10 points each. I will drop the lowest two scores for a total of 100 points. The quizzes will resemble the midterm and final, so they will be good study aides.
- Three Midterms (100 points each)
  - The midterm will cover the first half of the class and will be good practice for the final exam.
- Final (200 points)
  - The final exam will be comprehensive.
- Total (700 points)

6 Grading Policy

Your grades will be calculated as follows.

Point Total	Grade
[686,700]	A+
[644, 686)	A
[630,644)	A-
[616,630)	B+
[574,616)	B
[560,574)	B-
[546,560)	C+
[490,546)	C
[476,490)	D+
[434,476)	D
[420,434)	D-
[0,420)	F

7 Make-up Policy

I will allow up to four late submissions of homework assignments.

8 Schedule

- Week 1 (All of Chapters 3,4 and 5, and Sections 7.1-7.2)
  - Review, Inverse Functions
- Week 2 (7.1-7.3,7.6-7.7)
  - Exponential Functions, Review of Logarithms, Inverse Trig/Hyperbolic Functions
  - Quiz 1
- Week 3 (7.5)
  - L'Hospital's Rule and Review for Exam 1
  - Quiz 2
- Week 4 (8.1-8.3)
  - Integration by Parts, Trigonometric Integrals
  - Exam 1
- Week 5 (8.4-8.5)
  - Trigonometric Integrals continued and Trigonometric Substitution
  - Quiz 3
- Week 6 (8.7-8.8)
  - Quiz 4
  - Partial Fractions Decomposition, Numerical Integration and Improper Integrals
- Week 7 (7.4,9.2)
  - Quiz: 5
  - Differential Equations and Logistic Growth
  - Review for Exam 2
- Week 8 (10.1)
  - Exam 2
  - Introduction to Sequences
- Week 9
  - Spring Break
- Week 10 (10.2-10.3)
  - Quiz 6:
  - Integral Tests
- Week 11 (10.4-10.6)
  - Quiz 7, Quiz 8: (Take home)

  - Alternating Series, Convergence Tests
- Week 12 (10.7)
  - Quiz 9
  - Power Series
- Week 13 (10.8-10.10)
  - Quiz 10
  - Taylor Series and review for exam
- Week 14
  - Exam 3
- Week 15 (A.7 and my notes)
  - Quiz 11
  - Complex Series, Euler's Formula
- Week 16
  - Quiz 12
  - Review
- Week 17
  - Final Exam: Monday, May, 6 from 3:00PM to 5:00PM in A141.

9 Important Dates

Date	Event
1/21	Martin Luther King Jr Day
1/25	Last day to add or change credit hours or change grade mode on Loboweb
4/12	Last day to drop without Dean's permission
5/3	Last day to drop with Dean's permission

10 A note on academic integrity

We will follow the university policy on academic integrity listed below.

> Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy: `https://policy.unm.edu/regents-policies/section-4/4-8.html`. The policy states:
>
> Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.
>
> Academic Dishonesty is defined as: "Academic dishonesty" includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

11 Students with Disabilities

If you have a documented disability, please provide me with a copy of your letter from Equal Access Services as soon as possible to ensure that accommodations are provided in a timely manner.

12 Equal opportunity and non-discrimination

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see page 15 - `http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf`). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: `https://policy.unm.edu/university-policies/2000/2740.html`.

13 Citizenship and/or Immigration Status:

All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: `http://undocumented.unm.edu/`.

Note: This syllabus is subject to change, if needed.