

MAT 251
Unified Calculus and Analytics
(8:00-8:50 Monday, Wednesday, Friday)
WAL 225

Course Designation

MAT 251. UNIFIED CALCULUS AND ANALYTICS. First course of a four-semester sequence covering concepts of limits, differentiation of algebraic and trigonometric functions, and applications of differentiation. Prerequisites: MAT 104 and MAT 105, or MAT 106. (3 hours credit.)

Text

James Stewart. Calculus: Seventh Edition. Belmont, California: Brooks/Cole, Cengage Learning, 2012. ISBN: 978-0-538-49781-7

General Course Objectives

Upon completion of the course, the student will be able to:

1. Recognize, graph, and demonstrate an understanding of the behavior of algebraic and trigonometric functions.
2. Demonstrate a conceptual understanding of limits.
3. Demonstrate a conceptual understanding of continuity.
4. Demonstrate a conceptual understanding of the derivative of a function.
5. Interpret the derivative graphically.
6. Interpret the derivative analytically.
7. Interpret the derivative numerically.
8. Use the derivative to determine a linear approximation for a function at a point.
9. Demonstrate a conceptual understanding of the antiderivative of a function.
10. Use the graph of the derivative of a function to analyze the function.
11. Determine the derivatives of algebraic and trigonometric functions.
12. Demonstrate a conceptual understanding of the concept of the differential of a function.
13. Demonstrate a thorough knowledge of the techniques and applications of differential calculus.
14. Use mathematical modeling to solve problems in applied mathematics from fields such as physics, chemistry, economics, social studies, and engineering.
15. Determine the antiderivative of a function.

Subject Matter or Content to be Studied

1. Functions and modeling with functions
2. Limits
3. Continuity
4. Derivatives
5. Rules of differentiation
6. Applications of differentiation
7. Antiderivatives
8. Differentials

Student Activities and Requirements

1. Class attendance, as determined by the regulations of the university and the department.
2. Homework exercises to be completed by the student and graded at the discretion of the instructor.
3. Participation in class discussion.
4. Participation in cooperative learning activities.
5. Scheduled tests will be given periodically throughout the semester. Students will be given adequate notice.
6. A comprehensive final exam will be given as scheduled at the end of the semester. It will count approximately 25% of the grade for the class.
7. Regular and punctual attendance is necessary for successful completion of this course.
8. There will be at least one question on each test that requires you to provide a written explanation of a concept. Evaluation of the answer to this question will include mathematical content, spelling, grammar, and sentence construction.

Presentation Methods

Lecture with demonstration to include the use of graphing calculators and computer software as well as cooperative learning (75%); class discussion (25%).

Evaluation and Grading

- 4 tests
- Daily grade (based on homework and quizzes)
- Final exam grade
- Exam Date: Wednesday, May 4, 2016 at 8 a.m.

Grading Scale

Grades will be assigned according to the following scale:

A (90 or above) B (80 - 89) C (70 - 79) D (60 - 69) F (below 60)

Make-up Tests, Class Attendance, and Tardiness

A student absent from class and missing a scheduled test is entitled to a make-up test if evidence is presented to the instructor that the absence was due to personal illness or death in the immediate family. Absences authorized by the Vice-President of Academic Affairs for official purposes (athletics, performing groups, student government, etc.) also entitle a student to make-up test privileges. Any absence from scheduled work must be covered by an excuse from the Vice-President for Academic Affairs, the Student Health Service, or a doctor before the student is allowed to make up that work. Any exception to this rule must be arranged before the missed work! Each student is directly responsible to the individual faculty member for making up work missed due to excused absences. ALL make-up work must be completed within one week after returning to class. In order to receive credit in this course, a student must attend a minimum of 75% of the class meetings. Students in this class will be allowed no more than 11 absences, excused and unexcused. If a student exceeds the allowable number of absences, a grade of "F" will be assigned in the course. In order to be counted present, a student must arrive on time for the class and remain in class the entire time. When a student is tardy for a class, it is the student's responsibility to talk to the faculty member about changing the recorded absence to a tardy. This must be done on the day that the tardy occurred. Failure to do so will result in a recorded absence. Tardies in excess of three during the semester count as unexcused absences.

Classroom Policies

1. **Turn off cell phones upon entering the classroom. Do not check messages or send text messages during class. If you are seen using a cell phone during a test, I will assume that you are using it to cheat. No cell phone calculators may be used during class.**
2. Come to class on time.
3. Be prepared to start class at the scheduled time. Have all necessary items ready.
4. Do not ask to leave class early. Schedule any appointments at times that do not conflict with classroom time.
5. Calculator use is permitted and encouraged on all homework assignments and tests.
6. Be sure to show all work on homework assignments and tests. No partial credit can be given if no work is shown.
7. Homework may be collected and graded at the discretion of the instructor. Homework must be turned in at the time when it is requested. No late homework will be accepted.
8. Cheating and plagiarism are not tolerated. If it is established that a violation has occurred, the penalty will be a zero on the test, examination, or paper in question.
9. It is the responsibility of the individual student to inform the faculty member of any clinically diagnosed learning disability or other limiting disability that might in some way hinder the student's progress in this class. Reasonable accommodations are available upon request.

Important Dates

Students who remain in the course more than one week after the first test and who then elect to drop the course will receive a grade of **W** if passing or a grade of **F** if failing the course at the time of the drop. A drop is not effective and complete until the drop slip has been signed by all parties designated and turned in to the Registrar's office. No course may be dropped after **April 29**. If you plan to audit this

class, you must notify the instructor by **January 25**. You will not be allowed to change your status from credit to audit after this date. The final examination for this course is scheduled for **Wednesday, May 4, at 8 a.m.** That is when it must be taken.

Additional Statement Concerning MAT 251

Studying the assignments daily is absolutely necessary for success in this course. You will find that you will need at sometime during this semester almost all of the mathematics that you have been exposed to in the past, especially algebra. The only way you will be able to be successful in this course is to work the problems and attend every class meeting. We will be working some of the problems found in this textbook in a group format. You may find it helpful to collaborate with other students in working through the homework problems in the text. I would certainly encourage you to do so. It is always helpful to have more than one perspective when you approach the solution of a problem.

Throughout this course you will be asked to think about the geometrical and numerical meaning of calculus concepts. In many of the homework problems, you will be asked to explain verbally what your answers mean in practical terms.

In this course we will take advantage of computers and graphing calculators to help us learn to think mathematically. You will need a graphing calculator for this class. I am most familiar with the TI-86. It is the calculator that I plan to use for the purpose of classroom demonstration and for solving problems in the text that require a graphing utility. If you already have a graphing calculator other than the TI-86, you certainly may use it. However, you will be responsible for learning how to operate your calculator.

A grade of C or better in MAT 251 is required in order to enroll in MAT 252.

Please don't hesitate to consult the instructor during the designated office hours if you need individual help.

If a student has a disability that qualifies under the Americans with Disabilities Act and requires accommodation, he should contact Dr. Richard Houston (846-4690) for information on appropriate policies and procedures.

Instructor: Dr. Lee I. Virden

Instructor's Office: WAL 209C

Office Phone: 846-4511

Instructor's e-mail address: lvirden@deltastate.edu

Instructor's Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
10:00 – 11:00 1:30 – 3:30	1:30 – 3:30	10:00 – 11:00 1:30 – 3:30	1:30 – 3:30	10:00 – 11:00

Other office hours are available by appointment.