

MATH 259 MULTIVARIATE CALCULUS

Spring 2023, 3 credits

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Text: *Calculus*, by J. Rogawski & C. Adams, 4th ed. (early transcendentals version)

Lecture Hours: MWF 10:00-10:50 am (Sudro 24)

Office Hours: MWF 3:00-4:00 pm (or by appointment)

GENERAL INFORMATION

Course Description: Vectors and analytic geometry in space, functions of several variables (scalar and vector valued), partial derivatives, surfaces and gradients, tangent planes, differentials, chain rule, space curves and multiple integration.

Course Objectives: Multivariate Calculus develops very important tools and methods essential for analyzing and solving complex problems in mathematics, engineering, the natural sciences, and social sciences. The purpose of this course is to teach the concepts described in the course description and help students learn the associated tools and methods in a rigorous manner; develop mathematical skills needed to apply these to the problems arising within their field of study; gain increased understanding of how these concepts apply to various real-world problems.

Lecture and Assessment Format: The lecture/discussion format of this course, which precludes extensive interaction with individuals during lectures, makes active participation in-class discussions and group work very valuable. It is well-known that working together cooperatively enhances learning and retention. Students are encouraged to form study-groups on their own and work together on the material covered in class, discussing problems assigned, and preparing for the tests during the semester. However, any submitted work (assignment/test) should be an individual work and be written independently; any evidence of collaboration in a submitted work or test will result in poor grade or failure.

- All course-related information will be communicated primarily during class. Reminders, notification of any schedule or assignment changes will be communicated through NDSU email and posted on course Blackboard site relevant section(s). Student NDSU email address is the official route for information.
- At the end of each lecture (except first and last day of classes, test days and lectures prior to tests) students will be assigned exercises. These assignments are due next day by noon and be submitted on the course Blackboard site relevant section.

Grading: Grades in the course will reflect students' demonstrated attainment of course objectives and will be based on students' performance on assigned exercises, quizzes, term tests and the final exam. Grades will not be curved.

- Approximately 35 exercises will be assigned (1 point each); 30 best will be counted towards the final grade.
- There will be 11 weekly quizzes (5 points each) during recitations, 10 best of them will count towards the final grade.

- There will be three 50-minute term tests (100 points each). These tests will be on February 3, March 3, and April 5, 2023. Any conflicts must be resolved with Dr. Çömez well in advance of these dates.
- The final exam (120 points) will be on May 10, 2023, at 8 am.

Grades will not be curved. As a guideline, points in the range 451-500 are A, 401-450 are B, 351-400 are C, 300-350 are D, and below 300 is unsatisfactory.

Expectations: The instructor will teach the material in the best of his ability; however, students should assume full responsibility in their learning. This is a mathematics course; hence, it is expected that students know well how to provide mathematically rigorous arguments and solutions. Failure to do so will earn poor grades. Active participation in class is essential for success in any mathematics course; hence, class attendance (both in lectures and recitations) is strongly encouraged. Make-up tests will only be given in the most exceptional circumstances (such as medical emergencies) and require prior approval of the instructor (unless impossible, in which case written excuses may be required). No make-ups for missed assignments and quizzes. Students who are not regularly attending classes cannot expect special consideration in relation to their grades. Except for the purpose of notetaking, use of electronic equipment (including cell phones) will not be allowed during lectures. Calculators will not be allowed during tests and quizzes. Academic dishonesty will not be tolerated and will result in severe sanctions and failure of the course.

Important Notice:

1. Students who miss more than 20% of classes or more than 20% of exercises prior to the “Last day for no-record Drop of classes” may be administratively dropped from the course at the discretion of the instructor.
2. COVID-19 and its variants still cause serious health hazard which requires all of us to follow COVID-19-related precautions and guidelines (see CDC guidelines at <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>), which may change as the pandemic evolves. The instructor is fully vaccinated, and students are strongly advised to get vaccinated.
3. Students should not come to class if they experience COVID-like symptoms. If a student is infected with COVID-19, or is in a contact of an infected person, he/she should immediately inform the course instructor via an official means of communication, and isolate/quarantine at home (see CDC guidelines: <https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/quarantine.html>). Consistent with NDSU policies and procedures (including, but not limited to NDSU Policy 331.1: Course Syllabus, NDSU Policy 606: Guidelines for Student Requests for Reasonable Accommodation), faculty will offer the student a reasonable accommodation to maintain instructional continuity.

Academic Responsibility and Conduct: All work in this course must be completed in a manner consistent with **NDSU Policy, Section 335: Code of Academic Responsibility and Conduct**. This policy applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, such as failure of the course, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records.

Special needs: Any student with disabilities or other special needs, who needs special accommodations in the course, is invited to share these concerns or requests with Dr. Çömez and contact the NDSAU Disability Services Office as soon as possible.

Veterans: Veterans and student soldiers with special circumstances or who are activated are encouraged to notify Dr. Çömez in advance.

OUTLINE OF THE COURSE

1. Vectors in plane and space. Lines and planes in space.
2. Vector valued functions, study of curves in space.
3. Scalar valued multivariable functions, partial derivatives.
4. Multiple integrals.

TENTATIVE LECTURE SCHEDULE

- Week 1. Sections 12.1-12.2
- Week 2. Sections 12.3-12.5
- Week 3. Sections 12.6, 12.7
- Week 4. Sections 13.1, **Test 1**
- Week 5. Sections 13.2, 13.3
- Week 6. Sections 13.4, 13.5
- Week 7. Sections 14.1, 14.2
- Week 8. Sections 14.3, 14.4
- Week 9. Sections 14.5, **Test 2**
- Week 10. Sections 14.6, 14.7
- Week 11. Sections 14.8, 15.1
- Week 11. Sections 15.2
- Week 12. Sections 15.3, **Test 3**
- Week 13. Sections 15.4
- Week 14. Sections 15.5
- Week 15. Sections 15.6
- Week 16. **Final Examination**, Wednesday, May 10, 2023 (8:00-10:00 am).