

Math 251 - Multivariable Calculus, Spring 2018 Course Syllabus

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Office: Learning Resource Center 323K

Office hours: Mon 10-11 and 1-2, Wed 10-11 and 1-3

Math Tutoring Lab: Thurs 12-1, Fri 10-11

Class Room/Time: INN-B 201, MTWF 12:00-12:50 pm

Course website: community.wvu.edu/~bal0018/math251S18.html (as a backup website, I will also try to keep the eCampus site updated)

Homework assignments will be posted on the course website. Course announcements may also be posted on the website or sent via email. Please be sure to check the website regularly, and to regularly check the email address you have on record. You are responsible for any information posted on the course website.

Textbook: James Stewart, *Calculus*, 8th edition

Catalog Data: MATH 251 Multivariable Calculus (4-0) Credits 4. Introduction to solid analytic geometry, vector algebra, and calculus of several variables.

Prerequisite: MATH 156. (But really only MATH 155).

Course material: This course is a study of multidimensional space, approached from a couple different directions. First, we gain an understanding of three dimensional space using both an analytical geometry approach and a vector approach. Once we understand 3D space and surfaces in 3D space, we begin to use calculus to analyze them, analogous to how we used calculus to analyze curves. We find that partial derivatives can be used to give a 3D analog of the tangent line considerations of Calc 1, and we study how to use multiple integrals to compute general volumes and surface areas of surfaces. Finally, we finish by studying vector calculus, which is the calculus of functions that map points to vectors.

A rough outline of the topics covered can be found on the next page.

Course Objectives: Upon successful completion of the course, the student will be able to do the following:

1. Describe surfaces in 3D space using equations, and compute arc length and curvature.
2. Describe motion and displacement using vectors, and perform operations on vectors.
3. Analyze a multivariable function by finding its domain and computing limits.
4. Find partial derivatives of multivariable functions to solve geometric and optimization problems.
5. Evaluate double and triple integrals of multivariable functions, and use them in applications.
6. Evaluate line and surface integrals, and use the major theorems of vector calculus.

Topics:

1. Vectors and Three Dimensional Analytical Geometry (8 days - Chapter 12)
2. Vector-valued Functions (8 days - Chapter 13)
3. Partial Derivatives (14 days - Chapter 14)
4. Multiple Integrals (15 days - Chapter 15)
5. Vector Calculus (16 days - Chapter 16)

Grading: Your final grade will be based on homework, quizzes, four exams during the semester, and the final exam. Your final course score will be the maximum of the following two grading schemes:

- 10% Homework + 5% Quizzes + 15% Exam 1 + 15% Exam 2 + 15% Exam 3 + 15% Exam 4 + 25% Final Exam
- 10% Homework + 5% Quizzes + 25% (highest grade of the four exams) + 15% (2nd grade of the four exams) + 15% (3rd grade of the four exams) + 30% Final Exam

Letter Grade Cutoffs: A: 90%, B: 80%, C: 70%, D: 60%, F: below 60%

Homework: Homework assignments will be posted on the course website. Homework sections assigned during the week will typically be due on Fridays. There will likely be about 12 total assignments, and your lowest 2 homework scores will be dropped from grade computation.

A note about the homework: the only real point of the homework is for you to do it. The time you spend thinking, trying things, getting wrong answers, and (hopefully) getting right answers is the purpose of the homework. The exams are where your course grade will really be decided, and the homework is your training for the exams. Don't skip your training!

Exams: There will be four exams, tentatively scheduled for Wednesday, January 24; Friday, February 9; Friday, March 9; and Wednesday, April 11. These will be 50 minute exams taken during the regular lecture time. The final exam time has been set by the university, and will be on Monday, April 30 from 10:00 am to 11:50 am. Make-up exams will only be given to students with excused absences, and such make-up exams must be scheduled within 24 hours of the missed exam.

Quizzes: There will be a quiz given most weeks in which there is no exam. This will be a very brief quiz given at the beginning of class, intended to test you with more immediacy than the exams and with less consequence. The problems that appear on the quiz will be taken from the homework problems I assign. Only your best 5 quizzes will count toward your grade, and there will be absolutely NO make-up quizzes.

Class policies:

- Graphing calculators will never be allowed during any exams. Scientific calculators will be considered on an exam by exam basis. You may use any calculator to help you do the homework if you wish, but you should keep in mind that you may be required to solve similar problems without a calculator on the quizzes and exams.
- While class attendance does not directly factor into your grade computation, attendance of each lecture is highly recommended. Regular attendance will tend to lead to better understanding of the course material, which tends to lead to better performance on exams.
- If you believe a problem on a homework assignment or midterm exam has been graded incorrectly, you must notify the instructor of your complaint within 7 days of the date the exam is handed back. If you are unable to retrieve your graded material at the time it is handed back, it is your responsibility to make arrangements with the instructor to retrieve the material at another time.

Getting Help: Please feel free to come to office hours or email me if you have questions about the course material. If you are unable to make it to my regularly scheduled office hours, I am willing to make an appointment to meet at another time if possible. Additionally, you can get help in the Math Tutoring Lab in LRC 323 from 8 AM to 4:30 PM. Free tutoring is also available through Student Support Services, located in Benedum 130, and the Student Success Center, located in the library on the second floor of LRC. Finally, I would also encourage the formation of study groups, to learn from each other and help each other learn.

Academic Integrity: The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the Student Conduct Code at http://studentlife.wvu.edu/office_of_student_conduct/student_conduct_code. Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter. [Available at: <http://faculty senate.wvu.edu/r/download/15702>]