

MATH 283, Analytic Geometry and Calculus IV, Spring, 2012 Walla Walla University

BULLETIN DESCRIPTION: Study of differential and integral calculus of multi-variable functions, line and surface integrals, Green's theorem, divergence theorem, and Stokes' theorem. Prerequisite: MATH 282, 4 credits (quarter) .

INSTRUCTOR: Dr. Kenneth L. Wiggins, 338 KRH, 527-2088, ken.wiggins@wallawalla.edu

OFFICE HOURS: 2 M-Th, 9 F, Other Office hours by appointment

OBJECTIVES: After finishing this course, the student should be able to organize and effectively communicate ideas involving:

- *Functions of Several Variables.* Limits and continuity, partial derivatives, tangent planes and approximation, directional derivatives, extrema and optimization.
- *Multiple Integrals.* Double integrals, integrals in polar coordinates, surface area, triple integrals, center of mass, cylindrical and spherical coordinates, change of variables.
- *Vector Analysis.* Vector fields, line integrals, independence of path, Green's theorem, surface integrals, Stokes' theorem, divergence theorem.

TEXTBOOK: *Calculus*, 9th ed., Larson, Hostettler, and Edwards, 2006, Houghton Mifflin

ASSESSMENT: All assessment will be based on both correctness and quality, including the quality of your presentation.

Category		Weight	
Homework & quizzes		25%	
Three tests		45%	
Final exam		30%	
Grade	Percent	Grade	Percent
A	91-100%	C	70-74%
A-	89-90%	C-	65-69%
B+	86-88%	D+	62-64%
B	83-85%	D	58-61%
B-	80-82%	D-	55-57%
C+	75-79%	F	0-54%

Isaac Newton
MATH 283
March 30, 1693
W4



HOMEWORK: The surest way to succeed in MATH 283 is to study each day. To aid you in your study, homework problems will be assigned each day. Most of this homework will be done on the computer, but you will hand in a weekly written assignment. Be sure to show all work neatly and indicate your answers clearly. The weekly assignments are given specifically for you to practice clear and precise presentations. Please fold your paper homework lengthwise and label it as illustrated in the diagram above. Your written homework will be due Friday mornings at the beginning of class.

QUIZZES: Occasionally quizzes may be given over the lectures and homework.

TESTS: Three 50-minute examinations will be given during the quarter. These will cover the lectures and the homework, and you will take these tests without calculators.

FINAL EXAMINATION: This test is scheduled for 10-11:50 AM, Tuesday, June 5. Attendance is required, so make your travel plans early with this appointment in mind.

CLASS ATTENDANCE: Students are expected to attend all classes. In addition, students are expected to give their full attention to the class discussions, and to be courteous, respectful, and supportive of the learning environment. Cell phones, computers, personal organizers, and all other electronic devices are not to be used by students during class. Modifications to the homework assignments or test schedule may be announced in class.

DISABILITIES: If you have a physical and/or learning disability and require accommodations, please contact your instructor or the Special Services office at 527-2366. This syllabus is available in alternative print formats upon request. Please ask your instructor.

SPECIAL CONSIDERATION FOR EXTRA EFFORT: Your lowest test grade will be dropped and replaced with your final examination grade if you meet the following conditions: You must

- Be present, on time, and attentive for at least 37 of the 39 scheduled class sessions
- Turn in at least 95% of the homework on time.
- Make a higher grade on the final examination than you did on your lowest test.

ACADEMIC INTEGRITY: Some collaboration on homework is allowed, but the work you submit for grading must be your own. Any type of cheating on a test or examination, including but not limited to copying another student's work or using unauthorized notes or electronic equipment, will result in a zero grade for the test or a failing grade for the quarter, and possibly further disciplinary action taken by the Associate Vice President for Academic Administration.

TEACHING CERTIFICATION: Those seeking Washington state teaching certification please see <http://math.wallawalla.edu/teacherEd/>.

TOPICS BY WEEK:

Week 1

- Functions of Several Variables
- Limits and Continuity
- Partial Derivatives

Week 2

- Differentials
- Chain Rules for Functions of Several Variables
- Directional Derivatives and Gradients

Week 3

- Tangent Planes and Normal Lines
- Extrema of Functions of Two Variables
- Applications of Extrema of Functions of Two Variables

Week 4

- Lagrange Multipliers
- Multiple Integration
- Iterated Integrals and Area in the Plane

Week 5

- Double Integrals and Volume
- Change of Variables: Polar Coordinates
- Center of Mass and Moments of Inertia

Week 6

- Surface Area
- Triple Integrals and Applications
- Triple Integrals in Cylindrical and Spherical Coordinates

Week 7

- Change of Variables: Jacobians
- Vector Analysis

- Vector Fields

Week 8

- Line Integrals
- Conservative Vector Fields and Independence of Path
- Green's Theorem

Week 9

- Parametric Surfaces
- Surface Integrals
- Divergence Theorem

Week 10

- Stokes's Theorem