

Syllabus: Math 2850-005, Fall 2014

Elementary Multivariable Calculus

Instructor: Paul Hewitt

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Office: UH 4080c Hours: Mon, Tue, Thu, Fri, 10:30–11:50am
I am available at other times by appointment.

Welcome to Calc III! In this course we will apply the methods of Calc I and II to parametric curves and real-valued functions of several variables. A large part of the course is devoted to a vector-based study of the geometry of 2- and 3-dimensional space.

Textbook

Thomas' Calculus (12th edition) by Thomas, Weir, and Hass. An electronic version is available at a 30% discount from <http://www.coursesmart.com>.

Catalog description and prerequisites

Geometry of functions of several variables, partial differentiation, multiple integrals, vector algebra and calculus (including Theorems of Green, Gauss and Stokes), and applications. The prerequisite is a passing grade in Math 1860 or equivalent.

Course calendar

Monday, 1 September	<i>Labor Day: no classes</i>
Monday, 8 September	<i>Last day to drop</i>
Friday, 12 September	Exam 1: calc review, sections 12.6, 13.1–13.5
Friday, 10 October	Exam 2: sections 13.6, 14.1–14.7
Monday–Tuesday, 13–14 October	<i>Fall Break: no classes</i>
Tuesday, 4 November	Exam 3: sections 14.8, 15.1–15.7
Tuesday, 11 November	<i>Veterans Day: no classes</i>
Wednesday–Friday, 26–28 November	<i>Thanksgiving Break: no classes</i>
Tuesday, 9 December	Exam 4: sections 15.8, 16.1–16.8
12:30–2:30pm, Monday, 15 December	Comprehensive final exam

Please note that the last day to drop a course is Monday, 8 September; and the last day to withdraw with a grade of W is Friday, 31 October.

Contingencies

I reserve the right to adjust the course content and calendar as need arises due to unforeseen circumstances.

Exams

There will be four midterm exams and a comprehensive final exam, each worth 100 points. Your 3 best midterm exam scores count towards your final grade. The first midterm exam will include a diagnostic review of Calc I and II. The problems for all of the exams will be based on the homework. Some of the problems will be presented as multiple choice; some will require you to show all your work. The full exam schedule is shown in the table above.

Quizzes

There will be between twenty and thirty quizzes. Each quiz will consist of two 1-point multiple-choice questions. The problems on the quizzes will be taken from the homework, with only minor changes. Your 15 best quiz scores will count towards your final grade. Any missed quizzes will be among the scores dropped from your final grade.

Homework

I will post homework assignments from the text. These will not be collected. They are intended to prepare you for the quizzes and exams.

Each Friday you will turn in for grade one quiz problem of your choice from any of the quizzes that week. For these homework assignments you must show all steps of your solution in detail and use complete sentences in your explanations in order to get full credit. These problems are worth 5 points each. Your 14 best homework scores count towards your final grade. I will not accept any late homework assignments without written documentation of circumstances governed by the UT Missed Class Policy (see below).

Final grades

Your final grade will be based on the percentage of 500 total possible points earned, according to the following scale:

A: 90%, B: 80%, C: 70%, D: 60%.

However I will adjust the exam scores so that the medians align with these expectations. (That is, I may “curve” the exams.) I give few + or – grades.

Learning objectives

Upon successful completion of this class a student should be able to:

1. Differentiate and integrate vector-valued functions.
2. Evaluate limits and determine the continuity and differentiability of functions of several variables.
3. Describe graphs, level curves and level surfaces of functions of several variables.
4. Find partial derivatives, directional derivatives, and gradients and use them to solve applied problems.
5. Find equations of tangent planes and normal lines to surfaces that are given implicitly or parametrically.
6. Use the chain rule for functions of several variables (including implicit differentiation).
7. For functions of several variables, find critical points using first partials and interpret them as relative extrema/saddle points using the second partials test. Find absolute extrema on a closed region. Apply these techniques to optimization problems.
8. Evaluate multiple integrals in appropriate coordinate systems such as rectangular, polar, cylindrical and spherical coordinates and apply them to solve problems involving volume, surface area, density, moments and centroids.
9. Find the curl and divergence of a vector field, the work done on an object moving in a vector field, and the flux of a field through a surface. Use these ideas to solve applied problems.
10. Use the theorems of Green, Gauss, and Stokes.

Missed class policy

The UT Missed Class Policy can be found at www.utoledo.edu/facsenate/missed_class_policy.html. If circumstances governed by this policy result in you missing an assignment or an exam then you must contact me immediately, either by email, phone or in person, and provide official documentation to justify your absence and arrange to make up the missed work as soon as you return. Any missed quizzes will be among those dropped from your final grade.

Academic dishonesty

The UT policy on academic dishonesty can be found at www.utoledo.edu/dl/students/dishonesty.html. Any act of academic dishonesty will result in an F on the assignment, quiz, or exam in question. A second incident will result in an F for the course.

Nondiscrimination policy

The University of Toledo is committed to a policy of equal opportunity in education, affirms the values and goals of diversity.

Students with disabilities

The University will make reasonable academic accommodations for students with documented disabilities. Contact Student Disability Services (RH1820; 419.530.4981; studentdisabilitysvs@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see: www.utoledo.edu/offices/student-disability-services.

Student privacy

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the Confidentiality of Student Records (FERPA) section of the UT Policy Page at www.utoledo.edu/policies/academic/undergraduate/index.html.

Tutoring

Tutoring help is available during each week of the semester in the Mathematics Learning and Resource Center, located in Room B0200 in the lower level of Carlson Library (phone ext 2176). The center operates on a walk-in basis. MLRC hours can be found at math.utoledo.edu/mlrc/MLRC.pdf.