

# Multivariable Calculus (Math 272) — Fall, 2007

**Location and Time:** 137 Black, MTThF, 8:00-8:50 A.M.  
103 Bouillon W, 8:00-8:50 A.M.

**Instructor:** Dr. Dan Curtis

**Office:** 107a Bouillon

**Office Hours:** MTWThF 10:00-10:50 and by appointment. You can drop by my office at any time and usually I'll be able to talk with you.

**Office Phone:** 963-2125

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**Web Page:** [www.cwu.edu/~curtiswd](http://www.cwu.edu/~curtiswd)

**Final Exam:** Friday, December 7, 8:00-10:00am

**Textbook:** Thomas' Calculus, Early Transcendentals, 11<sup>th</sup> edition

**Calculator:** The TI-83+ is recommended but many others will do. Certain classroom demonstrations will be given using the TI-83+, so if you have a different calculator you will have to figure out how your calculator does things.

**Course Content:** The course will begin with chapter 11 and cover selected material from chapters 11-14 of the text, together with classroom handouts and additional material on applications. If time permits, we will go back and cover material from chapter 10. You will also be learning how to use the *Mathematica* software package to do many of the calculations in the course.

**Course Conduct:** You are expected to attend class daily. Homework will be assigned but will not be graded. However, if you expect to do well in this course, you must do the homework. Time will be available during class to discuss the homework problems and your instructor is available during office hours.

**Workgroups:** The class will be divided into workgroups of 4-5 students each. There will be a number of group assignments during the term (see below under **Grading**). For each of these, students in each group will work together to present a single paper to be handed in as a *Mathematica* notebook. All members of the group are responsible for the content of the group's paper and all will receive the same grade for the assignment. Part of the grade will be a peer assessment of each group member by the other members of that group.

**Mathematica in the Computer Lab:** Each Wednesday we will meet in the computer lab (Bu 103). We will work with the *Mathematica* software package which will allow extensive experiments to gain familiarity with the ideas being studied. There will be a number of lab assignments that will count as part of your course grade. On days when we are in the computer lab, you will be provided with a *Mathematica* notebook that will contain various examples and exercises relevant to the current topic under discussion. You'll be able to download this notebook from my website (see above for the URL) and work in that notebook during class. You should save your notebook so that you can work on it or refer to it later. Regarding saving notebooks, two points:

- Save to your own personal file space (your CWU student account). Do not save anything on the local drive of the lab machine, as such files will automatically be deleted by the system each night.
- When you want to save your file, first delete all output cells. This is because files containing output, particularly graphics output, tend to be quite large. You will waste a lot of disk space and worse yet, you may cause *Mathematica* to corrupt your file and lose it completely. To delete all output cells, use the command  
Kernel>Delete All Output.

Any output can always be recreated by rerunning the notebook using the command

Kernel>Evaluation>Evaluate Notebook

On days when a group lab assignment is made, work with your group to get it done. If you can't finish during class, you can meet later to get things finished. Note that in order to work on the notebook that contains the assignment, you will need to have *Mathematica* available. Thus, unless you have your own copy of the software (as a student you can get your own copy for \$140) you may need to work in the lab.

On days when I am lecturing in Black 137, I may use *Mathematica* to present the lecture. If I do, I will make the notebook containing what I did in class available on my website for you to download.

**Learner Outcomes:** After completing this course, the student will understand:

- what an infinite series is and how to tell whether a series converges;
- how to represent functions by power series;
- how to use Taylor polynomials to approximate functions;
- how to deal with functions of two and three variables and how to visualize such functions using graphs;
- basic properties of vectors in two and three dimensions, including the calculation and interpretation of dot and cross products and how to carry out such calculations in *Mathematica*;
- what partial derivatives are and how to calculate them;
- how to use the chain rule for multivariable functions;
- what the gradient vector is and how it is used;
- How to find critical points of a function of two variables and how to classify critical points using the Second-Derivative Test.
- how to use *Mathematica* to visualize surfaces in space, create contour plots and carry out calculations involving series and partial differentiation.

**Students with disabilities:** If you require accommodation based on a documented disability, have emergency medical information to share, or need special arrangements in case of emergency evacuation, please make an appointment with me as soon as possible.

**Grading:** Your course grade will be determined by the following:

1. Two 100-point in-class exams.
2. One 100-point take-home problem set (this is a workgroup assignment).
3. Five Computer Lab assignments, worth 10 points each for a total of 50 points. These are workgroup assignments.
4. A final exam worth 100 points.

A perfect score on the above categories would result in a total of 450 points. Your course grade will be determined by the percentage  $p$  of these points you earn, according the following scale.

$90 \leq p$	A	$65 \leq p < 77.5$	C
$89 \leq p < 90$	A-	$64 \leq p < 65$	C-
$87.5 \leq p < 89$	B+	$62.5 \leq p < 64$	D+
$80 \leq p < 87.5$	B	$50 \leq p < 62.5$	D
$79 \leq p < 80$	B-	$p < 50$	F
$77.5 \leq p < 79$	C+		

**Policy on Missed Exams:** If you must miss an exam, you should let me know **in advance**. This can be done by email, voicemail, or in person. You must have a **legitimate reason** for missing the exam. In such cases a makeup exam may be given.

**Policy on Partial Credit on Exam Problems:** In cases where an exam question is not answered correctly, partial credit may be given. This will only be done in cases where the attempted solution was substantially correct, both with respect to method and computations. Partial credit will **not** be given simply because something that was written was correct; a correct line of attack and generally correct calculations are required.

**Policy on showing work to receive credit:** Every answer given **must** be justified by showing how it was obtained, with enough detail to convince the reader that the answer was obtained in a logically correct manner. **If sufficient work is not shown, no credit will be given for the answer, even if the answer is correct!**

### Tentative Course Schedule (49 Class Days)

<b>Date</b>	<b>Class Activity</b>	<b>Date</b>	<b>Class Activity</b>
09/17		10/29	
09/18		10/30	
09/19	Classes Begin	10/31	
09/20		11/01	
09/21		11/02	Lab 4 due
09/24		11/05	
09/25		11/06	
09/26		11/07	
09/27		11/08	
09/28	Lab 1 due	11/09	
10/01	Exam 1	11/12	HOLIDAY: Veterans Day
10/02		11/13	Exam 3
10/03		11/14	
10/04		11/15	
10/05		11/16	Lab 5 due
10/08		11/19	
10/09		11/20	
10/10		11/21	HOLIDAY: Thanksgiving
10/11		11/22	HOLIDAY: Thanksgiving
10/12	Lab 2 due	11/23	HOLIDAY: Thanksgiving
10/15		11/26	
10/16		11/27	
10/17		11/28	
10/18		11/29	
10/19	Take-home Exam distributed	11/30	
10/22	Take-home Exam due	12/03	Prof. Dev. Day
10/23		12/04	
10/24		12/05	
10/25		12/06	
10/26	Lab 3 due	12/07	Final Exam: 8:00-10:00am