

Math 9: Calculus I
Porter Hall 3
MWF 8:00 - 9:00
Westmont College Fall 2007

Professor: Scott Taylor

Office:

Office Hours: MWF 7:30 AM & by appointment (which is encouraged!)

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Prerequisite: MA 8 or four years of college-preparatory high school mathematics.

Catalogue Course Description: Functions, graphs, limits, differentiation, integration, sequences, series. Introduction to numerical methods (includes topics covered in MA 10).

Calculus and the Liberal Arts: This course meets the general education requirement in *Reasoning Abstractly* as students will engage in critical and analytical reasoning about abstract concepts, theories and structures. This course also fulfills the general education requirement in *Quantitative and Analytical Reasoning* as we will examine several models of physical and social systems to motivate our learning.

Course Objectives: Calculus is the study of various types of approximation and limiting processes. First semester calculus primarily studies the limits of functions and the special limiting process that results in the derivative. Calculus I also introduces the limiting process that results in the integral. Calculus II will expand on the concept of the integral and will introduce additional notions of limit. By the end of the course you should:

- be able to identify the standard functions and sketch their graphs;
- understand the definition and origin of the derivative;
- understand the geometric significance of the derivative;
- understand the notion of limit and its relationship to the derivative;
- be comfortable using the derivative in applications such as related rates, optimization, and differential equations;
- have a basic understanding of the integral;
- be able to articulate the significance of the Fundamental Theorem of Calculus;
- develop the ability to express mathematical ideas and questions verbally and in writing;
- develop facility in computing derivatives of a wide range of functions and integrals of simple functions.

Often students approach mathematics as a set of computational techniques to be mastered. While this course does have such a set of techniques, computational mastery is only one of the goals of this course. Mastery of techniques without an understanding of the ideas that lead to those techniques or the ability to explain and adapt those ideas is of little value. Computers can perform techniques; understanding is a human activity.

Text: Ostebee and Zorn. *Calculus Volume 1*.

Calculators: You should have access to a graphing calculator or to graphing software. Maple and Mathematica are available in the Math/CS building computer lab.

Evaluation:

Your course grade will be determined by a weighted average as follows. The 15/20% indicates that the best score of Exams 1 and 2 will be weighted at 20% and the other at 15%.

15 % Quizzes	15/20 % Exam 1
20 % Homework	15/20 % Exam 2
5 % In-class work	25 % Final Exam

However, earning fewer than 50 % of available points on the Final Exam will automatically result in a course grade of “F”.

Course letter grades will be assigned (subject to above caveat) according to the following scale. Any curve will be determined at the end of the course, according to the discretion of the instructor.

93 - 100 %	A	73 - 77 %	C
90 - 93 %	A-	70 - 73 %	C-
87 - 90 %	B+	67 - 70 %	D+
83 - 87 %	B	63 - 67 %	D
80 - 83 %	B-	60 - 63 %	D-
77 - 80 %	C+	below 60 %	F

Attendance: Attendance is required. You are allowed 6 absences for any reason (but are encouraged not to have any!). Any absences beyond those four will result in the loss of one full letter grade in your final course grade. For instance, a B+ would be changed to a C+. This policy may be amended in the case of an emergency. Please contact the instructor as soon as possible upon word of an emergency that will result in extended absence from class.

Quizzes: A short quiz will be given every Monday. You should study for these.

Homework: Homework is an integral part of this course. You have not learned the subject if you cannot work through problems on your own. Homework is your chance to be sure that you understand the material and your chance to discover questions pertaining to the subject matter. You are encouraged to work together on the homework. This does not mean, “You do problems 1 - 3 and I’ll do problems 4 - 6 and we’ll exchange answers”. **All work must be**

your own. Homework assignments will be given in class and will also be posted on the class website. You are strongly encouraged to check the website to be sure that you have the entire assignment.

Homework will be due at the beginning of the class period indicated (usually on a Friday). If you are absent from class on the day homework is due, you should send the assignment with a friend or arrange to turn it in early. Late assignments will not be accepted unless cleared with the instructor in advance. Except in cases of emergency, extensions will not be granted.

Homework must be **very readable**. This means **no** messy scratchwork, no huge eraser marks, no loose pages. Problems must be in order with the section and problem number clearly indicated. **You must show all of your work.** Your work is your answer. Again, you must show all of your work.

Exams: All exams are cumulative. The two midterm exams will be in-class on the days indicated in the schedule. The final exam will be on **Thursday, December 13** from **12 PM - 2 PM**. The final exam may not be rescheduled for personal convenience, airline reservations, etc. Requests to reschedule a final because you have three scheduled in one day or because of a special situation must be completed and turned into the Student Records Office by Wednesday, November 28. Although calculators are allowed, exams will be designed to test your understanding of the material, not just your computational capabilities. You must understand, and communicate, the material.

Class	Day	Date	Sections	Comments
1	Mon.	Aug. 27	A review of lines	
2	Wed.	Aug. 29	Average Rates of Change	
3	Fri.	Aug. 31	1.4	HW # 1 Due
4	Mon.	Sep. 3	1.5	Tues. is the last day to drop. Quiz #1
5	Wed.	Sep. 5	1.6	
6	Fri.	Sep. 7	1.7	HW # 2 Due
7	Mon.	Sep. 10	Review	Quiz #2
8	Wed.	Sep. 12	2.1	
9	Fri.	Sep. 14	2.2	HW # 3 Due
10	Mon.	Sep. 17	2.3	Quiz #3
11	Wed.	Sep. 19	2.4	

Class	Day	Date	Sections	Comments
12	Fri.	Sep. 21	2.5	HW # 4 Due
13	Mon.	Sep. 24	Review of Exp and Log	Quiz #4
14	Wed.	Sep. 26	2.6	
15	Fri.	Sep. 28	Review of Trig functions	HW # 7 Due
16	Mon.	Oct. 1	2.7	Quiz #5
17	Wed.	Oct. 3	Review	
18	Fri.	Oct. 5	Exam 1	
	Mon.	Oct. 8		Holiday
19	Wed.	Oct. 10	3.1	
20	Fri.	Oct. 12	3.2	HW # 8 Due
21	Mon.	Oct. 15	3.3	Quiz #6
22	Wed.	Oct. 17	3.4	
23	Fri.	Oct. 19	3.5	HW # 9 Due
24	Mon.	Oct. 22		Quiz #7
25	Wed.	Oct. 24	4.1	
26	Fri.	Oct. 26	4.1 cont.	HW # 10 Due
27	Mon.	Oct. 29	4.2	Quiz #8
28	Wed.	Oct. 31	4.3	
29	Fri.	Nov. 2	4.3 cont.	Last day to withdraw. HW #11 Due
31	Mon.	Nov. 5	4.4	Quiz #9
30	Wed.	Nov. 7	4.5	
32	Fri.	Nov. 9	4.8 & 4.9	HW #12 Due
33	Mon.	Nov. 12	5.1	Quiz #10

Class	Day	Date	Sections	Comments
34	Wed.	Nov. 14	5.2	
35	Fri.	Nov. 16	Review	HW #13 Due
36	Mon.	Nov. 19	Exam 2	
	Wed.	Nov. 21		Holiday
	Fri.	Nov. 23		Holiday
37	Mon.	Nov. 26	5.3	
38	Wed.	Nov. 28	5.4	
39	Fri.	Nov. 30	5.6	HW #14 Due
40	Mon.	Dec. 3	5.7	Quiz #11
41	Wed.	Dec. 5		
42	Fri.	Dec. 7	Review	HW #15 Due
	THURS	Dec. 13	12 PM - 2 PM	FINAL EXAM