

Virginia State University
School of Engineering, Science, and Technology
Department of Mathematics and Computer Science
Course Syllabus: Math 200 – Calculus I
Spring 2009

Instructor Name:
Instructor Office:
Instructor phone number:
Instructor E-mail address: _____ [@vsu.edu](mailto:_____@vsu.edu)
Section:
Course Meeting Days, Time & Place:

Instructor's Scheduled Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday

Course Description:

Math 200 is the first course of four semester sequence of calculus for students majoring in mathematics, computer science, natural sciences, engineering, and for others who wish to learn and apply fundamental concepts of calculus.

The goal of this course is to introduce students to one of the two main branches of calculus¹, *differential calculus*. A major emphasis of the course consists of developing problem solving skills using differential calculus concepts and principles. The students will also construct proofs to a few selected theorems which involve a straightforward approach. The topics covered include: Review of functions and their graphs, limits and rate of change, continuity, derivatives, chain rule, implicit differentiation, higher derivatives, related rates, applications of differentiation: maximum and minimum values, The Mean Value Theorem, the first and second derivative tests, optimization problems.

Prerequisite: Math 121 – College Algebra and Trigonometry II

Textbook and Resources: *Calculus* by James Stewart, 6th Edition, 2008, Thomson Brooks/Cole, with Enhanced WebAssign.

Calculators: TI-83 or higher.

Computer Software: Matlab, Mathematica, and Maple can also be used.

Learning Outcomes and Evaluation Procedures

Knowledge

The student will

1. Know the relationship between graphic, numeric, and algebraic representation of a limit of function.
2. Define continuity of a function.

¹ The other branch of Calculus is Integral Calculus which we will cover in Math 201-Calculus II

3. Define the derivative of a function at a point x .
4. State the Intermediate Value Theorem.
5. Define differentiability on an open interval.
6. Define critical point for a function.
7. Define maxima and minima of a function.
8. Define horizontal and vertical asymptote.
9. State Rolle's Theorem and illustrate graphically.
10. State the Mean Value Theorem and illustrate graphically.

Skills

The student will

1. Calculate a limit of a given function.
2. Compute a limit using a graphing utility.
3. Determine limits of some algebraic and trigonometric functions.
4. Use the Intermediate Value Theorem to estimate the location of roots of continuous functions.
5. Compute the derivative (using the definition of derivative) of functions; linear (straight line), quadratic, square root, cubic, absolute value and piecewise defined functions.
6. Use a graphing utility to approximate a derivative.
7. Use the differentiation formulas to compute derivatives of algebraic, trigonometric, and transcendental functions.
8. Determine the derivative of composite functions using the chain rule.
9. Find the derivative of implicit functions.
10. Compute the equation of a tangent line by implicit differentiation.
11. Compute the higher derivatives of a function.
12. Solve related rates problems in applications of the derivative.
13. Use the first derivative test to determine the interval of increase and decrease.
14. Use the second derivative test to determine concavity of a function.
15. Solve applied maximum and minimum problems.

ABILITIES:

The student will be able to

1. Analyze the function graphically, numerically and algebraically.
2. Identify continuous and discontinuous functions using graphing techniques or the limit approach.
3. Find the derivative of a function.
4. Apply the derivative as a rate of change.
5. Use the derivative to determine the nature of the function (increasing, decreasing, and concavity)
6. Apply the Intermediate Value Theorem and Mean Value Theorem in some practical situations.

Course Requirements

1. Attend class regularly and on time, **coming late or leaving early should be avoided.**
2. **Eating and drinking are not permitted in the classroom.**
3. **Phones and pagers are to be turned off during class or put on vibration.**
4. Turn in written home assignments by the due date.
5. Purchase and read the required texts and related material.
6. Purchase and learn to effectively use a TI-X graphing calculator
7. Participate actively in class problem solving exercises.

8. Perform satisfactorily on examinations.
9. Students who are covered under the American Disability Act should privately inform the teacher of this fact so that appropriate instructional arrangements can be made.
10. All university policies specified in the Student Handbook regarding cheating, plagiarism, absenteeism, etc., will be strictly enforced. (See attached sheet on University Policies).

Grading Policy

Midterm Examination period: March 10-14
 Final Examination Period: May 6-9

Option I:

BEFORE MIDTERM	Pts.	AFTER MIDTERM	Pts.
Exams 1 and 2	150	Midterm Average	150
Scores from ESP Participation	100	Exams 3 and 4	150
Quizzes, HW, Others	50	Scores from ESP Participation	100
Midterm Exam	100	Quizzes, HW, Others	50
		Final Exam	150
Midterm Total	400	Final Total	600

Midterm Average – Your total Midterm points divided by 4.

Final Average – Your total Final points divided by 6.

Option II:

BEFORE MIDTERM		AFTER MIDTERM	
Exams 1 and 2	150	Midterm Average	150
Online HW Assign.	100	Exams 3 and 4	150
Quizzes, HW, Others	50	Online HW Assign.	100
Midterm Exam	100	Quizzes	50
		Final Exam	150
Midterm Total	400	Final Total	600

Midterm Average – Your total Midterm points divided by 4.

Final Average – Your total Final points divided by 6.

Standard Letter Grade

Percent	Grade	Percent	Grade
97%-100%	A+	77%-79.9%	C+
93%-96.9%	A	73%-76.9%	C
90%-92.9%	A-	70%-72.9%	C-
87%-89.9%	B+	67%-69.9%	D+
83%-86.9%	B	63%-66.9%	D
80%-82.9%	B-	60%-62.9%	D-
		0%-59.9%	F

Key dates of the university calendar

Monday Jan 26: Last day to add/drop a course

Wednesday Feb 11th: Assessment day

March 6th: Founder's day

Tuesday-Friday March 10-14: Midterm Examination period

Sunday-Sunday March 15-22: Spring break (No classes)

Monday-Friday March 23-April 17th: Early registration for Fall 2009

Friday March 27: Last day to withdraw from class(s) (grade registered as W)

Monday May 4th: University classes end

Tuesday May 5th: University reading day

Wed-Sat May 6-9: Final Exam period

BIBLIOGRAPHY/READING LIST

- 1) *CALCULUS AND ANALYTIC GEOMETRY*, Thomas, George G., Jr. and Finney, Ross L., 9th Edition, Addison Wesley Publishing Company, 1996.
- 2) *CALCULUS WITH ANALYTIC GEOMETRY*, Larson, Hostetler and Edwards, 5th Edition, D. C. Heath and Company, Lexington, MA 1994.
- 3) *CALCULUS*, Varberg, Dale and Puriell, Edwin J., 7th edition, Prentice hall, upper Saddle River, NY, 1997.
- 4) *CALCULUS*, Larson, Hostetler, Edwards, 7th edition, Houghton Mifflin.
- 5) *CALCULUS CONCEPT AND CONTEXTS*, 2nd edition, James Stewart, Brooks Cole
- 6) *CALCULUS*, Stewart, James, 3rd edition, Brooks Cole Publishing Company, Pacific Grove, California 1995.

Course Outline

(This outline is based on the 6th edition)

Date (Wk of)	Lecture Topics	Suggested practice exercises	Wk
	2.1 The velocity problems 2.2 The limit of a function 2.2 One-sided limit and infinite limits	3, 5, 7 5, 7, 9, 12, 15, 18, 21, 25, 27, 32	1
	2.3 Limit Laws, 2.3 Limit Laws & Squeeze Theorem	1, 3, 4, 9, 11, 13, 15, 17, 23, 25, 35, 37, 41, 47, 48	2
	2.5 Continuity, 2.5 Discontinuity, Intermediate Value Theorem	3, 9, 11, 13, 17, 19, 21, 27, 29, 33, 35 37, 39, 43(b), 47, 53	3
	Review or to finish Ch.2 Test I	Covers chapter 2	4
	3.1 The derivative & rate of change 3.2 The derivative as a function, functions fail to be differentiable and Higher Derivatives	3, 5, 7, 13, 15, 17, 18, 21, 25, 27, 31, 37 17-42(odd), 45	5
	3.3 Differentiation formulas 3.4 Derivative of trigonometric functions, Higher Derivatives	1-42(odd), 49,55-59(odd),62 , 63, 66, 71, 85, 90, 96 1-16(odd), 25, 30	6
	3.5 The Chain Rule Test II	1-55(odd), 59, 61, 65, 75 Covers 3.1-3.5	7
	3.6 Implicit differentiation Midterm Exam period (March 10-14)	1-20(odd), 23, 25, 27, 33, 35, 51 Covers 2.1--2.5 and 3.1-3.6	8
	Spring Break March 15-22	(No classes)	9
	3.7 Rate of change (Applications) 3.8 Related rates problems	1, 4, 7, 10 4, 5, 7, 9, 11, 13, 15, 21, 30, 41	10
	4.1 Absolute Max. and Min. & critical numbers 4.2 Rolle's Theorem & The Mean Value Theorem	5, 15-28(odd), 29-42(odd), 45-56(odd) 1, 3, 5, 11, 13, 15, 23, 25	11
	Test III 4.3 The First Derivative Test and Concavity	Covers 3.6--3.8, 4.1 5, 7, 11, 13, 15, 17, 18,	12
	4.3 The Second Derivative Test 4.4 Limits at infinity; Horizontal asymptotes	29-40(odd) 3, 7, 13, 14, 17, 23, 34,37	13
	4.5 Curve Sketching	9, 11, 15, 17	14
	Test IV 4.7 Optimization Problems Review for the final exam	Covers 4.2-4.5 3, 5, 9, 11, 13, 17, 31, 33, 50	15
W-Sat	May 6-9 Final Exam period	The final exam is a comprehensive exam covering chapters 2, 3 and 4.	16

Test date is subject to change.

Test I: The week of Feb 9th

Test II: The week of March 2nd

Test III: The week of April 6th

Test IV: The week of April 27th

The **MATH TUTORING LAB** is located in room 7S Hunter McDaniel Bldg (Basement)

“Homework Assignments/Outside class work with two options”

Students have to choose either option I or option II.

Option I-Emerging Scholar’s Program (ESP)

GOAL

Improve participants’ critical thinking, problem solving and teamwork skills.

EXPECTATIONS

- Active participation is **mandatory**
- No cell phone, Blackberry, I-pod, Sidekick, etc. use during ESP sessions.

LOCATION & TIME

Sessions are held Monday and Wednesday 3:30 PM- 5:00PM in room (TBA) Hunter-McDaniel (HM)

ESP SETUP

- Sessions will involve group activities in informal setting.
- There will be groups consisting of 4 students.
- During each session, the groups will be given a sheet containing about 5 problems (not directly related to Calculus 200 homework) to be discussed within each group and solved during the session.
- Faculty member and a Teaching Assistant will observe each group members’ participation and provide ideas that can facilitate solutions to assigned problems.
- The last 20 minutes of each session will be used for the presentation of problems by an assigned group. Each group member will participate in the presentation.
- Problems correctly completed will be tallied during the week. Each correct problem is worth 1 point. The total points from your ESP group will be added to your group’s average to determine the group with the highest average. That group will receive a prize at midterm and at the end of the semester.
- Points from ESP sessions will also be used in calculating the midterm and final average. In addition, there will extra points given towards the midterm and final grade average based on the following distribution of completing the online homework in WebAssign:

Points from online HW	Extra Credit points added to the midterm/Final grade
100-84	5 points
84-69	4 points
68-53	3 points
52-37	2 points
<=36	1 points

Option II- Online Assignments/Take-Home Homework Assignments/Recitations

Points from this option (homework assignments + online assignments) will be used in calculating the midterm and final average. In addition, there will be extra points given towards the midterm and final average based on the distribution in (3):

(1) Online homework assignments:

Students are required to do the online homework, see instructions below. There will be about 3 online homework assignments before the midterm and 4 after the midterm and each assignment will consist of 20 problems that students need to complete by the due date. No extension will be given.

Instructions on how to do these assignments are given below:

Instructions for online Homework

You will be using Enhanced WebAssign for online homework. To log-in, you will need to create your user name and password, please follow the following steps:

(1) go to <https://www.webassign.net/login.html>

(2) Click on “I have a class key”.

(3) Type the class key

--	--	--

and click submit.

(4) Click “Yes this is my class”.

(5) Choose “I need to create a WebAssign account” and click continue

(6) Fill out the log in information as follows:

- **Preferred Username:** first initial of your first name followed by the first 3

letters of your last name followed by the last 4 digits of your V #. (example: mtab1234)

-Your school is VSU.

- **Password:** choose a password you can remember and re-enter it again.

(7) Fill in the student information: your first name, last name, and your school e-mail address, students e-mail address format is (username@students.vsu.edu, example: mtab1234@students.vsu.edu), then click on “create my account”

(8) The next time you use the system, you need to click on log in and type your user name, your school (vsu), and your password.

The system does require an access code that comes bundled with a copy of a new textbook at the bookstore. You will be prompted for the code when you log-in. If you didn't buy a new textbook, you can purchase the access code on the website after you log-in or from the university bookstore (ask for enhanced web assign.).

There should be two codes bundled with a copy of a new book in the bookstore. The system gives you two weeks period to use the site without a code but after that you must have the code.

(2) Take-home Assignments/Quizzes

Students are also required to do the either take-home assignments or in class quizzes (ask your instructor).

(3) Recitation sessions(tutorial) Setup (for extra credit)

Students also need to attend at least one hour recitation session every week to obtain the extra points below:

Number of compet (1-hour) session of recitation	Extra Credit points added to the midterm/final average
20-24	5 points
15-19	4 points
10-14	3 points
5-9	2 points
3-4	1 points
<=2	0 points

LOCATION & TIME for the recitation session will be announced during the first three weeks of classes. See your instructor.