

MATH 191: Calculus & Analytic Geometry I (Fall 2007)

Class: MWF from 1:00 – 1:50 in Ambrose 002

Lab: Thursdays from 12:15 – 1:30 in Ambrose 224

Instructor: Brad Thiessen Office Hours: Ambrose 414: MWF 12-1, Thursday 11-12	Phone: 333-6160 E-mail: ThiessenBradleyA@ambrose.sau.edu
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Overview:

This course will introduce students to the fundamental concepts of calculus (limits, continuity, differentiation, analysis of graphs, and integration) and the applications of those concepts. Software packages used to solve problems and visualize concepts may be introduced throughout the course.

Required Materials:

Calculus of a Single Variable (8th ed.) by Anton (ISBN: 0-471-48274-9)
Binder or notebook for course notes and assignments
Graphing calculator (TI-82 or higher recommended)

Prerequisites:

Students enrolled in this course have successfully completed College Algebra (MATH 151), Trigonometry (MATH 152), Elementary Functions (MATH 171), and/or have received an appropriate score on the math placement test. Students are assumed to have facility with algebraic manipulations and some experience with graphing calculators. No previous knowledge of calculus concepts is assumed.

Note: We will begin the semester with a brief review of the prerequisite skills you'll need.

I will also provide students with a summary of trigonometric identities.

Outline of Major Topics:

- 1) Prerequisite Skill Review (functions, linear functions, trigonometry, graphing).
- 2) Limits (concepts, evaluating limits graphically and analytically)
- 3) Differentiation (tangent line problem; differentiation rules; the chain rule; implicit differentiation)
- 4) Applications of derivatives (related rates; extrema, increasing/decreasing functions, concavity, optimization)
- 5) Integration (area problem; rectangle approximation; antiderivatives; fundamental theorem of calculus)
- 6) Applications of Integration (area between curves; volume)
- 7) Exponential and logarithmic functions (differentiation, integration)

Course Procedures:

I will introduce new concepts via lecture. My lectures typically develop into question-and-answer sessions, so I expect students to actively participate in the lessons. Once we have an understanding of the concepts, I will guide students through examples of problems. Working together, we will learn important calculus concepts and apply those concepts to solve semi-real problems.

At times, I will have students work in small groups and present their solutions to the rest of the class. The purpose of this is not to embarrass you – I want you to gain experience solving problems and explaining your solutions. I encourage students to work together on difficult homework problems and share their notes. Just make sure you are able to solve problems individually before the exams.

Before each class period, I recommend you look over the corresponding section from your textbook. You'll get more out of each class period if you have a basic understanding of the day's topic. After class, you should solve all the assigned homework problems. The vast majority of the assigned homework problems are odds, so you can immediately check your answers in the back of the textbook. We will devote many of the Thursday lab sessions to answering homework questions (if you are unsure of an answer to an assigned problem) or to reviewing and applying the skills we've developed. We might also use the Thursday labs for quizzes or to introduce mathematical software packages.

Any quizzes I administer to you will be open-note and open-book. You will be allowed to use a graphing calculator and 1-2 pages of handwritten notes (but not the textbook) on exams. The exams will allow you to demonstrate your understanding of calculus concepts and your ability to apply those concepts to solve problems. The test questions will sample content we cover in class – if we spend lots of time on a topic, you can expect lots of test questions on that topic. We will have a review session before each exam.

Immediately following each exam, I will collect student homework portfolios. Students who complete all the assigned homework problems will receive credit. Students who do not complete the homework will not be penalized (although I have never seen a student successfully complete calculus without doing the homework).

Don't feel overwhelmed by this – the procedures will become routine within a couple of weeks. Just come prepared to class everyday by reading the textbook and completing the assigned homework. If you actively participate in class discussions and review your notes periodically, you should have success in this class.

Student Expectations:

- 1) Attend class. While I will not take attendance in class, your test performance will suffer if you are absent from class. If you must miss class, I'd appreciate it if you let me know in advance.
- 2) Actively participate in class discussions and complete the homework problems. If you actively participate in class (ask and answer questions), you will learn the material. Make sure you show all your work on the homework problems. This will help you during the exams.
- 3) Successfully complete all exams and classroom activities. All students will be required to complete all the classroom activities. You will be allowed to work with other students on these activities. Students will be allowed to use any hand-outs I provide and one page of written notes on the exams. Students absent on the day of an exam must notify me prior to the scheduled date in order to avoid penalty.
- 4) Take responsibility for their learning. Students are encouraged to work collaboratively on assigned problems, participate in class discussions (ask questions!), and seek assistance if needed. The best way to contact me outside of my posted office hours is via e-mail. Feel free to stop by my office for assistance.

Student Evaluation:

Each unit will have the following grading components:

	Traditional	No Homework
Unit Exam	65%	80%
Classroom Activities & Quizzes	20%	20%
Homework Portfolios (solutions and work shown)	15%	--

* I will give you all multiple opportunities to solve problems in class. You won't have to compete for these points.

You should expect the following grading scale:

90 -- 100%	A
80 -- 89%	B
70 -- 79%	C
60 -- 69%	D
0 -- 59%	F

The actual grading scale used to assign grades will depend on the exams I create for each unit (if I write more difficult tests, the grading scale **may** drop a bit)

Plagiarism:

Don't cheat. You can work with other students on the homework, but the exams should only represent your level of understanding. Review the Policy on Academic Dishonesty in the University Catalog.

Accommodations:

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Office of Services for Students with Disabilities at 333-6275 as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

Monday		Wednesday		Friday	
8/27	Introductions Syllabus & Course Overview • Purchase course materials • Skim sections 1.1- 1.5	8/29	Prerequisite Skills Day • 1.1: 1, 9, 13, 19, 27 • 1.3: 35, 39, 41, 53, 55 • 1.4: 1 • 1.5: 1, 11, 19	8/31	Finish review of prerequisites Linear, Polynomial, Rational Functions • In-class: Section 1.1: 29a • Read 2.1, 2.4
9/3	Labor Day – No Class	9/5	Evaluating Limits (Tables & Graphs) Definition & concept of limits • 2.1: 1, 3, 5, 9, 11, 13, 22a • Read 2.2, 2.3	9/7	Evaluating Limits (Analytically) Infinite Limits • 2.2: 3-29 odd • 2.3: 1, 3, 9, 11, 13, 15, 19, 21 • Read 2.5
9/10	Limits & Continuity • 2.5: 11, 13, 17, 23, 27, 29	9/12	Catch-up Day Finish all assigned homework Limits Quiz or Group Activity • Read 3.1, 3.2	9/14	Derivatives & Tangent Line Problem • 3.1: 13, 15 • 3.2: 9, 11, 15, 17, 23 • Read 3.3 – 3.5
9/17	Differentiation Rules • 3.3: 1-15 odd • 3.4: 3-15 odd, 39 • 3.5: 1-15 odd	9/19	Finish 3.3 – 3.5 homework Solve 3.5: 31 and 33 in-class Review trigonometry as needed • Read 3.6	9/21	Derivatives, Change, & Chain Rule • Create derivative rules sheet • 3.6: 7, 11, 15, 17, 21, 31, 43 • Read 3.7
9/24	Lab: Don't Jump! Implicit Differentiation • 3.7: 11, 13 • Practice chain rule	9/26	Review for Unit #1 Exam Finish all assigned homework Review objectives for Unit #1	9/28	Unit #1 Test (TF, MC, Apps) Portfolios Due • Read 3.8
10/1	Peanut (the cat), Goofus & Gallant, Bigfoot, and Wine Barrel Problems (Related Rates) • 3.8: Problems selected in-class • 3.5: 31, 33	10/3	Review solutions to Related Rates problems	10/5	Quiz: Related Rates • Read 4.1, 4.2
10/8	Review Exam Results Graphing Derivatives Activity • 4.1: 1, 3, 7, 13, 29 • 4.2: 1, 3, 7, 9 • Read 4.4	10/10	Lab: Concavity/2 nd Derivative Test • 4.4: 7, 11, 21 • Read 4.7	10/12	Rolle's & Mean Value Theorems First Derivative Test (Wiggle Graph) • 4.7: 1, 5, 7, 11 • Read 4.5
10/15	Optimization Groups solve track & pigpen problems	10/17	Lab: Optimization Solve section 4.5 problems in-class • 4.5: 1, 3, 9, 17, 29 • Read 4.6	10/19	Midterm Break – No Class
10/22	Present solutions to 4.5 problems Newton's Method • Catch up on homework • Review your notes	10/24	Review for exam #2	10/26	Unit #2 Test Portfolios Due • Read 5.1, 5.2
10/29	Antiderivatives Indefinite Integration • 5.2: 9-25 odd, 55 • Read 5.4	10/31	Area Approximations Riemann Sums • 5.4: 1, 39, 45 • Read 5.5, 5.6	11/2	Definite Integrals – Goat Fable Fundamental Theorem of Calculus • 5.5: 11, 13 • 5.6: 3, 5, 7 • Read 5.3, 5.8
11/5	Integration by Substitution • 5.3: 1, 3, 7-23 odd • 5.8: 21, 25	11/7	Catch-up day Answer all homework questions • Read 6.1	11/9	Area between curves (Group work) • 6.1: 7, 9, 11, 13 • Read 6.2
11/12	Volume: Disk & Washer methods • 6.2: 1, 3, 7, 9, 11, 15 • Read 6.3	11/14	Catch-up day Finish all assigned problems Answer all homework questions Review for exam	11/16	Unit #3 Test Portfolios Due • Read 7.1
11/19	Review exam results Exponential & logarithmic functions • Solve selected problems in-class • Read 7.2	11/21	Thanksgiving Break – No Class	11/23	Thanksgiving Break – No Class
11/26	Derivatives of natural logs & exp. • Complete Hand-out exercises	11/28	Integrating natural logs and exp. In-class group work • Complete Hand-out exercises	11/30	Applications of Exp/Log functions • Complete Hand-out exercises • Read 9.1
12/3	Differential Equations: Growth/Decay • Complete Hand-out exercises • Read 7.7	12/5	Inverse Trig Function Derivatives & Integrals • 7.7: 17-29 odd, 43-51 odd	12/7	Review for final exam

Final Exam: _____

4/10/2007