Syllabus

Course. Calculus I, Math 2413, Section 101, Fall 2009, MW1:30–3:10, Bullock Hall 104.

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Office. Canseco Hall, 313C. Phone: (956) 326-2570. Hours: M10–11, T2:30–4, W11–12, R9:30–11, F10–11, or by appointment.

Course description. Limits, continuity, differentiation, applications to optimization; integration and the Fundamental Theorem of Calculus. Prerequisite: One or more of an ACT Mathematics score of 29 or above, an SAT Mathematics score of 660 or above, a COMPASS score of College Algebra 60 or above and Trigonometry 51 or above, MATH 1316, or MATH 2412.

Student learning outcomes. Upon successful completion of this course, the student will be able to:

- recognize the basic concepts of certain mathematical models and functions and their representation;
- find limits of functions and use limits theorems. Transform indeterminate form limits and apply L'Hopital's rule to evaluate indeterminate limits. Determine continuity of functions;
- differentiate and sketch graphs of various functions such as: polynomial and rational functions, trigonometric functions, exponential functions and logarithmic functions;
- apply derivation rules and theorems such as the chain rule to find derivatives of sums, products, quotients, and compositions of functions, and use the derivative to solving extrema problems;
- interpret integration geometrically and apply techniques of integration.

Textbook. *Calculus: Early Transcendentals.* Sixth edition. James Stewart. Brooks Cole. ISBN-10: 0-495-01166-5, ISBN-13: 978-0-495-01166-8.

Homework. There will be homework each week, unless there is an exam coming up. Some homework assignments will be submitted electronically (through ANGEL). The electronic homework problems will generally be multiple choice or ask for numerical answers. The other homework assignments are for you to complete on paper. For paper assignments and for paper exam problems, your submitted solutions should include final answers and an organized presentation of the nontrivial steps you used to reach those answers. If you get the right answer but use a wrong step to get there, you probably won't receive full credit. Also, it's a good idea to initially solve problems on scratch paper and then write

up more organized solutions. Finally, if you're not sure whether a step is trivial enough that you don't need to write it down in your submitted solution, ask yourself these questions. 1) Does the professor usually skip this kind of step in his lectures? 2) Was this step easy enough to do in my head, or did I need to write some things down?

In summary, **show your work and show it neatly.**

Calculators. Calculators and/or computers may be used for homework assignments. Some homework questions will require numerical answers that are very difficult to compute by hand. However, such questions will not appear on the midterm or final exams. For these exams, calculators are not required and are *not permitted.*

Exams. There will be two midterm exams and a final exam. The final exam will be comprehensive.

- Midterm I, in class, September 28.
- Midterm II, in class, November 4.
- Final Exam, December 7, 11AM.

Grading. Components: Homework 20%; Midterm I 25%; Midterm II 25%; Final Exam 30%. Final letter grade, given a final score of x%: A: $x \geq 90$; B: $80 \leq x < 90$ C: $70 \leq x < 80$; D: $60 \leq x < 70$; F: $x < 60$.

Make-ups. There are no make-ups for missed work, except by situations covered by university rules.

Approximate Schedule of Topics

Date	HW Due	Topics
24-Aug		syllabus and pre-calculus review
26-Aug		limits: informal definition, limit laws, examples
31-Aug	1	ε and δ
2-Sep		limits involving ∞; sign tables
7-Sep	2	continuity; definition of derivative
9-Sep		tangents, velocity; derivative as a function
14-Sep		derivatives of polynomials, exponentials, logarithms
16-Sep	3	product and, quotient rules; trigonometric derivatives
21-Sep		chain rule
23-Sep		implicit differentiation; review
24-Sep	4	(not a class day)
28-Sep		Midterm I
30-Sep		exponential growth; linear approximation; related rates
5-Oct		related rates
7-Oct	5	discussion of Midterm I
12-Oct		Mean Value Theorem, L'Hospital's Rule
14-Oct	6	Extrema
19-Oct	7	optimization
21-Oct		curve sketching
26-Oct	8	curve sketching
28-Oct		antiderivatives
2-Nov	9	review
4-Nov		Midterm II
9-Nov		areas; integrals
11-Nov	10	discussion of Midterm II;
16-Nov		Fundamental Theorem of Calculus
18-Nov	11	substitution
23-Nov		areas between curves
30-Nov		review
2-Dec	12	review