Text: "Calculus for Business, Economics, and the Social and Life Sciences (Brief)", 11th edition, by Hoffmann, Bradley, Sobecki, Price

Technology: If you require a graphing calculator, use it and recommend a TI-84, TI-83 Plus or TI-83. If you do not allow the use of a calculator, be prepared to a) not use one yourself (lest ye be accused of hypocrisy) and b) write exams so that the simplification of arithmetically complex problems does not overshadow the actual concept they are being tested on.

Calculators like the TI-89, TI-92 and some Casio calculators (e.g. Casio FX-115ES and FX-991ES) can do differentiation and integration. The Casio calculators are not "graphing calculators", so simply banning any calculators that graph is insufficient. You may need to be *very specific* about your calculator policy if you want to limit this kind of assistance on exams.

Course Goals: A student successfully completing the course should, in general, have a foundation in non-trigonometric differential calculus and be able to succeed in a non-trigonometric integral calculus course. The student can model the mathematical topics described among the learning outcomes in words, then solve or simplify the relevant equations and/or expressions, and finally write a summary statement of the solution. In short, all of the learning outcomes should be incorporated with skill at mathematical modeling.

Learning Outcomes: A successful student can...

- use supply, demand, revenue, cost, and profit terminology in constructing and evaluating functions
- graph linear and quadratic functions, with the assistance of technology at instructor discretion
- construct linear and non-linear function models from written descriptions
- find one-sided and two-sided limits using numerical, algebraic, and graphical strategies
- identify continuity of a function given as a formula or graph
- use the definition to find the derivative of a function as a formula or at a point
- find the equation of a tangent line to a function at a point
- interpret the derivative as a rate of change
- compute derivatives using short cut rules including power, product, quotient, and chain rules
- find instantaneous rates of change for polynomial, rational, exponential, and logarithmic functions
- compute and interpret the second derivative
- compute relative and percentage rates of change in a function at a point
- use marginal analysis to describe changes in a function with the derivative
- identify intervals of increase, decrease, concave up, concave down, as well as the location of critical and inflection points for a function

Most importantly, the student can model the mathematical topics described among the learning outcomes in words, then solve or simplify the relevant equations and/or expressions, and finally write a summary statement of the solution.

Week	Sections to Cover	Notes	
1	1.1, 1.2, 1.3, 1.4, 1.5, 1.6	1.1 - 1.4 (1.5 hrs):	These should be review
		1.5, 1.6 (1.5 hrs):	These are likely new, so dedicate more time than to the rest of the chapter
2	2.1, 2.2	2.1 (1.5 hrs):	A more complete discussion of increasing/decreasing behavior takes place in Chapter 3, for the time being, noting that $f' > 0$ implies increasing and $f' < 0$ implies decreasing should be sufficient
		2.2 (1.5 hrs):	As much as possible, approach the rules using differentiation examples; make sure they get exposure to (and explanation of) the f' as well as $\frac{dy}{dx}$ notations.
3	2.3, 2.4	2.3 (1.5 hrs):	Try to develop practice with modeling products (e.g. given $p(t_0)$, $p'(t_0)$, $q(t_0)$ and $q'(t_0)$, find $R'(t_0)$); remember that without knowing chain rule, there is limited motivation for product rule, stress that you will return to this topic after section 2.4
		2.4 (2 hrs):	Chain rule is often very difficult for them to process in part because they never really learned what composition was
		Holiday (Winter):	Martin Luther King Jr. Day Monday
4	2.5, 2.6	2.5 (1.5 hrs):	This is one of the best chances to relate calculus to 200-level economics classes, take the opportunity to make the connections
		2.6 (1.5 hrs):	Related rates are a notoriously difficult subject, but there are some very interesting applications to explore; implicit differentiation is their least favorite topic of the entire quarter
5	3.1, 3.2	3.1 (1.5 hrs)	This chapter is the point at which the decision around graphing calculators becomes particularly important: how much can they work through on their calculators and use on homework and exams? Also, relative extrema are defined here, but absolute extrema not until 3.4
		3.2 (1.5 hrs)	
6	3.3, 3.4	3.3 (2 hrs)	Asking for intercepts, asymptotes, increase/decrease, concave up/down, extrema, and inflections points makes these examples each take a very long time to do thoroughly
		3.4 (2 hrs)	Elasticity is an interesting application, and another tie-in with economics
7	3.4, 3.5	3.5 (0-1 hr)	If you are behind at this point, spending little to no time on this section is okay
8	4.1, 4.2, 4.3	4.1, 4.2 (1.5 hrs)	These sections should be review, but many students will not have good facility with logarithms
		4.3 (1.5 hrs)	

9	4.4	4.4 (3 hrs)	The section includes exponential models with and without differentiation, which provides a good test of whether a student is simply blindly taking the derivative of everything and ignoring the question (spoiler: they are)
		Holiday (Fall):	Thanksgiving holiday Thursday/Friday
10	Review, Catch Up		
11	Final Exam	(`http://registrar.uoregon.edu/calendars/final_exam?schedule=2014-2015`)	

Additional Notes:

- The typical consumer of this course is a pre-business major satisfying their mathematics requirement. They will need 241, 242, and 243 completed for a grade in order to apply to the business school. More than any other math class, these students can be resentful of the need to take the course. There are also a sizable number of economics students who take this class instead of 251.
- Common areas of difficulty: Basic algebra (factoring, simplifying and operations on fractions), chain rule, implicit differentiation, logarithms, applications of any sort, modeling mathematically in particular. Be conscious of these facts when you approach each topic so that you can be ready for the confused looks, frustrated sighs, and eye rolling. Combat them with detailed examples and ample opportunities for practice. Basic algebra review is most effective when integrated into new concepts, so do it on an as-needed basis. Students complain about the abstract problems because they arent relatable. Students complain about word problems because theyre hard. Its a difficult situation to win, but a responsible math class for predominantly non-majors involves both abstract mathematics and applications.
- Word problems should be a key feature of the course. Consider introducing new topics in a non-mathematical context (there is lots of evidence that this helps students learn the material to begin with, but also to retain it longer). E.g. A function from the perspective of a machine like a wood-chipper or microwave oven; exponential functions from the notion of the thickness of paper after n foldings, and so on.
- Mike has lecture guides, worksheets, quizzes, exams, practice packets, and links to screen capture lecture videos available upon request.

Other Important Dates (`http://registrar.uoregon.edu/calendars/academic?ts=Fall-2014`):

Monday of 2nd week Last day to drop without a W (but only 75% tuition refund)
Wednesday of 2nd week Last day to add a class
Sunday after 7th week Last day to drop — period!