

Text: *Calculus for Business, Economics, the Social and Life Sciences, Brief, 11th edition*, by Hoffmann, Bradley, Sobecki and 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.

If you're open to it, free and/or browser-based programs like Wolfram | Alpha can be of tremendous use to you and to students.

Course Goals: A student successfully completing the course should, in a general sense, have...

- ✓ the tools necessary to succeed in an integral and multivariable calculus course with a focus in business and economics
- ✓ facility modeling 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

WEEK	SECTIONS TO COVER	NOTES
1	1.1, 1.2, 1.3, 1.4	1.1 – 1.4 (3 hrs) These students have met the college algebra prerequisite, so while this material may require review, in theory they have been exposed to, and tested, on it at a college level <i>Readiness Quiz optional</i>
2	1.5, 1.6	1.5, 1.6 (2-3 hrs) Limits are the foundation of calculus, yes, but try to avoid spending too much time here; Hal is found of saying like “if Newton could invent calculus with only a rudimentary understanding of limits, our students can probably learn calculus without a rigorous foundation”

3	2.1, 2.2	2.1	(2 hrs) Try to resist the temptation to give very involved derivative definition calculations, that's what the shortcut rules are for
		2.2	(1 hr)

(Winter) *Martin Luther King Jr. Day Monday*

4	2.3, 2.4, 2.5	2.3 – 2.4	(2 hrs)
		2.5	(1 hr) Not typically covered in engineering calculus, this is critical to bridge the gap between the discrete economics/business world and calculus on an uncountable domain

5	2.6	2.6	(2 hrs) Related rate models of the form “find rate of change in demand over time” can be a nice combination of challenging and applied
	<i>Review for Midterm Midterm 1</i>		1 st midterm (Chapters 1, 2 exam)

6	3.1, 3.2	3.1 – 3.2	(3 hrs)
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7	3.3, 3.4	3.3	(1 hr) Your calculator policy will affect how much effort students put into learning to sketch by hand
		3.4	(2 hrs) The only mathematical new topic is <i>absolute</i> extrema, but price elasticity and other applications are interesting

Have updated grades available by Sunday before the drop deadline

8	3.5, 4.1	3.5	(2 hr) Focus on applications that pertain to business and economics, or to social science
		4.1	(1 hr) Like 1.1, students in theory have exposure to exponential functions already; focus on applications and interpreting results

If teaching a non-large-lecture, Midterm II

9	4.2, 4.3, 4.4	4.2	(1 hr) Focus on using logarithms to solve equations
		4.3	(2 hr) Logarithmic differentiation is of debatable use, given the time

required to implement it

(Fall) *Thanksgiving holiday Thursday/Friday.*

10	4.4	4.4	(1-2 hrs) Most of the applications in the section are not business/economics-related
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This week is most responsibly dedicated to (1) finishing up content if necessary, and then (2) in-class individual or small-group review with students. Consider also reviewing 111 material in anticipation of students taking Math 251, in which algebra is key.

Catch-up, review

(Spring) *Memorial Day holiday Monday*

11 Final exam during scheduled time

(http://registrar.uoregon.edu/calendars/final_exam?schedule=2013-2014)

Additional Notes

- It is extremely important that the students know that Math 241 is a pre-business course. It is designed for students who have an understanding of college algebra content that is to be built upon in order to prepare them for integral and multivariable calculus in Math 242. Not all students fit this description, but nevertheless it is the assumption.
- Common areas of difficulty: Basic algebra (factoring, simplifying and operations on fractions, solving equations) and applications of any sort. 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.
- There are no sections listed as optional – it is your responsibility to your students to cover the material listed! To further that end, please use this syllabus when preparing your class lecture schedule, and keep it to refer to during the term. Ask if you have questions!
- Mike has lecture guides and worksheets, quizzes, exams, practice packets, and additional word problems available upon request.

Other Important Dates (<http://registrar.uoregon.edu/calendars/academic#fall2013>):

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