

ORIGINAL COURSE IMPLEMENTATION DATE:

REVISED COURSE IMPLEMENTATION DATE:

September 2010 September 2018

COURSE TO BE REVIEWED: (six years after UEC approval)

January 2020

Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Full Title: Calculus for Business Course Short Title (if title exceeds 30 characters): Faculty: Faculty of Science Calendar Description: Functions used in business, economics, and social science are analyzed, using techniques of single-variable differential and integral calculus, and the applications of these results are interpreted. Topics include optimization, curvature analysis, related rates, marginal analysis, linear approximation, and approximation of total change and average value by antidiferentiation and the Fundamental Theorem of Calculus. Note: Students with credit for MATH 111 curvature take this course for further credit. Prerequisites (or NONE): One of the following: (C+ or better in one of Foundations of Mathematics 12, Precalculus 12, Anath 1903 and 985) or (C or better in one of MATH 1993 or MATH 140) or (a score of 17725 or better on Parts A and 8 combined). Note: As of January 2019, prerequisites will change to: One of the following: (C+ or better in one of MATH 1993 and 985) or (C or better in both MATH 1994 and 985) or (C or better in both MATH 1995 or MATH 110) or (C+ or better in one of Phinciples of Mathematics 12, Pre-calculus 12, MATH 1996, or MATH 110) or (C+ or better in both MATH 1994 and 985) or (C or better in Part 1 MATH 1995 or MATH 110) or (C+ or better in both MATH 1995 and 985) or (C or better in both MATH 1995 or MATH 140) or (a score of 17725 or better on Parts A and B combined). **Corequisites (if applicable, or NONE):** Corequisites (if applicable, or NONE):** NONE	Course Code and Number: MATH 141			Number of Credits: 3 Course credit policy (105)				
Paculty: Faculty of Science Department (or program if no department): Mathematics and Statistics	Course Full Title: Calculus for Business							
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	Campus-Wide Consultation (CWC)					Date of posting:	October 13, 2017	
Undergraduate Education Committee (UEC) approval Date of meeting: October 27, 2017	Dean/Associate VP: Lucy Lee					Date approved:	September 8, 2017	
	Undergraduate Education Committee (UEC) approval					Date of meeting:	October 27, 2017	

Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1. Compute asymptotic limits and limiting difference quotients of simple functions numerically
- 2. Estimate tangent slopes graphically and estimate instantaneous rates of change numerically
- 3. Translate between tangent slope, instantaneous rate of change, and derivative notation
- 4. Describe derivative functions graphically, numerically, and algebraically
- 5. Apply techniques of differentiation (including product, quotient and chain rules) to compute the derivatives of functions built from polynomial, exponential, and logarithmic expressions
- 6. Apply derivatives to approximate function values and solve applied problems in optimization, related rates, and marginal analysis
- 7. Compute antiderivatives of basic functions
- 8. Use definite integrals to compute area under a curve, total change, and average value; both algebraically and with the aid of technology
- 9. Interpret all results in the field of interest from which the model being analyzed arose

Prior Learning Assessment and Recognition (PLAR)						
	☐ No, PLAR cannot be	awarded for this course	because			
Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)						
Students will learn to use graphing calculators as a tool for plotting and analyzing functions						
Grading system: Letter Grades: ☑ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☐						
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NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials							
	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year		
1.	Bittinger et al	Calculus and its Applications, 2 nd custom ed. for UFV		Pearson	2016		
2.							
3.							
D-	Described Additional Complice and Materials (afterns bankers tasks and the distributed)						

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Texas Instruments graphing calculator (TI-83, TI-83Plus, TI-84, TI-85, or TI-86) is required.

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	15%	Midterm exam:	%	Practicum:	%
Quizzes/tests:	45%	Lab work:	%	Field experience:	%	Shop work:	%
Other:	%	Other:	%	Other:	%	Total:	100%

Details (if necessary): Students must obtain at least 40% on the final exam to pass the course, regardless of term grades.

Typical Course Content and Topics

- 1. Limits, continuity, differentiability:
 - (a) Examining asymptotic limits, graphically and numerically
 - (b) Numerically estimating limiting difference quotients
- 2. The derivative:
 - (a) The numerical derivative as a tangent slope and as an instantaneous rate of change
 - (b) Derivative functions
 - (c) Using the graph of a function to graph its derivative
- 3. Techniques of differentiation:
 - (a) Constant, constant multiple, sum and difference rules
 - (b) Product and quotient rules
 - (c) The chain rule
 - (d) Second-order derivatives
- 4. Applications of differentiation:
 - (a) Optimization
 - (b) Marginal analysis
 - (c) Curvature and inflection points
 - (d) Linear approximation of change
 - (e) Related rates
- 5. Integration:
 - (a) The definite integral and its connection to area and total change.
 - (b) Accumulation functions
 - (c) The Fundamental Theorem of Calculus
 - (d) Average value of a function