MTH 141 Introductory Calculus – Fall 2015

Instructor:
Section/Meets:
Office Hrs:

Textbook: Calculus: Single Variable, by Hughes-Hallet et al, **6th ed.**, Wiley.
Also needed: access code to WileyPlus (included in new books)
Calculator: Not required, and not allowed in tests
Prerequisite Precalculus MTH111 with C-, or passing a URI placement exam

About the course The language of science is mathematics, and calculus is an indispensable part of everyday calculations used in science, technology, engineering, mathematics, and other fields. MTH 141 is the first calculus course for students in these areas. This course will make precise and deepen your understanding of fundamental concepts such as *change*, *limit*, and *rate*. You will apply differential calculus to problems in the physical and biological sciences involving *optimization*, *motion*, and *growth*. You will also receive an introduction to integral calculus, which will be further developed in subsequent courses. At the end of the semester you will be able to calculate with and apply differential calculus concepts and methods, including limits, continuity, derivatives, optimization, integration as a limit of sums, and the Fundamental Theorem of Calculus. In addition, you will have an understanding of mathematical modeling concepts and numerical issues

Evaluation

Three exams @ 13.33% each	= 40.0 %	(Oct 6, Nov 3, Dec 1)
WILEYPLUS Homework	= 7.5 %	
Mathematica Homework	= 7.5 %	
Class work	= 15.0 %	
Final exam	= 30.0 %	
TOTAL	= 100.0 %	

Letter grades:

A (92% - 100%)	A- (90% - 91%)	B+ (87% - 89%)	B (82% - 86%)	B- (80% - 81%)	C+ (77% - 79%)
C (72% - 76%)	C- (70% - 71%)	D+ (67% - 69%)	D (60% - 66%)	F (0% - 59%)	

a. Calculators are not allowed in all major tests. Exams are common to all sections, and given in the evening, outside normal class time.
b. WileyPlus is a computer homework system. The system will record your answers and keep track of your WileyPlus homework grades.
c. Mathematica is a computer algebra system. URI students can download and install the Mathematica software on their personal computers. Mathematica is installed on campus labs. *Mathematica assignments are to be submitted electronically to SAKAI, by using the Assignment tool.* The Mathematica software will be demonstrated in class by your instructor.
d. Class Work: To be explained in class.

e. The Final Exam is cumulative. The date and time will be announced later in the semester.

Learning Outcomes At the end of the course the student should be able to:

1. (Limits and continuity) Evaluate limits analytically, graphically, and numerically, and use limits to investigate properties of functions such as continuity and existence of asymptotes. Investigate continuity properties of functions.
2. (Derivatives) Define and evaluate the derivative at a point as a limit using limits, numerical, graphical methods. Investigate differentiability of a function at a point using limits, numerical, or graphical methods.
3. (Computing derivatives algebraically) Compute first and higher order derivatives algebraically by applying theorems. Compute derivatives of functions defined implicitly.
4. (Using Derivatives) Apply differentiation to investigate velocity, acceleration, related rates, monotonicity, optimization problems, linear approximation, limits (L'Hopital's rule), and functions defined parametrically. Apply theorems about continuous and differentiable functions (Extreme Value Theorem, Mean Value Theorem, Rolle's Theorem, the Racetrack Principle).
5. (Integration) Use Riemann sums to approximate integrals. Use the First and Second Fundamental Theorem of Calculus to compute integrals of simple functions, and apply them to total change. Use integrals to compute area of planar regions bounded by simple functions.
6. (Modeling, Approximation, Technology use) Use calculus and technology to investigate mathematical models and determine their applicability. Use technology to study accuracy of approximations, perform numerical and symbolic calculations, and produce graphical representations of functions to investigate their properties.

Special Needs Any student with a documented disability is welcome to contact the instructor as early in the semester as possible so that reasonable accommodations may be arranged (contact Disability Services for Students Office at 330 Memorial Union 401-874-2098).

Expectations

1. You are expected to attend every lecture, and to submit your work on time.
2. It is your responsibility to communicate clearly in writing up solutions for homework, quizzes, and exams. Your results must display your understanding well and be written in a correct, complete, coherent, and well organized fashion. The rules of language still apply in mathematics, and they apply even when symbols are used in formulas, equations, etc. Precise communication and neatness count!
3. The rapid pace of the class requires that you spend time every day doing homework, reviewing notes, reading the textbook, and working out extra problems, all in addition to the time spent in class.

Detailed information on the following topics below can be found in the website of the course www.math.uri.edu/~merino/fall15/mth141/more

Illness Due to Flu
Academic Honesty
Incomplete Grade
Getting started with WileyPlus
Tutoring help: The ACADEMIC ENHANCEMENT CENTER
Standards of Behavior
Religious holidays
Expectations
Grading disagreements.
Major Test Makeup Policy
Tests Policy
Electronic Devices
In class
Late Work Policy
Tardiness, leaving early

Are you planning to take MTH 142 soon? Recall that a MTH142 pre-req. is C- or better grade in MTH141

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MTH 141 Fall 2015 - Calendar

The following calendar gives a timetable for the course. Your class may be slightly behind or ahead at any given time. Some of the problems may be done in class, others as homework. Your instructor will be more specific. You should work out all the problems given below. NOTE: notation like "3-9" means that all problems from 3 to 9 are to be done. Textbook: Calculus: Single Variable, by Hughes-Hallet et al, **6th ed.**, Wiley.

Week	Dates	Sections/Events/Exams	Problems (*) = requires technology
1	Sept. 9 | Sept. 11	***First Day of Class Wed. Sept. 9*** (1.1) Functions and Change (1.2) Exponential Functions	 (1.1) 1,6,9,12,16*,17,21,26,37,40,43,44*,51,55 (1.2) 5-14,22*,23,30*,35*,37,38
2	Sept. 14 | Sept. 18	(1.3) New Functions From Old (1.4) Logarithmic Functions (1.5) Trigonometric Functions (1.6) Powers, Polynomials, and Rational Functions	(1.3) 1,2,3,8,11,13,15,23,24,28-31,36,37,,55 (1.4) 3,7-13,19,20,25,29,30,32*,33*,40*,50* (1.5) 14-19,22-23,27,30,33,39,41,43,44,51 (1.6) 3-10,19-22,36-38,45*,46*
3	Sept. 21 | Sept. 25	(1.7) Introduction to Continuity (1.8) Limits (2.1) How do we measure speed?	(1.7) 2-7,19-21,24-25,27,32,37 (1.8) 1-3,7-9,12-15,19*,23*,25*,29,31,54-62,64-67 (2.1) 1,3-5,8,9*,14-17,21,23,24*,25-28
4	Sept. 28 | Oct. 2	(2.2) The Derivative at a Point (2.3) The Derivative Function (2.4) Interpretations of the Derivative	(2.2) 1,4,10-13,17*,26*,35-38,41-50 (2.3) 1,3,7,9,11,13,15,16,19,21,28,29,31,33,43 (2.4) 1-4,6,9,11,12,18,21
5	Oct. 5 | Oct. 9	***EXAM 1 6:30pm-8.00pm Tues. Oct 6, Chafee 271*** (2.5) The Second Derivative (2.6) Differentiability	 (2.5) 2-4,8-13,16,18-23,28-31 (2.6) 1-4,6*,9,12,16
6	Oct. 12 | Oct. 16	(3.1) Powers and Polynomials (3.2) The Exponential Function (3.3) The Product and Quotient Rules	(3.1) 6-47odd,50-55-59,60,63,70,71 (3.2) 1-25odd,40,41 (3.3) 3-29odd,31,32,39-42,45,52,53
7	Oct. 19 | Oct. 23	(3.4) The Chain Rule (3.5) The Trigonometric Functions (3.6) The Chain Rule and Inverse Functions	(3.4) 1-55 odd, 57,58,61,62,67,76ab,77 (3.5) 10,11,18,21,27-30,38,42,62 (3.6) 1-8,21-28,43,57-59,63,65
8	Oct. 26 | Oct. 24	(3.7) Implicit Functions (3.8) Hyperbolic Functions (3.9) Linear Approximation and the Derivative	(3.7) 1-20odd,26-30,31-33,37 (3.8) 1-11,30 (3.9) 1-7,10,11*,13*,14,20-22,30,31,36,38,39
9	Nov. 2 | Nov 6	***EXAM 2 6:30pm-8.00pm Tue. Nov 3, Chafee 271*** (3.10) Theorems about Differentiable Functions (4.1) Using First and Second Derivatives	 (3.10) TBA (4.1) 1,4-14,16-19,28-29,33,38-40
10	Nov. 9 | Nov. 13	Wed. Nov. 11 Classes do not meet -Veteran's Day (4.2) Optimization (4.3) Optimization and Modeling	 (4.2) 1-25odd,27,28,29*,36 (4.3) 1-9 odd, 17, 20-21, 28-30
11	Nov. 16 | Nov. 20	(4.6) Rates and Related Rates (4.7) L'Hopital's Rule, Growth, and Dominance (5.1) How Do We Measure Distance Traveled?	(4.6) 1,2,5,7,11,12,16-19,25-29,33,44 (4.7) 1-8, 16-18, 25-41 odd, 48,49 (5.1) 1-4, 6-12,13,15,17-18,24-25,27
12	Nov. 23 | Nov. 27	(5.2) The Definite Integral (5.3) The Fundamental Theorem and Interpretations ***(No classes Thanksgiving Break Nov. 26 – Nov. 29***	(5.2) 3-4,11-17,19, 22*-28*, 31,32 (5.3) 3-7,9-12,21,31,42 (5.3) 3-7,9-12,21,31,42
13	Nov. 30 | Dec. 4	***EXAM 3 6:30pm-8.00pm Tue. Dec. 1 , Chafee 271*** (5.4) Theorems About Definite Integrals (6.1) Antiderivatives Graphically and Numerically	 (5.4) 2-12,13*-17*,21,24,27-30 (6.1) 2-9,13-14,17,19,23,25
14	Dec. 7 | Dec. 11	(6.2) Constructing Antiderivatives Analytically (6.4) The Second Fundamental Theorem of Calculus Friday Dec. 11 Last Day of Classes	(6.2) 1-60,65-67,70-71 (6.4) 4-5,11-14,35-38