

Course Number: MT 360A

Course Title: Calculus I

Course Description:

Treats standard topics of single variable calculus including limits, continuity, derivatives, applications of derivatives, and elements of integration.

Prerequisite Courses:

MT 201, College Algebra

Course Outcomes:

Upon successful completion of the course, the student should be able to:

- Demonstrate that the student is able to communicate mathematical concepts so that they may provide the public with information and expert judgment as part of the basis for social and political decisions.
- Demonstrate an awareness of the socially beneficial uses of mathematics, as well as harmful uses of mathematics.
- Define a function and recognize basic functions such as polynomials, trigonometric and inverse trigonometric functions, exponentials, and logarithmic functions.
- Define limits and evaluate limits numerically, graphically, and algebraically.
- Apply the definition of continuity to determine the intervals when a function is continuous.
- Define a tangent line and demonstrate methods for finding its slope and equation.
- Apply direct and indirect methods of differentiation to develop derivatives formulas for logarithmic, exponential, and inverse trigonometric functions.
- Apply derivatives to rate of change problems and use linear functions to approximate nonlinear functions.
- Demonstrate the ability to use methods of calculus to analyze functions and their graphs.
- Apply the Fundamental Theorem of Calculus to calculate the area under a curve.
- Define the average value of a function.

Course Materials:

Required Texts:

- Hess, Joel, Weir, Maurice D., & Thomas, George B. Jr. (2016) *University Calculus, Early Transcendentals*. 3rd Edition, Boston, MA: Pearson Education, Inc. ISBN: **0321999746**.

Required Resources:

- TI-8x or equivalent graphing calculator.

Course Assignments and Activities:

Week	Learning Topics	Activities	Reading Assignments	Assignments
1	Functions <ul style="list-style-type: none"> • Functions and Graphs • Combining Functions • Trigonometric Functions • Exponential Functions • Inverse Functions and Logarithms • Graphing with Calculators and Computers 	Discussion Forum: Topic 1 and 2 Lab Exercises (MyMathLab)	Chapter 1	First week assignment MyMathLab exercises Week 1 Quiz Discussion Forum
2	Limits and Continuity <ul style="list-style-type: none"> • Rates of Change • Limit of a Function • Limit Laws • Definition of a Limit 	Discussion Forum: Topic 1 Lab Exercises (MyMathLab)	Chapter 2, Sections 1-3	MyMathLab exercises Week 2 Quiz Discussion Forum
3	Limits and Continuity <ul style="list-style-type: none"> • One-Sided Limits • Continuity • Tangents and Derivatives 	Discussion Forum: Topic 1 Lab Exercises (MyMathLab)	Sections 2.4-2.6 and Section 3.1	MyMathLab exercises Week 3 Quiz Discussion forum
4	Derivatives <ul style="list-style-type: none"> • Derivative as a Function • Differentiation Rules • Derivative as a Rate of Change • Derivatives of Trigonometric Functions • Chain Rule and Parametric Equations 	Discussion Forum: Topic 1, 2, and 3 Lab Exercises (MyMathLab)	Sections 3.2-3.6	MyMathLab exercises Midterm Exam Discussion Forum

Week	Learning Topics	Activities	Reading Assignments	Assignments
5	Derivatives <ul style="list-style-type: none"> • Implicit Differentiation • Derivatives of Inverse Functions and Logarithms • Derivatives of Logarithms and Exponential Functions • Derivatives of Inverse Trigonometric Functions. • Related Rules • Linearization and Differentials 	Discussion Forum: Topic 1 and 2 Lab Exercises (MyMathLab)	Sections 3.7-3.11	MyMathLab exercises Week 5 Quiz Discussion Forum
6	Applications of Derivatives <ul style="list-style-type: none"> • Minimum and Maximum Values of Functions • Critical Points • The Mean Value Theorem • The First Derivative Test • Concavity 	Discussion Forum: Topic 1 Lab Exercises (MyMathLab)	Sections 4.1-4.4	MyMathLab exercises Week 6 Quiz Discussion Forum
7	Applications of Derivatives <ul style="list-style-type: none"> • Applied Optimization • Indeterminate Forms and L'Hopital's Rule • Newton's Method • Antiderivatives 	Discussion Forum: Topic 1 Lab Exercises (MyMathLab)	Sections 4.5-4.8	MyMathLab exercises Week 7 Quiz Discussion Forum
8	Introduction to Integration <ul style="list-style-type: none"> • Estimating with Finite Sums • Sigma Notation, Rieman Sums and the Definite Integral • Fundamental Theorem of Calculus 	Discussion Forum: Topic 1 Lab Exercises (MyMathLab)	Sections 5.1-5.4	MyMathLab exercises Final Exam Discussion Forum

Student Evaluation Grid:

Assignments	Weighted Percentage
Weekly Assignments	15%
Weekly Quizzes	25%
Midterm Exam	20%
Final Exam	30%
Participation	10%
TOTAL	100 %

Participation

Because of the accelerated nature of the course, class participation is very important. Class participation/effort is important because we can all learn from each other. Your participation points can make a difference in the final grade. If the student does not participate during any given week, they will lose the participation points for that week.

Participation means:

1. Present in class every session (classroom)/Present in the forum every week (on-line)
2. Effectively respond to questions from the facilitator (classroom)/Regularly check forum and post all required assignments/discussion questions/items by the deadlines (on-line)
3. Contributes to classroom/forum discussions.

Tutoring Information:

Occasionally students need additional assistance with course content. Tutorial assistance is available to students through SmartThinking, writing assistance and personal tutoring. SmartThinking provides every student with ten hours of free online tutoring in writing, math, statistics, economics and accounting each year. Writing assistance is available in the form of Roving Writing Tutors and a variety of writing workshops. Individual personal tutors are available in a variety of discipline areas with fees and arrangements made between the individual student and tutor. For access to these services, go www.regis.edu , Current Student, Services for CPS Students, Academic Tools, Tutoring/SmartThinking.

CC&IS Grading Scale

Letter Grade	Percentage	Grade Point
--------------	------------	-------------

A	93 to 100	4.00
A-	90 to less than 93	3.67
B+	87 to less than 90	3.33
B	83 to less than 87	3.00
B-	80 to less than 83	2.67
C+	77 to less than 80	2.33
C	73 to less than 77	2.00
C-	70 to less than 73	1.67
D+	67 to less than 70	1.33
D	63 to less than 67	1.00
D-	60 to less than 63	.67
F	Less than 60	0

Additional information about grading can be found in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx>.



CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx> or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.
- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the [U.S. Department of Education](http://www.ed.gov).
- The HIPAA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: <http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx>.
- The Human Subjects Institutional Review Board (IRB) procedures. More information about the IRB and its processes can be found here: <http://regis.edu/Academics/Academic-Grants/Proposals/Regis-Information/IRB.aspx>.

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: <https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx>.