



Course Number and Title: MAT 261 Business Calculus I

Campus Location:

Georgetown, Dover, Stanton, Wilmington

Effective Date:

2018-51

Prerequisite:

MAT 153 or MAT 180

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

4.00 lecture hours/week

0.00 lab hours/week

Course Description:

Course content includes solving mathematical models of real world phenomena including functions, graphs, limits, continuity, and the use of differentiation and integration to solve problems involving business management and computer science applications.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

Each student is required to have an electronic calculator capable of scientific calculations. The Math Department strongly recommends the TI-84. Calculators with CAS capabilities (TI-Inspire, TI89, HP-48, and HP-49 as examples) are inappropriate for this course and will not be permitted in test situations.

Schedule Type:

Classroom Course

Hybrid Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Interpret and discuss functions. (CCC 2, 6)
2. Apply concepts of limits and continuity. (CCC 2, 6)
3. Compute the derivative of a function. (CCC 2, 6)
4. Use derivatives to solve application problems. (CCC 2, 6)
5. Use integrals to solve application problems. (CCC 2, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Interpret and discuss functions.
 1. Evaluate functions.
 2. Graph functions.
 3. Simplify exponential, logarithmic, and rational expressions.
 4. Solve business application problems involving exponential and logarithmic functions, including growth and decay models.
2. Apply concepts of limits and continuity.
 1. Use graphical, algebraic, and numeric techniques to evaluate limits.
 2. Determine the continuity of a function.
 3. Determine the equations of asymptotes using limits.
 4. Identify the types of discontinuities in a function.
 5. Solve business application problems involving continuity.
3. Compute the derivative of a function.
 1. Determine the derivative of an algebraic function using the limit definition.
 2. Determine the derivative of algebraic, exponential, and logarithmic functions using the rules of differentiation, including the power, product, quotient, and chain rules.
 3. Compute higher-order derivatives.
 4. Differentiate functions implicitly.
4. Use derivatives to solve application problems.
 1. Calculate rates of change including velocity, acceleration, marginal profit, marginal revenue, and marginal cost.
 2. Use differentiation to solve optimization problems in business and economics.
 3. Calculate relative and absolute extrema over a specified interval.
 4. Solve related-rate problems.
 5. Sketch the graph of a function using the first and second derivative to determine the intervals of increasing/decreasing, relative extrema, concavity, points of inflection, and asymptotes.
5. Use integrals to solve business application problems.
 1. Determine the antiderivative of a function.
 2. Estimate the area under a curve using Riemann sums.
 3. Estimate distance traveled from a velocity graph.
 4. Define and compute the definite integral using the limit of a Riemann sum.
 5. Use the properties of addition and subtraction of integrals.
 6. Apply the fundamental theorem of calculus to the integration process and the total change theorem.
 7. Apply the substitution rule and symmetry in the evaluation of integrals.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

None

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.