



Course Number and Title: MAT 282 Calculus II

Campus Location:

Georgetown, Dover, Stanton, Wilmington

Effective Date:

2022-51

Prerequisite:

MAT 281

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

4.00 lecture hours/week

1.00 lab hours/week

Course Description:

This course provides a study of integral calculus of algebraic, trigonometric, exponential, and logarithmic functions with applications. Topics include methods and applications of integration, infinite series, parametric equations, and polar coordinates.

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:

Mathematica, Graphing calculator: TI 83 or TI 84

Schedule Type:

Classroom Course

Hybrid Course

Online Course

Disclaimer:

Proctored testing is required for all tests, regardless of the course format. Online students may use any DTCC Testing Center at no additional charge. Additional fees may apply for virtual proctoring or testing at another location.

Core Course Performance Objectives (CCPOs):

1. Evaluate integrals using various techniques. (CCC 2, 6)
2. Apply techniques of limits, differentiation, and integration to solve problems. (CCC 2, 6)
3. Apply differential and integral calculus techniques to parametric and polar equations and investigate their graphs. (CCC 2, 6)
4. Solve problems involving infinite sequences and series. (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. Evaluate integrals using various techniques.
 1. Integrate using methods of parts, substitution, trigonometric substitution, partial fractions, and a computer algebra system.
 2. Determine the convergence or divergence of an improper integral.
 3. Approximate the value of an integral using midpoint, trapezoidal, and Simpson's Rules.
2. Apply techniques of limits, differentiation, and integration to solve problems.
 1. Determine the area between curves.
 2. Determine the volume of a solid of revolution using disks, washers, or cylindrical shells.
 3. Determine work of physical phenomena using integration techniques.
 4. Determine the arc length or area of a surface of revolution of a function.
 5. Evaluate the limits of indeterminate forms using algebraic manipulation, L'Hospital's Rule, and logarithms.
3. Apply differential and integral calculus techniques to parametric and polar equations and investigate their graphs.
 1. Graph parametric and polar equations.
 2. Apply differentiation and integration techniques to parametric and polar equations.
 3. Find the slope of a tangent line, area of a region, and arc length of a curve determined by parametric and polar coordinates.
 4. Convert equations in polar or parametric form to rectangular form and vice versa.
4. Solve problems involving infinite sequences and series.
 1. Determine the convergence or divergence of a series that is geometric, harmonic, or p-series.
 2. Determine the convergence of a series using the integral, comparison, ratio, and root tests.
 3. Determine the absolute or conditional convergence of alternating series.
 4. Determine the interval and radius of convergence of a power series.
 5. Determine the Taylor and Maclaurin series of a given function.
 6. Determine the power series expansion of a function using differentiation and integration.
 7. Use the series expansion of a function to approximate its value, integral, or derivative.
 8. Determine the error bound between a function and its power series expansion on a given interval.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
0	-	69	=	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.

Final Course Grade:

Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Tests -Summative-Equally Weighted	75%
Homework-Formative	10%
Formative (Mathematica, quizzes)	15%
TOTAL	100%

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.