

DELAWARE TECHNICAL & COMMUNITY COLLEGE
COLLEGEWIDE COURSE SYLLABUS

Campus: Stanton

Department: Mathematics/Physics

Course Number and Title: MAT 282 – Calculus II

Instructor Name: **Telephone:** **E-mail:**

Prerequisites: MAT 281

Corequisites: None

Course Hours and Credits: 4:1:4

Course Description: 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.

Materials: Each student is required to have a graphing calculator. MAPLE will be used extensively for classroom and homework assignments. Each student must obtain a computer account in order to log-on to the system. These accounts may be obtained in room A229.

Methods of Instruction: Lecture or Telecourse

Manuals: None

CORE COURSE PERFORMANCE OBJECTIVES

The student will be able to:

1. Apply techniques of integration to solve application problems. (CCC 2, 7)
2. Apply differential and integral calculus techniques to solve problems involving inverse functions. (CCC 2, 7)
3. Define parametric equations, polar coordinates, and investigate their graphs. (CCC 2, 7)
4. Solve problems involving infinite sequences and series. (CCC 1, 2, 7)

MEASURABLE PERFORMANCE OBJECTIVES

- 1. Apply techniques of integration to solve application problems. (CCC 2, 7)**
 - 1.1 Determine the area between curves.
 - 1.2 Determine the volume of a solid of revolution using disks, washers, or cylindrical shells.
 - 1.3 Determine work of a physical phenomena utilizing integration techniques.
 - 1.4 Integrate utilizing methods of parts, substitution, partial fractions, and a computer algebra system.
 - 1.5 Determine integral of convergence or divergence of an improper integral.
 - 1.6 Determine the arc length or area of a surface of revolution of a function given either in rectangular or polar coordinates.
- 2. Apply differential and integral calculus techniques to solve problems involving inverse functions. (CCC 2, 7)**
 - 2.1 Demonstrate the ability to graph and solve equations involving logarithmic, exponential, inverse trigonometric, and hyperbolic functions.
 - 2.2 Differentiate and integrate logarithmic, exponential, inverse trigonometric, and hyperbolic functions.
 - 2.3 Evaluate the limits of indeterminate forms using L'Hôpital's Rule and logarithms.
- 3. Define parametric equations, polar coordinates, and investigate their graphs. (CCC 2, 7)**
 - 3.1 Investigate graphs of parametric equations.
 - 3.2 Apply differentiation to parametric equations to determine the graph of a set of parametric equations.
 - 3.3 Determine arc length and surface area generated by a curve given in parametric form.
 - 3.4 Investigate graphs of functions given in polar form.
 - 3.5 Determine the slope of a tangent line, area of a region, arc length, or area of surface of revolution of a curve determined by polar coordinates.

- 3.6 Be able to convert equations in polar or parametric to rectangular and vice versa.
- 4. Solve problems involving infinite sequences and series. (CCC 1, 2, 7)**
- 4.1 Determine the convergence or divergence of a series that is geometric, harmonic, or a p-series.
 - 4.2 Utilize the tests of convergence (integral test, comparison tests, ratio test, root test, alternating series test) to determine the convergence, conditional convergence, and absolute convergence of a series.
 - 4.3 Determine the interval and radius of convergence of a power series.
 - 4.4 Determine the Taylor and Maclaurin series of a given function.
 - 4.5 Utilize the series expansion of a series to approximate the value, integral, or derivative of a function.
 - 4.6 Determine a bound of the error between a function and its power series expansion on a given interval.

EVALUATION CRITERIA

Students will demonstrate proficiency on all Measurable Performance Objectives at least to the 75% level. The grade will be determined using the College Grading System:

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

Students should refer to the Student Handbook for information on Academic Standing Policy, Academic Honesty Policy, Students Rights and Responsibilities and other policies relevant to their academic progress.