

OHLONE COLLEGE
Ohlone Community College District
OFFICIAL COURSE OUTLINE

I. Description of Course:

1. **Department/Course:** MATH - 101B
2. **Title:** Calculus With Analytic Geometry
3. **Cross Reference:**
4. **Units:** 5
Lec Hrs: 5
Lab Hrs:
Tot Hrs: 90.00
5. **Repeatability:** No
6. **Grade Options:** Grade Only (GR)
7. **Degree/Applicability:**
Credit, Degree Applicable, Transferable - CSU & UC (T)
8. **General Education:** CSU General Education (Plan B)
B2 - Mathematics/Quantitative Reasoning
District General Education (Plan A)
IV-B. Analytical Thinking and Oral Communication IGETC (Plan C)
2. Mathematical Concepts/Quantitative Reasoning
9. **Field Trips:** Not Required
10. **Requisites:**
Prerequisite
MATH 101A Calculus With Analytic Geometry or equivalent

12. Catalog Description:

This course includes techniques of integration, related applications, infinite series, an advanced treatment of conics, parametric equations, and polar coordinates.

13. Class Schedule Description:

Integration techniques, series, conics, parametric equations and polar coordinates.

14. Counselor Information:

MATH 101B is the second course in the calculus sequence, required by students in a variety of majors (most especially mathematics, engineering, and the sciences). To succeed in this course, students need a strong foundation from the first course (MATH 101A) or the equivalent (such as evidenced by an AP exam).

II. Student Learning Outcomes

The student will:

1. Apply the use of integrals to problems involving volumes of solids, arc length, surface area, and physics applications.
2. Integrate mathematical functions using integration by parts, trigonometric substitutions, partial fractions, integral tables, and other techniques.
3. Solve basic differential equations.
4. Determine the convergence or divergence of infinite sequences and series by using appropriate tests.
5. Determine polynomial representations of mathematical functions by using power series.
6. Analyze mathematical relationships given in parametric and polar forms.

7. Graph conic sections and determine information about the conic from its algebraic equation.
8. Demonstrate logical thinking, correct use of notation, and mathematical precision in formulating and solving problems in the above areas.
9. Apply the use of a graphing calculator to each of the above areas.

III. **Course Outline:**

A. Applications of Integration

1. Areas between curves
2. Volumes
3. Arc length and surface area
4. Physics applications

B. Integration Techniques

1. Review of formulas and techniques
2. Integration by parts
3. Trigonometric techniques
4. Partial fractions
5. Integration tables and computer algebra systems
6. Improper integrals

C. First-order Differential Equations

1. Modeling with differential equations
2. Separable differential equations

D. Infinite Series

1. Sequences
2. Introduction to series
3. Integral test and p-series
4. Comparison tests
5. Alternating series
6. Ratio test
7. Power series
8. Taylor series and applications

E. Parametric Equations and Polar Coordinates

1. Plane curves and parametric equations
2. Calculus of parametric equations
3. Arc length and surface area in parametric equations
4. Polar coordinates
5. Calculus of polar coordinates
6. Conic sections

IV. **Course Assignments:**

A. Reading Assignments

B. Projects, Activities, and other Assignments

1. Projects
2. Homework

C. Writing Assignments

V. **Methods of Evaluation:**

- A. Exams
- B. Quizzes

VI. Methods of Instruction:

- A. Lecture
- B. Discussion
- C. Demonstration
- D. Audiovisual
- E. Computer Assisted Instruction
- F. Collaborative Learning

VII. Textbooks:

Recommended

1. Smith & Minton *Calculus Early Transcendental Functions* 3rd Edition, McGraw-Hill, 2007 ISBN: 0073229733

Supplemental

VIII. Supplies:

- A. Graphing calculator

CID 2210