Alabama Community College System

MTH 126
Calculus II

I. MTH 126 Calculus II– 4 Semester Hours

II. Course Description

This is the second of three courses in the basic calculus sequence. Topics include applications of integration, techniques of integration, infinite series, polar coordinates and parametric equations, lines and planes in space, and vectors in the plane and in space.

III. Prerequisite

Grade of C or higher in MTH 125

IV. Textbook

Due to the varied selection of quality college-level textbooks, each college will select the textbook needed to meet the requirements of this course.

V. Course Learning Outcomes

By the end of the course, students will be able to:

1. solve application problems using integration,
2. perform appropriate techniques of integration,
3. determine convergence or divergence of infinite sequences and series,
4. construct a Taylor series representation for a given function,
5. apply calculus concepts to functions with polar and parametric representations, and
6. perform vector operations and applications.

VI. Course Outline of Topics

Required Topics

1. Application of Integration
    a. Area of region between two curves
    b. Volumes of solids of revolution
    c. Arc length
2. Techniques of Integration
    a. Integration by parts
    b. Trigonometric integrals
    c. Trigonometric substitution
    d. Partial fractions
3. Indeterminate forms and L'Hopital's Rules
4. Improper integrals
5. Sequences
6. Convergence or divergence of infinite series
    a. Series and convergence
    b. The integral test and p-series
    c. Comparisons of series
    d. Alternating series
    e. The ratio and root tests
7. Power series
8. Taylor and Maclaurin series
9. Parametric equations
10. Polar coordinates and polar graphs
11. Area and arc length in polar coordinates
12. Operations with vectors
13. Vectors in the plane and space
14. Lines and planes in space

Optional Topics

1. Moments, center of mass, and centroids
2. Conics
3. Binomial series
4. Application of integration: work and fluid pressure
5. Numerical integration including Trapezoidal and Simpson's Rules

VII. Evaluation and Assessment

Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

VIII. Attendance

Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student's ability to achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

IX. Statement on Discrimination/Harassment

It is the official policy of the Alabama Community College System and entities under its control, including all Colleges, that no person shall be discriminated against on the basis of any impermissible criterion or characteristic, including, without limitation, race, color, national origin, religion, marital status, disability, sex, age, or any other protected class as defined by federal and state law. (ACCS Policies 601.02 and 800.00)

X. Americans with Disabilities

The Rehabilitation Act of 1973 (Section 504) and the *Americans with Disabilities Act* of 1990 state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student's responsibility to provide appropriate disability documentation to the College.