MA 126 CALCULUS II

Course Description: This is the second of three courses in the basic calculus sequence. Topics include vectors in the plane and in space, lines and planes in space, applications of integration (such as volume, arc length, work and average value), techniques of integration, infinite series, polar coordinates, and parametric equations.

Credit Hours. 4

Course Objectives:

The student shall demonstrate knowledge of:

1. Various problem-solving strategies including, but not limited, to reading the problem, interpreting the problem, selecting an appropriate mathematical model, solving the problem and reflecting on the reasonableness of the answer.
2. Resources available to enhance personal knowledge of mathematics.

The student shall demonstrate ability to:

3. Use estimation and approximation skills, and assess the reasonableness of solutions to problems.
4. Explain the role, nature, and limitations of current and emerging technology.
5. Use current technology in problem solving and in exploring mathematical concepts.
6. Present and interpret data in graphical form.
7. Select or create appropriate mathematical models to solve problems in mathematics and in other disciplines.

Course Content:

I. Applications of the Definite Integral In Geometry, Science, and Engineering
   1. Area Between Two Curves
   2. Volumes by Slicing; Disks and Washers
   3. Volumes by Cylindrical Shells
   4. Length of a Plane Curve
   5. Area of a Surface of Revolution
   6. Work
   7. Fluid Pressure and Force
   8. Hyperbolic Functions and Hanging Cables

II. Principles of Integral Evaluation
    1. An Overview of Integration Methods
    2. Integration by Parts
    3. Trigonometric Integrals
    4. Trigonometric Substitutions
    5. Integrating Rational Functions by Partial Fractions
    6. Using Tables of Integrals and Computer Algebra Systems
    7. Numerical Integration; Simpson's Rule
    8. Improper Integrals
III. Infinite Series
    1. Sequences
    2. Monotone Sequences
    3. Infinite Series
    4. Convergence Tests
    5. Taylor and Maclaurin Series
    6. The Comparison, Ratio, and Root Tests
    7. Alternating Series; Conditional Convergence
    8. Power Series
    9. Convergence of Taylor Series; Computational Methods
    10. Differentiating and Integrating Power Series; Modeling with Taylor Series
IV. Analytic Geometry in Calculus
    1. Polar Coordinates
    2. Tangent Lines and Arc Length for Parametric and Polar Curves
    3. Area in Polar Coordinates
    4. Conic Sections in Calculus
    5. Conic Sections in Polar Coordinates

Course Requirements: Regular attendance. IT-85 or IT-86 Graphing Calculator.

Course Evaluation: There will be a minimum of 4 hourly examinations at 100 pts. each and a comprehensive final examination.

ACCOMMODATION STATEMENT:

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. Under Title II of the Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973, a disability is defined as a physical or mental impairment that substantially limits one or more major life activities as compared to an average person in the population. It is the responsibility of the student to contact ***Developmental Services*** prior to the beginning of the semester to initiate the accommodation process and to notify instructors within the first three class meetings to develop an accommodation plan. Appropriate, reasonable accommodations will be made to allow each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. Students needing assistance should contact ***Developmental Services.***