Title: Calculus II
Abbreviation and Number: MATH271  AB Paper No.: 13-89
School: Mathematics, Physics and Technology
Department: Mathematics
Credits: 4  Course Sequence: ( ) Fall  ( ) Spring  (X) Fall and Spring
Hours Per Week: (4) Lecture  ( ) Seminar  ( ) Laboratory  ( ) Studio  ( ) Kitchen  ( ) Other (Tutorial)
Pre-requisite(s): MATH171 or permission of Chair/Instructor
Co-requisite(s): None

COURSE DESCRIPTION
This is the second in a three-course series in calculus. Students, with the aid of technology, study techniques of integration, sequences and series, conic sections, polar coordinates and an introduction to 3-dimensional geometry.

SPECIFIC OBJECTIVES
Upon successful completion of this course, students will be able to
1) apply techniques of integration;
2) determine convergence of sequences and series;
3) determine Taylor Series and use Taylor's Theorem to find approximations;
4) parametrize curves using parametric equations and polar coordinates;
5) compute areas and tangent lines in the polar coordinate plane;
6) derive arc length and surface area by using parametric equations;
7) apply vectors to solve problems in the plane and space; and
8) use a graphing calculator to analyze functions.

COURSE CONTENT
I. Integrals of Functions
   A. Techniques of Integration
      i. Basic Rules
      ii. By Parts
      iii. Powers of Trigonometric Functions
      iv. Trigonometric Substitution
      v. Partial Fractions
      vi. By Tables
   B. Improper Integrals

II. Sequences and Series
   A. Types and Properties
   B. Convergence of Series
      i. nth-term Test
      ii. Integral Test
      iii. Comparison Tests
      iv. Ratio Test
      v. Root Test
      vi. Alternating Series Test
      vii. Absolute and Conditional
C. Power Series
   i. Radius and Interval of Convergence
   ii. Functional Representation
   iii. Differentiation and Integration
D. Taylor and Maclaurin Series
   i. Polynomials
   ii. Approximations

III. Parametric Equations and Polar Coordinates
   A. Conic Sections
   B. Graphs
   C. Area and Tangent Lines
   D. Arc Length and Surface Area

IV. The Geometry of Space
   A. 3-Dimensional Coordinate System
   B. Vectors
   C. Dot Product
   D. Cross Product
   E. Lines and Planes
   F. Cylinders and Surfaces

ASSESSMENT
Assignments…………………………. 15%
Quizzes………………………………. 15%
In-Class Tests……………………….. 30%
Final Examination…………………… 40%
Total…………………………………… 100%

REQUIRED RESOURCES
MyMathLab Access Code
TI – 83/84 Calculator

REQUIRED TEXT

SUPPLEMENTARY READINGS/MATERIALS

JOURNALS
Educational Studies in Mathematics
For the Learning of Mathematics
<table>
<thead>
<tr>
<th>Title: Calculus II</th>
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<tbody>
<tr>
<td>Abbreviation and Number: MATH271</td>
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</tbody>
</table>

*International Journal of Mathematical Education in Science & Technology*
*Journal of Fractional Calculus and Applications*
*Mathematics in School*
*Mathematical Spectrum*

**WEBSITES**
- www.mymathlab.com  (MyMathLab)
- www.mathforum.org   (Math Forum)
- www.sosmath.com (Sosmath)
- www.karlscalculus.org (Calculus Tutor)
- www.analyzemath.com (Mathematics Tutorials)
- www.tutorial.math.lamar.edu  (Paul's Online Calculus Notes)