JEFFERSON COLLEGE

COURSE SYLLABUS

MTH 185

CALCULUS II

5 Credit Hours

Prepared by: Imran Shah
Date: August 2012

Ms. Shirley Davenport, Dean, Arts & Science Education
Ms. Linda Abernathy, Division Chair, Science, Math, & Business
MTH185: Calculus II

I. CATALOGUE DESCRIPTION

A. MTH180 with a grade of “C” or better and reading proficiency

B. 5 semester hours credit

C. Calculus II is a continuation of Calculus I. The student will study transcendental functions, techniques and applications of integration, infinite series, and conic sections. (F,S)

II. EXPECTED LEARNING OUTCOMES WITH ASSESSMENT MEASURES

<table>
<thead>
<tr>
<th>MTH185 Expected Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine the appropriate method (partial fractions, trig integration, trig substitution, inverse trig, integration by parts) for integrating a function and perform definite and indefinite integrals using these methods</td>
<td>Homework, Quizzes/tests</td>
</tr>
<tr>
<td>Solve logarithmic and exponential equations by use of inverse functions; differentiate and integrate compound algebraic and transcendental functions</td>
<td>Homework, Quizzes/tests</td>
</tr>
<tr>
<td>Graph the solutions of functions in polar and parametric form by traditional methods and through use of technology; translate these functions to and from rectangular form</td>
<td>Homework, Quizzes/tests</td>
</tr>
<tr>
<td>Graph conic sections and provide equations for given conic section graphs, in both rectangular and polar form</td>
<td>Homework, Quizzes/tests, Projects</td>
</tr>
<tr>
<td>Determine centroids, arc lengths, surface areas, and probabilities by integration and determine the reasonableness of these results by comparing them to estimates derived through non-calculus methods</td>
<td>Homework, Quizzes/tests, Projects</td>
</tr>
<tr>
<td>Represent transcendental functions as infinite polynomials and determine the intervals on which they converge, as well as the number of terms required to achieve a specified accuracy</td>
<td>Homework, Quizzes/tests</td>
</tr>
<tr>
<td>Evaluate the reasonableness of results by comparing them to estimates derived by non-calculus methods</td>
<td>Homework, Quizzes/tests</td>
</tr>
<tr>
<td>Determine appropriate roles for technology (TI calculators and PC software) and apply it to assist in graphing, checking and predicting results and approximating integrals</td>
<td>Homework, Quizzes/tests</td>
</tr>
</tbody>
</table>
III. OUTLINE OF TOPICS

A. Exponential, logarithmic, and inverse trigonometric functions
   1. Inverse functions
   2. Exponential functions and their derivatives
   3. Logarithmic functions
   4. Derivatives of logarithmic functions
   5. Inverse trigonometric functions
   6. Hyperbolic functions
   7. Indeterminate forms and L’Hospital’s Rule

B. Techniques of integration
   1. Integration by parts
   2. Trigonometric integrals
   3. Trigonometric substitution
   4. Integration of rational functions by partial fractions
   5. Strategies for integration
   6. Integration using tables
   7. Approximate integration
   8. Improper integrals

C. Applications of integration
   1. Arc length
   2. Area of a surface of revolution
   3. Applications to physics and engineering

D. Parametric equations and polar coordinates
   1. Curves defined by parametric equations
   2. Tangents and areas with parametric curves
   3. Polar coordinates
   4. Areas and lengths in polar coordinates
   5. Conic sections
   6. Conic sections in polar coordinate

E. Infinite sequences and series
   1. Sequences
   2. Series
   3. The integral test and estimates of sums
   4. The comparison tests
   5. Alternating series
   6. Absolute convergence and the ratio and root tests
   7. Strategy for testing series
   8. Power series
   9. Representation of functions as power series
   10. Taylor and Maclaurin series
   11. The binomial series
   12. Applications of Taylor polynomials
IV. METHODS OF INSTRUCTION
   A. Lectures
   B. Discussion

V. REQUIRED TEXTBOOK

VI. REQUIRED MATERIAL
   Graphics calculator required. TI-83/84 recommended; symbolic manipulating calculators prohibited.

VII. SUPPLEMENTAL REFERENCES
   None

VIII. METHODS OF EVALUATION
   A. Homework assignments (problems not from the book), 40%
   B. Quizzes (4), 40%
   C. Comprehensive final, 20%
   D. Attendance, 5% (For every class missed, 1% will be deducted from attendance credit, unless the absence is for a Jeffco-related purpose.)

IX. ADA AA STATEMENT
   Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT
   All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, http://www.jeffco.edu/jeffco/index.php?option=com_weblinks&catid=26&Itemid=84).