MATH 2414 CALCULUS II

COURSE DESCRIPTION
This course is a continuation of MATH 2413. Topics include differentiation and integration of hyperbolic and inverse trigonometric functions, techniques of integration, sequences and series, and applications such as the area between curves.

COURSE OBJECTIVES
This course is designed to develop an understanding of calculus as it is used in physics, chemistry, engineering, economics, and other subjects. At the same time, mathematics majors and others needing further knowledge of calculus will be able to take MATH 2415 after the completion of this course. The student must demonstrate an understanding of the topics covered in the course through testing.

METHODS FOR ACCOMPLISHING OBJECTIVES
1. Lecture
2. Special Problem Sessions
3. Instructional Media
4. Unit Examinations
5. Peer Tutoring
6. Faculty Tutoring

LEARNING OUTCOMES
Upon successful completion of the course, the student will demonstrate acquisition of the following skills:
1. Find the volume of a solid of revolution
2. Identify an integral to calculate the arclength of a function
3. Evaluate a given integral
4. Find the sum of a series
5. Determine the interval of convergence of a series
6. Create the Taylor series for a function
7. Find the limit at infinity of a given function
8. Find the Taylor polynomial for a given function
9. Find a power series for a function
10. Determine the area of the region bound by functions

BIBLIOGRAPHY

COURSE OUTLINE
A. Logarithmic, Exponential, and Other Transcendental Functions
   1. Inverse Trigonometric Functions and Differentiation
   2. Inverse Trigonometric Functions and Integration
   3. Hyperbolic Functions
B. Applications of Integration
   1. Area of a Region Between Two Curves
2. **Volume:** The Disc Method
3. **Volume:** The Shell Method
4. **Arc Length and Surfaces of Revolution**
5. **Work (optional)**
6. **Moments, Centers of Mass, and Centroids (optional)**
7. **Fluid Pressure and Fluid Force (optional)**

C. **Integration Techniques, L'Hôpital’s Rule, and Improper Integrals**
   1. **Basic Integration Rules**
   2. **Integration by Parts**
   3. **Trigonometric Integrals**
   4. **Trigonometric Substitution**
   5. **Partial Fractions**
   6. **Integration by Tables and Other Integration Techniques**
   7. **Indeterminate Forms and L’Hôpital’s Rule**
   8. **Improper Integrals**

D. **Infinite Series**
   1. **Sequences**
   2. **Series and Convergence**
   3. **The Integral Test and p-Series**
   4. **Comparisons of Series**
   5. **Alternating Series**
   6. **The Ratio and Root Tests**
   7. **Taylor Polynomials and Approximations**
   8. **Power Series**
   9. **Representation of Functions by Power Series**
   10. **Taylor and Maclaurin Series**

E. **Conics, Parametric Equations, and Polar Coordinates**
   1. **Conics and Calculus**
   2. **Plane Curves and Parametric Equations**
   3. **Parametric Equations and Calculus**
   4. **Polar Coordinates and Polar Graphs**
   5. **Area and Arc Length in Polar Coordinates (optional)**

**Evaluation Procedures:**

A. **Methods of Evaluation**
   1. **Homework**
   2. **Quizzes**
   3. **Exams**
   4. **Comprehensive Final Exam**

B. **Grading System**

<table>
<thead>
<tr>
<th>Course Average</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
</tbody>
</table>
below 60   W, I, or F

- **I**  Incomplete – An incomplete may be awarded when the instructor determines that minimal work on the part of the student and the instructor will complete the course requirements. An incomplete grade not changed by the instructor to a grade of completion (A, B, C, D, or F) by the end of the following semester will automatically be changed to an F.
- **W**  Withdrawal – Students who file withdrawal requests by the published deadline will receive a grade of W.

**ATTENDANCE**

Regular attendance in class is expected. If an absence is unavoidable, the student is responsible for completing all work missed during the absence. Any work missed and not subsequently completed will affect the grade of the student regardless of the reason for the absence. It should be noted that ceasing to attend class does not terminate enrollment. It is the student’s responsibility to initiate the withdrawal procedure. Therefore, a student who ceases to attend class without officially withdrawing from that class may receive a failing grade. Note, however, that withdrawal from class may affect enrollment in other courses, insurance eligibility, financial aid, and/or veteran’s benefits.

**CLASSROOM BEHAVIOR**

It is expected that students will behave in a mature and courteous manner. Disruptive behavior during class will not be tolerated. Students are expected to be attentive, take notes, ask pertinent questions, arrive on time, and not leave until the class is dismissed. Conflicts which arise between the scheduled class time and the student’s personal schedule must be resolved by the student.

Camcorders and any other video recording devices are prohibited in the classroom. Audio recording may be allowed **ONLY WITH THE PERMISSION OF THE INSTRUCTOR.**

**CELLPHONES** are not to be used and are not to ring during class. Cell phones are not to be out during tests. If there are special circumstances, arrangements must be made with the instructor.

**ACADEMIC HONESTY IS ASSUMED.** A student found guilty of scholastic dishonesty is subject to disciplinary action. Violations such as plagiarism, cheating on tests, and collusion are described in the ACC Student Handbook. Consequences are at the discretion of the instructor. **Any student caught cheating in the course will be given an F for the course and will forfeit any right to a grade of W.**

**ADA COMPLIANCE**

This college will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the policy of ACC to provide reasonable accommodations for qualified individuals who are students with disabilities. It is the student’s responsibility to contact the Counseling Center in a timely manner to arrange for appropriate accommodations.