**BARTON COMMUNITY COLLEGE**

**COURSE SYLLABUS**

**I. GENERAL COURSE INFORMATION**

Course Number: MATH 1836

Course Title: Analytic Geometry and Calculus III

Credit Hours: 3

Prerequisites: MATH 1834 Analytic Geometry and Calculus II with a C or better

Division/Discipline: Academics Division/Mathematics

Course Description: A study of vector functions, partial differentiation, multiple integrals, and moments of inertia.

**II. INSTRUCTOR INFORMATION**

**III. COLLEGE POLICIES**

Students and faculty of Barton Community College constitute a special community engaged in the process of education. The College assumes that its students and faculty will demonstrate a code of personal honor that is based upon courtesy, integrity, common sense, and respect for others both within and outside the classroom.

Plagiarism on any academic endeavors at Barton Community College will not be tolerated. The student is responsible for learning the rules of, and avoiding instances of, intentional or unintentional plagiarism. Information about academic integrity is located in the Student Handbook.

The College reserves the right to suspend a student for conduct that is determined to be detrimental to the College educational endeavors as outlined in the College Catalog, Student Handbook, and College Policy & Procedure Manual. [Most up-to-date documents are available on the College webpage.]

Any student seeking an accommodation under the provisions of the Americans with Disability Act (ADA) is to notify Student Support Services via email at [disabilityservices@bartonccc.edu](mailto:disabilityservices@bartonccc.edu).

**IV. COURSE AS VIEWED IN THE TOTAL CURRICULUM**

Calculus III is the third course in the calculus sequence. It provides engineering, math, or science majors with the background needed for differential equations and subsequent math classes.

This course transfers for credit to all Kansas Regent Universities, and may be used to help fulfill program requirements. The transferability of all college courses will vary among institutions, and perhaps even among departments, colleges, or programs within an institution. Institutional requirements may also change without prior notification. Students are responsible to obtain relevant information from intended transfer institutions to insure that the courses the student enrolls in are the most appropriate set of courses for the transfer program. <http://bartonccc.edu/transfer/schools>

**V. ASSESSMENT OF STUDENT LEARNING**

Barton Community College is committed to the assessment of student learning and to quality education. Assessment activities provide a means to develop an understanding of how students learn, what they know, and what they can do with their knowledge. Results from these various activities guide Barton, as a learning college, in finding ways to improve student learning.

Course Outcomes, Competencies, and Supplemental Competencies:

A. Apply vector operations in three-dimensional space and interpret their meaning.

1. Perform arithmetic on vectors.

2. Find the magnitude of a vector.

3. Find distance and midpoint of line segments in three-space.

4. Apply vector notation using standard unit vectors.

5. Find the dot product of two vectors.

6. Find the component and projection of one vector onto another.

7. Find the cross product of two vectors.

8. Determine the parametric and symmetric forms of a line in three-space.

9. Write the equation of a plane.

10. Graph and write the equations of cylindrical and quadric surfaces.

B. Use calculus methods on vector-valued functions and interpret their meaning.

1. Define a vector-valued function.

2. Differentiate a vector-valued function.

3. Integrate a vector-valued function.

4. Determine velocity and acceleration from a position vector.

5. Determine curvature and components of acceleration.

C. Apply calculus methods to functions of several variables and interpret their meaning.

1. Determine the domain of a function of several variables.

2. Evaluate limits of functions of several variables.

3. Find partial derivatives.

4. Compute differentials.

5. Determine if a differential is exact.

6. Apply the chain rule to functions of several variables.

7. Determine the gradient and directional derivatives.

8. Find tangent planes and normal lines.

9. Determine extrema for functions of several variables.

10. Use the method of Lagrange multipliers to find extrema.

D. Use double and triple integrals to solve problems.

1. Evaluate iterated and double integrals.

2. Evaluate double integrals in polar coordinates.

3. Find the surface area.

4. Evaluate triple integrals in rectangular, cylindrical and spherical coordinate systems.

5. Make changes of variables to simplify integration.

E. Apply line and surface integrals to solve problems.

1. Evaluate line integrals.

2. Apply Green’s Theorem.

3. Evaluate surface integrals.

4. Determine divergence and curl.

5. Apply Stokes’ Theorem.

6. Apply Divergence Theorem.

**VI. INSTRUCTOR’S EXPECTATIONS OF STUDENTS IN CLASS**

**VII. TEXTBOOKS AND OTHER REQUIRED MATERIALS**

**VIII. REFERENCES**

**IX. METHODS OF INSTRUCTION AND EVALUATION**

**X. ATTENDANCE REQUIREMENTS**

**XI. COURSE OUTLINE**