JEFFERSON COLLEGE

COURSE SYLLABUS

MTH 201

CALCULUS III

5 Credit Hours

Prepared by:
John M Johny
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Dr. Robert Brieler, Division Chair, Math & Science
Dr. Shirley Davenport, Dean, Arts & Science Education

MTH201: Calculus III

I. CATALOG DESCRIPTION

A. Course pre-requisites/co-requisites: MTH 185 with a grade of "C" or better, and reading proficiency

B. 5 semester credit hours

C. Calculus III is a continuation of Calculus II. The student will study vectors in two and three dimensions and calculus of several variables. A graphing calculator is required. (F, S)

D. Fulfills AS – Engineering emphasis degree requirement.
Elective course applies toward AA and AAT degree requirement.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Note: Each of the following learning outcomes will be measured on at least one in-class exam, but instructors are encouraged to assess them with additional measures including homework, quizzes, and/or projects.

Expected Learning Outcomes	Assessment Measures
Apply dot product, cross product, and scalar triple product of vectors to solve problems, especially problems from three dimensional geometry and physics.	Homework Quizzes/tests
Solve problems related to planes and lines in a three dimensional rectangular co-ordinate system, and identify and draw different kinds of surfaces	Homework Quizzes/tests
Solve problems involving the derivatives and integrals of vector- valued functions, use them to find the arc lengths of space curves, and apply the concepts to solve physics problems involving the velocity and acceleration of moving bodies in the space	Homework Quizzes/tests
Solve problems involving limits and partial derivatives of functions of several variables and appropriately apply them to find the equations of tangent planes and normal lines of surfaces and the extreme values of functions of several variables	Homework Quizzes/tests
Solve problems involving multiple integrals under rectangular, cylindrical	Homework Quizzes/tests

and spherical co-ordinate systems and use them to find the surface area and volume of 3D objects	
Solve problems involving line integrals and surface integrals, and solve problems using Green's theorem, Stokes' theorem, and divergence theorem and their application problems from physics	Homework Quizzes/tests

III. COURSE OUTLINE

A. Vectors and the geometry of space
1. Three-dimensional coordinate systems
2. Vectors
3. The dot product
4. The cross product
5. Equations of lines and planes
6. Cylinders and quadric surfaces
7. Cylindrical and spherical coordinates

B. Vector functions
1. Vector functions and space curves
2. Derivatives and integrals of vector functions
3. Arc length and curvature
4. Motion in space: velocity and acceleration

C. Partial derivatives
1. Functions of several variables
2. Limits and continuity
3. Partial derivatives
4. Tangent planes and linear approximations
5. The chain rule
6. Directional derivatives and the gradient vector
7. Maximum and minimum values

D. Multiple integrals
1. Double integrals over rectangles
2. Iterated integrals
3. Double integrals over general regions
4. Double integrals in polar coordinates
5. Applications of double integrals
6. Surface area
7. Triple integrals
8. Triple integrals in cylindrical and spherical coordinates

E. Vector calculus
   1. Vector fields
   2. Line integrals
   3. The fundamental theorem for line integrals
   4. Curl and divergence
   5. Parametric surfaces and their areas
   6. Surface integrals
   7. Green's theorem
   8. Stoke's theorem
   9. The divergence theorem

IV. METHODS OF INSTRUCTION

A. Lecture

B. Class discussion

C. Textbook

V. REQUIRED TEXTBOOKS

Stewart. *Calculus* (current edition). Belmont, CA: Brooks/Cole, Cengage Learning.

VI. REQUIRED MATERIALS

Graphics calculator required (TI-83/84 recommended)

Symbolic manipulating calculators prohibited

VII. SUPPLEMENTAL REFERENCES

No supplemental references

VIII. METHODS OF EVALUATION

A. Homework 10-20%

B. Classwork 0-20%
Worksheets and projects may be assigned at the discretion of the instructor to reinforce various concepts.

C. Tests 30-60%
There will be a minimum of three tests, each covering no more than 2 chapters of material.

D. Comprehensive final examination 15-25%

All students will be required to take a comprehensive final exam.

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; 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).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.