COURSE DESCRIPTION: Calculus III is a study of vectors, partial differentiation, directional derivatives, gradients, multiple integrals, vector calculus, line integrals, topics from vector analysis, and applications.

CREDITS/HOURS: 4 credits, 4 hours

PREREQUISITE: MAT-281 Calculus II with a grade of C or by permission of the Department Chair

GENERAL EDUCATION COURSE: Yes

STUDENT LEARNING OBJECTIVES:
1. Use vectors in two and three dimensions and apply their properties.
2. Apply various types of functions including functions of several variables, vector valued functions, and vector fields.
3. Compute partial derivatives of functions of two or more variables.
4. Use partial derivatives to find gradient vectors, equations of tangent planes, solve maximum and minimum problems (both constrained and unconstrained).
5. Set up and evaluate double and triple integrals and use them to compute surface areas and volumes. Use double and triple integrals to solve applied problems involving centers of mass and moments of inertia.
6. Apply calculus concepts to problems involving vector fields including line integrals, divergence, curl, and Green's Theorem, and use these concepts to solve problems in physics.

ASSESSMENT MEASURES:
1. Written assignments and/or quizzes.
2. Written examinations.
3. Other, as announced by the instructor.

COURSE GRADE: Students should refer to the instructor’s grading policy which will be distributed during the first meeting of the class.

COURSE CONTENT:

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<th>TOPIC</th>
<th>CHAPTER</th>
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<td>Vectors and the Geometry of Space</td>
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<td>All</td>
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| Vector Valued Functions              | 11      | 1, 2, 3 (optional: curvature), 4, (optional: 5,  
|                                      |         | tangential and normal components of acceleration) |
| Functions of Several Variables       | 12      | 1-8, (9 optional)                                 |
| Multiple Integrals                   | 13      | 1-7, (8 optional)                                 |
| Vector Analysis                      | 14      | 1-5, (6-9 optional)                               |

REFERENCES:  
Anton, Calculus with Analytic Geometry, John Wiley & Sons  
Larson, Hostetler, Edwards, Essential Calculus, Early Transcendental Functions,  
Houghton Mifflin  
Schaum's Outline of Calculus, McGraw Hill  
Shenk Calculus with Analytic Geometry, Goodyear  
Swotkowski, Calculus with Analytic Geometry, Prindle, Weber, and Schmidt

ELECTRONIC DEVICES:  
The Department of Mathematics prohibits the use of cell-phones, PDA’s, laptops, headphones, IPODs and other such devices in mathematics classes unless otherwise specified in the grading policy provided by the instructor at the beginning of the semester.

FACULTY ABSENCE PROCEDURE:  
“CLASS CANCELLATIONS” may be found by clicking on the bottom of the Bergen Community College website, www.bergen.edu. A list is also posted in a glass case near A-129, the main corridor on the first floor and in Ender Hall. Students may consult these listings before going to class. If a cancelled class is not listed, it should be reported to the Department Office (A-325) or the Adjunct Office (C-107).

WEBSITE:  
Go to www.bergen.edu/math for more information regarding the Mathematics Department.

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