**MATH 225 CALCULUS III**

**Department:** Mathematics and Computer Science

**Designation:** Required

**Catalog Data:** (4-0) 4 credits. Prerequisite: MATH 125 completed with a minimum grade of “C”. A continuation of the study of calculus, including an introduction to vectors, vector calculus, partial derivatives, and multiple integrals.

**Prerequisites:** Math 125 with a grade of ‘C’ or better.

**Textbook:** Calculus with Analytic Geometry, Eighth Edition, Larson, Hostetler, and Edwards

**Course Learning Outcomes:**

A student who successfully completes this should, at a minimum:

1. know basic vector operations
2. know how to work with lines and planes in space
3. understand vector-valued functions and their derivatives
4. be able to compute position, velocity and acceleration vectors
5. understand functions of several variables
6. be able to compute partial derivatives and gradients using multivariate chain rules
7. be able to interpret iterated integrals
8. be able to set up and evaluate double and triple integrals in various coordinate systems
9. be able to compute line integrals

**Topics:** vectors, vector calculus, partial derivatives, and multiple integrals..

**Class/Laboratory Schedule:** Variable

**Contribution to Criterion 5:** basic math and sciences

**Relationship of Course to ABET Outcomes (a) through (k)**

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| --- | --- | --- | --- |
|  | **Level of Emphasis** | | |
|  | Low | Medium | High |
| **ABET Outcome** |  |  |  |
| (a) an ability to apply knowledge of mathematics, science, and engineering |  |  | X |
| (b) an ability to design and conduct experiments, as well as to analyze and interpret data |  |  |  |
| (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability |  |  |  |
| (d) an ability to function on multidisciplinary teams |  |  |  |
| (e) an ability to identify, formulate, and solve engineering problems |  |  |  |
| (g) an ability to communicate effectively |  |  |  |
| (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context |  |  |  |
| (i) a recognition of the need for, and an ability to engage in life-long learning |  |  |  |
| (j) a knowledge of contemporary issues |  |  |  |
| (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. |  | X |  |

**Prepared By:** Dr. Kyle Riley, Department Chair; June 1, 2010