# MATH 221 - Multivariable Calculus Course Outline

**Approval Date:** 05/20/2013
**Effective Date:** 08/11/2013

## SECTION A

| | |
|---|---|
| **Unique ID Number** | CCC000522978 |
| **Discipline(s)** | |
| **Division** | Mathematics |
| **Subject Area** | Mathematics |
| **Subject Code** | MATH |
| **Course Number** | 221 |
| **Course Title** | Multivariable Calculus |
| **TOP Code/SAM Code** | 1701.00 - Mathematics, General / E - Non-Occupational |
| **Rationale for adding this course to the curriculum** | Course update. |
| **Units** | 5 |
| **Cross List** | *N/A* |
| **Typical Course Weeks** | |

**Total Instructional Hours**

### Contact Hours

| | |
|---|---|
| **Lecture** | 90.00 |
| **Lab** | 0.00 |
| **Activity** | 0.00 |
| **Work Experience** | 0.00 |
| **Outside of Class Hours** | 180.00 |

| | |
|---|---|
| **Total Contact Hours** | 90 |
| **Total Student Hours** | 270 |
| **Open Entry/Open Exit** | No |
| **Maximum Enrollment** | |
| **Grading Option** | Letter Grade Only |

**Distance Education Mode of Instruction**  On-Campus
Hybrid
Entirely Online

## SECTION B

**General Education Information:**

4) Differentiability and differentiation including partial derivatives, chain rule, higher-order derivatives, directional derivatives, and the gradient;
5) Arc length and curvature; tangent, normal, binormal vectors;
6) Vector-

B. Writing Assignments
   Daily homework assignments from the text, for example:
   1. Maximize $f(x,y) = x^2 + 2xy + y^2$
   2. Find the volume above the x-y plane enclosed by the paraboloid $z = 1 - x^2 - y^2$.
C. Other Assignments
   Other assignments such as research into applications or group projects assigned at instructors' discretion.

## 7. Required Materials

**A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.**

Book #1:
Author:              Briggs, W., Cochran, L.
Title:               Calculus
Publisher:           Pearson
Date of Publication: 2010
Edition:

**B. Other required materials/supplies.**

Graphical calculator is required