Calculus III
MATH 223
Fall 2015

This course is a continuation of MATH 222 Calculus II. Topics include conic sections, polar coordinates, parametric equations, two- and three-dimensional vectors, differential calculus of several variables, multiple integration, and applications. Prerequisite: C- or higher in MATH 222 Calculus II; waiver by placement testing results; or departmental approval.

COURSE OUTCOMES	OUTCOMES ACTIVITIES
At the end of this course, students will be able to:	
Demonstrate an understanding of basic conic sections, plane curves, and parametric equations in order to solve application problems.	1. Identify parabolas, eclipses and hyperbolas. (CT,QS,R) 2. Find equation of parabolas, eclipses and hyperbolas. (CT,R,QS) 3. Graph a curve represented by parametric equations. (CT,R,QS) 4. Write the rectangular equation of a curve by eliminating the parameter. (CT,R,QS) 5. Find the set of parametric equations for a given rectangular equation. (CT,R,QS) 6. Solve slope and tangent line problems, arc length problems and area problems of curves given by parametric equations. (CT,R,QS)
Demonstrate an understanding of polar coordinates and their graphs.	1. Rewrite rectangular coordinates and equations in polar form and vice versa. (CT,R,QS) 2. Sketch the graph of an equation given in polar form. (CT,R,QS) 3. Find the slope of a tangent line to a polar graph. (CT,R,QS) 4. Identify several types of special polar graphs. (CT,R,QS)
Demonstrate an understanding of vectors.	1. Write vectors, perform basic vector operations, and represent vectors graphically. (CT,R,QS) 2. Plot points in a three-dimensional coordinate system and analyze vectors in space. (CT,R,QS) 3. Find the dot product and cross product of two vectors. (CT,R,QS)
Demonstrate an understanding of functions of two variables.	1. Find equations of lines and planes in space. (CT,R,QS) 2. Find the distances between points, planes, and lines in space. (CT,R,QS) 3. Sketch the graph of a function of two variables. (CT,R,QS) 4. Find partial derivatives of a function of two variable. (CT,R,QS) 5. Use the Chain Rules for functions of several variables. 6. Evaluate an iterated integral. (CT,R,QS)

	7. Use an iterated integral to find the area of a plane region and other applications. (CT,R,QS)
	8. Use properties of double integrals. (CT,R,QS)
Demonstrate an understanding of vector fields and line integrals.	1. Sketch a vector field. (CT,R,QS)
	2. Find the curl and divergence of a vector field. (CT,R,QS)
	3. Write and evaluate a line integral. (CT,R,QS)
	4. Use Green's theorem to evaluate a line integral. (CT,R,QS)
Strengthen Core Competencies** in order to increase success in this and other courses and in the workplace.	Referenced above

**Indicate the Core Competencies that apply to the outcomes activities and assessment tools: Critical Thinking (CT); Technology Skills (TS); Oral Communications (OC); Quantitative Skills (QS); Reading (R); Writing (W).