MASTER COURSE OUTLINE
Prepared By: Date: September 2017

COURSE TITLE
Calculus 3

GENERAL COURSE INFORMATION

Dept.: MATH&	Course Num: 163	(Formerly: MATH 173)
CIP Code: 27.0103	Intent Code: 11	Program Code:
Credits: 5		
Total Contact Hrs Per Qtr.: 55		
Lecture Hrs: 55	Lab Hrs: 0	Other Hrs: 0

Distribution Designation: Math Science MS, Symbolic or Quantitative Reasoning SQR

COURSE DESCRIPTION (as it will appear in the catalog)
This course will expand on the applications and techniques of differentiation learned in the first and second quarters. It will introduce the student to the calculus of sequences and series and the use of the MacLaurin and Taylor series to approximate functions. It will introduce the student to the calculus of curvilinear functions and the concept of the vector and vector functions. It will also introduce the concept of a partial derivative and the maximization of functions given in more than one independent variable.

PREREQUISITES
MATH&152 or instructor permission

TEXTBOOK GUIDELINES
Appropriate college level text as chosen by instructor.

COURSE LEARNING OUTCOMES
Upon successful completion of the course, students should be able to demonstrate the following knowledge or skills:
1. Determine the convergence of series and sequences
2. Use series to represent and model functions
3. Apply calculus to functions in Cartesian, polar, cylindrical, and spherical coordinates
4. Find extrinsic properties (E.G. curvature, arc length) of vector-valued functions

INSTITUTIONAL OUTCOMES
IO2 Quantitative Reasoning: Students will be able to reason mathematically.

COURSE CONTENT OUTLINE
1. Sequences
2. Infinite Series
3. Comparison and Integral Tests
4. Ratio and Root Tests
5. Alternating Series and Absolute Convergence

6. Power Series
7. Taylor and MacLaurin Series
8. Calculations with Taylor Series
9. Conic Sections and Quadratic Equations
10. Parameterizations of Curves
11. Calculus with Parameterized Curves
12. Polar Coordinates
13. Polar Graphs
14. Polar Equations for Conic Sections
15. Integration in Polar Coordinates
16. Vectors in the Plane
17. Cartesian (Rectangular) Coordinates and Vectors in Space
18. Dot Products
19. Cross Products
20. Lines and Planes in Space
21. Surfaces in Space
22. Cylindrical and Spherical Coordinates
23. Vector-Valued Functions and Space Curves
24. Modeling Projectile Motion
25. Arc Length and the Unit Tangent Vector
26. Curvature
27. Introduction to Differential Equations (Optional)

DEPARTMENTAL GUIDELINES *(optional)*

In order to give the instructor the greatest flexibility in assigning a grade for the course, grades will be based on various instruments at the instructor's discretion. However, to maintain instructional integrity there must be four class exams or three class exams and a project. A final exam will be given if there are less than four exams or a project may be substituted for the final exam if there are four in-class exams. At least 60% of the grade will be based on quantifiable work (exams, homework, quizzes, etc.). The remaining portion of the grade may be based on quantifiable work, attendance, projects, journal work, etc., at the instructor's discretion.

The following is a compilation of acceptable grading instruments: In class exams and a final, attendance, homework or quizzes, research paper, modeling projects on the calculator or computer. Other projects or assignments may be assigned as deemed appropriate at the instructor's discretion.

_____ _____

DIVISION CHAIR APPROVAL **DATE**