MATH 143 Calculus III

1. Catalog Description

MATH 143 Calculus III **4 units**
GE Area B1

Prerequisite: MATH 142 with a grade of C- or better or consent of instructor.

Infinite sequences and series, vector algebra, curves. 4 lectures. Crosslisted as HNRS/MATH 143. Fulfills GE Area B4 (GE Area B1 for students on the 2019-20 or earlier catalogs); a grade of C- or better is required in one course in this GE Area.

2. Required Background or Experience

Math 142.

3. Learning Objectives

The student should:

a. Understand parametric equations and polar coordinates, and their applications.
b. Understand vector algebra and elementary differential vector calculus.
c. Be able to test infinite series for convergence.
d. Be able to calculate power series and Taylor series.

4. Text and References

- Stewart, Calculus, 8th edition, Cengage

5. Minimum Student Materials

Paper, pencils and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

7. Content and Method

Content	No. of Lectures
CHAPTER 10 - **Parametric Equations and Polar Coordinates**	6
10.1 Curves Defined by Parametric Equations	
10.2 Calculus with Parametric Curves	
10.3 Polar Coordinates	
10.4 Areas and Lengths in Polar Coordinates	
CHAPTER 11- **Infinite Sequences and Series**	13
The goal of the chapter is to develop Taylor Series.	
11.1 Sequences	
11.2 Series	
11.3 The Integral Test and Estimates of Sums	
11.4 The Comparison Tests	
11.5 Alternating Series	
11.6 Absolute Convergence and the Ratio and Root Tests	
11.7 Strategy for Testing Series	
11.8 Power Series	
11.9 Representations of Functions as Power Series	
11.10 Taylor and Maclaurin Series	
11.11 Applications of Taylor Polynomials	
CHAPTER 12 - **Vectors and the Geometry of Space**	6
12.1 Three-Dimensional Coordinate Systems	
12.2 Vectors	
12.3 The Dot Product	
12.4 The Cross Product	
12.5 Equations of Lines and Planes	
CHAPTER 13 - **Vector Functions**	5
13.1 Vector Functions and Space Curves	
13.2 Derivatives and Integrals of Vector Functions	
13.3 Arc Length and Curvature	
13.4 Motion in Space: Velocity and Acceleration	
Total	30

8. Methods of Assessment

The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination.