

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 B1; for students admitted Fall 2016 or later, a grade of C- or better in one GE B1 course is required to fulfill GE Area B.

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

- Weir and Hass, Thomas' Calculus, Addison-Wesley

5. Minimum Student Materials

Paper, pencils and notebook.

6. Minimum University Facilities

Classroom with ample chalkboard space for class use.

<u>7. Content and Method</u>	<u>No. of Lectures</u>
<u>Content</u>	
CHAPTER 10 – Infinite Sequences and Series	13
The goal of the chapter is to develop Taylor Series.	
10.1 Sequences	
10.2 Infinite Series	
10.3 The Integral Test	
10.4 Comparison Tests	
10.5 The Ratio and Root Tests	
10.6 Alternating Series, Absolute and Conditional Convergence	
10.7 Power Series	
10.8 Taylor and Maclaurin Series	
10.9 Convergence of Taylor Series	
10.10 The Binomial Series and Applications of Taylor Series	
CHAPTER 11 - Parametric Equations and Polar Coordinates	6
11.1 Parametrizations of Plane Curves	
11.2 Calculus with Parametric Curves	
11.3 Polar Coordinates	
11.4 Graphing in Polar Coordinates	
11.5 Areas and Lengths in Polar Coordinates	
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 Lines and Planes in Space	
CHAPTER 13 – Vector-Valued Functions and Motion in Space	5
13.1 Curves in Space and Their Tangents	
13.2 Integrals of Vector Functions; Projectile Motion	
13.3 Arc Length in Space	
13.4 Curvature and Normal Vectors of a Curve	
13.5 Tangential and Normal Components of Acceleration	
13.6 Velocity and Acceleration in Polar Coordinates	
Total	<u>30</u>

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. Students are required to show their work, and are graded not only on the correctness of their answers, but also on their understanding of the concepts and techniques.