

1. Department, Course Number, and Course Title:

MATHEMATICS AND COMPUTER SCIENCE

MATH 208 CALCULUS III: SEQUENCES, SERIES, AND COORDINATE SYSTEMS (4)

2. Designation: Required Elective
Lower Division Upper Division

3. Course Description: Limits of sequences and series, indeterminate forms, Taylor Series, plane coordinate systems, and change of coordinates.

4. Prerequisites: MATH 207 with minimum C grade.

5. Text and Materials: Calculus, Early Transcendentals, 5th ed., Stewart, Thomson, 2002
Single Variations Calculus, Early Transcendentals, 5th ed., Stewart, ITP

6. Course Objectives: This course is designed to broaden the students skills and knowledge of differential and integral calculus of functions of one real variable. Major topics are infinite sequences and series with emphasis on Taylor series and polar coordinates in the plane. Vector geometry and parameterized curves begin the study of higher dimensions

Course Outcomes

- The student should gain an intuitive understanding and computational facility with the limits of sequences of real numbers and the algebra of limits.
- The student should gain an intuitive understanding of the convergence of infinite series and computational facility with important cases, especially geometric series. The student should be familiar with and be able to apply standard tests for the convergence of series. The student should be familiar with the basic facts about power series and the radius of convergence.
- The student should be familiar with application of the ideas of part (B) to Taylor series and should be familiar with the Taylor series expansions of important functions, especially the exponential and trigonometric functions.
- The student should be familiar with the use of polar coordinates in the plane and cylindrical and spherical coordinates in space.. The student should be familiar with the idea of parameterized curves in two and three dimensions and with the basic use of calculus along such curves (velocity and acceleration)
- The student should be familiar with and have computational facility in the tools of vector geometry in two and three dimensions. (projection, dot product, cross product), the equations of lines and planes, and standard quadric surfaces.

7. Topics Covered: (in Order of Presentation)

- Limits of sequences (Ch. 8)
- Convergence of infinite series (Ch. 8)
- Standard tests for convergence (Ch. 8)
- Absolute and conditional conv. (Ch. 8)
- Power series, radius of conv. (Ch. 8)
- Taylor series expansions (Ch. 8)
- Parameterized plane curves (Ch. 9)
- Polar coordinates (Ch. 9)
- Vectors (Ch. 10)
- Dot and cross products (Ch. 10)
- Lines and planes (Ch. 10)
- Quadric surfaces (Ch. 10)
- Cylindrical & Spherical coord. (Ch. 10)
- Curves in space (Ch. 11)

8. Class Schedule: Number of Sessions per week: 2 lectures
Duration of each session: Lectures 1 hour and 40 minutes

9. Contribution of course to meeting the professional component:

This course is part of the one year (48 quarter units) of Basic Mathematics and Science.
Mathematics 4 units

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)

Skill outcomes:

- an ability to communicate effectively (abet g)
- an ability to think in a logical sequential process

Attitudes Outcome:

11. Prepared by:

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