

1. Department, Course Number, and Course Title:

MATHEMATICS AND COMPUTER SCIENCE

MATH 206 CALCULUS I: DIFFERENTIATION (4)

- 2. Designation:** Required Elective
Lower Division Upper Division
- 3. Course Description:** Functions, graphs, conics, limits, continuity and derivatives, anti-differentiation, and applications.
- 4. Prerequisites:** Satisfactory score on (or exemption from) ELM; MATH 102 AND 103, each with a minimum C grade or satisfactory score on placement examination.
- 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 teach the student the principles and techniques of differential calculus of functions of one real variable with a selection of typical applications

Course Outcomes

- The student should attain an intuitive understanding of limits and continuity and computation facility with commonly encountered limit problems. The students should have an intuitive understanding of the intermediate value theory and be able to apply it to locate solutions within an interval.
- The student should have an understanding of the derivative as a slope, as a rate of change, and as a limit and should have computational facility with standard methods for derivatives including the chain rule.
- The student should have an understanding of the second derivative as an indicator of concavity and as acceleration.
- The student should be able to apply derivative methods to the graphing of functions and to optimization (max-min) problems as well as other selected applications.
- The student should be familiar with the idea of an antiderivative, basic facts about them, and the solution to a first order initial value problem.

7. Topics Covered: (in Order of Presentation)

- Idea of limit and continuity (Ch. 1)
- Computation of limits (Ch. 1)
- Derivative as a slope (Ch. 2)
- Derivative as a rate of change (Ch. 2)
- Derivative as a limit (Ch. 2)
- Computation of derivatives (Ch.2)
- Implicit differentiation (Ch. 2)
- Application to graphing (Ch. 3)
- Application to optimization (Ch. 3)
- Newton's Method (optional) (Ch. 3)
- Antiderivatives (Ch. 4)
- Initial Value Problems (Ch. 4)
- Substitution (Ch. 4)

- 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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