

1. Department, Course Number, and Course Title:

MATHEMATICS AND COMPUTER SCIENCE

MATH 207 CALCULUS II: INTEGRATION (4)

2. Designation: Required Elective
Lower Division Upper Division

3. Course Description: The definite integral, Fundamental Theorem of the Calculus, transcendental functions, methods of integration, applications to physics and biology.

4. Prerequisites: MATH 206 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 teach the student the principles and techniques of integral calculus of functions of one real variable with a selection of typical applications

Course Outcomes

- The student should attain an intuitive understanding of the integral as a limit of sums and as an antiderivative. The student should have an appreciation for the fundamental theorem of calculus especially as the method of solution of integration problems.
- The students should have an understanding of and computational facility with integration by substitution, parts, and partial fractions as well as other selected techniques.
- The student should be familiar with and have computational facility in common geometric applications such as area between curves, volumes and areas of solids of revolution, and length of curves as well as other selected applications.
- The students should have familiarity and computational facility with the calculus of the common transcendental functions especially exponential, logarithm, and the trigonometric functions and their inverses. The exponential function should be familiar as the solution to a growth problem.
- Improper integrals, L'Hopital's Rule and related computations should be familiar.

7. Topics Covered: (in Order of Presentation)

- Antiderivatives and substitution (Ch. 4)
- Integral as limit of sums (Ch. 4)
- Fundamental Theorem (Ch. 4)
- Areas (Ch. 5)
- Solids of Revolution (Ch. 5)
- Length of plane curves (Ch.5)
- Other applications (optional) (Ch. 5)
- Log and Exponential (Ch. 6)
- Growth and decay (Ch. 6)
- L'Hopital's Rule (Ch. 6)
- Inverse trig functions (Ch. 6)
- Integration by parts (Ch. 7)
- Partial fractions (Ch. 7)
- Other techniques (Ch. 7)
- Improper integrals (Ch. 7)

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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Updated by Maj Dean Mirmirani

03/2000

01/2006