MTH 252 : CALCULUS II

Transcript title

Calculus II

Credits

4

Grading mode

Standard letter grades

Total contact hours

60

Lecture hours

30

Lab hours

30

Recommended preparation

MTH 251 or minimum placement Math Level 24.

Course Description

Introduces concepts of integral calculus to science, mathematics and engineering students. Includes antidifferentiation, the Fundamental Theorem of Calculus, integration techniques, numerical methods, improper integrals and mathematical modeling with applications to geometry, physics, economics and population dynamics. Graphing calculator required.

Course learning outcomes

1. Use the Fundamental Theorem of Calculus to analyze problems including determining the area under a curve, the area between curves, and the average value of a function.
2. Interpret the value of the definite integral in a variety of contexts.
3. Apply a variety of numerical methods and appropriate technology to approximate the value of a definite integral.
4. Use the definite integral to solve applied problems, which may include determining volumes of solids, arc length, surface area of solids, fluid force, work, and center of mass.
5. Use appropriate integration techniques to determine antiderivatives.
6. Determine and analyze the total change in a function given function data from a graph, table of values, or formula.
7. Analyze mathematical problems, develop solutions, and communicate those solutions through a technical or laboratory report.

Content outline

1. Antiderivatives
2. Introduction to integration
3. The Fundamental Theorem of Calculus
4. Integration techniques
   a. Substitution
   b. Integration by parts
   c. Indefinite integrals
   d. Approximating integrals
   e. Additional methods
5. Applications of integration
   a. Net change
   b. Areas and volumes
   c. Work
   d. Additional applications

Required materials

Students are required to have a license for web-based software which will include an e-text. Paper copy of the textbook is optional.

General education/Related instruction lists

- Mathematics