San Francisco State University
Department of Mathematics
Course Syllabus

MATH 227
Calculus II

Prerequisites

MATH 226 with a grade of C or better.

Bulletin Description

The second semester of Calculus: integration, area between curves, volume, integration by parts, partial fractions, improper integrals, parametric equations, infinite sequences and series, an introduction to Mathematica.

Course Objectives

The main objective of Calculus II is for students to continue learning the basics of the calculus of functions of one variable. They will study both the concepts and techniques of integration, parametric equations, and infinite sequences and series, culminating with Taylor series. They will also apply these ideas to a wide range of problems that include area between curves, volume, work, arc length and surface area. They will study approximate integration, a topic that will involve an introduction to Mathematica. The students should be able to interpret the concepts of Calculus algebraically, graphically and verbally.

More generally, the students will improve their ability to think critically, to analyze a problem and solve it using a wide array of tools. These skills will be invaluable to them in whatever path they choose to follow, be it as a mathematics major or in pursuit of a career in one of the other sciences.

Upon successful completion of the course, students should be able to

- Calculate integrals exactly
- Perform numerical integration using the Trapezoidal Rule and Simpson's Rule
- Approximate integrals using Mathematica
- Apply integration to problems such as volume, work, arc length and surface area
- Apply convergence tests to a wide range of infinite series
- Expand a function in a Taylor series

Evaluation of Students

Students will be evaluated on their ability to devise, organize and present complete solutions to problems. While instructors may design their own methods of evaluating student performance, these methods must include in-class examinations, frequent homework assignments and a final exam.

Course Outline

Topics	Number of Weeks
Integrals	2
Applications of Integration	2
Techniques of Integration	3
Further Applications of Integration	1
Parametric Equations and Polar Coordinates	2
Infinite Sequences and Series	5

Textbooks and Software

Calculus, Early Transcendentals , by James Stewart (4th edition)
Mathematica

Submitted by: Alex Schuster Date: May 7, 2003