

ACADEMIC

UNIVERSITY DATE 03/21/93

UNIVERSITY Sacramento

Department: SCIENCE & MATHEMATICS

New Course:

Revision of Course

Information form: X

DATED: March, 1993

MATH 220

CALCULUS II

Subject & Course No. Descriptive Title Semester Cr

Calendar Description

Summary of Revision

20 and

Math 220 is an introduction to integral calculus. It develops the concept of the integral and its applications. Other topics include techniques of integration, improper integrals, sequences and series of

Redistribution of topics between Math 1220 and

UNIVERSITY Sacramento

(Use Bibliographic Form)

Stewart, Calculus: Early Transcendentals, 3rd Edition, Brooks/Cole

A graphing calculator

Course Objectives

Comments:

General co

... required for continued studies in science, engineering, computer science, and mathematics.

Math 321

421 provides the found

a major ma

Objectives:

Specific obje

At the conclusion of this course, the student should be able to:

- compute finite Riemann sums and use to estimate area
- form limits of Riemann sums and write the corresponding definite integral

- determine if a sequence is bounded and/or monotonic
- determine the sum of a geometric series

choose an appropriate test and determine series convergence/divergence using

be able to

- al test
- comparison test
- comparison test
- and root tests
- ating series test

- a) integra
- b) simple
- c) limit co
- d) ratio a
- e) alterna

ch and apply concepts of absolute and conditional convergence of a

distinguish

radius and interval of convergence of a power series

determine the ra

approximate a differentiable function by a Taylor polynomial, determine the remainder term

and compute the error in using the approximation

tion
tution, differentiation or integration of related power series

- a) direct computa
- b) means of substi



- find the area of a region bounded by the graph of a polar equation or parametric equations

ordinates or in parametric form

find the lengths of curves in polar coord

tion by method of separation of variables apply to

solve first order linear differential equ
growth and decay problems

D Course Content

1. Introduction to the Integral

- sigma notation

- Riemann sums
- the definite integral

- the Fundamental Theorem of Calculus
- antiderivatives, elementary substitutions

applications to area, length, and volume

2. Techniques of Integration

- parts
- trigonometric substitution
- trigonometric integrals (products and powers)
- partial fractions (linear factors and distinct quadratic factors)
- rationalizing substitutions

er integrals



impro

- areas between curves

- volumes by slicing and cylindrical shells

- work

- separable differential equations

- arc length

- sequences

- sum of a geometric series

- absolute and conditional convergence

- comparison tests

- alternating series

- ratio and root test

- integral test

- power series

- differentiation and integration

- Taylor and Maclaurin series

- polynomial approximations; Taylor polynomials

5. Parametric Equations and Polar Coordinates

- areas and arc lengths of curves in polar coordinates

- areas and arc lengths of functions in parametric form

6. Optional Topics (included at the discretion of the instructor)

- tables of integrals

- approximation of integrals by numerical techniques

- a rigorous proof of the fundamental theorem of calculus

- the notion of the logarithm defined as an integral

- further applications of Riemann sums

- binomial series

Q. Method of Instruction

Lectures, problem sessions and assignments.

R. Course Evaluation

Evaluation will be carried out in accordance with Douglas College policy.