CALCULUS III
MA 290

Catalogue Description

This is a continuation of Calculus II. Topics studied include improper integrals, L'Hopital's Rule, infinite series, conic sections, polar coordinates, parametric equations, and introduction to vectors.

Goals

A. To introduce the traditional material covered in the 2nd year Calculus sequence.
B. To sharpen the calculus background of students.
C. To prepare students for more advanced math courses such as Advanced Calculus, Differential Equations, etc.

Procedures

A. Lecture/Discussion
B. Use of available software (Derive)
C. Possible use of graphing calculators
D. Computer software supplements in Math Resource Center

Course Content

A. Improper Integrals; L'Hopital's Rule
1. Improper Integrals
2. L'Hopital's Rule (Indeterminate Forms of Type 0/0)
3. Other Indeterminate Forms

B. Infinite Series
1. Sequences
2. Monotone Sequences
3. Infinite Series
4. Convergence: The Integral Test
5. Additional Convergence Tests
6. Applying the Comparison Test
7. Alternating Series: Conditional Convergence
8. Power Series
9. Taylor & MacLaurin Series
10. Taylor Formula with Remainder, Convergence of Taylor Series
11. Computation Using Taylor Series
12. Differentiation and Integration of Power Series

C. Topics In Analytic Geometry
1. Introduction to the Conic Sections
2. Parabola; Translation of Coordinate Axes
3. The Ellipse
4. The Hyperbola

D. Polar Coordinates and Parametric Equations
1. Polar Coordinates
2. Graphs in Polar Coordinates
3. Area in Polar Coordinates
4. Parametric Equations

E. Vectors (An Introduction)

Evaluation methods at the discretion of the instructor.

Bibliography

Required Text:

Anton, Howard, Calculus with Analytic Geometry, 5th ed., John Wiley & Sons, New York, N.Y. 1995.

Coughlin/Zitarelli, Brief Calculus with Applications, Saunders Pub., Phila., Pa., 1990

Lial, Margaret L. & Miller, Charles D., Finite Math & Calculus with Applications, 3rd Ed., Scott, Foreman & Co. 1989.

Cannon, Raymond & Williams, Gareth, Calculus Management, Social and Life Sciences, W.C. Brown Pub., Donahue, Ia., 1988.

Software

Andrews, Richard, Student Edition of Mathcad , Addison Wesley Pub., Reading, Mass., 1988

Burgmeier, Kost, Explorations Programs in Calculus, Prentice Hall, Englewood Cliffs., N.J. 1985.

Derive A Mathematical Assistant, Version 1.62, Soft Warehouse Inc., Honolulu, Hawaii, USA., 1988

Finney, Hoffman, Schwartz, Wilde, The Calculus Toolkit, Addison Wesley Pub., Reading, Mass., 1986

Flanders, Harley, <u>Microcalc 4.01</u>, Software for Teaching/Learning Calculus, Ann Arbor, Mi., 1987

Kemeny, Kurtz, <u>Calculus</u>, Tru Basic Inc., New Hampshire, 1988

Meyers, Roy, <u>Surface Plotter</u>, Elm Software, Leechburg, Pa., 1987

Rowell, James, <u>Mathematical Modeling with Mathcad Explorations in the Calculus and Beyond</u>, Addison Wesley Pub., Co., Inc., 1990

Waits, Demana, <u>Master Grapher and 3D Graphics</u>, Addison Wesley Inc., Reading, Mass., 1988

SAMPLE WEEKLY PROGRESS

TEXT: Anton, Calculus with Analytic Geometry, John Wiley & Sons, New York, N.Y. 1988

Calculus III

WEEK

1	Sec. 10.1, (2 Classes), Sec. 10.2
2	Sec. 10.3, 11.1, 11.2
3	Sec. 11.3, (2 Classes), 11.4
4	Sec. 11.5, 11.6 (2 Classes)
5	Review, Exam #1, Sec. 11.7
6	Sec. 11.8, 11.9 (2 Classes)
7	Sec. 11.10, 11.11, 11.12
8	Sec. 11.12, 12.1, 12.2
9	Review, Exam #2, Sec. 12.3
10	Sec. 12.4, 13.1, 13.2
11	Sec. 13.2, 13.3, (2 Classes)
12	Sec. 13.4, (2 Classes), 14.1
13	Review, Exam #3, Sec. 14.2
14	Sec. 14.3, 14.4, Review
15	Review