College of Science and Health

Department of Mathematics

MAEN Program

Course Outline

1. **Title of Course, Course Number and Credits**:

Calculus with Applications II - MAEN5100, 3 credits

1. **Description of Course**:

This course is a continuation of MAEN5070, Calculus with Applications I. The topics included in the course are Integration and Applications, Differential Equations, Infinite Series and Taylor Polynomials, Multivariable Calculus, and Linear Algebra.

1. **Course Prerequisites**:

MAEN5070 - Calculus with Applications I

1. **Course Objectives**:

To understand the basic concepts and techniques of integration in relation to differentiation as a inverse operation, and its applications to science, the other sciences, to understand multivariable calculus and its applications, to be able to use series to approximate and define functions.

To learn how to use the graphing calculator and the computer in order to enhance the understanding of the basic concepts of integration and solve more complicated applications.

1. **Student Learning Outcomes**:

Homework, class quizzes and tests, and a final exam will be used to assess the Student Learning Outcomes. Students will be able to:

* Effectively express themselves in oral form through class participation, and project presentations; communicate clearly and orderly in writing by translating a real life problem into a mathematical model.
* Apply critical thinking skills by interpreting and solving work, moments, centers of mass, and additional application problems.
* Locate and use information in problem solving requiring calculus concepts.
* Demonstrate the ability to integrate knowledge and ideas using the techniques available for finding areas, volumes, and arc length, in a coherent and meaningful manner.
* Work effectively with others on projects and homework assignments.
* Use technology such as graphing calculators and computers in order to more deeply understand the building blocks of this courses as well as providing them with the means of analyzing more complicated applications.

After successful completion o ft he course, students should be able to:

* Demonstration the ability to integrate knowledge to evaluation Riemann sums and integrals, through theorems and technology.
* Demonstrate the ability to think critically by using the appropriate tests for the convergence of infinite series, and finding the representation of functions by power series.
* Calculate plane and surface areas and volumes of solids.
* Locate and use information to solve integral calculus problems and real world applications.
* Use the concepts of vectors to solve problems in mathematics and sciences.

1. **Course Content**:

Integration 2 weeks

Differential Equations 2 weeks

Applications of Integration 2 weeks

Integration Techniques 2 weeks

Infinite Series 2 weeks

Vectors and the Geometry of Space 2 weeks

Functions of Several Variables 2 weeks

Projects: Portfolio; Proofs, Selected Problems, and a Topic from Chapter 9

1. **Guidelines/Suggestions for Teaching Methods and Student Learning Activities:**

This course is taught as a lecture course with student participation and use of computers and graphing calculators. The TI-83 is required. MATHEMATICA is available in the Computer Lab in Science room 349.

1. **Guidelines/Suggestions for Methods of Student Assessment (Student Learning Outcomes)**

In class: Weekly quizzes, Midterm, and Cumulative Final.

Research Project.

1. **Suggested Reading, Texts and Objects of Study**:
2. Calculus; E.T.F., 3ed., Larson, Hostetler, and Edwards; Houghton Mifflin
3. TI-83
4. The student version of “MATHEMATICA” – Optional
5. **Bibliography of Supportive Texts and Other Materials:**

Calculus, A New Horizon; Anton, Howard; John Wiley & Sons, Inc.

Calculus, James Stewart, Brooks/Cole

Calculus, Early Transcendentals Version, 6ed., by Edwards & Penny; Prentice Hall

TI-83+ Graphing Calculator. A TI Graphing Calculator Approach to Calculus, 2ed., John T. Gresser, Prentice Hall

1. Preparer’s Name and Date:

Dr. Beva Eastman, Fall 1990

1. Original Department Approval Date:

Fall 1990

1. Reviser’s Name and Date:

Dr. Diane Kalish, Fall 2006

1. Departmental Revision Approval Date: