Administrative Unit: Computer and Mathematical Sciences Department

Course Prefix and Number: MATH 494

Course Title: Senior Seminar in Mathematics

Number of Credit Hours: 1 Lecture Hours: 1 Laboratory Hours: 0

Catalog Description: A seminar course required as a culminating experience for mathematics majors. Students will prepare and present a portfolio following departmental guidelines to document achievement of the learning goals for the mathematics majors. Additionally, students will present a lecture on a topic not covered in core courses in consultation with the instructor and will take the Major Field Test for Mathematics. A grade of C or higher is required for this course. Prerequisites: Senior standing and faculty advisor approval.

Prerequisite(s)/Corequisite(s): Senior standing and faculty advisor approval.

Text(s): None.

Course Objectives:

• To understand the theory and application of algebra and analysis.
• To write a computer program in a high-level language to solve a mathematical problem.
• To identify and apply appropriate technologies to solve mathematical problems.
• To write rigorous mathematical proofs.
• To solve real-world problems from a variety of disciplines using mathematical techniques.
• To approach a topic in calculus from the four perspectives: numerical, graphical, analytical, and verbal.

Measurable Learning Outcomes:

• Demonstrate a fluency in the language of mathematics and with the fundamental results of analysis and algebra.

Topical Outline (major areas of coverage):

The Major Field Test in Mathematics will be administered and students will make the following presentations (all materials will be archived in the students' portfolios):

• Write a computer program to implement a mathematical algorithm.
• Demonstrate an example of solving a mathematical problem using technology.
• Present a summary and critique of a selection of proofs written for the core courses of Linear Algebra, Abstract Algebra, Probability Theory, and Advanced Calculus.
• Present a lecture on a topic not covered in core
courses in consultation with the instructor.
• Present three examples of solving problems in other disciplines using mathematics.
• Present a topic from analysis demonstrated from the four viewpoints.

Recommended maximum class size for this course: 10

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

Prepared by: Suzanne Tourville
Name ________________________________ Signature ________________________________

Date: March 8, 2006

NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

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