

**MOREHOUSE COLLEGE
DEPARTMENT OF MATHEMATICS**

**SENIOR SEMINAR
MATH 497**

- PREREQUISITE:** Math 361 and Math 371 with a grade of “C” or better
- TEXT:** Class Handouts.
- RECOMMENDED SUPPLEMENT:** *Advanced Mathematics*. 2nd Ed., W. Barnier and N. Feldman, Prentice Hall, 2000
Contemporary Abstract Algebra. 3rd Ed., Joseph Gallian Heath and Company, 1994
Analysis with an introduction to proof. 3rd Ed., S. Lay, Prentice, 2001
Graph Theory. R. Gould, Benjamin and Cummings, 1998.
Elementary Differential equations and Boundary. W.Boyce et al, Wiley&Sons, 1986
- COVERAGE:** **Math logic** - Axiomatic set theory
Number Theory - Fermat and Goldbach conjectures, and additive number theory
Abstract Algebra - Class equations, Sylow's theorems
Topology - General and point set topology, metric spaces
Graph Theory - Euler and Hamilton graphs
Complex Analysis - Differential and analytic functions, Cauchy-Riemann equations
Differential Equation - Introduction to partial and ordinary differential equations.
Linear and non-linear equations
-

COURSE OUTLINE

1. **Introduction to senior seminar.**
 - 1.1. Capstone course
 - 1.2. Major subfields and integration of concepts
2. **Introduction to scientific typesetting**
 - 2.1 TeX and LaTeX
 - 2.2 Scientific paper typesetting
 - 2.3 Scientific presentation typesetting
3. **Research talks**
 - 3.1 Introduction to mathematical research
 - 3.2 Introduction to graduate schools
4. **Research project**
 - 4.1 Weekly meetings with advisor(s)
 - 4.2 Weekly report
5. **Presentations**
 - 5.1 Abstract
 - 5.2 Midterm report
 - 5.3 Final presentation

BEHAVIORAL OBJECTIVES

After successfully completing this course, the students should be able to perform the following tasks:

- Seek to integrate concepts, theories and their applications from the various subfields of Mathematics.
- Conduct undergraduate level mathematical research
- Write, and present a substantive paper in their respective areas of concentration

A syllabus is not a contract between instructor and student. The instructor reserves the right to alter, based on new materials, class discussions, or other legitimate pedagogical objectives. Morehouse College is committed to equal opportunity in education for all students, including those with documented disabilities. Students with disabilities or those who suspect they have a disability must register with the Office of Disability Services ("ODS") in order to receive accommodations. Students currently registered with the ODS are required to present their Disability Services Accommodation Letter to faculty immediately upon receiving the accommodation. If you have any questions, contact the Office of Disability Services, 104 Sale Hall Annex, Morehouse College, 830 Westview Dr. S.W., Atlanta, GA 30314, (404) 215-2636, FAX: (404) 215-2749.