Graduate Studies in the
Department of Mathematical Sciences

Brief History:

• Graduate Program started 1960
• First Ph.D. 1967
• Department of Mathematical Sciences since 1971
• M.S. and Ph.D. programs restructured in the late 1970’s–early 1980’s
Graduate Programs

• M.S. and Ph.D. in Mathematical Sciences
• Emphasis Areas
  – algebra and discrete mathematics
  – applied analysis
  – computational mathematics
  – mathematics education
  – operations research
  – probability and statistics
• Study in all areas include courses to provide both breadth and depth
• Also Ph.D. in Management Science (with Management Department)
FACULTY INTEREST AREAS

ALGEBRA/DISCRETE MATH
- Graph Theory
- Combinatorics
- Geometry
- Coding Theory
- Cryptography
- Discrete Mathematics
- Finite Fields
- Number Theory

APPLIED ANALYSIS
- Nonlinear Differential Equations
- Biomathematical Modeling
- Financial Mathematics
- Partial Differential Equations
- Control Theory
- Dynamical Systems
- Neural Networks
- Functional Analysis

COMPUTATIONAL MATHEMATICS
- Fluid Dynamics
- Integral Equations
- Discrete Computing
- Environmental Modeling
- Simulation
- Parallel Processing

OPERATIONS RESEARCH
- Mathematical Programming
- Optimization
- Network Algorithms
- Stochastic Processes
- Graph Theory
- Computational OR

STATISTICS
- Decision Theory
- Reliability
- Data Analysis
- Statistical Computing
- Quality Control
- Sampling Theory
- Biostatistics
- Artificial Intelligence
Interdisciplinary Approach
Mathematical Sciences M.S. Program

• Prerequisites
  Linear Algebra
  Differential Equations
  Computer Language
  Statistics

• Foundations
  Modern Algebra
  Advanced Calculus
  Probability
  Discrete Computing Course

• Breadth Area
  Algebra 853 Matrix Analysis
  Analysis 821 Linear Analysis
  Scientific Computing 860 Intro. to Scientific Computation
  Operations Research 810 Linear Programming
  Statistics 805 Data Analysis
  804 Intro. to Statistical Inference
  Statistics/OR 800 Probability
  803 Stochastic Processes
  814 Network Flow Programming

• Concentration
  Six Courses

• Master’s Project (MthSc 892)
Mathematical Sciences Ph.D. Program

• Student’s curriculum includes at least two graduate courses in each of the five areas: algebra/discrete math, analysis, computational math, operations research, and probability/statistics

• Curriculum includes twenty or more 800/900 level graduate courses gives depth to concentration area and to a supporting secondary area

• Timeline
take preliminary exams in three areas selected from:
  algebra, analysis, computational mathematics,
  operations research, statistics, stochastic processes

Ph.D. advisor and committee formed
comprehensive exam
dissertation defense

• Preliminary exams are offered in January and late May/early June

• Ph.D. advisory committee (four members) reflects breadth and interdisciplinary nature of the program
A Sampling of Recent M.S. Graduates

Project Title (Initial Employment)

“Solution Approaches to the Path-Preservation Cutset Problem” (Satellite Systems Engineer, Lockheed Martin)

“Vibration Suppression of Simple Space Station Models Using Position and Velocity Feedback” (Naval Air Systems Command)

“Implementation of Multiple Criteria Dynamic Programming Procedures for Affordable Decision Making” (Analyst, Scientific Research Corporation)

“Statistical Analysis of Penaeid Shrimp Toxicity Values” (Database Marketing Analyst, Rodale, Inc)

“Automating External Radiation Beam-On Time Using Statistical Techniques” (Risk Analyst, Bank USA)

“Characterization, Enumeration, and Products of Involutory Matrices” (National Security Agency)

“An Introduction to Numerical Modeling of Stock Options” (Milliken & Company)

“Using Multicommodity Networks to Model a Manufacturing Distribution System” (Sonoco Corp.)

“Bayesian Inferences” (Bank One)
A Sampling of Recent Ph.D. Graduates

Dissertation Title (Initial Employment)

“Norm-Based Evaluation and Approximation in Multicriteria Programming” (Information Technology Specialist in Information Management, BMW)

“Root-Based Polynomial Compositions over Finite Fields” (Davies Fellow, NRC/ARL/USMA Fellowship)

“Solution Approaches for a Multi-Dimensional Scheduling Problem in the Apparel Industry” (Analyst, Technology Strategy, Inc.)

“Quantifying Error in the Analysis of Partitioning Interwell Tracer Tests” (Analyst, Solipsys Corporation)

“Full-Load Truck Routing with Time Windows” (IBM)

“Some Issues in Nonparametric Regression Inference” (Talus Solutions, Inc.)

“Stochastic Models for Workstation Utilization” (GE Capital Mortgage Corporation)

“Addressing Formulation Size, Strength, and Structure in Modeling Discrete Decision Problems” (Dickinson College)

“Using a Circadian Rhythms Model to Identify Optimal Shift Work Schedules” (Western Carolina University)

“Stochastic Minimum Spanning Trees” (Denison University)
## Recent Industrial Employers

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<thead>
<tr>
<th>Company</th>
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<tbody>
<tr>
<td>The Acacia Group</td>
<td>Axiom Corporation</td>
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<tr>
<td>Bank One</td>
<td>Bank USA</td>
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<td>Blue Cross/Blue Shield</td>
<td>BMW</td>
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<td>Centers for Disease Control</td>
<td>Department of Defense</td>
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<td>J. D. Edwards</td>
<td>Ericsson Inc.</td>
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<tr>
<td>Fair, Isaac and Company</td>
<td>First Union Securities</td>
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<td>First USA Bank</td>
<td>Greenville Hospital System</td>
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<td>GTE</td>
<td>IBM Corporation</td>
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<td>Institute for Defense Analyses</td>
<td>Lockheed Martin</td>
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<td>Lucent Technologies</td>
<td>Melita International</td>
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<td>Micron Technology Inc.</td>
<td>Milliken &amp; Company</td>
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<td>Naval Air Systems Command</td>
<td>National Security Agency</td>
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<td>Rodale Press</td>
<td>Sabre Systems</td>
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<td>SAIC</td>
<td>SAS Institute</td>
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<td>Scientific Research Corporation</td>
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<td>Solipsys Corporation</td>
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<td>Sparta Inc.</td>
<td>Talus Solutions, Inc.</td>
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<td>Technology Strategy Inc.</td>
<td>Trilogy Computing</td>
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<td>Unisys</td>
<td>WorldCom</td>
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Women
Men
Summary

• Mathematical Science Approach
  multidisciplinary tools
  interdisciplinary faculty

• Breadth and Depth in M.S. and Ph.D.

• Produce Graduates with Flexible Career Paths
  education
  business–industry–government
Other Information

• web page

  www.math.clemson.edu

  – links to faculty web pages

  – link to the math graduate program page

  – link to the Graduate School page (off the math graduate page)

• email

  mathsci@clemson.edu

• telephone

  (864) 656-3434

• online application

  www.grad.clemson.edu