What is Mathematical Research?

- Exploring and attempting to answer new mathematical questions
- Developing new concepts, methods, and/or proofs to solve a problem
- Typically, problems have no known solution

What courses do I need to complete before I conduct mathematical research?

It varies. For Example:

- Graph Theory or Combinatorics: MATH 295 Introduction to Proofs or MATH 207 Discrete Mathematics
- Abstract Algebra: MATH 303 Abstract Algebra I
- Statistics: MATH 250 Statistical Methods I and MATH 350 Statistical Methods II

If you think someone's research looks interesting, ask what courses they recommend!

How can I begin conducting mathematical research at CofC?

Look at the Mathematics Department's website and find someone's research that interests you. Email them!

- Apply for URCA funds for projects during the semester or in the summer
- Apply for SECM funds for summer projects
- Some professors have external grants to fund your research
- Take MATH 395 Research Experience in Mathematics, MATH 417/418 Reading and Research in Mathematics, MATH 475 Statistical Consulting, MATH 490 Practicum in Mathematics, MATH 495 Capstone in Mathematics

Faculty Research Areas

- Graph Theory
- Combinatorics
- Design Theory
- Algebra
- Lie Algebras
- Linear Algebra
- Representation Theory of Groups
- Random Walks on Groups
- Field Theory
- Differential Geometry
- Low Dimensional Topology
- Hyperbolic Geometry and Topology
- Nonstandard Analysis
- Set Theory and Set-Theoretic Topology
- Model Theory
- Number Theory
- P-adic Analysis
- Statistical Inference
- Stochastic Analysis
- Dimension Reduction Methods
- Time Series Modeling
- Nonparametric Statistics
- Financial/Econometric Applications of Statistics
- Functional Analysis
- Algebraic Analysis
- Algebraic Geometry
- Orthogonal Polynomials
- Soliton Theory
- Linear Optimization
- Integer Programming
- Ranking and Clustering in Networks
- Test and Data Mining
- Web Analytics
- Search Strategies
- Stochastic Analysis
- Probability
- Dynamical Systems
- Data Science
- Mathematical Modeling in Biology and Linguistics
- Approximation Theory

Recent Undergraduate Student Research Projects with Faculty

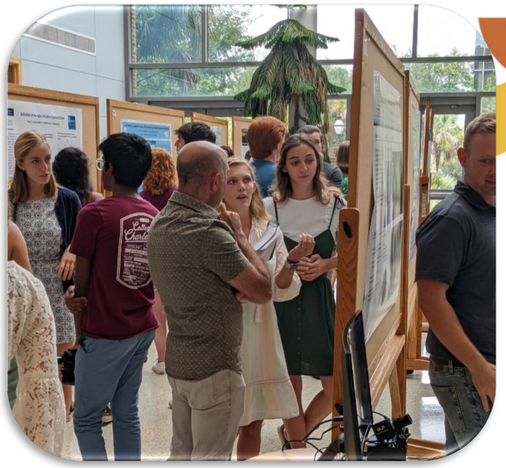
- Localization for Rings and Categories
- Deconstruct Calculus Project
- The Empirical Studies on Variance and Volatility Estimation
- Computational Studies of Damping Effects on Rogue Wave Formation
- Edge-coloring for Graphs
- Mathematical Modeling in Biology
- Pattern Observed on Mussel Bed Formation
- On Data Management, Data Analysis, Data Interpretation
- The Work and Life of Karen Uhlenbeck
- The Rise of E-Cigarettes: A Comparative Statistical Analysis on cigarette vs. Juul Usage
- Exploration of Integrability
- Combustible Waves in Porus Materials
- H-bases and their computation
- Quaternionic KdV Solitons
- An Automated System for Polyp Detection in Wireless Capsule Endoscopy Images Based on Deep Learning
- Evaluation of an Interpretable Machine Learning Method

Department of Mathematics and Statistics

Faculty Expertise

36 faculty members, including 25 research faculty

Publishing ~25 peer-reviewed journal articles annually



Top Employers

Alumni are working at top companies and agencies around the country

citi

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

J.P.Morgan

Naval Information Warfare Center ATLANTIC

StateFarm

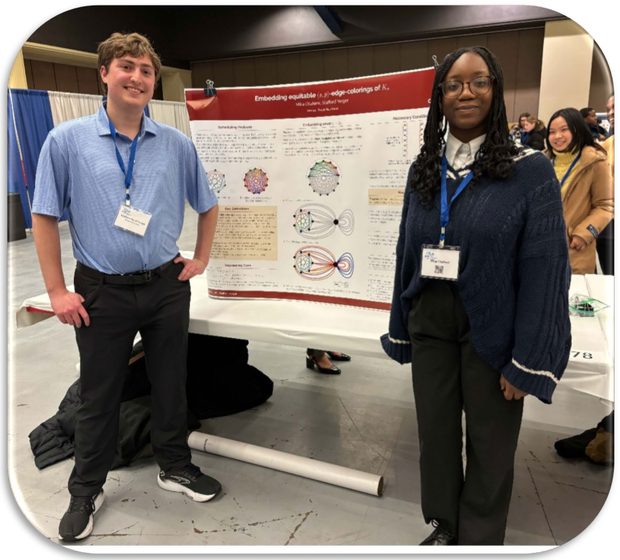
MUSC Medical University of South Carolina

AMERICAN EXPRESS

Major Programs

Mathematics, Statistics, Data Science (with Computer Science), and Math Teacher Education for grades 9-12

These are great options as a second major to complement other STEM or Business majors!



Research opportunities

Recent undergraduate student projects include:

- Biological Implications of Soliton Theory
- Statistical Prediction of UFC fight data
- Evaluation of an Interpretable Machine Learning Method
- Stochastic Processes in Quantitative Finance
- Seasonal Performance Trends in College Baseball