Graduate Studies
College of Arts and Sciences

www.jcu.edu/graduate

John Carroll University

MATHEMATICS
Master of Arts

Program Overview

This program is designed for high school teachers who have a strong desire to increase their knowledge of mathematics in a program designed specifically for them. The emphasis is on the most interesting ideas in mathematics that relate to the topics that they themselves teach.

Program Outcomes

- Continue your professional development by studying mathematics that is relevant to your teaching
- Reinvigorate your interest in the subject to which you have dedicated your career
- Enhance your standing in your school district with a graduate degree in mathematics
- Become an even better math teacher
- Interact and share ideas with other math teachers
- Earn graduate credits or a master's degree

Program Features

The M.A. program reflects the National Council of Teachers of Mathematics standards, the recommendations of the Mathematical Association of America, and the Common Core. It combines topics directly related to the secondary curriculum with enrichment material that teachers can apply directly to their own classes. Program features include:

- Close personal attention and small classes. We work hard to help students succeed.
- Classes conducted in the spirit of the NCTM standards
- Collaborative learning opportunities
- Convenient class scheduling
- Degree can be earned in summers only, or in a period as short as 15 months

Admission Requirements

- An undergraduate mathematics GPA of at least 2.5.
- Certification to teach secondary mathematics.
- Other teachers of mathematics may also be admitted on a provisional basis, depending on background.

Financial Assistance

- Certified teachers qualify for a 33% tuition reduction scholarship.
- Some Graduate Assistantships for full-time students are available. Graduate assistants are given a tuition waiver for 15-18 credit hours per year plus a stipend. Students are expected to spend 20 hours per week working for the Department.
- The University's Office of Admissions and Financial Aid offers assistance on student loans.

Program Coordinator

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Continued on back page >>

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Degree Requirements

- Ten courses (30 semester hours) in mathematics, including at least six courses numbered 500-519
- An expository essay
- A comprehensive exam

Courses

The 12 different summer M.A. courses have been carefully designed to explore mathematical topics that all teachers should be familiar with. They include topics that range from applied mathematics to ideas that display the beauty and excitement of the subject.

- **Mathematical Structures:** Patterns and properties that both distinguish and unite ideas of algebra and geometry.
- **Discrete Mathematics:** High school courses now include the study of matrices, combinatorics, and iterative processes.
- **Modern Geometry:** You can't really understand Euclidean geometry unless you have seen non-Euclidean geometry.
- **Curves, Surfaces and Space:** Explore the geometric idea of shape and how it relates to the shape of the universe.
- **Topics in Calculus:** Refresh and deepen your understanding of calculus.
- **Statistical Literacy:** An understanding of statistics is playing a larger role in society and in the high school curriculum.
- **Great Moments in Mathematics:** Relive the journey that brought us to the current state of our art.
- **Mathematical Potpourri:** Those fascinating ideas you wish you had seen as an undergraduate.
- **Technology in the Teaching of Mathematics:** Graphing calculators, geometry software, web pages, and more.
- **Computer Science for High School Teachers:** Developing programs relating to classroom topics for computers or other electronic devices.
- **Problems in Mathematics:** Learn problem-solving strategies inspired by the high school American Mathematical Competition (ACM).
- **Chaos and Fractals in the Classroom:** Discover hidden geometric patterns in nature and examine order and pattern in seemingly erratic phenomena.

Faculty

Patrick B. Chen, Ph.D.
(Case Western Reserve University)
Topological groups, lie groups, algebraic groups

Barbara K. D'Ambrosia, Ph.D.
(University of Oregon)
Algebra, ring theory

Brendan J. Foreman, Ph.D.
(Michigan State University)
Mathematics education, differential geometry

Marc Kirschenbaum, Ph.D.
(The Ohio State University)
Swarm intelligence, logic programming, artificial intelligence

Robert J. Kolesar, Ph.D.
(Northwestern University)
Algebraic topology, history of mathematics

Douglas A. Norris, Ph.D.
(University of Notre Dame)
Differential geometry, mathematics education

Daniel W. Palmer, Ph.D.
(University of North Carolina at Chapel Hill)
Swarm intelligence, decentralized control algorithms, software engineering

Paige E. Rinker, Ph.D.
(Dartmouth College)
Applied Abstract Algebra, Cluster Analysis of Ranked Data, Graph Theory

Linda M. Seiter, Ph.D.
(Northeastern University)
Software Engineering

Paul L. Shick, Ph.D. (Chair)
(Northwestern University)
Algebraic topology, homological algebra

Thomas H. Short, Ph.D.
(Carnegie Mellon University)
Probability, statistics, statistics education

Carl R. Spitznagel, Ph.D.
(University of Kentucky)
Structure of semi groups, statistical computing, fractal geometry, algebra

David L. Stenson, Ph.D.
(University of Massachusetts)
Topological algebra, database systems