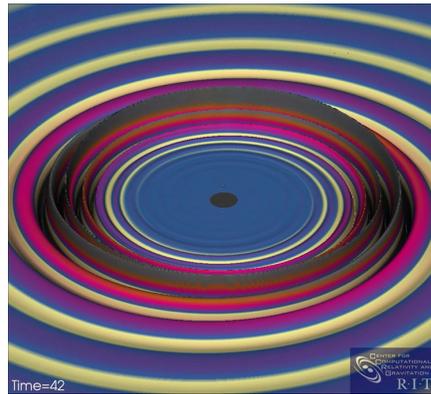
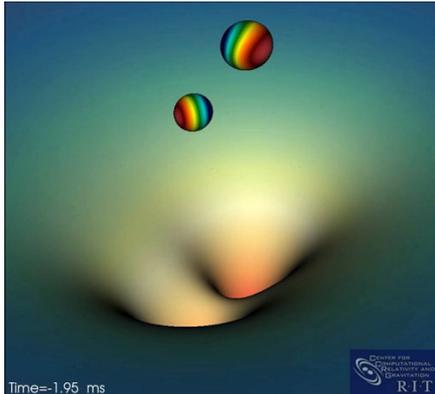


Mathematical Modeling



▶ USE MATH TO UNDERSTAND AND PREDICT THE WORLD

Learn how mathematical modeling applies math and computation to address real-world challenges

Gain a solid foundation in the development and application of mathematical models through this pioneering doctoral program at the Rochester Institute of Technology in Upstate New York. Through extensive research, you will develop expertise in using the tools of mathematical modeling, contribute in creative and innovative ways to solving complex interdisciplinary problems, carry out independent research, and learn to communicate effectively with researchers in other fields.

APPLICATION DOMAINS

Our application domains are interdisciplinary by nature, fostering collaboration among faculty and students across RIT and diverse sectors of industry and academia.

- ▶ Biomedicine
- ▶ Earth Systems Modeling
- ▶ Finance
- ▶ Data Analytics and Simulation of Complex Systems
- ▶ Network Analysis

KEY FEATURES

- ▶ **Tailor your own program**
Building on core courses, you will craft a customized program of study to map out, in a unified manner, an application-specific curriculum culminating with a Ph.D. dissertation.
- ▶ **Connect with industry through interdisciplinary internship**
Your training will include an internship in an application domain of mathematical modeling outside RIT. This experience will help you develop contacts with industry and is likely to provide opportunities for job placement.
- ▶ **Assistantships**
Support will be available through research and teaching assistantships.
- ▶ **Application requirements**
 - Official transcripts
 - Minimum GPA of at least 3.0 in the primary field of study
 - Previous mathematical coursework beyond calculus
 - GRE Exam
 - Two letters of recommendation
 - Personal statement
 - TOEFL/IELTS Exam (international only)
- ▶ **Application deadline**
The application deadline is January 15 to enter the program

CONTACT

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Ph.D. Program Director

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mathmodeling.rit.edu



R·I·T
COLLEGE OF SCIENCE

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RIT Math
Career
Placements



CURRICULUM

TYPICAL COURSE SEQUENCES

COURSE CREDIT HOURS

(BY SEMESTER)

MATH 602	Numerical Analysis I	3
MATH 622	Mathematical Modeling I	3
MATH-722	Mathematical Modeling II	3
MATH-606	Graduate Research Seminar	1
MATH-607	Graduate Research Seminar	1
	* Concentration Foundation Courses	9
	High-Performance Computing	3
	* Electives (three credits each)	9
	Dissertation Research	28

TOTAL SEMESTER CREDIT HOURS **60**

* Concentration foundation courses and electives will be chosen based on the application domain selected.

Why Mathematical Modeling?

Essential to Dozens of Disciplines

Researchers use mathematical models in all STEM disciplines, including medical sciences, materials science, defense, social sciences, business and finance, and economics.

Collaborative Approach

Our five application domains—biomedicine, earth systems modeling, finance, data analytics and simulation of complex systems, and network analysis—are interdisciplinary by nature and foster collaboration with other researchers.

Solid Foundation

With a Ph.D. in mathematical modeling, you will become an expert in formulating application-field problems mathematically, analyzing results, integrating data with models, devising and implementing algorithms, and communicating results to others.

Diverse Toolset

To achieve your goals, you will choose to focus on applied inverse problems; biomedical mathematics; discrete mathematics; dynamical systems and fluid dynamics; or geometry, relativity, and gravitation.

CAREER POSSIBILITIES

Mathematical modeling has the potential to provide innovative solutions to problems in fields from medicine to climate change. There is a broad need for researchers with sophisticated quantitative skills to develop and expand current and future advances in science and technology. Training to work across two or more disciplines will prepare you for opportunities connecting diverse teams of researchers.

Industries ranging from data analytics and transportation to medical devices and pharmaceutical development use mathematical modeling to understand new technologies and to forecast events. The mathematical and computational tools you develop will be applicable across a broad range of application fields, allowing you to contribute meaningfully to solving a broad range of problems and to seize new career opportunities as they arise.

Mathematical modeling will prepare you for careers in employment sectors that include corporate research and development, defense laboratories, and government agencies as well as academe. With training in the emerging discipline of mathematical modeling, you will be positioned to advance emerging technologies in a wide variety of application fields.

The United States Bureau of Labor Statistics forecasts optimistic employment prospects for those with advanced training in mathematical modeling. It projects employment of mathematicians to grow at 23 percent from 2012 to 2022, a rate much faster than the average for all occupations. It also states that “candidates with a background in advanced mathematical techniques and modeling will have the best job prospects in related occupations.”

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