

# COMPUTATIONAL MATHEMATICS

## PROGRAM OVERVIEW FOR EMPLOYERS

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School of Mathematical Sciences website: <http://math.rit.edu>

The Computational Mathematics program combines the beauty and logic of mathematics with the application of today's fastest and most powerful computers. Much emphasis is given on using the computer as a tool to solve mathematically modeled physical problems. The result is a program that integrates mathematical theory into solutions for real-world problems, offering the best of both worlds: mathematics and computer science. Computational Mathematics includes the study of problems that have applications in engineering, operations research and other areas of the sciences. These include many problems that affect our everyday life, from Internet security and telecommunication networking, to routes for school buses and delivery companies. This program provides a solid foundation in both mathematics and computational methods, preparing its graduates to fill positions as mathematical analysts, scientific programmers, software engineers, systems analysts, and others.

### Degree(s) Awarded

Bachelor of Science in Computational Mathematics

Bachelor of Science in Computational Mathematics & Master of Science in Computer Science (dual degree program)

Bachelor of Science in Computational Mathematics & Master of Science in Applied Mathematics (dual degree program)

### Enrollment

Approximately 30 students are enrolled.

### Cooperative Education Component

Students are eligible to participate in an optional co-op program upon completion of 2<sup>nd</sup> year courses. Participation is strongly encouraged.

### Salary Information (Avg/Range)

Co-op:	\$16.67	\$15.00-19.00
*BS:	\$62,932	\$55,000-70,000

\*Statistics from the Nat'l Assn. of Colleges & Employers (NACE) for 2010-2011 graduates

### Equipment & Facilities

- Students have access to programming and statistical and simulation languages, graphics software and design tools on a variety of platforms.

- Symbolic computation and statistical laboratories are also available.

### Student Skills & Capabilities

- Mathematically formulating, modeling and solving problems; flexibility to quickly learn new computer concepts/methods; computer networking; communication and working in teams.
- Computer Skills:
  - Languages: C++, Java, Python
  - Software: Mathematica, MATLAB, Maple, Minitab
  - Operating Systems/Environments: UNIX, VMS, Mac OS, Windows
  - Other: Fundamentals of computer science
- Students focus in the discrete areas of mathematics including graph theory, as well as matrix, linear, and abstract algebra. They also have significant coursework in the principal areas of analysis including calculus, differential equations, real variables, probability, and statistics. In addition, students have many opportunities to pursue independent study or undergraduate research under the guidance of faculty members.

# Computational Mathematics

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## Course Sequence BS degree

### First Year:

Project-Based Calculus I – III  
Discrete Math I  
Problem-Based Intro to Computer Science  
Data Structures for Problem Solving (Python)  
Intro to Object-Oriented Programming (Java)  
Science Electives  
Liberal Arts

### Third Year

Linear Algebra II  
Graph Theory  
Mathematical Modeling  
Computational Math Concentration Courses  
Liberal Arts

### Second Year:

Multivariable Calculus  
Differential Equations I  
Probability & Applied Statistics  
Linear Algebra I  
Computer Science IV (C++; analysis & design techniques and advanced programming)  
Software Engineering  
Computational Math Concentration Courses  
Technical Writing  
Liberal Arts

### Fourth/Fifth Years\*:

Real Variables I  
Numerical Analysis  
Numerical Linear Algebra  
Abstract Algebra I, II  
Computational Math Concentration Courses  
General Education Electives  
Liberal Arts

\* Program can typically be completed in four years.

### Employers of Computational Mathematics Co-op and Graduating Students:

Bausch & Lomb Inc., CooperVision, Inc., Digital Receiver Technology, Inc., Eastman Kodak, Epic, Harbridge Consulting Group, Hewlett-Packard, Lockheed Martin Corp., Los Alamos National Laboratory, Microsoft Corporation, Maxwell Systems, National Geospatial-Intelligence Agency, National Security Agency, Oak Ridge National Laboratory, Ortho-Clinical Diagnostics, Thomson Reuters, University of Rochester Medical Center, Xerox Corp.

### Contact Us:

We appreciate your interest in RIT co-op, graduating students or alumni. We will make every effort to make your recruiting endeavor a success. Feel free to contact Kara Leonard and Lisa Monette, the program coordinators who work with the Computational Mathematics program. For your convenience, you can access information and services through our web site at <http://www.rit.edu/recruit>.

**Kara Leonard, Lisa Monette, Program Coordinators, [kmloce@rit.edu](mailto:kmloce@rit.edu), [lamoce@rit.edu](mailto:lamoce@rit.edu)**

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