R·I·T

B. THOMAS GOLISANO COLLEGE
OF COMPUTING AND INFORMATION SCIENCES

COMPUTING &
INFORMATION SCIENCES

Contents

As one of the world's leading technological universities, RIT educates future leaders in the fields of computing and information sciences.

Comprising nine colleges, RIT offers unparalleled depth and breadth in computing, information sciences, business, engineering, technology, and the visual arts. No other university in America offers you all of these: a comprehensive range of academic programs, our number of teaching faculty, our extensive computing facilities and technology, and our commitment to experiential learning.

RIT has been at the forefront of computing since launching a computer science program more than 40 years ago. Continuing a tradition of innovation, RIT consistently anticipates developments in the computing field. We respond by designing academic programs flexible enough to keep up with changing demands, yet focused enough to develop the computing expertise required today. For example, RIT was the first university in the nation to offer baccalaureate degree programs in information technology (1991) and software engineering (1996), and introduced one of the nation's first dedicated computing security departments (2013).

RIT features one of the most comprehensive computing colleges in the nation, the **B. Thomas Golisano College of Computing and Information Sciences**. In addition to outstanding academic programs, the college showcases cutting-edge innovation and renowned faculty who are passionate about their work. While the Golisano College is at the heart of computing and information sciences at RIT, it also collaborates with five other RIT colleges to offer nine additional bachelor of science degree programs. These partnerships offer students an unequaled range of program options; committed, experienced faculty; myriad research and co-op opportunities; and student access to incredible laboratory equipment and facilities.

In short, the Golisano College and its alliances with other colleges at RIT form a living/learning computing education powerhouse. We invite you to join us on the cutting edge of computing at RIT.

B. Thomas Golisano College of Computing and Information Sciences

Undergraduate students: 3,116

Graduate students: 856

Faculty: 131

Outcomes Rate: 96%

Degrees offered: BS, MS, Ph.D.

Alumni: 12,640

National Rankings:
- *Princeton Review* ranked RIT 5th nationally for "Top Schools for Video Game Design for 2018" for our undergraduate game design and development major

- Global Gaming League ranked RIT 3rd in the inaugural Top Gaming Colleges survey

- *Great Value Colleges* ranked RIT 36th for "The Most Technologically Advanced Universities" in the world

- LinkedIn ranked RIT 25th for how successful new graduates are at securing desirable software development jobs

Research Highlights:
- Computing for accessibility
- Cybersecurity
- Data science
- Human computer interaction
- Health IT
- Software process and product analysis

B. Thomas Golisano College of Computing and Information Sciences

RIT features one of the most comprehensive computing colleges in the nation, a visionary institution among its peers.

Housed in a 126,000-square-foot facility, the B. Thomas Golisano College of Computing and Information Sciences showcases cutting-edge innovation and renowned faculty who are passionate about their work.

It has garnered accolades and recognition as a premier computing education and applied research facility. The college offers eight bachelor of science degrees: computer science, computing and information technologies, computing security, game design and development, human-centered computing, new media interactive development, software engineering, and web and mobile computing.

Real-world work experience

Classroom learning is only one part of an RIT education. Starting in your freshman year, we'll encourage you to think about your career ambitions. Our computing programs offer you the opportunity to gain paid, professional experience through cooperative education—alternating periods of on-campus study with periods of full-time, paid employment in your career field. Co-op can give you a broad view of the career opportunities available and deepen your understanding of your academic studies. It is an especially valuable way to build your resume and set yourself apart from other graduates in the job market.

Our students view co-op as a way to gain professional experience, learn a practical application of their area of study, and earn money to put toward the cost of their education.

Career connections

Our strong ties with leading corporations, government agencies, medical centers, professional associations, and key industrial organizations have enabled us to shape our computing programs to meet the needs of today's marketplace. Leading employers know RIT alumni have up-to-the-minute knowledge, hands-on skills, and relevant work experience gained through cooperative education. Recent alumni have secured exciting positions

at companies across the nation and around the world. RIT alumni are making their marks in cyber security, software engineering and product development, medical information systems, database development, web design and development, network administration, gaming, computer animation and special effects, microchip design, sales and marketing, project management, education, research, and more.

Research opportunities

The Golisano College supports learning and research across disciplines where students, faculty, and industry converge to explore and develop innovative applications of emerging technologies. Typically, students and faculty work with an industry partner to develop a proposal and plan of work. A project team (often multidisciplinary) forms to begin working on exploratory uses of emerging technologies, proof-of-concept studies, investigations of specific technical problems, and software development. Students have worked on projects for the U.S. Department of Education, Microsoft, Hewlett-Packard, IBM, Cisco, Xerox, Apple, Google, and Sun Microsystems, among others.

As an RIT student, you may take part in research by arranging to work directly with faculty members who are investigating areas that interest you, including artificial intelligence, human-computer interaction, gaming, interface design, software engineering, databases, system software, robotics, social computing, networking, wireless and computing security, virtual reality, accessibility, and multimedia.

Computing Exploration Option

The computing exploration option provides students with the opportunity to explore seven of the college's undergraduate computing majors—computer science, computing and information technologies, computing security, human-centered computing, new media interactive development, software engineering, and web and mobile computing. Students complete courses in computer science, computing security, and web and mobile computing. They also may take additional courses in the other four computing majors as they decide on which major bests fits their career goals and aspirations.

Students may stay in the exploration option for up to two semesters (one academic year). Each student has an assigned academic adviser who provides guidance on course selection, immersions and minors, and career options. All courses taken in the computing exploration option are accepted by the seven computing majors with all credits earned applicable to a student's chosen major. Students do not lose time toward graduation.

Computer science
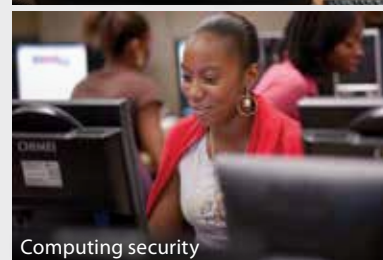
Computing and information technologies

Computing security

Human-centered computing

New media interactive development

Software engineering

Web and mobile computing

A supportive environment designed to help you succeed.

The Women in Computing organization wants to see you succeed and thrive at RIT, and beyond. Its goal is to provide support, assistance, and guidance to female students enrolled in RIT's computing majors.

The organization is an interdisciplinary network of students, faculty, staff, and alumni involved in the various fields of computing. They provide professional, leadership, mentorship, and technical development opportunities and encourage the advancement of women in computing through community outreach.

The organization strives to:
- Create opportunities for members to gain and expand their technical knowledge through projects, WiCHacks, tech talks, and conferences.

- Organize social events to provide both networking and relationship-building opportunities.

- Accumulate technical news, knowledge, and information to encourage the involvement of women in the field of computing and provide a clearer path to success within it.

- Encourage young women in grades K-12 to explore computing through outreach programs, camps, and mentorship.

Events include:
- Corporate visits—Companies such as HubSpot, Intuit, Microsoft, Google, and BlackBaud.

- WiCHacks—A collaborative programming event in which participants create an app, website, game, or other piece of software over the course of the event.

- TechTalks—Featuring special guests who share the latest trends in computing.

- Local and national conferences, such as:
  - **Grace Hopper Women In Computing**— The world's largest gathering of women technologists brings the research and career interests of women in computing to the forefront.

  - **Harvard WeCode Conference**— An event for college technology students to expand your skills, build your network, and promote women in technology.

  - **Women in Cyber Security Conference**— Bringing together hundreds of women in cyber security from academia, research, and industry for sharing experiences, networking, and mentoring.

Women in Computing: A Rich History

For nearly 150 years, women have been making important contributions to the fields of computing and information sciences. In the mid-1800s,

Ada Lovelace

Englishwoman Ada Lovelace worked as an analyst on one of the computer's earliest forerunners, the Analytical Engine, and is considered the first computer programmer. Grace Hopper was a United States Navy officer during the late 1940s, developed the first compiler for an electronic computer, and is known as the "Mother of COBOL." Karen Spärck Jones was a pioneer of information retrieval and natural language processing, Roberta Williams did pioneering work in graphical adventure games for personal computers and is credited with creating the graphic adventure genre, and Frances Allen became the first IBM Fellow in 1989 and worked in programming languages and security codes for the National Security Agency (NSA).

The B. Thomas Golisano College of Computing and Information Sciences
is one of the most comprehensive computing colleges in the nation.

Laura Corrigan

Hometown: Riverside, CT

Major: Computer Science

Co-op Placements: Software Engineer Co-op, Communication Systems Division, Harris Corporation; Summer Co-op, Global Technology Division, Corporate Trust Team, Bank of America

Clubs and Campus Activities: Events Committee Head, Women in Computing; RIT Orientation Leader; Computer Science Ambassador

Laura Corrigan was asked to represent RIT at the 2016 Grace Hopper Celebration of Women in Computing, the world's largest gathering of female technologists. It's just one of the ways she gives back to RIT, and to future female students interested in majoring in computer science.

"Supporting and empowering fellow students by sharing my experiences and providing mentorship, motivation, and resources to my peers on campus or to the next generation of students is extremely rewarding and mutually beneficial," Corrigan said.

Her leadership role with Women in Computing has resulted in her organizing events ranging from workshops for students in the STEM fields to hosting industry speakers from Google, Microsoft, and Intuit. "These events cultivate a supportive network, as well as alleviate fears and doubts many students have in their ability to thrive in technology fields," she said.

Corrigan credits RIT with opening many doors of opportunity for her. "RIT has exposed me to numerous unique experiences and organizations that have provided remarkable opportunities," she said.

Computer Science

cs.rit.edu

A career field evolving at lightning speed.

Solve challenging problems
In the computer science major you'll learn how to approach computing problems from the perspective of a scientist, and discover new solutions to challenging problems in the computer lab as you prepare for cooperative education work assignments, your future career, and a lifetime of learning. The curriculum provides you with a broad background in software development, computer science theory, the operations of modern digital computer systems, and systems comprising multiple computers, as well as a look at select application areas.

The introductory computer science sequence places an emphasis on understanding problems, developing suitable solutions, and introducing students to object-oriented programming. Courses in mathematics, science, and liberal arts complement the strong technical core.

Work on problem-solving teams
Today's computer scientist is likely to work on one team after another for an entire career, so communication skills are essential. You will complete three writing intensive courses, and courses in the liberal arts and sciences round out your curriculum. In addition, the major features several team-based lab projects and assignments, and offers a number of extra-curricular clubs and competitions where your teamwork skills can be put to the test.

Go deeper into an area of specialization
After your foundation course work, you'll concentrate on one or two computing areas, such as intelligent systems, data management, theory, languages and tools, distributed systems, computer graphics and visualization, security, or architecture and operating systems. Free electives allow you to minor in other disciplines, further enhancing your skill set.

What you'll study

First and Second Years
Computer Science I, II
Project-based Calculus I, II
Discrete Mathematics for Computing
Mechanics of Programming
Introduction to Computer Science Theory
Probability and Statistics I
Concepts of Computer Systems
Introduction to Software Engineering
Linear Algebra
Cooperative Education
First Year Writing
General Education—Liberal Arts and Sciences
Year One: College Experience
Wellness Education

Third through Fifth Years
Concepts of Parallel and Distributed Systems
Principles of Data Management
Analysis of Algorithms
Programming Language Concepts
Professional Communications
Introduction to Intelligent Systems
Cooperative Education
Free Electives
Computer Science Electives
General Education—Liberal Arts and Sciences

This program is accredited by the Computing Accreditation Commission of ABET, abet.org.
Accelerated BS/MS option available.
Approved independent study projects are also available.

Computing and
Information Technologies

Solution architects leading us into the future.

A broad curriculum

Students in the computing and information technologies major use their hands-on approach to technology to solve complex problems. While these students are designers and builders, they are primarily enablers. They translate user needs and create custom solutions that address complex problems and help them meet organizational goals. They play an integral role in any type or size organization, working behind the scenes to deploy leading edge technology to any facet of an organization. The ability to understand the breadth of computing technology and the versatility to apply it in any industry segment is the core principle of this major.

Computing technology becomes more integrated into the fabric of our personal and work lives every day. This drives the demand for computing professionals who have broad, practical skills to facilitate these interactions across a variety of industry sectors. A hospital needs a stable web presence; our students can build it. A government agency needs a database developed to track disaster relief efforts; our students can design it. The possibilities are numerous, and are growing every day. CIT students not only learn to design and implement complex systems of hardware and software, but they are also become proficient in securing and managing them as well.

A choice of advanced tracks

You may choose two advanced tracks designed to provide in-depth study in an area of interest. These courses serve to enhance your career objectives and personal interests. Advanced tracks are available in database, enterprise administration, networking and communications, web administration, or web development.

Develop teamwork skills

Computing and information technologies features an innovative and acclaimed capstone project, a yearlong course where students solve a complex problem in a team setting. You will work with your peers from other computing majors as well as in collaboration with international students from RIT's global campuses in Croatia and Dubai. This unique exercise allows you to develop skills in problem solving, international relations, and teamwork.

What you'll study

First and Second Years
Foundations of Information
    Processing
Computational Problem
    Solving I, II
Discrete Math, Calculus,
    Statistics
Computer System
    Concepts
Introduction to Routing
    and Switching
Task Automation
System Administration
Introduction to Database
Web and Mobile I, II
Technical Communications
General Education—
    Liberal Arts and Sciences
First Year Writing
Wellness Education
Year One: College
    Experience

Third and Fourth Years
Information Requirements
    Modeling
Designing the User
    Experience
Senior Development
    Project I, II
Concentration Courses
General Education—
    Liberal Arts and Sciences
Free Electives
Cooperative Education

Concentration Tracks
Database
Networking and
    Communications
Web Development
Enterprise Administration
Web Administration

Cameron Clark

Hometown: Saco, Maine

Major: Computing Security, BS/MS

Minors: Web Development, Software Engineering

Co-op Placements: Web Application Tester, Indeed.com; Application Tester, Apple

Clubs and Campus Activities: Captain, RIT Cyber Defense Team

Cameron Clark likes to break things. This habit will serve him well as a computing security professional, where he will be tasked with figuring out how hackers break into websites or servers to disrupt financial networks or to steal sensitive information. His involvement as captain of the RIT Cyber Defense Team has prepared him well for the challenge. At competitions, the team is given a network to defend against professional cyber security experts who stage a series of attacks. Clark's team needs to know every way a system can break so they can identify when and where an attack is happening.

"The competition is probably some of the best networking I've ever experienced," Clark said.

The regional and national competitions are also networking events with top cyber defense firms, such as Amazon, the Department of Homeland Security, and the U.S. Air Force, engaging with the student competitors. "We're the best teams in the nation, so these organizations want to hire us," Clark said. Students also meet with professional security experts. "We get to meet them face-to-face, talk to them about things they have done professionally, how well we are doing in the competition, and what we could do better," he said. "If I want to move into the industry, I already know a bunch of people I can network with."

Computing Security

csec.rit.edu

One of the fastest growing computing disciplines.

A balanced curriculum

The computing security major boasts a unique blend of theory and lab-based courses, as well as opportunities for independent exploration. In addition to a foundation in computing security, you'll study programming, ethics, databases, networks, and computing systems. Your core competencies will expand to include cryptography, authentication, and security models. Liberal arts requirements help you develop ancillary skills in writing, critical thinking, analysis, and interpersonal communications as you develop a global perspective.

A choice of advanced courses

In addition to core courses, you'll complete six advanced security courses, which will provide you the opportunity to expand your knowledge in one of several different areas of security such as infrastructure security (network and system security), secure coding, mobile security, or digital forensics. You will complete the curriculum by participating on a team-based senior project.

Career outlook

Demand for professionals who can identify security vulnerabilities, prevent intrusions, and detail the extent and nature of data breaches when they occur—and apply these skills to new systems and technology as they emerge—increases every day. As a graduate of the program, you can look forward to an exciting and challenging career in one of the fastest growing employment sectors in the world. If your interest is in graduate study, this program at RIT also provides a foundation for further academic work.

To support our curriculum, we have extensive lab facilities including an air gap lab that allows students to experiment with malware and cyber defense techniques without danger of impacting any other RIT computing environment. We also have a security lab, and make extensive use of virtualization and cloud computing.

What you'll study

First and Second Years
Fundamentals of
    Computing Security
Computer Science I, II
Project-based Calculus I, II
Discrete Mathematics for
    Computing
Programming for Security
Probability and Statistics I, II
Lab Sciences
Reverse Engineering
Linear Algebra
Introduction to Routing
    and Switching
Network Services
Systems Administration
Cooperative Education
First Year Writing
General Education—
    Liberal Arts and Sciences
Year One: College
    Experience
Wellness Education
Co-op Seminar

Third and Fourth Years
Introduction to Database
    and Data Model
Introduction to
    Cryptography
Authentication and Security
    Models
Cyber Security Policy
    and Law
Ethics
Advanced Courses in
    Computing Security
Principles of Web App
    Security
Capstone in Computing
    Security
General Education—
    Liberal Arts and Sciences
Free Electives
Cooperative Education

Accelerated BS/MS option available.

Game Design and Development
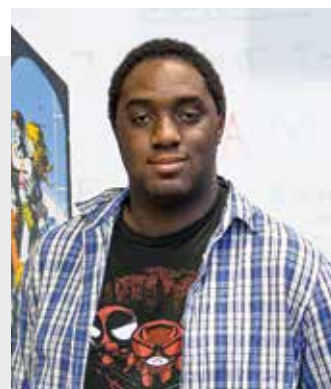
Interested in game design and development? At RIT, you'll hit the ground running.

What it takes

RIT's game design and development major is intended for those who aspire to hold careers within the professional games industry or a related field such as serious or casual games, simulation, edutainment, or visualization. A strong interest in math and physics also will serve you well in this major. Mastery of programming skills is essential, as is careful attention to detail and aesthetics.

Knowledge from every angle

This major lets you explore the entertainment technology landscape and other related areas while pursuing a broad-based university education. You will complete core courses in computing and information sciences, then pursue a block of course work in advanced studies customizable to your individual interests and career goals. In-depth exploration of topics such as game design, game production, and game architecture round out your education, giving you a thorough grounding in development processes.

Career opportunities abound

Growth in the field of game design and development shows no sign of slowing down. As you can imagine, competition for these positions is fierce. Your degree from RIT will go a long way toward making sure you stand out in the employment crowd. Our graduates work for industry leaders such as Sony Computer Entertainment of America, Rockstar Games, Microsoft Games Studios, Sledgehammer Games, 343 Industries, and Activision, among others.

This major is also particularly well suited to prepare students for further study in RIT's master of science degree in game design and development.

What you'll study

First and Second Years
First Year Writing
Year One: College Experience
Introduction to Interactive Media
Interactive Media Development
Interaction, Immersion, and the Media Interface
Data Structures and Algorithms for Games/Simulation I
Discrete Mathematics
College Physics I
Co-op Preparation Workshop
Mathematics of Graphical Simulation I, II
2D and 3D Animation and Asset Production
Game Design and Development I

Game Development and Algorithmic Problem Solving I, II
Website Design and Implementation
Wellness Education
General Education— Liberal Arts and Sciences

Third and Fourth Years
Game Design and Development II
Data Structures and Algorithms for Games/Simulations II
Rich Media Web Application Development I
Advanced Electives
Free Electives
Cooperative Education
General Education— Liberal Arts and Sciences

Accelerated BS/MS option available.

Stefan Lewis

Hometown: Woodbridge, VA

Major: Game Design and Development

Clubs and Campus Activities:
RIT Pokémon League

Co-op Placement: NTID Learning Game

In "World Building," a course that invites students to create worlds, characters, and entire narratives of their own, Stefan Lewis began to visualize the landscape for "The Mavericks of the Magnificent West," a video game he developed with his roommate and small team of developers.

"Essentially, I wanted to make a magic system," Lewis said. But he needed to find a hook, or some element no else had done before in a magical environment. Through writing assignments that tasked him with thinking critically about the world he was creating, Lewis found his niche. "I ended up creating a magical wild west." Lewis is hoping to commercialize the game and launch it on STEAM or Nintendo Switch. Ultimately, he's hoping MAGIC Spell Studios will help him launch the game. MAGIC Spell is a commercial studio located on campus that develops and publishes digital media, including video games, films, art installations, and more.

When he graduates, Lewis wants find work in the gaming industry. "One thing I've really enjoyed about developing the 'The Mavericks of the Magnificent West' project is that I've had my hands in everything. I've been the creative director of the game, so it's my job to make sure the look and feel of the entire game—the writing, art, music, programming, and design—all mesh well," he said. "I've found that this is really what I want to do, a position that's somewhere between creative director and programmer."

Human-Centered Computing

hcc.rit.edu

The intersection of computer advancements and understanding human behavior with technology.

Fundamental to human-centered computing (HCC) is a focus on humans as individuals and in social contexts, and their behavior with technology. With roots in multiple areas of computing, psychology, and design, HCC studies these varied disciplines to understand the way in which people use technology. Given society's growing reliance on computing, technology is no longer the exclusive realm of tech-savvy individuals; industry has recognized the need to make software and devices that are usable by a wide variety of people. HCC topics of consideration include the design, evaluation, and implementation of interactive computing systems and the understanding of ways in which such systems can transform our lives. This major prepares students for careers in industry or graduate study, offering options to specialize in different areas of HCC depending on individual student interests in computing, design, or psychology.

Choose a concentration

Students complete a set of core courses in psychology, computing, and design before selecting two concentrations from the following offerings: *accessibility, design, front-end development, psychology, instructional technology,* or *natural language processing*. Students may use additional electives to further their depth of understanding, or complete a minor in another field.

Develop teamwork skills

Human-centered computing features an innovative capstone project, a yearlong course where students solve a complex problem in a team setting. You will work with your peers from other computing majors as well as in collaboration with international students from RIT's global campuses in Croatia and Dubai. This unique exercise allows you to develop skills in problem solving, international relations, and teamwork—building a foundation for career success.

What you'll study

First and Second Years
Year One: College Experience
Computer Problem Solving: Information Domain I, II
Web and Mobile I, II
Ethics in Computing
Introduction to Psychology
Cognitive Psychology
Introduction to Statistics I, II
New Media Digital Design Survey I, II
Research Methods I, II
Foundations of HCC
Foundations of Mobile
General Education— Liberal Arts and Sciences
Wellness Education

Third and Fourth Years
Design for Accessibility
Concentration Courses
General Education— Liberal Arts and Sciences
Free Electives
Senior Development Project I, II
Cooperative Education

Concentration Tracks
Accessibility
Design
Front End Development
Psychology
Instructional Technology
Natural Language Processing

10   Computing and Information Sciences

New Media Interactive Development

Each year, senior students from the new media interactive development major and the new media design major, housed in the College of Art and Design, come together to create an interactive digital product as part of their senior capstone project. Adobe, sponsor of this year's New Media Team Project, challenged the seven cross-disciplinary teams to create new user experiences that take advantage of the interaction between hand-held mobile devices and big screens. The cross-disciplinary work aims to give both visual design and computer programming students the tools needed to create the next generation of web, desktop, and mobile applications for the interactive design and development fields.

Design and develop new and creative interfaces for communicating with people.

The new media interactive development major provides you with a balanced background in design and technology. Foundation courses focus on web design and development, programming, mobile apps, user interface and experience, and graphic design. You'll also gain experience in concept development, animation, and project management.

Interdisciplinary education

Required and elective courses provide you with outstanding technical skills, while course work within RIT's College of Art and Design strengthens and refines your design capabilities. In your senior year, you will join students from other RIT new media programs to complete a team project that tackles real-world challenges.

Active learning

Most new media courses are held in active-learning classrooms, where you can put theories and concepts to the test while they are being discussed in class. In addition, you'll be able to take advantage of RIT's cooperative education program, alternating time studying on campus with paid, professional employment in locations across the country. New media interactive development co-op students have worked for web development departments of large corpo-rations, interaction design labs, casual game studios, advertising agencies, educational software companies, and other related businesses.

Job prospects are strong

There is virtually no area of society that does not benefit from the capabilities new media offers. In light of such high demand, you can look forward to an employment market with extremely interesting and diverse jobs.

What you'll study

First and Second Years
First Year Writing
Year One:
    College Experience
New Media Interactive
    Design and Algorithmic
    Problem Solving I, II, III
Introduction to Interactive
    Media
New Media Design
    Imaging
New Media Design
    Elements I
Website Design and
    Implementation
Interactive Media
    Development
Interaction, Immersion,
    and the Media Interface
Discrete Mathematics
Rich Media Web Applica-
    tion Development I

Mathematics of Graphical
    Simulation
Mobile App Development
Statistics or Calculus
Wellness Education
General Education—
    Liberal Arts and Sciences

Third and Fourth Years
Physical Computing
Current Topics in Interactive
    Development
New Media Design
    Career Skills
New Media Team Project
New Media Advanced
    Electives
Cooperative Education
General Education—
    Liberal Arts and Sciences

Kayla Davis

Hometown: Middlebury, VT

Major: Software Engineering

Co-op Placements: PowerShell Core Team, Health Team, Azure Team, Microsoft Corp. (three placements)

Clubs and Campus Activities: President, RIT's Society of Software Engineers; member, Women in Computing

As the president of the Society of Software Engineers, a student-run organization with nearly 100 members, Kayla Davis is helping to build a supportive environment for students in any computing major, especially female students. Just don't ask her what it means to be a woman studying computing. "It means that one day I hope this isn't a question that needs to be asked," she said. "Code is code and I write software just like anyone else in the field. Hopefully it's the products that I build that are focused on, not the fact that I'm a woman."

Davis has completed three co-ops with Microsoft. She helped to create a platform for PowerShell development support. "At the end of my internship I demoed what I made to about 50 of my closest coworkers, and it was received really well," she said. "One of my coworkers even interrupted my presentation to ask when he could use the tool that I had made."

At Microsoft, Davis has worked on three different teams, which has given her a chance to explore different areas of the company. Her co-ops have given her insight into how best she likes to work: on smaller teams with a consumer product focus. "Switching teams has been really good. I've gotten a chance to see different parts of the industry," she said. "I've gotten a good breadth of experience."

Software Engineering

se.rit.edu

Get the training and experience you need to build quality software systems.

In RIT's software engineering major you will learn the skills you need to develop quality software that meets the needs of the customer and is delivered on time, within budget, and without defect. The major emphasizes the engineering design of software and the development practices needed to bring software projects from ideation through to deployment and continued maintenance and evolution.

The major provides a flexible offering of electives courses. You can tailor these courses to your interests in areas that complement your work in the required software engineering courses. In your senior year, you will complete a team-based senior project where you will solve a real-world problem for a corporate, government, or nonprofit sponsor.

A community of students

Students develop strong connections to our dedicated academic advisers. The Society of Software Engineers adds to this community by offering technical, mentoring, and social activities throughout the year. You can take advantage of the student-run mentoring lab to ask questions related to your courses, or attend study sessions scheduled prior to major exams. Or if you have an idea for a cool project, pitch it to the Projects Committee to get support and have other students work on it with you.

Exciting career opportunities

Software engineering is rated among the top employment fields. Our graduates are highly sought after by employers in every industry sector that develops software as a product, a service to be sold, or a tool to run its business. Opportunities include such positions as software architects, developers, programmers, consultants, researchers, and analysts.

What you'll study

First and Second Years	Third through Fifth Years
Computer Science I, II	Engineering Fundamentals of Computer Systems
Project-based Calculus I, II	Engineering Secure Software
Discrete Mathematics for Computing	Human-Centered Requirements and Design
University Physics I, II	Software Systems Requirements and Architecture
Applied Statistics	Software Engineering Electives
Communication	Software Engineering Senior Project I, II
Personal Software Engineering	Analysis of Algorithms
Introduction to Software Engineering	Math/Science Electives
Engineering of Software Subsystems	Free Electives
Mathematical Models of Software Engineering	Cooperative Education
Software Process and Project Management	General Education— Liberal Arts and Sciences
First Year Writing	
Year One:	
College Experience	
Wellness Education	
General Education— Liberal Arts and Sciences	

This program is accredited by the Computing Accreditation Commission of ABET, abet.org.
Accelerated BS/MS option available.

Web and Mobile Computing

Building the next generation of computing applications.

An innovative degree

Web and mobile computing explores ubiquitous application delivery with a firm focus on the end user experience. The major combines users and technology to bring out the best in both. What truly sets our graduates apart is their ability to see the world through the eyes of the user. Creating an effective, impressive app begins with solid code and good design, but understanding user expectations is the cornerstone of that process. Coupled with a robust developer skill set, you will produce apps that connect with multiple users across varied environments. The curriculum is structured with this in mind. Courses are designed to teach you how to integrate the back end code with the front end user interface, and you will be able to do it across several languages and platforms. This full stack knowledge enables you to impact the application design process at all levels, and will make you stand out to potential employers.

Select an advanced track

You will choose from four advanced tracks, all designed to further your career objectives and personal interests. Advanced tracks are available in web application development, mobile application development, geographic information systems, and wearable and ubiquitous development.

Develop teamwork skills

Web and mobile computing features an innovative and acclaimed capstone project, a yearlong course where students solve a complex a problem in a team setting. You will work with your peers from other computing majors as well as in collaboration with international students from RIT's global campuses in Croatia and Dubai. This unique exercise allows you to develop skills in problem solving, international relations, and teamwork—building a foundation for career success.

What you'll study

First and Second Years
Foundations of Information
    Processing
Computational Problem
    Solving I, II
Discrete Math, Calculus
Software Design Principles
    and Patterns
Foundations of
    Mobile Design
Networking Essentials
    for Developers
Designing the User
    Experience
Introduction to Database
Web and Mobile I, II
Client Programming
New Media Design I
Database Connectivity
    and Access
General Education—
    Liberal Arts and Sciences
First Year Writing
Wellness Education

Year One:
    College Experience

Third and Fourth Years
Server Programming
Application Development
    Practices
Senior Development
    Project I, II
Concentration Courses
General Education—
    Liberal Arts and Sciences
Free Electives
Cooperative Education

Concentration Tracks
Web Application
    Development
Geographic Information
    Systems
Mobile Application
    Development
Wearable and Ubiquitous
   Development

Bioinformatics

College of Science
rit.edu/science

A fast-growing field

Bioinformatics is changing the way science and technology interact. It can help reduce the cost of drug and vaccine development, permit unprecedented biological image analysis, and provide an understanding of biological processes that were unimaginable as recently as 10 years ago.

A curriculum designed for success

The bioinformatics major features a curriculum developed by faculty in RIT's departments of biological sciences, chemistry, computer science, mathematics and statistics, and information technology. Courses are taught by faculty members who are experts in biotechnology, computer science, and information technology. In laboratory exercises and assignments—all designed to emulate projects you will encounter on the job—you'll learn how to sequence DNA, then use sophisticated computer programs to analyze the sequence and predict molecular models. You will learn how to interpret vast amounts of data, predict targets for new drugs, or determine routes to gene therapy.
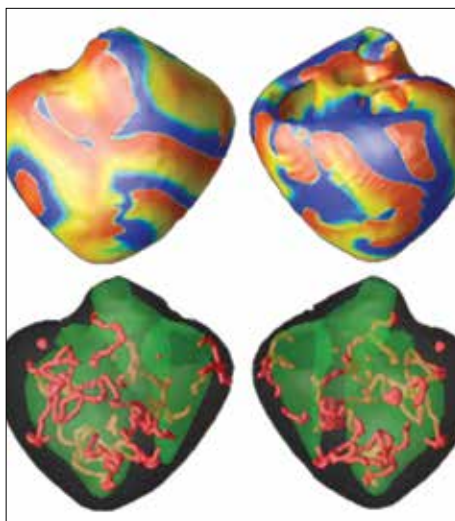
Computational Mathematics

College of Science
rit.edu/science

A foundation to build on

RIT's computational mathematics major provides a foundation in mathematics through courses in calculus, differential equations, graphs and networks, abstract and linear algebra, mathematical modeling, numerical analysis, and several other areas. You will gain extensive computing skills through a minimum of nine high-level courses in programming, computer system design, and more. Your studies will focus on using the computer as a tool to solve mathematically modeled physical problems, a concept reinforced through project-oriented team assignments and laboratory sessions that emphasize real-world applications. You also can complete RIT's MS program in computer science with as little as one extra year of study.

Graduates in demand

RIT graduates are eagerly sought by many employers. Upon graduation, you'll join our successful alumni who are working as mathematical analysts, scientific programmers, software engineers, systems analysts, and more.
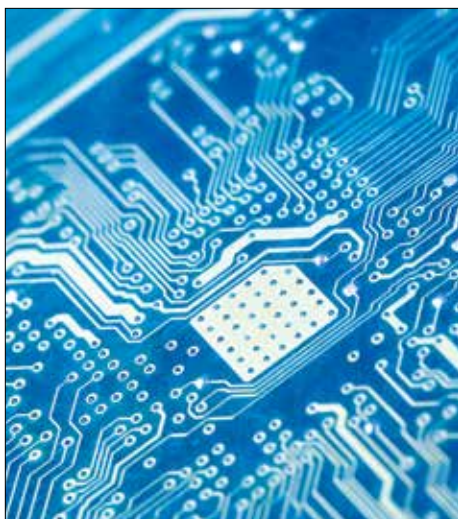
Computer Engineering

Kate Gleason College of Engineering
rit.edu/engineering

The computer engineering major begins with the basic principles of science, mathematics, and computing. Since computer engineering is closely related to both electrical engineering and computer science, you'll study computer architecture, digital systems, VLSI design, interfacing, computer networks, and real-time programming. You'll also take courses in computer science, including data structures, operating systems, and object-oriented programming languages. During your fifth year, the capstone project will put your skills to the test as you participate in developing a working prototype of a team-based multi-disciplinary design.

Weighing your options

The computer engineering major offers professional electives that allow you to tailor your curriculum to your career aspirations. Microchip design, wireless networks, and artificial intelligence are exciting career fields. You may also choose to complete electives in high-performance computing, integrated circuit design, software and embedded systems, networks and security, or computer vision and image processing.

Computer Engineering Technology

College of Engineering Technology
rit.edu/engineeringtechnology

An emphasis on skill development

RIT's computer engineering technology major bridges the gap between hardware and software by providing you with a solid foundation in both areas and tying them together with a curriculum that includes intensive classroom, laboratory, and cooperative education components. The curriculum includes the underpinnings of math, physics, circuit theory, digital electronics, and microprocessor-based hardware and software design. Through a variety of theoretical learning, laboratory exercises, and projects, students learn industry-standard approaches to hardware and software development with a focus on embedded systems design and integration. In order to customize your educational experience, you may select from a variety of technical areas including audio, computer science, telecommunications, or wireless networks.

Film and Animation (Animation option)

College of Art and Design
rit.edu/artdesign

The film and animation major recognizes the moving image as an expressive force uniquely important to modern life. It emphasizes production, with students working their first year in 16mm film, digital video, and animation. The major's goal is to prepare students to produce, creatively and practically, their own independent work and/or fulfill professional production responsibilities in any medium suitable to their interests and abilities.

Animation option

The animation option covers 2D, 3D, and stop motion animation. Courses in 2D animation begin with character design and progress through dynamics and sequences. 3D courses teach students all aspects of computer animation. Modeling in Polygons, NURBs, and Subdivision surfaces is taught, with an emphasis on a balance between heavy detail and economy of animation. Other areas include character rigging, set construction, dynamics, character animation, particles, and compositing. All aspects involved in creating stop motion films are covered. Students are taught animating technique, wire armature construction, and set construction.

Management Information Systems

Saunders College of Business
rit.edu/business

A leader in business

In the management information systems major, course work exposes you to a range of state-of-the-art computing, networking, and information processing systems. Hands-on lab experiences give you a thorough understanding of networks and computer technology. As a result, you'll be able to design practical, cost-effective, and customized systems that help meet an organization's need for information.

Career opportunities

Career paths for MIS graduates include business and systems analysis, management and information technology consulting, enterprise systems analysis, database application development and administration, network design and administration, web systems development, and information technology project management.

Media Arts and Technology

College of Art and Design
rit.edu/artdesign

The media arts and technology major incorporates the convergence of technologies that allow content to be created, formatted, stored, and then shared via computer-based publications, printed material, online services, and various forms of interactive media. Students to build skills not only in traditional publishing but also in database management, new media production, networking, and mobile communications.

Co-op prepares you for success

You will spend two blocks in a paid cooperative education experience with a related business, learning the ropes of the printing and publishing industries. These real-life experiences will assist you in your ultimate job search. Upon graduation, students can work with photographers, graphic designers, advertisers, and publishers to create cross-media communications that inform, entertain, and persuade others. Graduates have found positions in advertising production, digital imaging, print production, and Web design and development.

Motion Picture Science

College of Art and Design
rit.edu/artdesign

The motion picture science major provides an education in the fundamental imaging technologies used for the motion picture industry. Students learn to work across a wide spectrum of the motion picture industry, from research engineering roles at technology providers like Sony, Technicolor, Dolby, and others to technical post-production positions such as digital color correction, sound design, visual effects, and more.

The technology of filmmaking

Students engage in course work that covers imaging physics, motion picture engineering, film and digital image capture, film scanning, digital image manipulation, color science, visual effects, and digital and traditional projection. Facilities provide students hands-on experience with the same equipment being used in major motion picture production.

New Media Design

College of Art and Design
rit.edu/artdesign

The new media design major offers a unique course of study in the field of interactive and digital media. You will gain experience in concept development, information architecture, animation, interactive development, digital photography and video, and multimedia.

A computing collaboration

You will also explore design for mobile devices, entertainment multimedia, user-interface design, motion graphics, and other areas of new media, while sharing courses with the new media interactive development major within the Golisano College of Computing and Information Sciences. Collaboration between these majors will allow you to experience a truly dynamic interdisciplinary curriculum. As a graduate of the new media design major, you will be prepared to work in a team-based environment, meeting the growing demand for interactive professionals.

Professors Laurence Sugarman and Steve Jacobs work with student Kenneth Stewart on MindGamers, a role-playing video game platform in development at RIT's MAGIC Center. The package is designed to teach calming and self-regulating skills to teenagers with autism spectrum and obsessive-compulsive disorders.

In RIT's fast-paced and stimulating environment, our approach to teaching makes us different. Our faculty place emphasis on using their real-life experiences to give you perspectives on what it takes to be successful in the real world. Their teaching is grounded in reality, and their roles in the computing and information sciences industries mean courses, assignments, and projects are timely and relevant. There are no graduate teaching assistants—you are taught by professionals who are interested in guiding future computing and information technology leaders.

In computing and information sciences at RIT, there are over 180 full-time faculty. Collectively and individually they are an incredible resource for students. Here are just a few examples of our outstanding faculty.
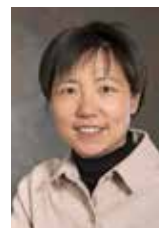
Yin Pan, professor of computing security and associate director of the college's doctoral program in computing and information sciences, focuses on security audits and digital forensics. Her current research interests include game-based digital forensics that utilizes the game-based learning approach to introduce forensic concepts and technologies, and malware analysis using machine learning and memory forensics analysis.

Hans-Peter Bischof, professor of computer science and co-director of RIT's Laboratory for Astrophysical Dynamics, leads a project titled Spiegel. The visualization system allows a user to explore the simulation by moving through time and space in a three-dimensional environment. Spiegel was developed as a team effort, with more than 30 undergraduate and graduate computer science students providing assistance.

Tae (Tom) Oh, associate professor of information sciences and technologies, utilizes his networking and security background to research ways to increase independence for people with disabilities. He also designs algorithms to address safety and navigation issues in Vehicular Area Networks (local networks in and around moving vehicles that enable devices to communicate). Oh developed the "Smart Cane," which allows deaf and blind people to better navigate using ultrasonic object detection and tactile feedback.

Andy Meneely, assistant professor of software engineering, analyzes how software developers collaborate in large teams. He focuses on how to measure team activity and coordination, and how team dynamics impact software quality and security.

Ian Schreiber, assistant professor in the School of Interactive Games and Media, worked in the gaming industry for eight years as a programmer and game designer. He worked on several popular game titles, including Playboy: The Mansion and Marvel Trading Card Game. He also developed training/simulation games for two Fortune 500 companies. Schreiber authored two books, *Challenges for Game Designers* and *Breaking into the Game Industry*.

Michelle Harris , assistant professor in the School of Interactive Games and Media, is a media artist. Her work mixes digital/multimedia elements with materials such as texture, sound, and light to engage the audience while addressing the roles of women in American culture. Her work has been shown at the ACM SIGGRAPH, World Maker Faire, and reActor International Conference on Digital Live Art.

Mohamed Wiem Mkaouer, assistant professor of software engineering, focuses his research on software quality, systems refactoring, model-driven engineering, and software testing. He has collaborations with industrial companies on the use of computational search and evolutionary algorithms to address several software engineering problems such as software quality, software remodularization, and software evolution.

Linwei Wang, assistant professor in the Ph.D. department, is director of the Computational Biomedicine Laboratory and leads research that seeks and develops methods, algorithms, and systems for mapping the electrophysiology and electromechanics of the heart. Her research will lead to more effective, and less invasive, cardiac treatment methods.

Matt Huenerfauth, associate professor of information sciences and technologies, is the director of the Linguistics and Assistive Technologies Laboratory and co-director of the Center for Accessibility and Inclusion Research. His research focuses on computer accessibility and assistive technology for people with disabilities, natural language processing, human-computer interaction, and the computational linguistics of American Sign Language.

Rennie Bailey, associate professor of computer science, researches applied visual perception in computer science. Bailey's research seeks to exploit ever-expanding knowledge of the human visual system to develop innovative computer graphics applications, novel rendering techniques, and better display systems. His research activities are motivated by a multidisciplinary study in the areas of computer graphics, physiology, physics, psychology, and art.

Sumita Mishra, associate professor of computing security, researches on security and privacy for resource-constrained devices and networks, and cybersecurity pedagogy. Her current work focuses on the study of privacy-preserving techniques for the smart grid. She is also interested in pedagogical approaches for making cybersecurity pervasive across non-computing disciplines and high school curricula.

Ivona Bezáková, associate professor of computer science, believes anyone can understand the mathematical foundations of computer science. "Many people will tell you they were bad at math in high school and will never be good at it," she says. "I am not willing to accept that, because oftentimes you just need to demystify the formulas, provide motivation, and change your viewpoint." Bezáková sees math as a problem-solving tool for programming and algorithmic thinking. Her courses in Algorithms, Advanced Algorithms, and Introduction to Computer Science Theory allow students to apply mathematical techniques to real-world computing problems.

Dan Ashbrook, assistant professor of information sciences and technologies, focuses his research in the area of human-computer interaction, where he concentrates on new interaction techniques, devices, and applications. He has been researching wearable and mobile computing, with the goal of allowing people to be less focused on their technology and more engaged with the world, while still reaping the benefits of their devices. He is also the director of the Future Everyday Technology Lab.

Jessica Bayliss, associate professor in the School of Interactive Games and Media, conducts research in the areas of brain-computer interfaces, treating amblyopia using first person shooting games, and developing an anaerobic digestion simulator for teaching students enrolled in advanced placement environmental science courses. Her interests lie in game engine creation, systems design, and game design.

Today's top employers are looking for ambitious graduates who couple enriching experiences outside the classroom with a high-quality academic background. At RIT, you get both.

Real-world preparation

The necessary elements of a satisfying and rewarding educational experience are cutting-edge academic programs, outstanding faculty, and first-rate facilities—all of which you'll find at RIT. In today's world, however, that's not enough. You also need to find a way to make your education "real." To successfully face the challenges that await you upon graduation, you must prove your ability to tackle real-world problems and operate in real-world settings.

Through varied experiential learning opportunities and our renowned cooperative education program, RIT helps you "keep it real."

Value-added learning

Simply translated, experiential education means learning by doing. These initiatives put classroom lectures and textbook theories to the test, all the while letting you hone your sense of direction and purpose.

RIT's computing and information sciences students receive a full array of experiential learning opportunities. A few to consider:

• Test your skills during the anual Northeast and National Collegiate Cyber Defense Competition, where teams of students maintain and enhance an enterprise computing environment, then defend it from attack initiated by computing professionals. In 2013, RIT won the national championship title. In 2014 and 2015, RIT placed in the top three, finishing second and third, respectively.

• Team with students from RIT's College of Imaging Arts and Sciences on new media projects that propel your skills to the next level while cementing lifelong friendships.

• Participate in the Study Abroad program, living and learning in another culture.

Work while you learn

Cooperative education is the most extensive and intensive of experiential education experiences at RIT. Co-op is full-time, paid work experience directly related to your course of study and career interests. In addition to gaining professional work experience and developing a critical network of contacts, co-op is often the best way to develop the necessary business success skills—leadership, decision-making, communication, professionalism, flexibility, and independence—you'll need on the job.

Experience that pays

Besides being a great way to gain professional experience, co-op also provides you with a salary—real income that you can apply toward tuition, books, and living expenses. What's more, no tuition is charged for the semesters you are employed as a co-op student.

How it works

RIT's Office of Career Services and Cooperative Education offers instructional materials, workshops, and access to thousands of job postings and employer contacts to help you through the entire work preparation and job search process. A coordinator assigned to your academic program will work with you one-on-one to achieve your employment and career goals as well as guide you as you complete your co-op assignments. All you need is an open and inquisitive mind and a passion for exploring and developing your career interests.

Recent employers

A sample of recent co-op and permanent placement employers includes:

Adobe Systems
Ahold Inc.
Alstom Transport
Amazon
American Greetings
Apple
Autodesk, Inc.
Blizzard Entertainment
Bose Corporation
Box, Inc.
Brand Networks Inc.
Cartoon Network
Central Intelligence
    Agency
Cisco Meraki
Cisco Systems Inc.
Citigroup
CloudCheckr
Computer Systems
    Corporation (CSC)
Constant Contact
Darkwind Media
Datto Inc.
Dell SecureWorks
Disney Interactive
Dreamworks Animation
EagleDream
    Technologies

eHealth Global
    Technologies Inc.
Electronic Access
    Solutions-Lenel
EMC Corporation
EnerNOC Inc.
Epic Games
Expensify
Facebook
FactSet Research
    Systems, Inc.
Federal Bureau of
    Investigation
Fidelity Investments
FM Global
Frontier Corp/
    A Citizens Comm. Co.
Fujifilm North America
General Electric
Global Printing
    (Global Thinking)
Google
Harris Corporation
HP
HubSpot
Hudl
IBM Corporation
iD Tech Camps
    (Internal Drive)

IDI Billing Solutions
Indeed.com
Intel Corporation
Interactive
    Intelligence Inc.
Intuit
iRobot
JPMorgan Chase
Juniper Networks
Kodak Alaris
Liberty Mutual
LinkedIn
Little Monsters
Lockheed Martin
M&T Bank
Microsoft Corporation
MIT Lincoln Laboratory
Mitre Corp
MOOG Inc.
NASA Goddard Space
    Flight Center
NASA Langley Research
    Center
National Security Agency
NetApp
Northrop Grumman
NVIDIA Corporation
Oracle

Parsons
Paychex Inc.
Philips North America
Pictometry
    International LLC
Rochester Software
    Associates
Sesame Workshop
Sherwin-Williams
Space X
Symantec Corporation
Target Corporation
Tesla Motors
Thomson Reuters
Twitter
Verizon Wireless
Vmware
Wayfair
Wegmans Food
    Markets Inc.
Windstream
Workinman
Xamarin
Xerox Corporation
Yahoo!

Graduate school

Many RIT students set their sights on graduate school. Our students enjoy a high rate of acceptance into top-tier graduate programs in computing, the sciences, business, education, and other areas. Below is just a sampling of the top graduate schools where our students have chosen to continue their studies.

Babson College
Boston University
Carnegie Mellon University
Case Western Reserve University
Cornell University
Drexel University
Duke University
Georgia Institute of Technology
Johns Hopkins University
Harvard University
Iowa State university
Massachusetts Institute of Technology
New York University
Northeastern University
Ohio State
Penn State
Rhode Island School of Design
Rochester Institute of Technology
School of Visual Arts
Syracuse University
University of Buffalo
University of California, Berkeley
University of Cincinnati
University of Maryland
University of Michigan
University of Rochester
University of Southern Denmark
University of Virginia
Virginia Tech

Sign Language Animation Technology

Matt Huenerfauth (right) directs the Linguistic and Assistive Technologies Lab at RIT. Providing American Sign Language (ASL) on websites can make information and services more accessible, especially for people with lower English literacy. Currently, some websites use videos of human signers, but it is difficult and costly to make content updates. Huenerfauth is creating software to automatically produce an animation of ASL based on an easy-to-update script, thereby making it easier for companies and organizations to put ASL content on the web. Wearing a motion-capture body suit, eye-tracker, and gloves, research participants perform ASL sentences, and software uses this data to produce natural animations. Scott Farrell is performing the sign "live."
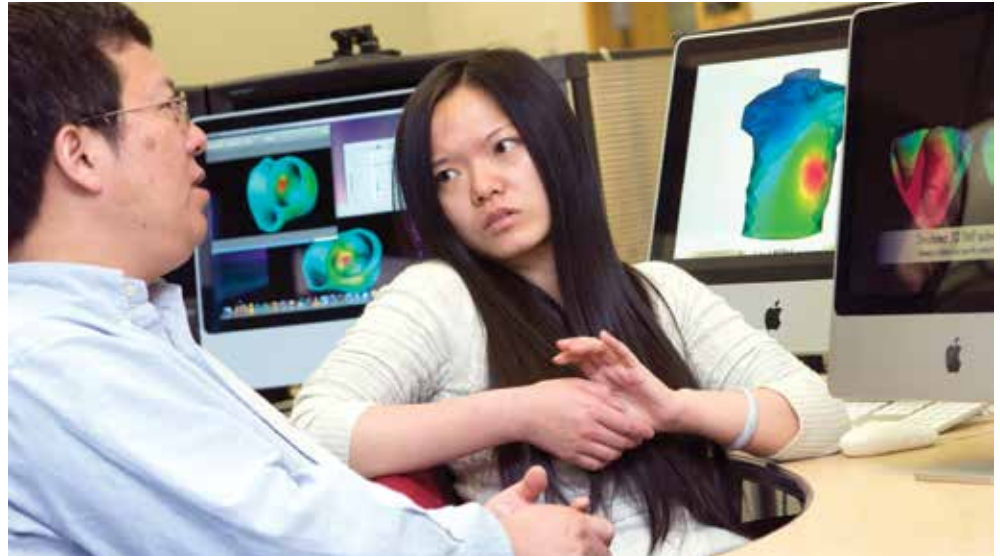
Research

Undergraduate students at RIT have the opportunity to collaborate with faculty members on innovative and exciting applied research projects. The Golisano College is augmenting its strengths in accessibility and computing security while expanding its research in emerging areas such as pervasive computing, personalized medicine, and games for learning and social impact. The college's research portfolio has grown with the hiring of esteemed researchers.

Accessibility and learning

The college has recruited former head and founder of IBM's Accessibility Research Group Vicki Hanson, as well as computer scientist and linguistics expert Matt Huenerfauth, who has performed leading research in American Sign Language (ASL) animations. Both professors bring cross-disciplinary expertise to RIT that creates new opportunities for research with colleges such as RIT's National Technical Institute for the Deaf.

We continue to grow our portfolio of cross-disciplinary research in accessibility, security, and personalized medicine. Faculty members also are securing funding in emerging areas like pervasive computing and wearable tech.

Cross-disciplinary research is also ongoing in the School of Interactive Games and Media, where professors including Jessica Bayliss and Owen Gottlieb are exploring games and learning initiatives that help students learn topics through gameplay.

New connections. New security needs.

While computing security has been a major research focus at Golisano College for years—researchers study viruses and other vulnerabilities in the college's secure airgap lab—security research is now expanding to additional departments. Andy Meneely, assistant professor of software engineering, studies software repositories to understand how collaborative development occurs and how software processes can be designed to prevent vulnerabilities like the 2014 Heartbleed bug.

Finally, college researchers are exploring ways computing pervades each facet of our lives and finding ways that devices can interconnect to enhance these experiences. Mohan Kumar, professor and chair of computer science, and other faculty are involved in research related to pervasive systems. Kumar co-developed the concept of distributed opportunistic computing in which resources on user devices provide information and services useful to other users and applications. His current research addresses ways to apply distributed, opportunistic computing to areas like health care, transportation, and crisis management.

There's no question that RIT has one of the most modern, high-tech campuses in the nation.

We've taken a leadership role in academic computing by continually upgrading our technology infrastructure. Our two OC3 connections to the internet, 20,000 network connections, 530 miles of Ethernet cable, and an 8-million-foot fiber optic backbone provide computing access that is hard to beat. RIT is also one of a select group of universities with access to the Internet2 research network.

Get connected

As an undergraduate student, you'll be in a hands-on learning environment at the cutting edge of technological developments in your field. The Golisano College houses more than 50 classrooms and labs equipped for both instruction and specialized research in areas such as security, robotics, and vision/artificial intelligence (AI). Labs within the college include:

• a networking and distributed systems lab, featuring dual-processor PC workstations and file servers,

• five computer science teaching labs, one open computing lab, and five specialty labs with over 150 desktop machines that support Ubuntu, Windows, and Mac OS,

• an information technology lab complex that houses more than 300 computers distributed among several specialty labs, including cross-platform web browser/server, and Oracle-based database labs.

Here are some additional computing facilities you'll find at RIT:

• The Golisano College's **School of Interactive Games and Media** features a wide variety of world-class computing facilities, including studio-style classrooms, collaborative computer workstations, sound studio, and video production environment, including green-screen capability. All are supported on the back end by high-speed networks and access across campus.

• The **Computer Architecture and Digital Computer Organization labs** in RIT's Kate Gleason College of Engineering are equipped with PC workstations, electronic measuring equipment, microprocessor/microcontroller boards, and software for digital system design, digital signal and image processing, control systems, and networking.

• The **Very Large Scale Integration Lab** houses workstations that run CAD tools from Synopsys and MentorGraphics for chip design.

• The **Real-Time Systems Lab** is used for senior design projects involving embedded systems in applications such as robotics, gaming, imaging, and security.

• Computer labs in RIT's Saunders College of Business are equipped with state-of-the-art workstations featuring Intel Core i7 processors, and software used by Fortune 1000 companies.

The **MAGIC Center** (short for Media, Arts, Games, Interaction, and Creativity) bridges the gap between research and prototyping, and enables students to bring industry polish and commercial scale and support to myriad projects. This allows these works to have wider and greater impact. For this reason, MAGIC is composed of both a research laboratory (in which many other labs and working groups are housed or affiliated) and a production studio (Magic Spell Studios), which leverages projects in ways that can more broadly disseminate games, production projects, and digital media ventures to peers and to the public at large. MAGIC is intended as a university-wide, cross-disciplinary center in which faculty, staff, student researchers, artists, and practitioners come together to create, contextualize, and apply new knowledge in a multitude of related fields and disciplines.

- **MAGIC Spell Studios** began as a commercial studio that has been developing and publishing digital media—such as games, apps, films, art installations, and interactives—since 2013. The studio helps students grow their ideas into products and companies, and engages students and faculty across multiple disciplines to build these digital products from the proof-of-concept stage into refined prototypes that demonstrate commercial viability. In 2016, the studio published the game "Hack, Slash & Backstab" on Xbox One, making RIT the first university in the country to publish to this platform. **A new 43,000-square-foot building, also known as MAGIC Spell Studios, will feature a state-of-the-art sound stage, tiered theater with a projection booth and a cinema-quality audiovisual system, sound mixing and color correction rooms, and numerous labs and production facilities.** This facility, which is set to open in fall 2018, will support RIT's recent designation by Empire State Development as a digital gaming hub.

- The **New Media Lab** in RIT's College of Art and Design is equipped with 25 Apple iMacs, and software packages used in the design, printing, publishing, digital video, and animation industries.

- The **Barschel Lab** is equipped with 25 Apple iMacs and a complete suite of 2D and 3D graphic design, imaging, illustration, web development, and motion graphics software packages.

- The **3D Lab** features 23 PC workstations running a suite of the latest Autodesk and Adobe applications.

- Studio labs and the collaboration lab— All of our courses are taught in a studio lab environment that is designed to increase student-instructor interaction. By seamlessly mixing lectures and hands-on class exercises, you will start working with the most complex concepts before the class session even ends.

- Student team rooms—Teamwork is a major component of the computing industry. Our facilities include 11 team rooms that provide space for teamwork and group discussion. Instructors incorporate team rooms into your class sessions so that you can immediately engage with your team and begin working on the computing concepts you learn in the classroom.

- Real-time and embedded systems lab—Jet engines, cellular phones, medical devices, and robots are examples of systems that could not operate without software running in real time on embedded processors. This lab will help you learn how to develop software for these dynamic systems.

- A forensic and mobile security lab as well as a dedicated lab isolated from the rest of the campus's networks allows for the in-depth study of viruses, firewalls, and other computer vulnerabilities.

RIT's Study Abroad programs and international campuses unlock a world of opportunity for our students. RIT operates in five countries abroad (including Croatia, pictured here) and through our partnerships with other universities offers more than 250 programs in over 50 countries worldwide. Our study abroad programs help our students gain valuable, unforgettable cross-cultural experiences while further preparing them for success in an increasingly globalized economy.
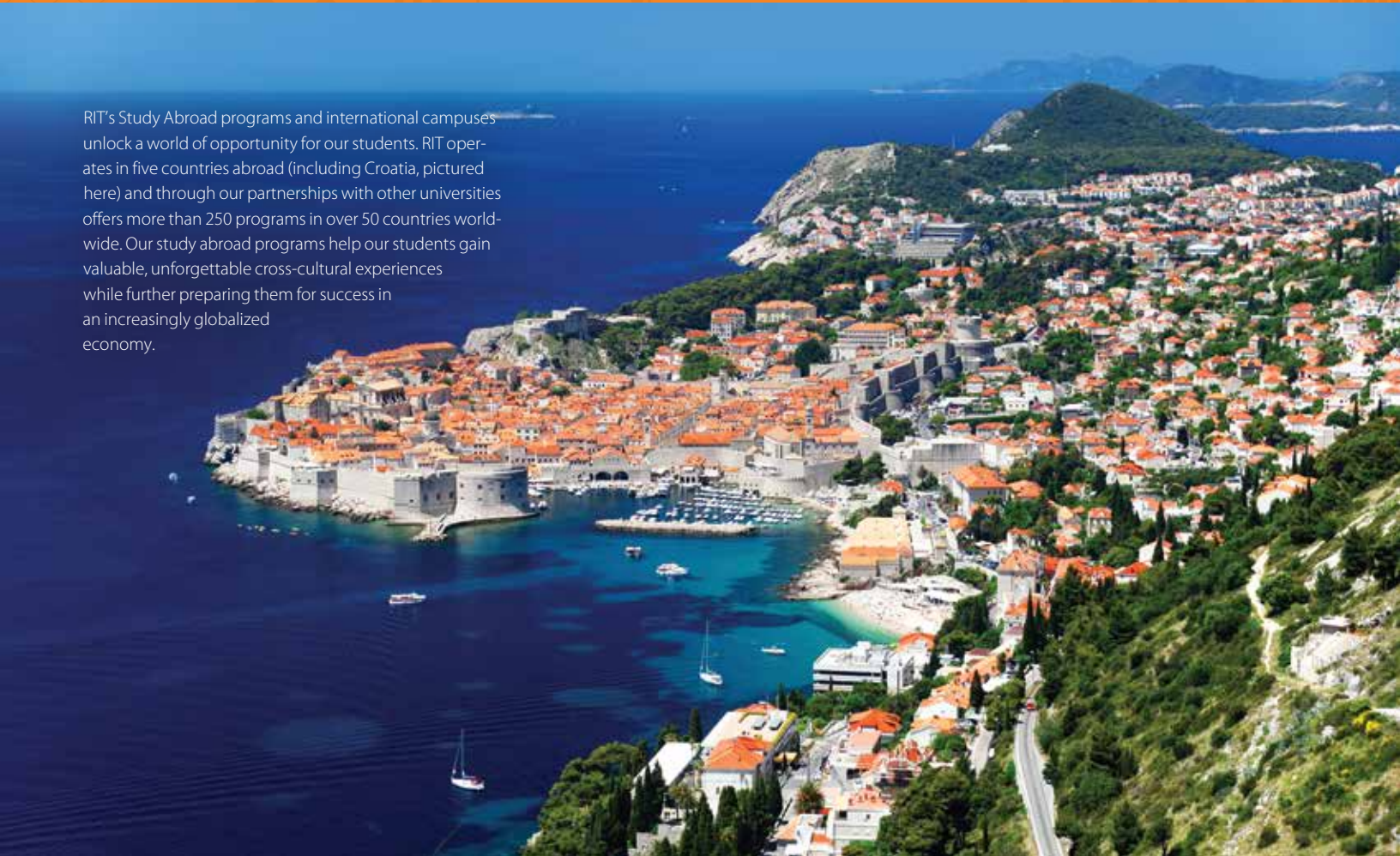
College is a place where you should challenge yourself with not only your academics, but also special projects and programs that can help you reach your academic goals, then exceed them.

Chief among these special initiatives are applied research opportunities, study abroad, and the RIT Honors Program. Each gives you the chance to stretch and test your abilities while providing a mark of distinction that is guaranteed to impress prospective employers.

Study Abroad

The Study Abroad program enhances the understanding of other cultures. You may study full time in RIT-affiliated programs in more than 20 countries around the world. In addition, the computer science department of the Golisano College, in affiliation with SUNY Oswego, offers a five-month study abroad program in Osnabrück, Germany. Students receive a mix of seminar classes, traditional lectures, and practice sections on computing topics such as artificial intelligence and functional programming, as well as German language instruction.

Honors Program

The RIT Honors Program provides a challenging, individualized, and rewarding experience for students who have distinguished themselves academically. The program complements your degree requirements with exceptional opportunities for research, travel, and professional development.

Honors students have access to special courses, seminars, projects, and advising. They also have early course registration privileges, and participate in a dedicated general education curriculum that brings together Honors students from across the university. The Honors capstone presentation is a formal, public presentation based on material developed in the student's course of study.

Outside the classroom, Honors students benefit from enhanced cooperative education placements and a substantial menu of extracurricular opportunities. Special housing in Gibson Hall is guaranteed for freshman and upperclass Honors students.

Accelerated dual-degree options

The Golisano College offers a number of accelerated dual-degree options for outstanding undergraduate students who wish to earn both a bachelor's and a master's degree in approximately five years of study.

Accelerated options are available in:
- BS/MS in Computer Science
- BS/MS in Computing Security
- BS/MS in Game Design and Development
- BS/MS in Software Engineering
- 4+1 options are also available, which allow students to combine one of the college's BS degrees with an MBA.

Graduate study

The Golisano College's graduate degree programs are focused on educating future leaders of the computing industry as they engage in graduate study that solves complex present-day and future computing challenges.

The following graduate degrees are available:
- MS in Computer Science
- MS in Computing Security
- MS in Game Design and Development
- MS in Human-Computer Interaction
- MS in Information Sciences and Technologies
- MS in Networking and System Administration
- MS in Software Engineering

If you are interested in further study, you may choose to continue in RIT's interdisciplinary doctoral program in computing and information sciences. It produces independent scholars, well-prepared educators, and cutting-edge researchers poised to excel in their work in computing and interdisciplinary academic, industrial, or government environments. The degree highlights two of the unique characteristics of the Golisano College: its breadth of program offerings and its scholarly focus on discovering solutions to real-world problems by balancing theory and practice.

MINORS AND IMMERSIONS

Minors and immersions can give you a secondary area of expertise or the chance to explore other areas of interest to you. They may complement your major, broaden your career options, or expand your personal interests. For the most current list of minors and immersions please visit rit.edu/minors and rit.edu/immersions.

ART, DESIGN & CRAFTS

American Art ●▲
Art History ●▲

BUSINESS & MANAGEMENT

Accounting ●
Business Administration ●
Construction Management ●
Digital Business ●
Engineering Management ●
Entrepreneurship ●
Finance ●
Hospitality Management ●
Innovation ●
International Business ●
Management ●
Management Information Systems ●
Marketing ●
Supply Chain Management ●

COMMUNICATIONS & DIGITAL MEDIA

Advertising and Public Relations ●▲
American Sign Language and Deaf Cultural Studies ●▲
Communication ●▲
Digital Literatures and Comparative Media ●▲
Health Communication ●
Journalism ●▲

COMPUTING & INFORMATION SCIENCES

Bioinformatics Analysis ●
Computer Science ●
Computing Security ●▲
Database Design and Development ●
Free and Open Source Software and Free Culture ●
Game Design ●
Game Design and Development ●
Geographic Information Systems ●▲
Health IT ●
Mobile Design and Development ●
Mobile Development ●
Networking and Systems Administration ●
Software Engineering ●
Web Design and Development ●
Web Development ●

ENGINEERING, ENGINEERING TECHNOLOGY & RELATED PROGRAMS

Chemical Engineering Systems Analysis ●
Computer Engineering ●
Electrical Engineering ●
Flexible Packaging ●
Industrial Engineering ●
Mechanical Engineering ●
Microelectronic Engineering ●
Packaging Science ●

Software Engineering ●
Structural Design ●

ENVIRONMENTAL STUDIES & SUSTAINABILITY

Environmental Modeling ●
Environmental Science ●
Environmental Studies ●▲
Sustainable Product Development ●
Water Resources ●

HEALTH & LIFE SCIENCES

Biology ▲
Biology: Cellular and Molecular ●
Biology: Ecology and Evolution ●
Exercise Science ●
Health and Culture ●▲
Nutritional Sciences ●

MATHEMATICS & PHYSICAL SCIENCES

Applied Statistics ●▲
Astronomy ●▲
Chemistry ●▲
Imaging Science ●
Mathematics ●▲
Optical Science ●
Physics ●▲

PHOTOGRAPHY, FILM & ANIMATION

Film Studies ●▲
Imaging Systems ●

Media Arts and Technology ●
Science of Film, Photography, and Imaging ▲
Visual Culture ●▲

SOCIAL SCIENCES, HUMANITIES & EDUCATION

African Studies ▲
American Politics ●▲
Anthropology and Sociology ●
Archaeological Science ●
Archaeology ▲
Black Studies ●
Creative Writing ●▲
Criminal Justice ●▲
Cultural Anthropology ▲
Diversity in the U.S. ▲
Economics ●▲
English ●▲
Ethics ●▲
Global Justice ▲
Global Literatures and Cultures ●
Globalization ●
Globalization Theory ▲
History ●▲
Human Language Technology and Computational Linguistics ▲
International Relations ●▲
Language Science ●▲
Latino/Latina/Latin American Studies ●▲
Legal Studies ●▲
Linguistic Anthropology ▲

Military Studies and Leadership ●
Modern Language (Arabic, Chinese, French, German, Italian, Japanese, Portuguese, Russian, Spanish) ●
Modern Languages and Cultures (Arabic, Chinese, French, German, Italian, Japanese, Portuguese, Russian, Spanish) ●▲
Museum Studies ●▲
Music ▲
Music Performance ●
Music and Technology ●
Native American and Indigenous Studies ▲
Philosophy ●▲
Political Science ●▲
Psychology ●▲
Public Policy ●▲
Religious Studies ▲
Renaissance Studies ▲
Science and Technology Studies ▲
Science, Technology, and Society ●
Social Inequalities ▲
Theater Arts ●▲
Urban Studies ▲
Women's and Gender Studies ●▲

● Minor   ▲ Immersion

Among the world's leading technological universities, RIT is an exciting living and learning environment where students find an engaging and challenging academic setting, a strong commitment to undergraduate education, and a vibrant campus life.

Students from all 50 states and more than 100 countries find the RIT campus, and Rochester, N.Y., full of life.

You will find your social circle includes friends from all majors and from many different cultures. Clubs and activities, sports, field trips, concerts, and cultural events all shape the social scene at RIT. There are a number of opportunities you can take advantage of to foster lifelong friendships while building your academic portfolio.

Community service

RIT is active in community service as a university, and our College of Liberal Arts promotes and encourages service to the community at large. Students have performed community service for Habitat for Humanity, organized the annual Mud Tug to raise money for organizations such as the Susan G. Komen Breast Cancer Foundation, and arranged conferences with local business leaders. The time spent involved in clubs and organizations can help build relationships that last well after graduation, and is a plus on your resume.

Sports, recreation, and activities

The campus is alive with sports and recreation activities. RIT's men's and women's intercollegiate athletic teams have a history of excellence, and more than half of our undergraduate students participate in an intramural or club sport team each year. The Gordon Field House and Activities Center is a state-of-the-art athletics and recreation facility featuring a spectacular fitness center, an indoor track, an aquatics center, and multipurpose gyms. The university also features the Ritter ice arena, an outdoor track, outdoor tennis courts, and playing fields. The newly opened Gene Polisseni

Center houses the ice arena where our men's and women's Division I hockey teams play. RIT is the only university in the country with an ESPN Sports Center desk where students can test their broadcasting skills while reporting on their favorite Tiger sports.

Currently there are more than 300 student clubs and organizations on campus, offering opportunities to network with professionals in your field, compete in national competitions, and meet students who share your interests. Here are just a few of RIT's organizations and social clubs that might be of interest to you: College Activities Board, Dance Team, Debate Society, Global Union, Habitat for Humanity, Pre-law Association, RIT Philharmonia, and RIT Science Fiction Association.

Our graduates are changing the world. Here are just a few of our notable alumni:

Tad Hunt
Co-founder and chief technology officer of Exablox

Alex Kipman
Technical Fellow, Microsoft

Katie Linendoll
Tech expert for NBC's TODAY Show

John Resig
Creator, jQuery

Tad Hunt ('97, computer science) is the co-founder and chief technology officer of Exablox, a Silicon Valley-based venture focused on redefining the economics of enterprise storage. Hunt has more than 18 years of experience in information technology, most of it dedicated to some of the most fundamental and complex aspects of computer science: the design and development of operating systems, networking, and storage. Hunt's initial career was focused on the design, architecture, and implementation of systems ranging from embedded consumer devices to telco big iron. At RIT, Hunt had his sights set on embedded software design. After an undergraduate work experience project, he joined AT&T's Bell Labs to work as a kernel developer on the Inferno OS project. This led to his appointment as senior engineer on the PathStar project, one of the first VoIP telephone switches. He then became a principal engineer at Entrisphere, a last-mile telecom technology startup, from its inception through acquisition by Ericsson. Two years later, Hunt co-founded Exablox.

Alex Kipman ('01, software engineering) is the Technical Fellow of new device categories in the Operating System Group at Microsoft. An innovator at heart, Kipman has led four major breakthrough products for the company, including Kinect in 2010. Microsoft HoloLens is his latest product creation, blending high-definition holograms with the real world. Kipman is named as the primary inventor on more than 100 patents since joining Microsoft in 2001. Kipman's dedication to creating new experiences with cutting-edge technology propelled Kinect to become the world's fastest selling consumer electronics device. As a result he entered Microsoft's Hall of Legends in 2011. He was named one of *TIME Magazine's* 2011 "100 People of the Year." In 2012, the Intellectual Property Foundation named Kipman the National Inventor of the Year.

Katie Linendoll ('05, information technology) is an Emmy Award-winning TV personality, writer, tech expert, and global tech consultant. In those roles, she spends as much time in the field as she does on her laptop. Linendoll has interviewed hundreds of celebrities, tech entrepreneurs, CEOs, and sports stars. She introduced Google Glass to the NFL via the St. Louis Rams (a piece that went viral), detoxed in digital rehab, won the Guinness World Record for performing the most "high fives" in 60 seconds, and shared the stage with Lady Gaga— all in the name of technology. She also serves as a technology consultant for NBC's TODAY Show, where she co-designed and developed three apps, including "Al's Weather Rokies," for TODAY's meteorologist Al Roker.

John Resig ('05, computer science) is the creator of jQuery, a JavaScript library that helps programmers more quickly create dynamic websites that display on a range of browsers. Resig's library of features fundamentally changed the way developers work with the web, helping simplify scripting for browsers and offering companies like Google, Microsoft, and Apple an important tool in managing their online presence. Resig has emerged as a leading figure in tech, publishing popular books like *Secrets of a JavaScript Ninja*, speaking at major tech conferences like South by Southwest, and serving as moderator for a number of Reddit 'subreddits,' including the RIT subreddit, which he founded.
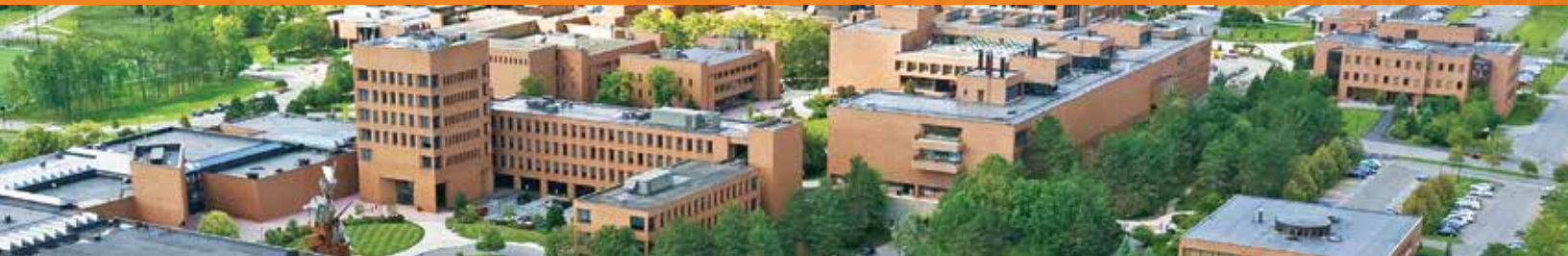
Aerial image courtesy of Stratus Imaging

COLLEGES AND DEGREE-GRANTING UNITS:

College of Art and Design
- School for American Crafts
- School of Art
- School of Design
- School of Film and Animation
- School of Photographic Arts and Sciences

Saunders College of Business

B. Thomas Golisano College of Computing and Information Sciences

Kate Gleason College of Engineering

College of Engineering Technology
- School of Media Sciences

College of Health Sciences and Technology
- Wegmans School of Health and Nutrition

College of Liberal Arts

National Technical Institute for the Deaf

College of Science
- Chester F. Carlson Center for Imaging Science
- Thomas H. Gosnell School of Life Sciences
- School of Mathematical Sciences
- School of Chemistry and Materials Science
- School of Physics and Astronomy

Golisano Institute for Sustainability

School of Individualized Study

FOUNDED IN 1829, Rochester Institute of Technology is a privately endowed, coeducational university with nine colleges and two degree-granting units emphasizing career-focused education and experiential learning.

THE CAMPUS occupies 1,300 acres in suburban Rochester, the third-largest city in New York state. RIT also has international campuses in China, Croatia, Dubai, and Kosovo.

DEGREES: RIT offers the following degrees: doctoral (Ph.D.) programs in astrophysical sciences and technology, color science, computing and information sciences, engineering, imaging science, mathematical modeling, microsystems engineering, and sustainability; master's degree programs: master of architecture (M.Arch.), master of business administration (MBA), master of engineering (ME), master of fine arts (MFA), master of science (MS), and master of science for teachers (MST); bachelor's degree programs: bachelor of fine arts (BFA) and bachelor of science (BS); and associate degree programs: AS, AOS, AAS.

THE RIT STUDENT BODY consists of approximately 15,700 undergraduate and 3,250 graduate students. Enrolled students represent all 50 states and more than 100 countries. More than 3,400 students from diverse racial and ethnic backgrounds are enrolled on the main campus along with nearly 2,700

international students. An additional 2,188 students are enrolled at RIT's international campuses.

RIT is an internationally recognized leader in preparing deaf and hard-of-hearing students for successful careers in professional and technical fields. The university provides unparalleled access and support services for the more than 1,100 deaf and hard-of-hearing students who live, study, and work with hearing students on the RIT campus.

RIT ALUMNI number nearly 125,000 worldwide.

COOPERATIVE EDUCATION provides paid career-related work experience in many degree programs. RIT has the fourth-oldest and one of the largest cooperative education programs in the world, annually placing more than 4,400 students in nearly 6,300 co-op assignments with nearly 2,300 employers across the United States and overseas.

The RIT LIBRARIES consist of Wallace Library, the RIT Archive Collections, and the Cary Graphic Arts Collection. Wallace Library provides a vast array of resource materials, both print and online, and is open 24/5 during the academic year. Librarians associated with each college are ready to assist with research and class assignments. The RIT Archive Collections serves as the official repository for RIT's historically valuable records and artifacts. The Cary Collection is one of the country's premier libraries on graphic communication history and practices, and has a policy of liberal access for all students. For more information: http://library.rit.edu/.

HOUSING: Many of RIT's full-time students live in RIT residence halls, apartments, or townhouses on campus. On-campus fraternities, sororities, and special-interest houses are also available. Freshmen are guaranteed housing.

STUDENT ACTIVITIES: Major social events and activities are sponsored by the College Activities Board, Residence Halls Association, sororities, fraternities, and special-interest clubs of many kinds. There are more than 300 clubs and student organizations on campus

ATHLETICS: Men's Teams—baseball, basketball, crew, cross country, ice hockey (Division I), lacrosse, soccer, swimming, tennis, track, and wrestling

Women's Teams—basketball, crew, cross country, ice hockey (Division I), lacrosse, soccer, softball, swimming, tennis, track, and volleyball

RIT offers a wide variety of activities for students at all levels of ability. More than 50 percent of our undergraduate students participate in intramural sports ranging from flag football to golf to indoor soccer. Facilities include the Gene Polisseni Center,

which houses RIT's hockey arena and accommodates 4,300; the Gordon Field House, featuring two swimming pools, a fitness center, indoor track, and an event venue with seating for 8,500; the Hale-Andrews Student Life Center, with five multipurpose courts, eight racquetball courts, and a dance/aerobics studio; the Ritter Ice Arena; and outdoor facilities including an all-weather track, tennis courts, and several athletic fields.

EXPENSES: Full-time students enrolling for the first time and living in an RIT residence hall have the following 2018-19 academic year expenses. We estimate that the typical student also spends an average of $2,054 per year for books, transportation, and personal expenses.

Charges	2018-2019 Academic Year (two semesters)	NTID*
Tuition	$43,546	$16,518
Room (double)	7,598	7,598
Board (standard plan)	5,448	5,448
Fees	584	584
Total	$57,176	$30,148

Deaf and hard-of-hearing students who are U.S. citizens enrolled in any undergraduate program and students enrolled in the ASL-English Interpretation major will pay these charges instead of the regular academic year charges.

VISITS TO CAMPUS are encouraged and may be arranged in advance by calling 585-475-6631. Deaf and hard-of-hearing students may arrange campus visits by calling 585-475-6700, toll free in the U.S. and Canada at 866-644-6843, or by videophone at 585-743-1366.

HOME PAGE: www.rit.edu
EMAIL: admissions@rit.edu
UNIVERSITY COLORS: Orange and brown
UNIVERSITY MASCOT: Bengal tiger "Ritchie"
UNIVERSITY ATHLETIC TEAMS: Tigers

RIT does not discriminate. RIT promotes and values diversity within its workforce and provides equal opportunity to all qualified individuals regardless of race, color, creed, age, marital status, sex, gender, religion, sexual orientation, gender identity, gender expression, national origin, veteran status, or disability.

The Advisory Committee on Campus Safety will provide, upon request, all campus crime statistics as reported to the United States Department of Education. RIT crime statistics can be found at the Department of Education website, http://ope.ed.gov/security, and by contacting RIT's Public Safety Department at 585-475-6620 (v/tty).

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