R·I·T

COLLEGE OF **SCIENCE**

Contents

All RIT College of Science majors complete an experiential learning option. Often, they choose to do independent research with a faculty mentor.

Scientists and mathematicians will continue to challenge accepted truths, which will lead to discoveries we can't even imagine today. If you want to make a difference in the world, RIT can help you realize your dreams.

The College of Science houses some of RIT's most respected disciplines including the astrophysical sciences and technology program, recognized for seminal scholarship in that field. In addition, it is the home college of four of RIT's eight Ph.D. programs and the parent college to the internationally recognized Carlson Center for Imaging Science and the Center for Computational Relativity and Gravitation.

The college has been at the forefront of the remarkable growth in RIT's undergraduate student research programs and for the growth of peer-reviewed publications and external grants awarded to its faculty. Many of our faculty members are conducting cutting-edge research that is nationally and internationally recognized, and our students work alongside our researchers in the pursuit of new knowledge and discoveries.

Undergraduate students in the College of Science receive a diverse and unique education in the foundations of science and mathematical sciences, are exposed to current methodology, and gain firsthand experience in successfully applying this knowledge to solve real-world problems as members of interdisciplinary teams. All students are expected to complete an experiential learning component in their intended career fields as part of their graduation requirement. Our students also receive a comprehensive liberal arts education in the humanities and social sciences. College of Science curricula reflect modern trends in the application of science and mathematical sciences while preparing students for graduate study and for successful lifetime careers and immediate employment in business, industry, government, medical science professions, and academia. In addition to its degree programs, the college delivers the required scientific and mathematical underpinnings for most of the programs offered at RIT.

I encourage you to explore all that the College of Science, and RIT, has to offer.

Sophia Maggelakis, Ph.D.
Dean, College of Science

College of Science

Undergraduate students: 821

Graduate students: 318

Faculty: 191

Alumni: 7,700

Degrees offered: BS, MS, Ph.D.

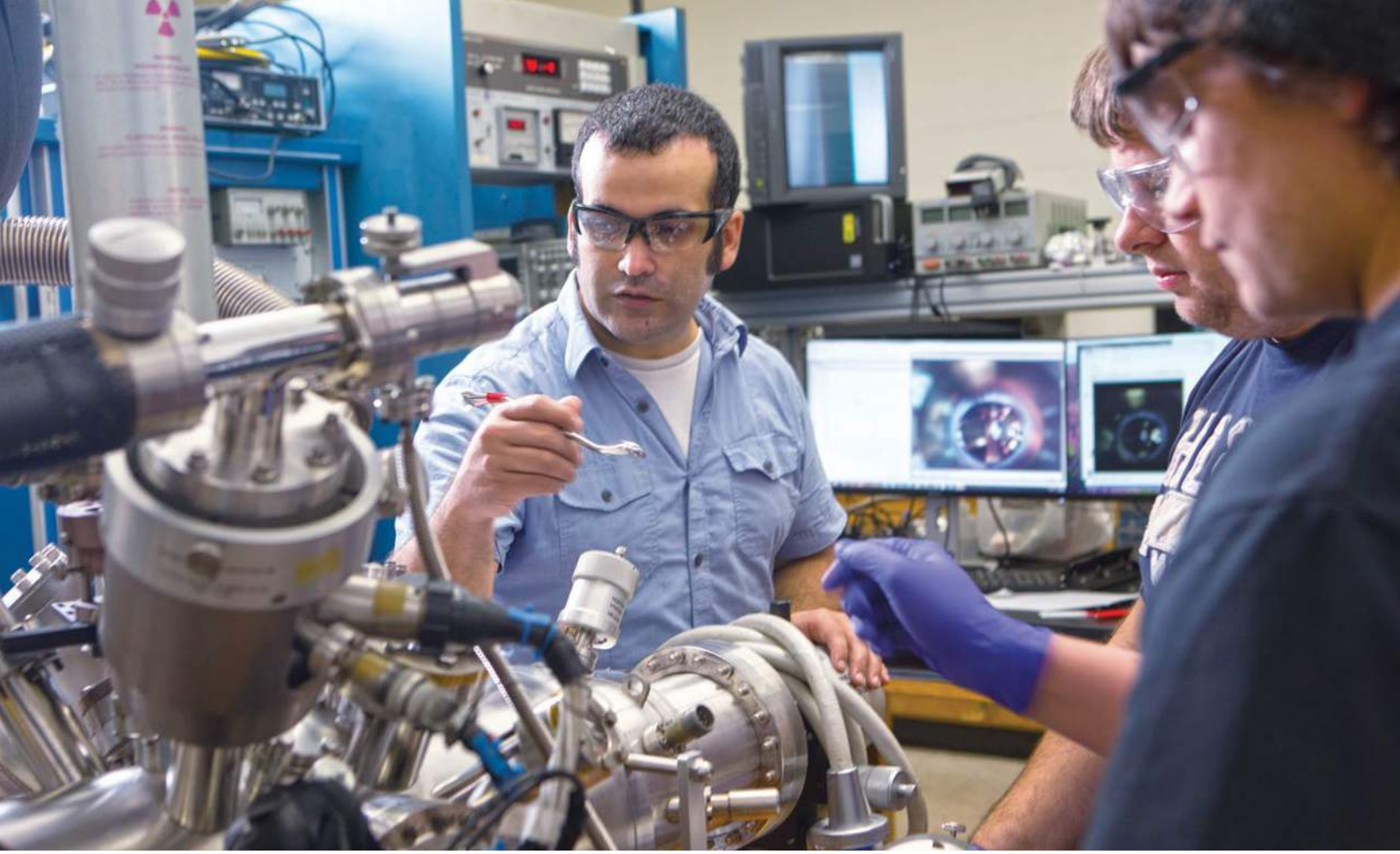
Experiential learning:
All RIT science and mathematics majors are required to complete an experiential learning option. Co-op is required in bioinformatics. Senior projects are required in physics and environmental science. Both freshman and senior projects are required in imaging science. Study abroad and undergraduate research are encouraged.

28 Goldwater Scholars in 15 years:
The Goldwater Scholarship is the premier award of its type in the fields of mathematics, natural sciences, and engineering. In 2015, RIT was one of only eight universities in the nation awarded the maximum number of four scholars.

2015 Fulbright Scholar:
Rose Rustowicz, an imaging science undergraduate, worked with a research team at the University of Iceland to conduct remote sensing at the Hekla volcano to create an assessment of the landscape that will allow them to map and monitor hazardous and vulnerable areas.

Research highlights:

- Bio+Sciences (biochemistry, biomathematics, biophysics, bioimaging, biotechnology, bioinformatics, and biostatistics)
- Imaging science
- Color science
- Detectors
- Astrophysical sciences
- Physical sciences
- STEM education and evaluation
- Mathematical modeling
- Data science



The College of Science is at the heart of math and science education at RIT. It also collaborates with other RIT colleges to offer additional related bachelor of science degree programs. These partnerships offer students an unequaled range of program options; committed, experienced faculty; myriad undergraduate research and co-op opportunities; and student access to incredible laboratory equipment and facilities. In short, the College of Science and its alliances with other RIT colleges form a dynamic math and science education powerhouse.

A student-centered environment
RIT's College of Science combines the best features of a large technological university—a challenging academic curriculum, state-of-the-art facilities and technology, and extensive after-class opportunities—with the benefits of a small college—intimate, interactive classes, personal attention from professors, and staff members who know you.

Career-oriented programs
You'll find that our combination of teaching, research, and practical work experience ensures you receive an education that is comprehensive and up to date. The College of Science has an outstanding record of producing graduates capable of leading the next wave of breakthroughs, discoveries, and innovations. **Consistently, within six months of graduation 91 percent of our graduates are employed full time or enrolled in graduate school.**

Graduate school placement
The College of Science gives you the academic preparation you need to succeed in graduate school. Our students enjoy a high rate of acceptance into top-notch graduate programs in science, business, and other areas, as well as respected medical, dental, veterinary, and optometry schools. Many of our College of Science graduates choose to go directly into graduate or professional school after graduation. Many others will return for further education at the graduate level as part of their career development. Our graduates do especially well in graduate school because of the strong academic program and laboratory and cooperative education experiences gained at RIT. See page 3 for more specific information on graduate schools enrolling RIT graduates.

Dedicated, accessible faculty
Your professors will be among your most important resources at RIT. Because many of them are active in research and consulting, they'll bring real-world issues into the classroom and challenge you to evaluate the latest scientific developments. They are eager to help you initiate your own original research projects, and to give you advice about graduate schools and careers. By working with them, you'll learn how scholars and researchers work, and you'll benefit from the chance to know them as mentors, advisors, and friends who are dedicated to helping you succeed. See page 26 for an introduction to a few of our faculty.

Undergraduate research

A great benefit of the programs in RIT's College of Science is the opportunity to perform research while you're an undergraduate student. Under the guidance of your faculty research advisor, you can design your own project (based on a topic that intrigues you), carry out all of the experiments, and analyze and interpret the results. Credit toward your degree can be earned for this research, and some students present their findings at scientific meetings or publish their work in professional science journals.

Women in Science

The Women in Science (WISe) program plays a central role in contributing to the engagement of women in sciences and mathematics through a diverse and unique educational experience. The program engages women by offering information, support and advocacy, and equity and collaboration opportunities that break down barriers and enhance the education and career growth of our female students. The program creates networking opportunities, increases the awareness of all the possibilities that exist for women in science and mathematics, and strives to increase enrollment and participation by women in science and math at all levels. For more information, visit rit.edu/science/wise.

A launching pad for brilliant careers

Rigorous academic preparation is only one part of your RIT education. You'll also have the opportunity to gain practical experience through undergraduate research, internships, or cooperative education (co-op). A number of opportunities give you the chance to work with faculty members on research initiatives that interest you. These experiences can give you a broad view of the opportunities available in your career, deepen your understanding of your academic studies, and provide a launching pad for a brilliant future.

Graduate School

Our students enjoy a high rate of acceptance into top-tier graduate programs. Here is a list of the institutions attended by recent College of Science graduates.

- Baylor College of Medicine
- Case Western Reserve University
- Clemson University
- Cornell University
- Dartmouth College
- Duke University
- Emory University
- Harvard University
- Indiana University
- Johns Hopkins University
- MIT
- Northwestern University
- NYU School of Medicine
- The Ohio State University
- Penn State University
- Philadelphia College of Osteopathic Medicine
- Rice University
- Rochester Institute of Technology
- The Royal Veterinary College
- Stanford University
- Texas A&M University
- Thomas Jefferson University
- University of Arizona
- University of Buffalo—Roswell Park
- University of Colorado—Colorado Springs
- University of Delaware
- University of Illinois
- University of Maryland
- University of Medicine and Dentistry of New Jersey
- University of Miami
- University of North Carolina
- University of Notre Dame
- University of Oregon
- University of Rochester
- University of Southern California
- University of Tennessee
- University of Texas Health Science Center
- University of Vermont
- University of Virginia
- University of Washington
- Virginia Tech

Co-op and Permanent Placement

Below are examples of co-op and permanent employers of College of Science students and graduates.

- Agilent Technologies
- Alpha Analytical
- Applied Biosystems
- Aptina Imaging
- Bausch & Lomb, Inc.
- Brigham and Women's Hospital
- Bristol-Myers Squibb
- Bronx VA Medical Center
- Centocor
- Children's Hospital of Philadelphia
- Cornell University—Nanobiotechnology Center
- Eastman Kodak Co.
- GlaxoSmithKline
- Harris, Inc.
- Harvard Stem Cell Institute
- Intel Corp.
- Life Technologies
- LMI
- Masonic Medical Research Laboratory
- Mt. Sinai Medical Center
- NASA Jet Propulsion Laboratory
- NASA Langley Research Center
- National Energy Tech Lab
- National Institute of Environmental Health Sciences
- National Renewable Energy Lab
- Ortho Clinical Diagnostics
- Pfizer Inc.
- Princeton University Materials Institute
- Rochester Regional Health
- SCHOTT North America
- SHARP Laboratories of America
- Smithsonian Institution
- University of Rochester Medical Center
- The J. Craig Venter Institute
- Vicor
- Xerox Corp.

Majors and Options

The College of Science is home to 11 undergraduate majors in science and mathematics.
Our students enjoy an exceptional range of program specialties, undergraduate research opportunities with full-time faculty, and a personalized approach to education not found at other universities of this size.

Premedical and Health Professions Advising

How it works

If you are interested in medical school or one of the other health profession schools (dentistry, optometry, pharmacy, or veterinary), RIT's premedical studies and pre-health professions advisory program is available to you regardless of your major. The advisory program provides you with the guidance, assistance, and information you will need to complete the admissions requirements for graduate programs in the medical and health professions. Schools where our graduates have successfully been admitted to further study in the medical and health professions include Johns Hopkins University, University of Rochester, Stanford University, Tulane University, Georgetown University, and Case Western Reserve.

Lake Erie College of Osteopathic Medicine (LECOM) Early Acceptance Programs

RIT students interested in medicine, pharmacy, and dentistry are able to gain provisional early acceptance to LECOM, and in some cases, begin their studies at LECOM prior to completing their bachelor's degrees. The LECOM's Early Acceptance Program agreements with RIT are as follows:

- College of Medicine, "3+4" and "4+4"—Students will attend RIT for either three or four years, and then complete four years of study at LECOM to earn the Doctor of Osteopathic Medicine (D.O.) degree.

- School of Pharmacy, "3+3 (4)" and "4+3 (4)"—Students will attend RIT for either three or four years, and then complete three years at LECOM's School of Pharmacy in Erie, or four years at its School of Pharmacy in Bradenton, Fla. LECOM's Erie campus is one of the few nationally to offer an accelerated, three-year Doctor of Pharmacy (Pharm.D.) degree. The School of Pharmacy at the Bradenton campus offers a more traditional, four-year program.

- School of Dental Medicine, "4+4"—Students will attend RIT for four years and then complete four years at LECOM. The Early Acceptance Program for the DMD degree is offered only at LECOM's campus in Bradenton, Fla.

The affiliation program is administered through RIT's office of the Director of Premedical and Health Professions Advising in the College of Health Sciences and Technology. For more information, go to https://lecom.edu/entrance-requirements and follow the link for LECOM Undergraduate Affiliated Colleges.

Minimum premedical core requirements

Preparation for medical school is changing due to alterations in the Medical College Admission Test (MCAT). Students are encouraged to communicate regularly with their academic advisor for updates on prerequisites, and for planning and course selection. To ensure you meet the core prerequisites for medical school, and have the content knowledge necessary for the MCAT, the following core requirements are recommended:

What you'll study

Minimum premedical core requirements

Biology	one year with lab
General Chemistry	one year with lab
Biochemistry	one or two courses
Physics	one year with lab
English	one year
Psychology	one or two courses
Sociology	one course

Science Exploration Option

First-year students in the science exploration option are simulating the right atmospheric conditions within the habitable zone suitable for supporting life beyond our solar system.

Explore your options

The science exploration option lets you take one academic year to explore different programs in the College of Science. This option provides extra time for you to meet faculty and students in each academic major, tour facilities, experience classes and labs, and investigate the rewards of a career in each discipline.

How it works

During your first year, you will participate in a yearlong sequence of classes built around a single project aimed at designing, building, and conducting scientific research. While exploring the various majors to choose from, students will use a team-based approach to conduct research, propose scientific studies, analyze and validate the results, and present the findings. This approach to interdisciplinary education emphasizes real-world, hands-on problem solving.

By the end of the year, students choose from any of the majors in the College of Science. Students may also apply to transfer to majors in other colleges of RIT on a space-available basis.

What you'll study

First Year

Science Exploration
First Year Writing
Year One: College Experience
Mathematics or Calculus sequence
Choice of laboratory sciences:
- Biology
- Chemistry
- Physics
- Imaging Science

Additional course choices:
- Computer Science

General Education—Liberal Arts and Sciences
Wellness Education

Program Strengths

Personalized individual advising sessions

Computer-assisted career exploration

Cross-disciplinary advising team

Co-op and career opportunities explored

Hands-on undergraduate research

Color-adjusted Mars image
Photo: NASA-JPL-Caltech

Applied Mathematics School of Mathematical Sciences

A focus on problem solving

RIT's applied mathematics major focuses on the solution of problems that can be mathematically analyzed. The curriculum provides you with broad-based mathematics and statistics knowledge and appropriate computer skills. RIT professors integrate symbolic computation into their courses, and software such as Mathematica, Maple, and Matlab is used to enhance your learning. In specially equipped facilities, you will also have access to programming, statistical and simulation languages, graphics and multimedia software, and design tools on a variety of platforms. The major aims to develop your logical, analytical, and problem-solving abilities and increase your use of the mathematical sciences as a problem-solving tool in a wide range of application areas.

Specialize with a program concentration

As part of this major, you will select an area of specialization in a subject of particular interest to you. Concentrations provide the knowledge and skills you need to collaborate on complex problems with scientists, engineers, computer specialists, and other professionals, and to apply your mathematical expertise in a specific career area. You can choose from one of more than 20 applications areas, such as applied statistics, actuarial science, biology, economics, chemistry, and engineering.

Earn an accelerated master's degree

Students in the applied mathematics major may elect one of our accelerated dual-degree programs. These options enable you to earn both a bachelor's degree and a master's degree in less time than completing both programs separately. Applied mathematics students may consider an MS degree in applied and computational mathematics.

Success after graduation

A BS degree in applied mathematics is highly regarded in business and industry and provides a foundation for advanced degrees in business, law, medicine, computer science, and economics, as well as mathematics. Applied mathematics graduates work in federal and state government and in a range of business, scientific, engineering, and high-tech fields, including information technology, telecommunications, medical research, and others.

What you'll study

First and Second Years

First Year Writing
Year One: College Experience
Mathematics and Statistics Seminar
Project-Based Calculus I, II
Discrete Mathematics with Introduction to Proofs
Principles of Computing
Computer Science I
Multivariable and Vector Calculus
Probability and Statistics I, II
Differential Equations
Linear Algebra
Mathematical Sciences Job Search Seminar
General Education—Liberal Arts and Sciences
Free Elective
Wellness Education

Third and Fourth Years

Real Variables I
Advanced Linear Algebra
Abstract Algebra I
Numerical Analysis
Mathematical Modeling
Program Electives
Laboratory Science Sequence
General Education—Liberal Arts and Sciences
Free Electives
Cooperative Education (Optional)

Alison Prengaman

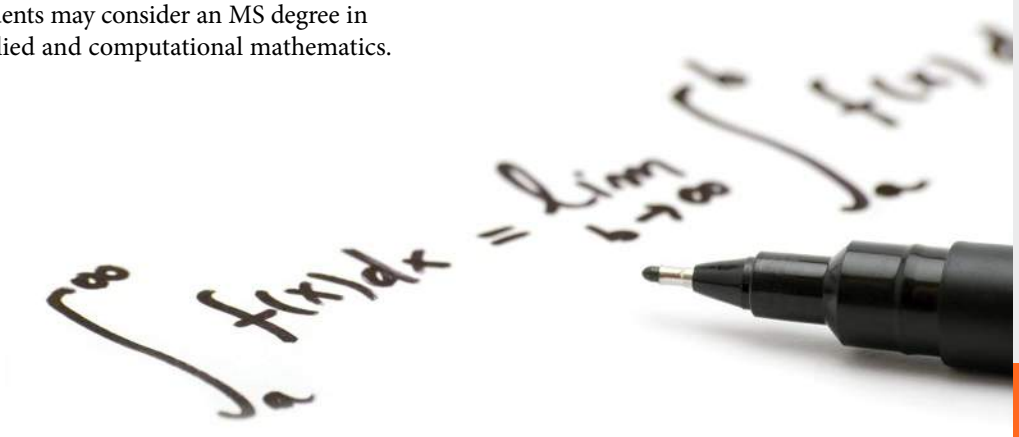
Hometown: Riverside, Rhode Island

Major: BS/MS, Applied Mathematics

Activities: Honors Program; member, PiRIT; Assistant Vice President, College Panhellenic Council (RIT's Greek Council); Honor Council Chairwoman, Sigma Sigma Sigma; Resident Advisor, Center for Residence Life; Student Government Greek Senator

Co-op Placement: Operations Logistics Co-op, LMI

Alison Prengaman had no idea what she wanted to do with her math major; all she knew was that she loved math and loved the idea that you could "use the information you're given and learn how it can lead you to where you need to go." When she was on co-op at LMI, a government contractor, Prengaman was stationed with the U.S. Army inside the Pentagon, where she provided analytical support for several of the Army's logistic issues. "My co-op was really cool and fascinating. It really opened my eyes to the fact that you can use math for literally anything you want to," she says. The uniqueness of her major, which combines applied mathematics with a strong theoretical background, has prepared her to engage in an applied co-op, but she also feels primed for theoretical work, such as research. "I like that I have the option of going on to get a Ph.D. and become a professor, or I can graduate and go straight into industry to work. This major prepares you for both."



Emily O'Connor

Hometown: Barre, Vermont

Major: Applied Statistics and Actuarial Science

Immersion: Economics

Research Experience: Research Assistant, RIT's ADVANCE Office

Activities: Orientation Assistant; member, PiRIT; member, Pep Band

Emily O'Connor likes tangible numbers and data sets, and the information you can derive from them. This has led her to consider a career in insurance when she graduates. "Actuarial science and statistics are used in insurance to predict the future. Based on how many accidents one has had, an insurance company uses that data to determine how much they should charge for premiums," she says. She applied only to RIT, and when she visited she found a campus and people she could connect to. "I love that we're very nerdy but that we have such great school spirit with hockey and others sports. I also like that there's that artsy mix. It feels very balanced."

Applied Statistics and Actuarial Science

School of Mathematical Sciences

A career-oriented focus

The applied statistics and actuarial science major provides you with a strong foundation in mathematical and statistical methodology, experience in applications of statistics, and a strong background in the use of modern statistical software to analyze and interpret data.

You will be exposed to application areas such as product design, quality control, statistical forecasting, biostatistics, and research methodology. Your course work also gives you the needed training to apply statistics in biological sciences as a bio-statistician in medicine, public health, or in the rapidly growing field of bioinformatics. You could also choose to get trained in the aspects of quality science from problem definition to solution implementation.

With careful planning you can complete course work preparing you for at least two of the preliminary exams offered by the Society of Actuaries and the Casualty Actuarial Society. With the careful choice of elective courses, you may take the American Society for Quality Certified Process Analyst exam, which opens doors in many industries in need of such experience.

Two degrees in five years

RIT offers accelerated BS/MS programs that enable you to earn a bachelor's and master's degree with just one additional year of study. The BS in applied statistics and actuarial science may be combined with an MS in applied statistics or with an MBA offered by RIT's Saunders College of Business. You may also pursue the MS in applied and computational mathematics.

A wide choice for careers and advanced study

Graduates with a degree in applied statistics and actuarial science have a wide choice of job opportunities and excellent long-term career prospects. Recent graduates work in many areas of government, business, and industry as financial consultants, analysts, life insurance actuaries, and quality control specialists. A number of our graduates are also pursuing graduate degrees in prestigious doctoral programs in statistics, mathematics, economics, business, or law.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Mathematics and Statistics Seminar
- Project-Based Calculus I, II
- Discrete Mathematics with Introduction to Proofs
- Principles of Computer Science
- Multivariable and Vector Calculus
- Probability and Statistics I, II
- Linear Algebra
- Laboratory Science Sequence
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Design of Experiments
- Regression
- Mathematical Statistics I, II
- Actuarial Mathematics
- Statistical Software
- Statistics Seminar
- Program Electives
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education (Optional)

Biochemistry School of Chemistry and Materials Science

Combine your interests

In the biochemistry major, you will learn about the study of biological questions using the quantitative tools and molecular principles that lie at the heart of chemistry. Traditional chemistry course work is supplemented with introductory and advanced courses in biological sciences, including cell biology and molecular biology. The biochemistry curriculum can be completed in four or five years, depending on the amount of cooperative education you complete. Research is highly recommended, as is co-op, which may begin as early as the summer after your first year.

Two tracks

The biochemistry major offers two tracks: one that follows the guidelines of the American Society of Biochemists and Molecular Biologists (ASBMB) and one that is approved by the American Chemical Society (ACS). The ASBMB program allows more science and other electives in fields such as biology, while the ACS program includes courses in quantum chemistry and inorganic chemistry; both prepare students for direct entry into graduate-level chemistry, biochemistry, and biomolecular science programs.

Undergraduate research—the chance of a lifetime

Although research is optional for biochemistry majors, many students choose to participate at some point during their academic career. Recent biochemistry majors have worked with RIT faculty during both the academic year and summers as Undergraduate Research Scholars. Other biochemistry students have taken advantage of summer research opportunities at a variety of other institutions ranging from Boston University and University of Rochester to UC-San Diego and Amgen Corporation (Los Angeles).

ACS Approved Programs

RIT's School of Chemistry and Materials Science offers undergraduate programs in biochemistry and chemistry. These programs are certified by the Committee on Professional Training of the American Chemical Society (ACS) and meet a wide range of quality standards relating to curriculum, teaching, research, and intellectual climate. This certification ensures a rigorous program and strong career preparation.

Graduate study and employment opportunities

Our biochemistry graduates have been admitted to doctoral programs in biochemistry and other associated areas at a number of highly prestigious universities, including Cornell, Harvard, Duke, and UC Berkeley. Students seeking employment after graduation have obtained jobs at well-respected companies such as Merck and Johnson & Johnson. For students interested in pursuing a career in medicine, biochemistry graduates have been accepted to a number of medical schools, including Syracuse, Georgetown, and University of Rochester.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Chemical Connections
- General Chemistry
- Project-Based Calculus I, II
- Multivariable Calculus or Probability and Statistics
- Introductory Biology I, II
- Comprehensive Organic Chemistry I, II, and Labs
- Quantitative Analysis
- Analytical Methods Lab
- Instrumental Analysis
- Biochemistry I
- University Physics I
- Cellular and Molecular Biology
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Biochemistry Experimental Techniques
- University Physics II
- Inorganic Chemistry I
- Advanced Biochemistry Electives
- Advanced Biology Electives
- Advanced Chemistry Electives
- Physical Chemistry I
- Biochemistry Research (Optional)
- General Education—Liberal Arts and Sciences
- Cooperative Education (Optional)

Brooke D'Arcy

Hometown: Buffalo, New York

Major: Biochemistry

Minor: Communication

Activities: Honors Program; member, Intramural Volleyball Team

Undergraduate Research: Studying a dual orientation in peptidoglycan-associated lipoprotein (PAL) in e.coli with Professor Lea Vacca Michel

Awards: Honorable Mention, Barry M. Goldwater Scholarship and Excellence in Education Award; recipient, Rochester Academy of Science Student Research grant; recipient, Honors Program Summer Fellowship

Since her freshman year, Brooke D'Arcy has spent much of her time at RIT in labs. She has been a part of two major research studies with Professor Lea Vacca Michel, an associate professor in the School of Chemistry and Materials Science. D'Arcy chose RIT for the undergraduate research opportunities.

"A lot of other schools focus on their doctorate students. They do the real research at those institutions. I knew that wasn't what I wanted," D'Arcy says. "I wanted to have research experience because at that point I was thinking about graduate school. Having research experience gives you a real advantage."

D'Arcy has presented her research findings at several national meetings and is a coauthor on a paper published in the journal *Microbiology*. D'Arcy has been accepted to a doctorate program at Duke University, where she will study cellular and molecular biology.

Jeff "Nick" Fisk

Hometown: Las Cruces, New Mexico

Major: BS, Biotechnology and Molecular Bioscience; and BS/MS, Bioinformatics

Activities: Varsity Men's Wrestling

Research: "Science of Superheroes," an interactive exhibit for Imagine RIT: Innovation and Creativity Festival

The "Science of Superheroes" exhibit, at 2015's Imagine RIT: Innovation and Creativity Festival, drew crowds. While its timing was perfect, with Marvel's *The Avengers: Age of Ultron* film hitting theaters two weeks later, the exhibit looked at superheroes and dissected their super talents. Nick Fisk, the mastermind behind the exhibit, has a theory: that super powers exist already in science. Case in point: Fisk compared Marvel Comic supervillain Mystique's shape-shifting talent to an octopus' "chromataphores," or cells that contain pigment and reflect light.

Fisk enrolled in RIT with several college credits from high school, which is enabling him to earn two bachelor's degrees, one in biotechnology and molecular bioscience and a second in bioinformatics. While engaged in his bioinformatics studies, he decided to pursue the BS/MS option to assess his interest and aptitude for pursing an advanced degree. Fisk is motivated by his interest in helping people. "Solving seemingly impossible problems really sold me," he says of his program. He hopes to pursue a doctorate in computational biology.

Bioinformatics Thomas H. Gosnell School of Life Sciences

Exploring the human genome

Biotechnology research is creating an exploding demand for well-trained bioinformatics professionals. RIT has responded to this need by offering BS and MS programs in bioinformatics. In laboratory exercises and assignments, you'll learn how to sequence DNA, then use sophisticated computer programs to analyze that sequence and predict molecular models. You will learn how to interpret vast amounts of data, predict targets for new drugs, and determine routes to gene therapy.

Get hands-on experience through co-op

A valuable aspect of an RIT education is the opportunity to integrate cooperative education experiences into your degree program. These short-term, full-time, paid jobs allow you to enhance your education in real-world situations. Bioinformatics students are prepared for cooperative work experience upon completion of their second year of the program.

BS/MS option

If you really want to differentiate yourself in the job market, you may choose to pursue an accelerated BS/MS program in bioinformatics. This option can enrich your research experiences and better prepare you for further graduate education as well.

What kinds of careers are available?

As the most rapidly growing field within biotechnology, bioinformatics encompasses several disciplines and can lead to several career directions. Your studies may lead to a career in genomics—the application of computational methods to analyze the vast amounts of data being produced by sequencing centers throughout the world and related efforts in the public and private sectors. Another career option is proteomics, or the use of computer technologies to analyze protein structures, a critical function within the modern drug discovery process.

What you'll study

First and Second Years

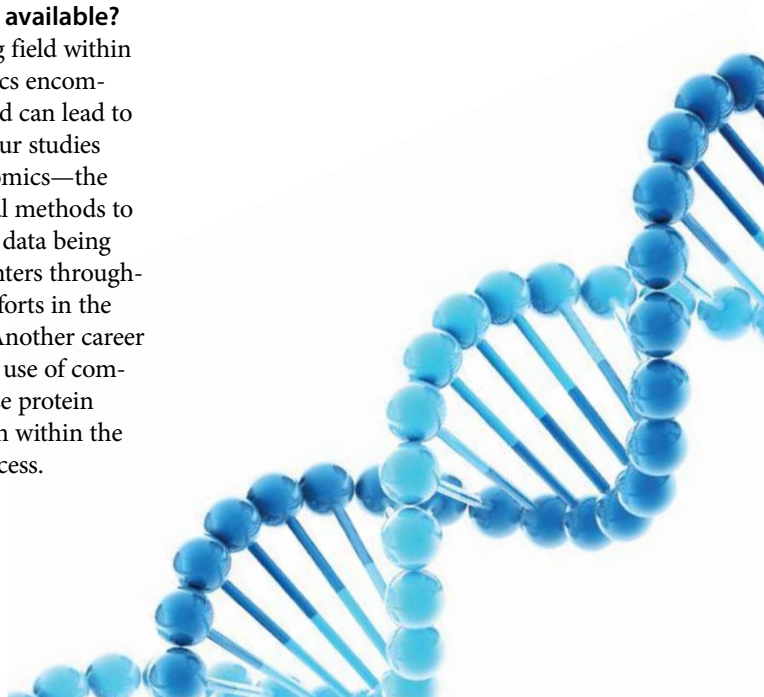
- First Year Writing
- Year One: College Experience
- Introductory Biology I, II
- Introduction to Bioinformatics
- Cellular and Molecular Biology
- Genetics
- Computer Science I, II
- The Mechanics of Programming
- Applied Calculus
- Discrete Math
- Introduction to Statistics
- General and Analytical Chemistry I, II, and Labs
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Bioinformatics
- Genetic Engineering
- Bioinformatics Languages
- Ethics in Bioinformatics
- Genomics
- Bioinformatics Algorithms
- Molecular Modeling and Proteomics
- Concepts of Parallel and Distributed Systems
- Introduction to Database and Data Modeling
- Organic Chemistry I and Lab
- Biochemistry I
- Statistical Analysis for Bioinformatics
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education Required (summer)

Fifth Year (BS/MS students)

- Graduate Ethics in Bioinformatics
- Bioinformatics Seminar
- Graduate Bioinformatics Resources
- Statistical Models for Bioinformatics
- Graduate Electives
- Thesis



Biology Thomas H. Gosnell School of Life Sciences

A flexible major

Your biology program starts with foundation courses in biology, math, chemistry, and the liberal arts and then immerses you in the biological sciences, studying animals, microorganisms, and plants at the levels of molecules, cells, tissues, organisms, populations, and the environment. You will acquire a comprehensive set of practical skills, from the proper way to prepare cultures in the lab to the proper way to gather and analyze ecological data in the field. Undergraduate research is strongly encouraged and further strengthens your preparation for graduate study or employment.

Enhance your education

Through research, minors, and study abroad, you will have opportunities to customize your education. The Research Scholars Program is an active community of students who design and execute their own research projects under the guidance of faculty mentors. Students conduct research, attend weekly seminars, and have the opportunity to publish their research findings. With more than 90 minors to choose from, you can strengthen your biology degree with a complementary set of courses or explore an area of personal interest. Study abroad gives you a global view of the world and its different cultures.

Embark on a rewarding career

Career opportunities are abundant in exciting fields in the life sciences. You will be well prepared for careers in biomedical research, medicine, genetics, immunology, virology, microbiology, plant science, ecology, animal behavior, veterinary medicine, infectious diseases, cancer research, pharmaceuticals, vaccine development, and scientific management.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Introductory Biology I, II, and Labs
- Cellular and Molecular Biology
- General and Analytical Chemistry I, II, and Labs
- Organic Chemistry I, II, and Labs
- General Ecology or Evolutionary Biology
- Introduction to Statistics or Introduction to Biostatistics
- Genetics or Introduction to Population Genetics
- Applied Calculus
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Developmental Biology or Comparative Animal Physiology
- College Physics I, II, and Labs
- Program Electives
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education (Optional)

Calvin Carrington

Hometown: Huntington, Massachusetts

Major: Biology

Activities: President, Pre-Vet Club

Research: Avian Nutritional Ecology with Dr. Susan Smith Pagano

Calvin Carrington grew up on a small dairy farm with 30 milking short-horn cows. He showed cows at state and county fairs and grew acquainted with large animal care. After his freshman year of college he worked at a family friend's dairy farm, where a cow developed a displaced abomasum. It's a condition where a cow's abomasum (or true stomach) rises to the top of the abdomen and becomes displaced. "We had the cow cut open and that was it for me. It was pretty much the coolest thing I've ever seen," he says of the experience, which influenced his decision to pursue veterinary school.

Carrington points to the personalized attention he received from College of Science faculty and his research with Dr. Susan Smith Pagano, an assistant professor in the School of Life Sciences, as highlights of his studies at RIT. With Dr. Pagano, Carrington conducted migratory bird research. He studied blood samples from birds to determine which native fruits are best during migration and which should be conserved during migratory periods. They shared their results in a paper Carrington co-authored, titled "Seasonal Variation in Plasma Triglyceride Levels in Three Species of Migratory Songbirds."

Carrington was accepted to four U.S. veterinary medical schools: Tufts University, the University of Pennsylvania, Washington State University, and Michigan State University.

Alexander Triassi

Hometown: Henrietta, New York

Major: Biotechnology and Molecular Bioscience

Activities: College of Science Ambassador; Honors Program; National Society for Leadership and Success; captain, Men's Soccer Club

Research Experience:
Amgen Summer Scholar, MIT

Awards: 2014 Barry M. Goldwater Scholar; John Wiley Jones Outstanding Student in Science Award

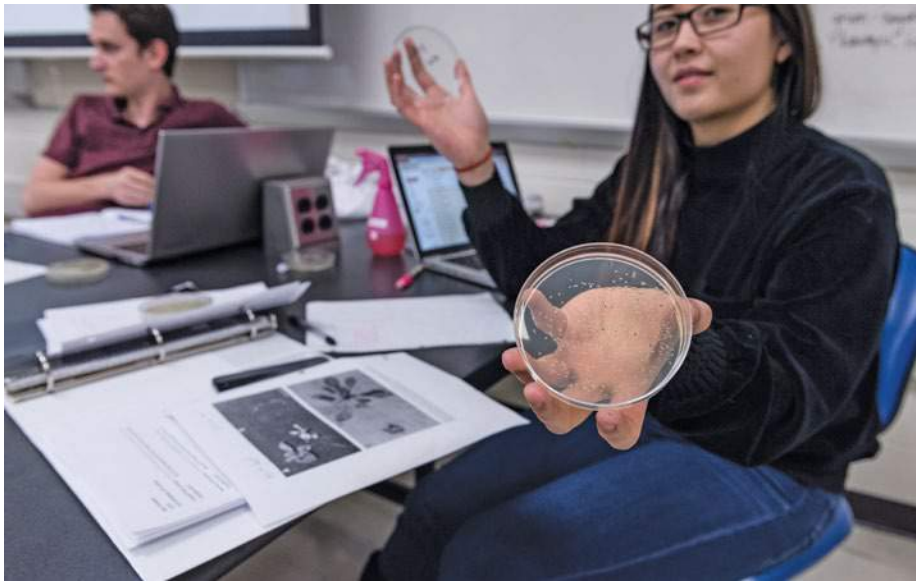
In high school, Alexander Triassi's Advanced Placement Biology class first propelled him to begin asking research-type questions. A personal meeting with Gary Skuse, then-head of the biotechnology and molecular bioscience major, and the research focus of the program, led Triassi to choose RIT. "This program is very good at preparing you for not just industry but a career in research. They do a good job of setting you up for whatever direction you want to go in," he says.

Triassi is research-bound. With Dr. André Hudson, Triassi has been involved in the discovery of potentially novel antibiotic targets in pathogenic bacteria and the discovery of new bacterial species.

As an author on two scientific peer-reviewed journal articles, Triassi has presented his research at the American Society for Microbiology National Meeting. He also spent the summer of 2014 at MIT as an Amgen Undergraduate Research Scholar. Triassi is now a graduate student in MIT's biomedical engineering doctoral program.

Biotechnology and Molecular Bioscience

Thomas H. Gosnell School of Life Sciences



A molecular bioscience perspective

Building on a core of biology/molecular biology, chemistry, math, and the liberal arts, the courses in our major are taught from a molecular bioscience perspective focused on the central dogma of molecular biology. The curriculum explores the exciting and rapidly expanding field of genetic engineering and the almost unlimited potential that controlled genetic experiments have for improving the quality of life. Specialized areas of emphasis include recombinant DNA, mammalian and plant tissue culture, monoclonal antibody production and purification, large-scale fermentation techniques, and methods for characterization and separation of proteins and nucleic acids, in addition to other micro- and macro-molecules.

Build a career in biotechnology

Genetics plays a role in virtually every aspect of life. As a result, careers in biotechnology are growing rapidly. With a degree from RIT, you are prepared to play a central role in this innovative, emerging field. Our graduates are successfully working in many areas of biology and biotechnology, including pharmaceuticals, environmental science, forensic science, genomics, health care, and biomedical research.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Introductory to Biology I, II
- Cellular and Molecular Biology and Lab
- Microbiology and Lab
- Genetics
- Bioinformatic Analysis of Macromolecules
- General and Analytical Chemistry I, II, and Labs
- Organic Chemistry I, II, and Labs
- Applied Calculus
- Introduction to Statistics or Biostatistics
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Biochemistry I
- Program Electives
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education (Optional)

Chemistry School of Chemistry and Materials Science

Choose your path

In the chemistry major, you'll acquire a sound base of scientific knowledge and learn the modern applications of chemistry. Through courses in general, analytical, physical, organic, and inorganic chemistry, you'll develop a thorough understanding of substances and their chemical properties, how they can be manipulated, and ultimately how they can be transformed into new materials. This major offers you the chance to choose a concentration or minor in complementary fields such as imaging science, business, communication, biology, criminal justice, engineering, environmental science, packaging science, computer science, physics, or mathematics.

Opportunities are everywhere

Top employers hold RIT chemistry graduates in high regard due to the large amount of laboratory work required in our programs. Our graduates are employed by a wide range of industries, including pharmaceuticals, plastics, environmental health, microelectronics, and many others. There are career options in research and development, laboratory operations and production, marketing, and management. The scientific and analytical skills that you acquire can also lead to careers in other high-tech fields. More than 50 percent of our graduates pursue advanced degrees at many of our nation's most respected graduate and professional schools.

ACS approved programs

The School of Chemistry and Materials Science offers undergraduate majors in biochemistry and chemistry. These programs are approved by the Committee on Professional Training of the American Chemical Society (ACS) and meet a wide range of quality standards relating to curriculum, teaching, research, and intellectual climate. This approval ensures a rigorous program and strong career preparation.

Accelerated dual-degree options

Chemistry majors have an opportunity to participate in one of two accelerated BS/MS degree options. Highly motivated students may earn a BS/MS in chemistry or a BS in chemistry with an MS in materials science and engineering. Students can earn either dual-degree option in five years with careful planning and course selection.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Chemical Connections
- General Chemistry
- Chemistry Workshop
- Project-Based Calculus I, II
- Multivariable Calculus
- Quantitative Analysis
- Analytical Methods Lab
- Comprehensive Organic Chemistry I, II, and Labs
- Descriptive Inorganic Chemistry
- Biochemistry I
- University Physics I
- General Education—Liberal Arts and Sciences
- Wellness Education
- Chemistry Research (Optional)
- Cooperative Education (Optional)

Third and Fourth Years

- Physical Chemistry I, II
- Experimental Physical Chemistry
- Structural Inorganic Chemistry
- Instrumental Analysis
- Advanced Chemistry Lab
- Advanced Chemistry Electives
- University Physics II
- General Education—Liberal Arts and Sciences
- Free Electives
- Chemistry Research (Optional)
- Cooperative Education (Optional)

Taylor Barrett

Hometown: Middletown, Pennsylvania

Major: Chemistry

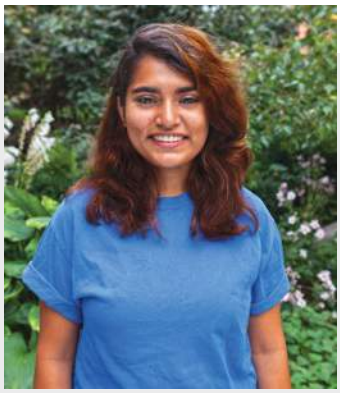
Minor: Spanish

Awards and Recognition: 2014 Barry M. Goldwater Scholar; recipient, World Molecular Imaging Congress travel grant

Activities: Honors Program; RIT Chemistry Research Scholar; secretary, House of General Science; peer advisor, RIT's Year One Program; orientation assistant and operations manager, New Student Orientation

Research Experience: Amgen Scholar, University of California at Berkeley

Taylor Barrett chose RIT for its range of undergraduate research opportunities. "Many schools do not have undergraduates in the lab in the way that RIT does," she says. "In my lab, I'm not working on a graduate student's project and simply helping them. I am running my own project and coming up with my own ideas of how to overcome any challenges a research project may present." It's this hands-on experience that helped Barrett win a 2014 Barry M. Goldwater Scholarship, the premier undergraduate award for research in the sciences. Working in the laboratory of Hans Schmitthenner, an RIT research scientist, Barrett has worked on creating peptide scaffolds for targeted multi-modal imaging agents. "The thing I love about research is that if I have a question about the way the world around me works, I can use my knowledge of chemistry to try and answer those questions," she says. Barrett plans to pursue a doctorate and hopes to open her own lab or help create science policy.



Tamalika Mukherjee

Hometown: Kolkata, India

Major: BS/MS, Computational Mathematics/Applied and Computational Mathematics

Minor: Computer Science

Activities: Student ambassador, RIT Office of Career Services and Co-operative Education; RIT Leadership Institute; PiRIT (mathematics club)

Co-op Placement: Windows Azure Explorer Intern, Microsoft

Awards: RIT Outstanding Undergraduate Scholar; John Wiley Jones Outstanding Student in Science Award

Research Experience: 2014 RIT Summer Undergraduate Research Fellowship; Cryptography Research Project at Indian Statistical Institute, Kolkata, India

Tamalika Mukherjee is ambitious with three different research projects in the pipeline. On a summer fellowship from the College of Science, Mukherjee studied the dynamics of an economic model and the behavior of its inverse limits. Her second research project focused on studying the properties logical puzzles made by the famous puzzle designer Oskar van Deventer and trying to generalize their solutions. Her third research project laid the groundwork for her thesis, which will center on elliptic curve cryptography. "The more I learn, the better I get at learning and understanding new things. Research has taught me discipline and patience, and how to apply my mind in ways I couldn't imagine," she says. Mukherjee hopes to earn her doctorate in mathematics and work in a research and development lab for a company such as IBM, Microsoft, or Google.

Computational Mathematics School of Mathematical Sciences

The best of both worlds

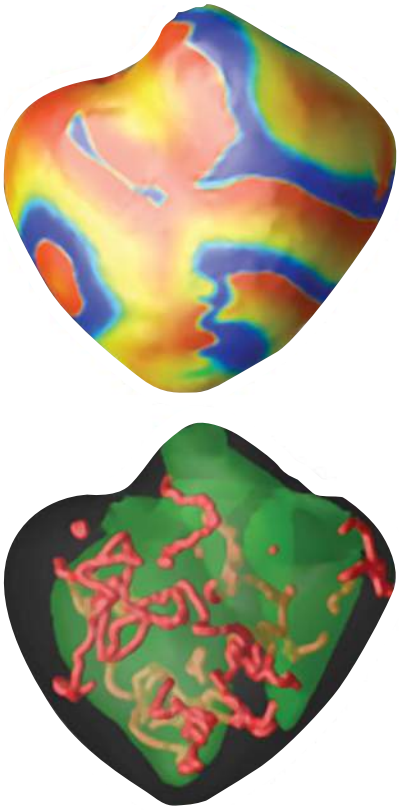
RIT's computational mathematics major allows you to explore the exciting interactions between mathematics and computer science. The curriculum provides a foundation in mathematics through courses in calculus, differential equations, graph theory, abstract and linear algebra, mathematical modeling, numerical analysis, and several other areas. You will gain extensive computing skills through a number of high-level programming, system design, and other computer science courses, open access to educational and professional software, and hands-on exposure to RIT's state-of-the-art computing equipment. Your studies will focus on using the computer as a tool to solve mathematically modeled physical problems through project-oriented team assignments and laboratory sessions that emphasize real-world applications of knowledge.

Combined BS/MS opportunity

A great feature of the computational mathematics major is the opportunity it provides for students to complete a dual degree in as little as one extra year of study. You can complete a BS in computational mathematics and an MS in computer science, giving you an edge over many math or computer science majors entering the work force. You also may combine a BS in computational mathematics with an MS in applied and computational mathematics.

Select your career

Job opportunities in private industry and government are plentiful, and RIT graduates are eagerly sought after 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. Other graduates are working in education and consulting or pursuing advanced degrees in graduate programs across the nation.



Mathematical Modeling of Arrhythmia

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Mathematics and Statistics Seminar
- Project-Based Calculus I, II
- Discrete Mathematics with Introduction to Proofs
- Computer Science I, II
- Multivariable and Vector Calculus
- Probability and Statistics I
- Differential Equations
- Linear Algebra
- Mechanics of Programming
- Introduction to Computer Science Theory
- Mathematical Sciences Job Search Seminar
- Laboratory Science Sequence
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Real Variables I
- Advanced Linear Algebra
- Abstract Algebra I
- Software Engineering
- Numerical Analysis
- Mathematical Modeling
- Numerical Linear Algebra or Graph Theory
- Program Electives
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education (Optional)

Environmental Science
Thomas H. Gosnell School of Life Sciences

An interdisciplinary major
RIT's environmental science major provides solid educational preparation in science, math, liberal arts, communication, critical thinking, and problem solving. The interdisciplinary nature of environmental science demands a foundation of knowledge from a variety of academic fields. This major is unique because it is designed and implemented jointly by the College of Science and the College of Liberal Arts. After the fundamentals, you will take specialized electives to gain depth in a scientific/technical area. Available tracks include environmental chemistry, digital imaging, remote sensing, environmental engineering technology, environmental biology, mathematics and statistics, environmental public policy, and environmental economics, or you may self-design a concentration. Upon graduation, you will have not only a substantial scientific understanding of environmental problems but also an appreciation of the larger social, political, and economic contexts in which they arise and from which solutions must be sought.

Solve real-world problems
We place an emphasis on finding the solutions to environmental problems, rather than merely describing them. Our major incorporates extensive field work, research, and problem-solving exercises. In a yearlong senior capstone experience, you and your professors will work closely with members of the environmental community (government agencies, private organizations, and industry) to develop and implement workable solutions. Your participation in cooperative education is highly recommended. Co-op gives you the chance to make a positive impact on the environment while you're still in school and can provide you with valuable, hands-on experience in environmental settings such as wildlife conservation, pollution control, energy, waste management, or public health.

The BS/MS advantage
The environmental science major offers three degree options: a four-year program leading to a bachelor of science degree, or two accelerated five-year dual-degree options, available to students who want to earn a graduate degree in less time. You can complete a BS/MS in environmental science, which includes an extensive environmental research project, or a BS in environmental science with an MS in science, technology, and public policy.

What you'll study

First and Second Years
- First Year Writing
- Year One: College Experience
- Concepts of Environmental Science
- Introductory Biology I, II
- General Ecology
- Conservation Biology
- General and Analytical Chemistry I, II, and Labs
- Environmental Workshop
- Applications of Geographic Information Systems
- Environmental Science Field Studies
- Environment and Society
- Applied Calculus
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years
- Great Lakes
- Introduction to Statistics I, II
- Environmental Science Concentration Courses
- Organic Chemistry I and Lab
- Environmental Policy or Introduction to Qualitative Policy Analysis
- Environmental Science Capstone I, II
- Environmental Applications of Remote Sensing
- Hydraulic Applications of GIS
- General Education—Liberal Arts and Sciences
- Free Electives
- Cooperative Education (Optional)

Fifth Year (BS/MS students)
- Environmental Science Graduate Studies
- Biodiversity and Society
- Graduate Public Policy Core Elective
- Graduate Science Core Elective
- Graduate Elective
- Advanced Concepts of Environmental Chemistry
- Advanced Applications of GIS
- Environmental Science Graduate Research
- Environmental Science Thesis or Environmental Science Project

Delanie Spangler

Hometown: Cazenovia, New York

Major: Environmental Science

Minor: Music Performance

Activities: Exhibitor, "Environmental Explorations in Your Own Backyard," Imagine RIT: Innovation and Creativity Festival

Research: Decomposition of black soldier fly larvae for composting with Dr. Dawn Carter; Green infrastructure at the Rochester Museum and Science Center with Dr. Christy Tyler

Delanie Spangler doesn't mind "getting her hands dirty by just going out into the field and taking samples in the mud." It's her love of the environment that drives her. "I love the conservation part of it and helping to save the planet," she says. Spangler chose the College of Science for its close, intimate setting. "I know a lot of the faculty by name and I have close relationships with them." The environmental science program, with concentrations in areas as diverse as digital imaging, environmental biology, environmental economics, and public policy, is broad enough to cover students' diverse interests and career aspirations. "All of the environmental science students want to do something different and we all bring something unique to the table." When she completes her studies, Spangler wants to pursue graduate study in conservation and help clean up the environment.

Elizabeth Bondi

Hometown: Dansville, New York

Major: Imaging Science

Immersion: Italian

Activities: Honors Program; Optical Society of America, Rochester Section and RIT Student Chapter; National Society of Leadership and Success; Imaging Science & Technology Student Chapter; RIT Yoga Club

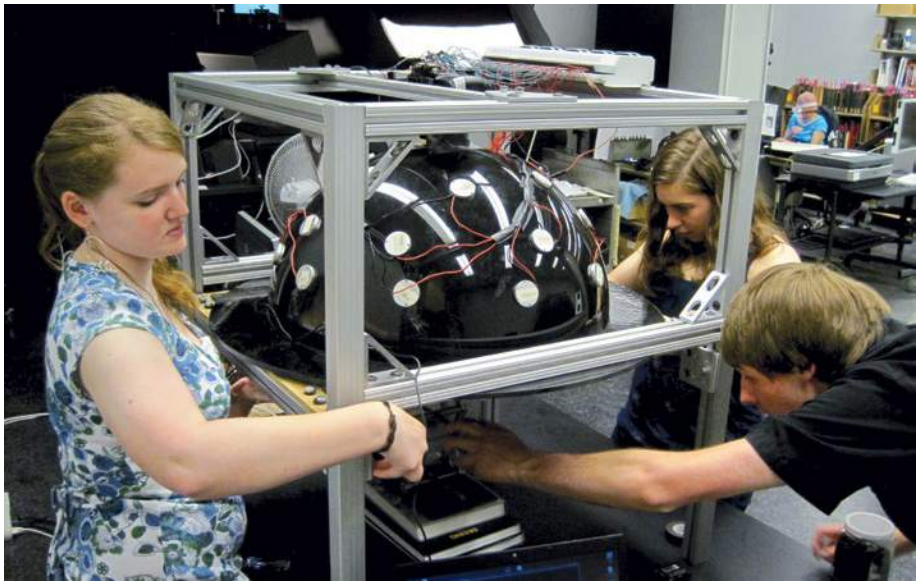
Research Experience: Imaging Science Research Assistant with Dr. Roger Easton and Joe Pow

Co-op Placements: Jet Propulsion Lab, Exelis

Liz Bondi first explored RIT through a summer research program she completed her junior year of high school. She fell in love with imaging science and the multidisciplinary nature of the field. "I've been learning physics, calculus, computer science, engineering—all of these different types of fields. I found imaging science and it combined all these wonderful areas. The applications of imaging science are so cool," she says.

An application area she has focused her research on is the restoration of ancient documents, which led her to Vercelli, Italy, where she spent two weeks at the Museo del Tesoro del Duomo. There, she participated in restoring the "Vercelli Codex Evangeliorum Vercellensis," a 4th century text of the first four books of the New Testament in Latin. Bondi assisted in processing multispectral images of the document. She taught other students from the University of Mississippi some of the processing techniques she and Dr. Easton employed. Bondi is pursuing a doctorate at the University of Southern California.

Imaging Science Chester F. Carlson Center for Imaging Science



The science you can see

Imaging scientists are responsible for such innovations as digital cameras, scanners, satellite imaging systems, radar, sonar, night vision equipment, image processing software, and medical imaging technologies like magnetic resonance imagers (MRI) and X-ray systems. The unique, interdisciplinary BS degree program offered by RIT's Chester F. Carlson Center for Imaging Science allows you to explore this world of imaging. You'll undertake a laboratory-intensive program that combines physics, mathematics, and computer science en route to a degree with a wide variety of exciting career options. The imaging science undergraduate major begins with a novel, yearlong, project-based class in a free-form learning environment, and culminates with an independent research project under the guidance of center faculty.

Unmatched facilities

The department features dozens of highly specialized teaching and research labs filled with powerful learning tools such as scanning and transmission electron microscopes, thermal imagers, spectrophotometers, and eye-tracking devices.

As an undergraduate student, you'll have access to all of our facilities, including the Digital Imaging and Remote Sensing Lab, Digital Image Restoration Lab, Unmanned Aerial Vehicle Imaging Systems Lab, the Multidisciplinary Vision Research Lab, and the Perception for Movement Lab.

What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Introduction to Computing and Control
- Innovative Freshman Experience I, II
- Introduction to Video and Imaging Systems
- Project-Based Calculus I, II
- Multivariable and Vector Calculus
- Probability and Statistics for Imaging
- University Physics I, II
- Modern Physics
- Vision and Psychophysics
- Fundamentals of Color Science
- Linear and Fourier Methods for Imaging
- General Education—Liberal Arts and Sciences
- Wellness Education

Third and Fourth Years

- Geometric Optics
- Physical Optics
- Radiometry
- Interactions Between Light and Matter
- Image Processing and Computer Vision I, II
- Noise and System Modeling
- Imaging Detectors
- Imaging Science Senior Project I, II
- Imaging Science Elective Track I, II
- General Education—Liberal Arts and Sciences
- Free Electives

Physics School of Physics and Astronomy

Balance is the key

The hallmark of the RIT physics major is the balance between theoretical content and practical skill development. The curriculum begins with mathematics, science, and liberal arts courses, then adds courses covering the breadth of the subject from condensed matter to cosmology. The major can be completed in four years. Students also optionally engage in cooperative education work experiences during summers.

A planned elective concentration or minor in another field such as biology, chemistry, mathematics, computer science, business, imaging science, or optical physics is possible. Upon graduation, you will have successfully completed one of the most intellectually challenging academic programs. You will have gained experience working with professional researchers and on teams with your fellow students. As a result, you'll enjoy a wide choice of high-quality career opportunities.

High-tech physics laboratories

The School of Physics and Astronomy has a broad range of specialized facilities with state-of-the-art equipment for teaching and research. These labs are available for undergraduate student use and include the Solar Cell Technology Lab, Nanopower Research Lab, Magnetic Materials Lab, Laser Light Scattering Lab, X-ray and Surface Science Lab, Atomic-Scale Microscopy, Granular Materials Lab, Electronics Lab, Optics Lab, Quantum Optics Lab, and Modern Physics Lab. A supercomputer cluster has been developed for research in astrophysics.

Cutting-edge research

Each RIT physics major gains real-world research experience through a significant and individualized senior capstone project mentored by one of our faculty members. Students undertake research in such areas as astrophysics and astronomy, optics and lasers, X-ray and surface science, biological physics, and nanomaterials, with projects that can be experimental, computational, and/or theoretical in nature. Students present their progress both via publication-formatted written reports and conference-style talks. Some student research projects are presented at professional meetings or lead to publications in refereed physics journals. Physics majors also have numerous opportunities to engage in cooperative education experiences, although this is not required. These include summer experiences in industry, as well as at various national and university laboratories. Physics students may also complete an accelerated dual degree, where they can earn a BS in physics along with an MS in materials science and engineering; science, technology, and public policy; or astrophysical sciences and technology.

Career possibilities

Physics graduates find employment in a wide range of fields, including astrophysics, solid state physics, nuclear physics, optics, atomic and molecular physics, materials science, engineering, computing, and education. Many graduates pursue advanced degrees in physics or physics-related areas, such as biophysics, geophysics, atmospheric science, imaging science, and engineering. Others prepare for entry into medical, law, or business schools.

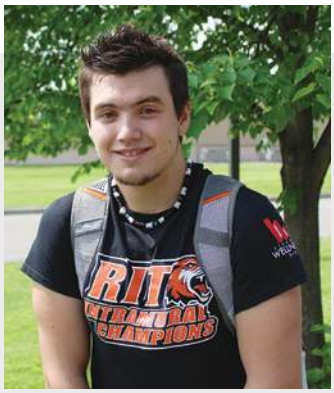
What you'll study

First and Second Years

- First Year Writing
- Year One: College Experience
- Introduction to Special Relativity
- University Physics I, II
- Project-Based Calculus I, II
- Science sequence (choose one)
- General and Analytical Chemistry and Lab I, II
- General Biology and Lab I, II
- Modern Physics I
- Electronic Measurements
- Vibrations and Waves
- Sophomore Physics Seminar
- Multivariable Calculus
- Differential Equations
- Introduction to Computational Physics and Programming
- General Education—Liberal Arts and Sciences
- Cooperative Education (Optional)

Third and Fourth Years

- Modern Physics II
- Experiments in Modern Physics
- Classical Mechanics
- Thermal and Statistical Physics
- Advanced Laboratory in Physics
- Mathematical Methods in Physics
- Electricity and Magnetism
- Quantum Mechanics
- Capstone Preparation
- Capstone Project I, II
- Physics Electives
- Free Electives
- General Education—Liberal Arts and Sciences
- Cooperative Education (Optional)



Lucas Shadler

Hometown: Irondequoit, New York

Major: Physics

Minors: Mathematics, Computer Science, Electrical Engineering

Research Experience:
REU at the Fermilab in Chicago

The opportunity to conduct undergraduate research drew Lucas Shadler to RIT. He chose to major in physics because he enjoys "using creative problem solving and applying it to math. I also enjoy trying to understand and explain things."

His research interests have brought him to the Universidade Federal Do Rio Grande Do Sul in Porto Alegre, Brazil, where he gave a weeklong workshop on how to use a program that simulates black holes. He also had the opportunity to study photovoltaics in RIT's Microelectronics and Nanopower Lab, where he tested the efficiency of solar cells. Shadler was awarded a Research Experience for Undergraduates (REU) at the Fermilab in Chicago, where he studied high-energy particle physics. As for his future plans, Shadler is unsure which direction he plans to pursue, but hopes his quest for knowledge will lead him toward making the biggest impact he can on the world. Whether that's through research, a position in industry, or as a professor, he likes that the physics program gives him the option to pursue any direction he chooses.

Related Majors

As one of the world's leading technological institutions, RIT excels not only in the traditional sciences and mathematics, but also in innovative offerings in health sciences, computing, business, engineering, technology, and the visual arts.

Biomedical Engineering

Kate Gleason College of Engineering
rit.edu/engineering

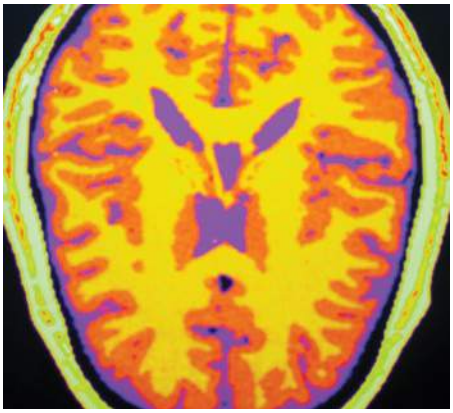
Prosthetic limbs and joints, microscopic cameras used in orthopedic surgery, dialysis machines, cardiac assist devices ... these medical instruments and systems were developed by biomedical engineers. Biomedical engineering applies the principles and theories of engineering to solve problems in the widely varied field of medicine.

An in-demand field

The need for sophisticated diagnostic and therapeutic equipment and solutions has fueled the demand for biomedical engineers. Biomedical engineers combine their knowledge of engineering with biology, anatomy, and physiology, to create devices and systems for a variety of health care issues. They can be found working alongside scientists, other engineering professionals, and medical practitioners to evaluate the complex, interdependent systems of the human body to develop effective solutions to enhance the quality of life for patients.

Gain hands-on experience

What sets RIT's biomedical engineering program apart from other programs is approximately one year of cooperative education, which allows students to apply the skills they learn in the classroom to the development of real medical solutions.



Photographic Sciences

College of Art and Design
rit.edu/artdesign

The photographic sciences major, with its options in biomedical photographic communications and imaging and photographic technology, prepares you for a career providing for scientific information via imagery.

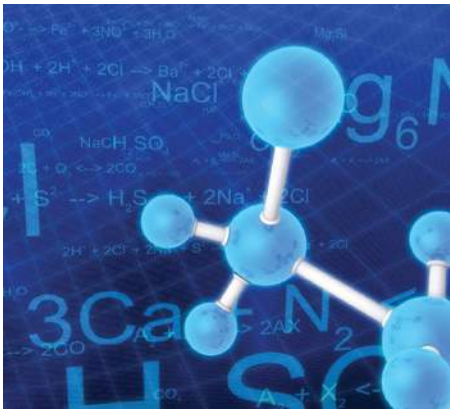
Two options

Biomedical photographers are at the forefront of advances in medicine and science, whether photographing landmark surgery in an operating room or the rainbow of colors in a butterfly wing. You are prepared for a photographic career in forensics, research, hospitals, and other biological settings such as ophthalmic (eye) clinics, veterinary centers, and other life science situations.

Lasers, computer-controlled cameras, high-speed film, stroboscopes, digital editing equipment—these powerful tools are altering the face of photography, and at the forefront of these changes is the imaging and photographic technology option. This unique, applications-oriented program prepares you for careers in a technical, industrial, or scientific environment.

Certification

The biomedical photographic communications option provides the educational background for the registered biomedical photographer (RBP) certification after you enter the profession. Your course work also can be tailored to assist you in preparing for the certified retinal angiographer (CRA) exam.



Biomedical Sciences

College of Health Sciences and Technology
rit.edu/healthsciences

Careers in health care are growing rapidly and our biomedical sciences major is your gateway to an exciting profession in the fields of health care and biomedical research. The biomedical sciences major is designed to prepare you for entry to health care or research positions where you'll assist patients and help discover new advances. The program will also prepare you with the training and support you'll need to take on the rigors of advanced study should you choose to pursue medical, dental, pharmacy, physician assistant, or graduate school.

Tailor your degree

Further develop your skills and knowledge by choosing a concentration or selected electives. Concentrations are available in forensic science, professional studies (pre-medical, pre-dental, or pre-veterinary), exercise science, or pathology (the study of disease). Elective courses such as endocrinology, genetics, histology, diagnostic medical imaging, patient care, virology, diagnosing the criminal mind, gross anatomy, and biochemistry allow you to customize your education.

Career success

Advances in biotechnology and an increase in staff needed in new medical research industries have led to rapid growth in the field of biomedical sciences. The need is great for more research in many areas of health care, including AIDS, diabetes, cancer, and neurological disorders such as Parkinson's and Alzheimer's.

Diagnostic Medical Sonography

College of Health Sciences and Technology
rit.edu/healthsciences

Diagnostic medical sonography, one of the fastest growing areas in diagnostic medicine, is a noninvasive, nontoxic medical procedure that uses high-frequency sound waves to create images of a variety of human organs such as the heart, kidneys, liver, pancreas, blood vessels, and reproductive organs. The sonographer works directly with patients, physicians, and other medical personnel on a daily basis and performs a key role in the process of data gathering and synthesis required in the diagnosis and treatment of disease and in the study of the developing fetus.

Practical experience
Extensive on-campus hands-on experience plus an off-campus clinical internship allow you to apply what you've learned in real-world settings.

National qualifying exam and career opportunities
Upon successful completion of the program, you will be eligible to sit for a national qualifying exam administered by the American Registry of Diagnostic Medical Sonography (ARDMS). Passing this examination allows you to work in this field anywhere in the United States and around the world.

Certificate programs available
Certificates in diagnostic medical sonography and echocardiography are designed for individuals with an allied health background or an undergraduate or advanced degree in the life sciences.

Medical Illustration

College of Art and Design
rit.edu/artdesign

Combining art and science, medical illustrators provide visual support for the health science and medical instruction fields. From traditional carbon dust renderings to three-dimensional, animated digital imagery, medical illustration spans the fullest range of artistic media.

Art meets science
This major combines the studies of the visual arts and science, including gross anatomy. You will learn how to translate anatomical and surgical sketches into instructional illustrations, courtroom exhibitions, computer graphics, ads, and more.

Practical experience
Through collaboration with area hospitals, you will be able to draw from direct observation of operations in progress. The University of Rochester's Medical Center library provides exceptional medical information and research data. Digital technology integrated into the studio environment enables you to create highly polished, sophisticated images and well-designed, interactive, educational media presentations that include motion graphics and sound.

Master's degree option
You may decide upon graduation to further pursue your studies. RIT also offers a master of fine arts degree in medical illustration.

Dietetics and Nutrition

College of Health Sciences and Technology
rit.edu/healthsciences

Dietetics and nutrition have expanded from traditional environments—like hospitals, schools, and nursing homes—into restaurants, fitness centers, and even boardrooms. Today's dietitian might plan a high-energy menu for a baseball franchise or suggest healthier alternatives to meals for busy executives on the run. The role of nutrition in people's lives has expanded and changed.

A strong foundation
The dietetics and nutrition major, accredited by the Academy of Nutrition and Dietetics (AND), provides you with the knowledge and practical experience necessary to become a registered dietitian. The major offers a challenging curriculum that prepares you for diverse professional opportunities. Biology and chemistry courses expand your scientific knowledge by teaching you how food is used by the human body. Students enrolled in other RIT majors may study nutrition through the nutritional sciences minor.

Academy of Nutrition and Dietetics
The dietetics and nutrition major, housed in RIT's College of Health Sciences and Technology, has specific course requirements necessary to meet the core knowledge requirements of the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics. Upon completion of the degree program and a required dietetic internship, students are eligible to take the National Registration Exam for Dietitians.

Nutritional Sciences

College of Health Sciences and Technology
rit.edu/healthsciences

Educating the public about the benefits of nutrition, and the various ways healthy living can improve our well-being, is the focus of the BS degree in nutritional sciences. The major helps health professionals understand and translate the science of food into policy and practice.

Reshape the health of your community
An effective nutritional scientist helps to address behavioral issues, teaches clients about the nutrition and health properties in food, and offers nutrition supervision. You'll build a solid foundation in nutritional sciences as well as leadership skills that include communication, problem solving, team dynamics, and interaction with the community. Two blocks of cooperative education give you hands-on experience in the field.

Opportunities abound
Careers in nutrition are diverse. Students are prepared for graduate programs, such as medical school or further biomedical studies, or to provide expertise in nutrition to the general public in a range of settings (e.g., sports fitness programs, hospitality industry, nutrition writing, and federal nutrition programs). Select electives make you eligible to sit for the Certified Health Education Specialist (CHES), a respected credential in health care education.

Note: *The nutritional sciences program does not meet the educational requirements of the Academy of Nutrition and Dietetics that lead to eligibility to become a Registered Dietitian Nutritionist.*

Physician Assistant (BS/MS)

College of Health Sciences and Technology
rit.edu/healthsciences

Physician assistants are health care professionals licensed to practice medicine with physician supervision. Working with a broad range of responsibilities, physician assistants obtain medical histories, conduct physical exams, order and interpret laboratory tests, diagnose common illnesses, determine and initiate treatment, counsel patients to promote wellness and disease prevention, apply casts, and suture wounds. Physician assistants can also prescribe medications in virtually all states in the U.S. and the profession continues to offer excellent growth opportunities for the future.

A focus on patient care
This major, housed in RIT's College of Health Sciences and Technology, is a five-year combined BS/MS degree program. From the onset, your studies are centered on the health care environment and patient care.

A full year of clinical experience
Your education includes 12 months of supervised clinical rotations in various health care settings. You'll get hands-on patient care experience in clinical areas such as inpatient medicine, pediatrics, obstetrics/gynecology, orthopedics, emergency medicine, surgery, family practice, psychiatry, and geriatrics.

National certifying exam
The National Commission on Certification of Physician Assistants (NCCPA) administers the national board examination. Certification is required to practice in most states, including New York.

Undergraduate Research

The College of Science has well-established areas of research in imaging science, color science, detectors, astrophysical sciences, and the physical sciences. Undergraduate students can engage in research as early as their freshman year, working alongside faculty to conduct original research. You'll carry out all of the experiments, and analyze and interpret the results. You can earn credit toward your degree while you gain valuable, hands-on experience. Our students regularly present their findings at national and international scientific meetings and conferences, or publish their work in professional science journals. You also have access to additional research opportunities that include:

Research Scholars Program—
The Research Scholars Program is intended for our most advanced research students who wish to pursue graduate school and/or research-based careers.

- *Biological Sciences Research Scholars Program:* A substantial hands-on experience where students execute their own high-quality research projects under the guidance of faculty mentors. Students gain valuable research experience, write papers discussing their work, present their findings, and participate in discussion and lecture series.

- *Chemistry Research Scholars Program:* Intended for students to engage in serious undergraduate research in chemistry, the program features a significant research experience for students to design and execute their own research under the direction of a faculty mentor. Participants take part in discussions and lectures, earn opportunities to travel to conferences, and present their findings.

Summer Undergraduate Research— A limited number of students are awarded undergraduate research fellowships each summer. Students are provided a stipend to work on a targeted research project for 10 weeks. The program culminates in the Summer Undergraduate Research Symposium, a free, public event showcasing the research undertaken by undergraduate students across the RIT campus.

Research Experiences for Undergraduates (REUs)— The National Science Foundation funds a large number of summer research opportunities for undergraduate students through its REU Sites program. Undergraduates apply to universities around the country to work in the research programs of the host institution. Students are associated with a specific research project, where they work closely with the host institution's faculty and other researchers. REUs give students an opportunity to participate in research at other institutions, on exciting projects that may differ from RIT's research initiatives.

Undergraduate Research Examples

X-ray Diffraction Experiments at Argonne National Laboratory

Student Researcher
John Collini, BS, Physics

Faculty Advisor
Michael Pierce

Description
The activity of a catalyst is often set by the physical arrangement of the atoms at the surface. Controlling the physical character of the surface atoms melds technological challenges and academic curiosity. To understand such catalysts, the student conducted X-ray scattering experiments from a model surface at the Advanced Photon Source at Argonne National Laboratory. These experiments have determined how the dynamics of the surface atoms can be controlled through electrical and chemical means.

Identification of Three Bacteria from Dioscorea sp. (Yellow Yam) by Whole Genome Sequencing and Annotation

Student Researchers
Alexander Triassi, BS, Biotechnology and Molecular Bioscience; Matthew Wheatley, BS, Biotechnology and Molecular Bioscience

Faculty Advisors
André O. Hudson, Michael A. Savka

Description
In the plant Dioscorea sp. "yellow yam," we have identified and sequenced the genomes of three bacteria belonging to the genus Enterobacter. Preliminary analyses from the annotated genomes suggest that the bacteria possess genes involved in the production of secondary metabolites involved in plant resistance to pathogens in addition to genes involved in the production of hormones that have an integral role in plant growth and development.

Integrin Targeted Imaging of A549 Lung Cancer Cells

Student Researchers
Sean Aronow, BS, Biotechnology; Sarah Wang, BS, Biotechnology with Bioinformatics Option; Yin Peng Lee, BS, Biotechnology

Faculty Advisors
Irene M. Evans, Hans Schmitthenner

Description
The goals of this research are to assess the performance of new Targeted Molecular Imaging Agents (TMIAs). Such dyes have a role in noninvasive imaging of cancers and can be useful for detecting cancer sites in the body.

Targeted Molecular Imaging Agents

Student Researchers
Taylor Barrett, BS, Chemistry; Chelsea Weidman, BS, Biochemistry; Stephanie Beach, BS, Chemistry; Lauren Heese, BS, Biochemistry

Faculty Advisor
Hans Schmitthenner

Description
Under Schmitthenner's direction, the students conducted groundbreaking research on targeted molecular imaging agents, which allows medical professionals to easily distinguish cancerous cells from healthy cells and has applications in virtually every stage of cancer treatment, including early detection, diagnosis, surgery, and recurrence checks. In early 2015, the researchers won a $440,000 grant from the National Institutes of Health for the development of a photoacoustic imaging component in collaboration with the University of Rochester.

Experiential Education and Co-op

Cooperative education
Today's top employers are looking for ambitious graduates who have professional work experience in addition to a quality academic background. At RIT, you can get both. Cooperative education has been a hallmark at RIT for more than 100 years and is the centerpiece of RIT's commitment to experiential education.

Cooperative education (co-op) provides an opportunity to put classroom lectures, textbook theories, laboratory research, and your personal initiative to the ultimate test—performance in the workplace. Hundreds of companies—from Fortune 500 firms to smaller, privately owned companies—come to campus each semester to recruit students for co-op positions. There's no question that RIT's cooperative education program provides you with a competitive advantage over science graduates from other colleges and universities. With the exception of bioinformatics, co-op is optional for students in the College of Science. In some programs, co-op can begin as early as the summer after your freshman year, but co-op typically takes place in your third and fourth years. You can alternate semesters of academic study with co-op work periods—full-time, paid work experiences in positions related to your major. RIT's Office of Career Services and Cooperative Education will help you assess your career ambitions, identify opportunities, and assist you in the application process.

Study Abroad
There's no better way to gain an understanding of another culture than to experience it firsthand. To prepare you for success in our global society, RIT offers a range of exciting study abroad opportunities that expand your horizons in every sense. The College of Science offers faculty-led study abroad opportunities in Malmö, Sweden, and Arctic Russia.

Explore Evolution on the Galápagos Islands
Robert Rothman, professor in the Thomas H. Gosnell School of Life Sciences, arranges an annual 12-day trip to the Galápagos Islands at the end of the spring semester. This year marks Rothman's 23rd visit to the Pacific archipelago, located 600 miles off the coast of Ecuador. His trips share an appreciation for the wildlife and geology that informed Darwin's theory of natural selection. In his class, "Galápagos: Evolution and Ecology," Rothman's lectures begin with Darwin and the voyage of the *Beagle*, and the role the Galápagos played in Darwin's thinking about evolution. "In class we cover everything we're going to see in the Galápagos," he says. "We consider the geology and formation of the islands, the land and sea birds, and the reptiles. We go over the history and human impact, and then we go see everything that we have been discussing all semester."

Academic Enrichment Opportunities

Students at RIT have a wide range of options in their academic experience. You can pursue a minor or immersion in a second area of science and mathematics, add a liberal arts or business minor to complement your studies, enroll in a study abroad program, or apply for admission to an accelerated BS/MS program.

The Honors Program

The Honors Program in the College of Science is a challenging, individualized experience for students who have demonstrated outstanding academic performance. Honors students have access to special courses, seminars, projects, and advising. Recent Honors students have received summer research stipends in environmental science and imaging science and have traveled to professional conferences in bioinformatics, chemistry, and biology.

Accelerated dual-degree options

Allowing you to earn both a bachelor's and a master's degree in less time than it would normally take to complete each degree separately, the College of Science has many options to choose from (BS major/MS major).

- Applied Mathematics/Applied and Computational Mathematics
- Applied Statistics and Actuarial Science/Applied and Computational Mathematics
- Applied Statistics and Actuarial Science/Applied Statistics
- BS/MS in Bioinformatics
- BS/MS in Chemistry
- Chemistry/Materials Science and Engineering
- Computational Mathematics/Applied Computational Mathematics
- Computational Mathematics/Computer Science
- BS/MS in Environmental Science
- Environmental Science/Science, Technology, and Public Policy
- Physics/Materials Science and Engineering
- Physics/Science, Technology, and Public Policy
- Physics/Astrophysical Sciences and Technology

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.

Accounting ●
Advertising and Public Relations ●▲
African Studies ▲
American Art ●▲
American Politics ●▲
American Sign Language and Deaf Cultural Studies ●▲
Anthropology and Sociology ●
Applied Statistics ●▲
Archaeological Science ●
Archaeology ▲
Art History ●▲
Astronomy ●▲
Bioinformatics Analysis ●
Biology ▲
Biology: Cellular and Molecular ●
Biology: Ecology and Evolution ●
Black Studies ●
Business Administration ●
Chemical Engineering Systems Analysis ●
Chemistry ●▲
Communication ●▲
Computer Engineering ●
Computer Science ●
Computing Security ●
Construction Management ●
Creative Writing ●▲
Criminal Justice ●▲
Cultural Anthropology ▲
Database Design and Development ●
Digital Business ●
Digital Literatures and Comparative Media ●▲
Diversity in the U.S. ▲
Economics ●▲
Electrical Engineering ●
Engineering Management ●
English ●▲
Entrepreneurship ●
Environmental Modeling ●
Environmental Science ●
Environmental Studies ●▲
Ethics ●▲
Exercise Science ●
Film Studies ●▲
Finance ●
Flexible Packaging ●
Free and Open Source Software and Free Culture ●
Game Design ●
Game Design and Development ●
Geographic Information Systems ●▲
Global Justice ▲
Global Literatures and Cultures ●
Globalization ●
Globalization Theory ▲
Health Communication ●
Health and Culture ●▲
Health IT ●
History ●▲
Hospitality Management ●
Human Language Technology and Computational Linguistics ▲
Imaging Science ●
Imaging Systems ●
Industrial Engineering ●
Innovation ●
International Business ●
International Relations ●▲
Journalism ●▲
Language Science ●▲
Latino/Latina/Latin American Studies ●▲
Legal Studies ●▲
Linguistic Anthropology ▲
Management ●
Management Information Systems ●
Marketing ●
Mathematics ●▲
Mechanical Engineering ●
Media Arts and Technology ●
Microelectronic Engineering ●
Military Studies and Leadership ●
Mobile Design and Development ●
Mobile Development ●
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 ▲
Networking and Systems Administration ●
Nutritional Sciences ●
Optical Science ●
Packaging Science ●
Philosophy ●▲
Physics ●▲
Political Science ●
Psychology ●▲
Public Policy ●▲
Religious Studies ▲
Renaissance Studies ▲
Science of Film, Photography and Imaging ▲
Science, Technology, and Society ●
Science and Technology Studies ▲
Social Inequalities ▲
Software Engineering ●
Structural Design ●
Supply Chain Management ●
Sustainable Product Development ●
Theater Arts ●▲
Urban Studies ▲
Visual Culture ●▲
Water Resources ●
Web Design and Development ●
Web Development ●
Women's and Gender Studies ●▲

● Minor
▲ Immersion

Featured Faculty

RIT's College of Science has a diverse, talented, and dedicated faculty numbering nearly 200. A few are highlighted here.

Mishkat Bhattacharya

Assistant Professor, School of Physics and Astronomy

Mishkat Bhattacharya's research has developed techniques for measuring mechanical rotation at the quantum level, while identifying and circumventing the limits placed by quantum mechanics on sensor capabilities. His research is expected to have a technological impact on society by taking rotation-sensor technology—like that used in cell phones, gyroscopes on ships and airplanes, and global positioning system satellites—to its limits. He is the recipient of the Faculty Early Career Development (CAREER) Program Award from the National Science Foundation, and plans to use the award's funding to examine the continuing demand for better optical sensing of mechanical rotation devices used in fields such as nanoscience, precision measurement, remote sensing, and quantum computing.

Manuela Campanelli

Professor, School of Mathematical Sciences

Manuela Campanelli in the School of Mathematical Sciences was part of a team that put none other than Albert Einstein to the test. Campanelli's team validated the discovery of gravitational waves from colliding black holes. The signal matched their simulations of colliding black holes on supercomputers.

A recipient of the RIT Trustee's Scholarship Award (2013-2014), Campanelli is a Principal Investigator in multiple NSF- and NASA-funded research projects, a member of the LIGO Scientific Collaboration, and has served on numerous panels at the NSF and NASA.

Elizabeth Cherry

Associate Professor, School of Mathematical Sciences

Elizabeth Cherry is a member of a multidisciplinary National Science Foundation team that is developing the "Cyberheart" platform for virtual, patient-specific human heart models and associated device

therapies. Cherry's role is focused on the foundations of modeling, synthesizing, and developing medical device software and systems from closed-loop models of the device and organ. The project's goal is to build safe and effective software for future medical devices.

Carrie McCalley

Assistant Professor, Thomas H. Gosnell School of Life Sciences

Carrie McCalley is a biogeochemist who studies greenhouse gas emissions from wetlands, with projects spanning the globe, from local wetlands to the Arctic. Current research focuses on understanding how microbial communities respond to environmental change, including permafrost thaw in high-latitude peatlands and management practices in created wetlands, with the goal of improving predictions of methane emissions in a changing climate. McCalley has received funding from NASA, DOE, and NSF and has published highly cited articles in peer-reviewed journals including both *Science* and *Nature*.

Joe Hornak

Professor, Chester F. Carlson Center for Imaging Science

Joe Hornak teaches courses in magnetic resonance imaging, nuclear magnetic resonance spectroscopy, analytical chemistry, and physical chemistry. He is also director of the Magnetic Resonance Laboratory. His research interests include multi-spectral tissue classification with magnetic resonance images, magnetic resonance hardware development, and magnetic resonance imaging of materials.

Seth M. Hubbard

Associate Professor of Physics

Seth Hubbard is an associate professor of physics and the director of the NanoPower Research Laboratory, where he leads a team working on the epitaxial growth, fabrication, and characterization of nanostructured solar photovoltaic devices. He has co-authored more than 34 journal publications on quantum electronic and photovoltaic devices. Prior to RIT, Hubbard was a National Research Council Post-doctoral Research Associate at the NASA Glenn Research Center. He currently serves as an editor of the *IEEE Journal of Photovoltaics* and is the publication's chair of the 38th IEEE Photovoltaics Specialist Conference. Hubbard also is a 2009 recipient of the prestigious National Science Foundation CAREER award.

Julie Thomas

Assistant Professor, Thomas H. Gosnell School of Life Sciences

Julie Thomas' laboratory conducts research on a large virus, or phage, which infects the bacterium Salmonella. Thomas is interested in elucidating the molecular mechanisms by which this virus hijacks the Salmonella cell and assembles new virions, a process which ultimately results in cell lysis (death). To study these mechanisms, her research group and collaborators at RIT, the University of Texas Health Science Center at San Antonio, and the University of Massachusetts Boston use multidisciplinary approaches including genomics, bioinformatics, proteomics, biochemistry, and electron microscopy. Having recently established a genetic model system with this virus, the team's research represents a resource for understanding related phages used for biocontrol purposes on human and plant pathogens.

Lea Vacca Michel

Associate Professor, School of Chemistry and Materials Science

Lea Vacca Michel collaborates with pediatrician Dr. Michael Pichichero at the Rochester General Hospital Research Institute to study the properties of protein vaccine candidates. Recently, her lab used a combination of structural and biochemical techniques to elucidate a novel orientation of one vaccine candidate from the pathogenic bacteria Nontypable Haemophilusinfluenzae (NTHi). Michel hopes that her work will contribute to the vaccine development process for protection against NTHi infections.

Jan van Aardt

Professor, Chester F. Carlson Center for Imaging Science

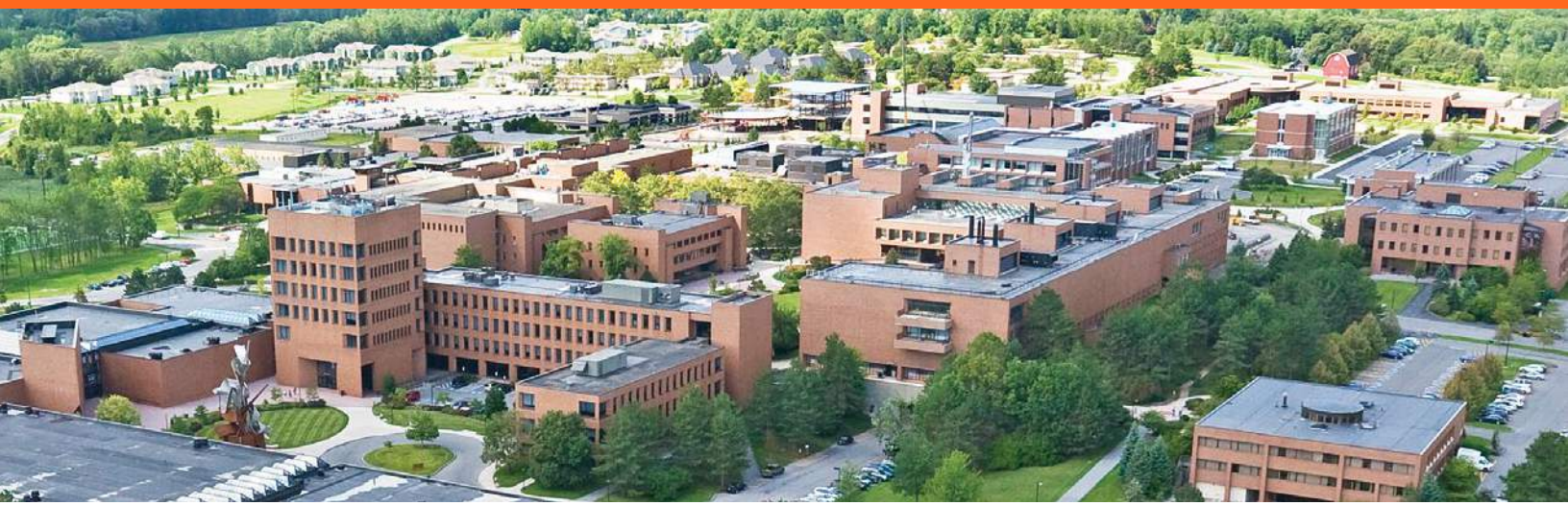
Jan van Aardt is a professor in the Chester F. Carlson Center for Imaging Science. Imaging spectroscopy and structural (lidar) sensing of natural resources form the core of van Aardt's research efforts, which vary between vegetation structural and system state (physiology) assessment. He has received funding from NSF, NASA, Google, and USDA, among others. Van Aardt has published more than 55 peer-reviewed papers and has made more than 70 contributions to professional conferences.

Scott Williams

Professor, School of Chemistry and Materials Science

Scott Williams is a professor of inorganic chemistry in the School of Chemistry and Materials Science. Functional nanomaterial synthesis and formulation into printable inks remains the focus of Williams' research efforts. In collaboration with the RIT AMPrint center, Williams' research translates or develops novel nanomaterials used in making sensors and actuators into printable form factors. Undergraduate researchers comprise the research team, and many publish and report on their findings in regional and national conferences. Williams' research funding is primarily derived from corporate sponsors looking to develop and fabricate new devices for the marketplace. He holds more than 60 patents and has published in research publications that bridge the printing and materials science interface.

Facilities and Centers



World-class facilities

RIT and the College of Science host some of the most sophisticated, high-tech facilities in the world. Many of your classes will be taught in multimedia-supported classrooms and labs that allow the use of computer modeling, 3D imaging, and virtual reality for conducting experiments. You will find top-notch teaching and research laboratories–including an X-ray and surface science laboratory, an animal care facility, a plasma etching laboratory, an electronics laboratory, a confocal microscopy lab, and a nuclear magnetic resonance laboratory–computer centers, two statistical computing laboratories, a laser light scattering laboratory, a greenhouse, and dozens of community spaces for small-group study, projects, and informal gatherings. A selection of the college's major facilities include:

Center for Advancing Science/ Mathematics Teaching, Learning, and Evaluation
A network of affiliated faculty, projects, and programs engaged in scholarship surrounding science and math education.

Center for Applied and Computational Mathematics
Promotes interdisciplinary research with a particular focus on cultivating emerging applications in the sciences and engineering.

Center for Computational Relativity and Gravitation
A research center dedicated to study at the frontiers of numerical relativity and relativistic astrophysics, gravitational-wave physics, its connection to experiments and observations, and high-performance computation and scientific visualization.

Center for Detectors
Designs, develops, and implements new advanced sensor technologies through collaboration with academic researchers, industry engineers, government scientists, and university/college students.

Center for Materials Science and Engineering
Provides an integrated interdisciplinary approach to the study of materials.

Digital Imaging and Remote Sensing Laboratory
A research group focused on the development of hardware and software tools to facilitate the extraction of information from remotely sensed data of the earth and the education of students who will continue this work for government agencies and private industry.

Laboratory for Multiwavelength Astrophysics
A subset of the faculty, staff, and students from the School of Physics and Astronomy and the Chester F. Carlson Center for Imaging Science using data from multiwavelength sensors.

Magnetic Resonance Laboratory
A research and development laboratory devoted to solving real-world problems with magnetic resonance.

Multidisciplinary Vision Research Laboratory
Aims to further the understanding of high-level visual perception, how humans extract information from images and the environment, and how that information is used in decision-making and to guide actions.

Munsell Color Science Laboratory
A world-class academic laboratory dedicated to education, research, and outreach in the broad multidisciplinary field of color science.

RIT in Brief

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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Rochester Institute of Technology

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