IMAGING SCIENCE
UNDERGRADUATE PROGRAM INFO
INTRODUCTION: WHAT IS IMAGING SCIENCE?
Imaging Scientists work with science and technology that is focused on the creation and extraction of information from an image, including...

- development and characterization of technologies used in imaging devices
- the integration of those technologies into systems
- the use of those systems to visualize a broad range of objects and phenomena

...in a wide range of application fields.

RIT has the only BS in Imaging Science program in the United States.
QUESTION: DO YOU WANT TO...

HELP THE WORLD RESPOND TO NATURAL DISASTERS LIKE FLOODS, VOLCANOES, TSUNAMIS, FIRES, AND HURRICANES?

ENGINEER NEW OPTICAL AND SPECTROSCOPIC SYSTEMS TO DETECT EARTH-LIKE PLANETS AND SEARCH FOR LIFE IN THE UNIVERSE?

HELP KEEP OUR NATION SECURE BY DESIGNING NEW SENSOR SYSTEMS, ALGORITHMS, AND VISUALIZATION TECHNIQUES?

UNEARTH HIDDEN SECRETS IN ANCIENT DOCUMENTS?

RECREATE FAMOUS WORKS OF ART IN THEIR ORIGINAL PALETTES?

DEVELOP NEW TECHNIQUES TO DIAGNOSE AND CURE DISEASE?

YOU CAN! AND MORE... WITH IMAGING SCIENCE.
The Chester F. Carlson Center for Imaging Science at RIT is a highly interdisciplinary university research and education center dedicated to pushing the frontiers of imaging in all its forms and uses.

FROM THE COSMIC TO THE MICROSCOPIC, IMAGING SCIENCE IS EVERYWHERE.
IMAGING SCIENCE IS IN A LEAGUE ALL ITS OWN.
Imaging Scientists are responsible for designing, developing, evaluating, testing, characterizing, and applying high tech imaging systems such as...

- Digital Cameras - CCD/CMOS technology
- Fingerprint/Retina Scanners and Identification
- Satellite Imaging Systems
- Radar/Sonar/LiDAR
- Night Vision Equipment
- Scanners/Fax/Copiers
- Medical Imaging - MRI, PET/CT-scan, X-Ray

IMAGING WAS RATED THE 14TH GREATEST ENGINEERING ACHIEVEMENT OF THE 20TH CENTURY. http://greatachievements.org/
Application-Based Curriculum
The Imaging Science curriculum is based upon knowledge application and preparation for entering the science and engineering work force and/or top notch graduate schools.

Dedicated, Accessible Faculty
Because many professors are active in research and consulting, they bring real-world issues to the classroom and challenge students to evaluate the latest scientific developments.

Research opportunities for Undergraduates
Under the guidance of a faculty research advisor, students design their own project, carry out all of the experiments, and analyze and interpret the results. Opportunities exist for earning credits, presenting at scientific meetings, being named on patents, and getting published in professional science journals.

Internships and Cooperative Education (Co-op)
Optional co-op’s alternate periods of paid, professional work in Imaging Science careers with periods of on-campus study.

>90% OF IMAGING SCIENCE STUDENTS PERFORM OFF-CAMPUS RESEARCH.
Students undertake a laboratory intensive program that includes aspects of Physics, Mathematics, Engineering, and Computer Science en route to a degree with a wide variety of exciting career options.

- Students may optionally choose to focus in areas such as astronomy, optics, environmental systems, remote sensing, medical imaging, and more.
- Both curriculum and timing are very flexible.
- Students entering with college credits have the ability to graduate early.
- BS + MS/PhD combos are available.
STUDENT-CENTERED ENVIRONMENT

Features of a large university...

- First-rate research and facilities
- Distinctive culture and identity
- Extensive extracurricular activities

Benefits of a small college

- Intimate, interactive classes
- Personal attention from professors
- Staff members who know you

COLLABORATION AND TEAMWORK

- Emphasis on project-based learning, teamwork, and interaction among students, often from other science and engineering disciplines
- Encourage creativity and confidence in critical thinking, problem solving, and communication

CLASSES AVERAGE ~14 STUDENTS WITH A ~2:1 STUDENT : FACULTY RATIO.
LET’S GET DOWN TO DETAIL.

IMAGING SCIENCE

UNDERGRADUATE CURRICULUM
## Typical Course of Study

### First Year
- Innovative Freshmen Experience I, II
- Introduction to Computing & Control
- Film/Video Materials & Technology
- Project-Based Calculus I, II
- First-Year Writing
- First-Year Seminar
- University Physics I
- Liberal Arts & Sciences

### Second Year
- Probability & Statistics for Imaging
- Color Science
- Vision & Psychophysics
- Linear & Fourier Methods for Imaging
- Multivariable & Vector Calculus
- University Physics II
- Modern Physics I
- Liberal Arts & Sciences (3)

**Transfer Student? No Problem. AP and College Credits Carry Over.**
**TYPICAL COURSE OF STUDY**

<table>
<thead>
<tr>
<th>Third Year</th>
<th>Fourth Year</th>
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<tbody>
<tr>
<td>Geometric Optics</td>
<td>Senior Project I, II</td>
</tr>
<tr>
<td>Physical Optics</td>
<td>Imaging Elective Track I, II</td>
</tr>
<tr>
<td>Radiometry</td>
<td>Noise &amp; System Modeling</td>
</tr>
<tr>
<td>Interactions Between Light &amp; Matter</td>
<td>Imaging Detectors</td>
</tr>
<tr>
<td>Image Processing &amp; Computer Vision I, II</td>
<td>Advanced Imaging Laboratory I, II</td>
</tr>
<tr>
<td>Open Elective (2)</td>
<td>General Education Elective</td>
</tr>
<tr>
<td>Liberal Arts &amp; Sciences Immersion (2)</td>
<td>Liberal Arts &amp; Sciences Immersion</td>
</tr>
</tbody>
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**4+1 BS/MS Option**

Inquire for Details

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**MINORS ARE AVAILABLE:** [WWW.RIT.EDU/PROGRAMS/MINORS-AND-CONCENTRATIONS](http://WWW.RIT.EDU/PROGRAMS/MINORS-AND-CONCENTRATIONS)
FIRST-YEAR EXPERIENCE

- Unique student-centered, free-form learning environment
- Hands on, experiential learning and real world preparation
- NO lectures, NO textbooks, NO exams
- Focuses on researching, designing, and building a complete imaging system in time to exhibit at Imagine RIT
- Builds interpersonal and teamwork skills in addition to knowledge
- Multidisciplinary: students come from multiple majors across campus
- Unlike any freshman experience at RIT!

SEE MORE: www.cis.rit.edu/IFE
IMAGING SCIENCE EXPOSES A WORLD OF OPPORTUNITY.
SCHOLARSHIPS

Exclusively for Imaging Science Students

Carlson Family Scholarship  Merit scholarship for accepted undergraduate freshman and transfer students based on scholarship, leadership and service.

The Carlson Scholarship in Imaging Science

Jerry Hughes Scholarship

CIS Faculty Scholarship

For RIT College of Science Students

John Wiley Jones Scholarship

Related External Scholarships

The Society for Imaging Science & Technology: The Raymond Davis Scholarship

International Society of Optical Engineering (SPIE)

Boeing Corporation - Boeing Scholarship

United States Department of Homeland Defense - Department of Homeland Security Scholarship

United States Geospatial-Information Foundation - United States Geospatial-Information Foundation Scholarship

American Society for Photogrammetry and Remote Sensing - Central New York Region - Student of the Year Award

THERE IS MONEY WAITING FOR IMAGING SCIENCE STUDENTS.
RIT’s Study Abroad programs are offered in cooperation with:

- The American College of Management and Technology (Croatia)
- Queens University (England)
- University of Osnabruck (Germany)
- Kanazawa Institute of Technology (Japan)

In programs affiliated with other institutions, RIT students also have the opportunity to study in Italy, Spain, France, Ireland, Australia, China, Kenya, New Zealand, Germany, Greece, South Africa, and other international locations.

There is no better way to gain an understanding of another culture than to experience it firsthand.
Co-op can fit seamlessly into the Imaging Science curriculum, without causing the student to fall behind or require extra time.

IMAGING SCIENCE STUDENTS ARE UNIQUELY PREPARED TO EFFECTIVELY BEGIN RESEARCH WORK IN AS LITTLE AS 1 YEAR.
www.cis.rit.edu/jobs for past and present opportunities

~99% ACCEPTANCE INTO 1ST CHOICE CAREERS/GRAD SCHOOLS
• Many Imaging Science graduates are hired as Systems Engineers
• Google “Best job in America 2009”
• Based on: job security; job growth; # of jobs available; hours spent on the job; job satisfaction; salary; etc.

How Best Jobs were picked
For the Top 250.
More than 7,000 jobs and then focused on jobs that the Bureau of Labor Statistics projects will grow 10% or more over the next decade and that require at least a bachelor’s degree. Titles with median pay below $45,000 for experienced workers (at least twelve seven years of experience in the field, depending on the job) and fewer than 10,000 positions nationwide were screened out.

For the Top 100.
Eliminated jobs that did poorly during the recession (based on Conference Board data showing growth in online help wanted ads in 2009), and grouped jobs with similar responsibilities and skills.

For the Top 50.
More than 35,000 workers rated their jobs on quality-of-life factors such as flexibility, stress, and personal satisfaction. Ranked top 50 on current employment, long-term growth, pay, and security; projected openings and quality-of-life factors.

For the Top 10.
Interviewed industry experts and people in each of the professions. Selected the top 10 jobs based on those findings.

Avg/Range for Imaging Scientists

Co-op: $17.00 / $16.00 - $18.00

BS: $72,000 / $70,000 - $90,000

Source: www.rit.edu/emcs/oce/employer/salary
<table>
<thead>
<tr>
<th></th>
<th>Imaging Science</th>
<th>Physics</th>
<th>Computer Science</th>
<th>Imaging &amp; Photographic Technology</th>
<th>Electrical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College at RIT</strong></td>
<td>College of Science</td>
<td>College of Science</td>
<td>B. Thomas Golisano College of Computing and Information Sciences</td>
<td>College of Imaging Arts and Sciences</td>
<td>Kate Gleason College of Engineering</td>
</tr>
<tr>
<td><strong>Approx # students enrolled</strong></td>
<td>40</td>
<td>110</td>
<td>700</td>
<td>50</td>
<td>500</td>
</tr>
<tr>
<td><strong>#years to complete BS degree</strong></td>
<td>3 to 4 years Co-op optional</td>
<td>4 or 5 years Co-op optional</td>
<td>5 years 3 Co-op semesters required</td>
<td>4 years 1 Co-op semester required</td>
<td>5 years 2 Co-op semesters required</td>
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<td><strong>Co-op requirements</strong></td>
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<tr>
<td><strong>Possible Careers</strong></td>
<td>Imaging Scientists, Systems Engineers $70,000-$90,000</td>
<td>Physicists $40,000-$64,000</td>
<td>Computer Programmers $50,000-$95,000</td>
<td>Imaging and Photographic Technologists $41,800-$73,900</td>
<td>Electrical Engineers $50,000-$80,000</td>
</tr>
</tbody>
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Data compiled from the following websites: [http://www.rit.edu/programs/program_listing.php](http://www.rit.edu/programs/program_listing.php); [http://www.rit.edu/emcs/oce/employer/salary](http://www.rit.edu/emcs/oce/employer/salary)

**IMAGING SCIENCE IS ONE OF THE MOST CHALLENGING (AND REWARDING) MAJORS AT RIT.**
THE IMAGING SCIENCE WINNING COMBINATION:

+ UNIQUE DISCIPLINE
+ SMALL CLASS SIZE
+ HIGH CAREER PLACEMENT WITH COMPETITIVE STARTING SALARIES
+ PLENTIFUL GRADUATE SCHOOL OPTIONS

AND A TOP NOTCH REPUTATION.
Sponsored by the EPA, this award supports environmental education and research for undergraduates. As a recipient, Dickey has been awarded $48,900 over two years, is funded to attend two scientific conferences of his choosing, and will participate in a 12-week paid summer internship at an EPA research facility. Dickey, whose scientific interests focus on environmental applications of remote sensing, cites the imaging science faculty as being instrumental in his success: “There is an excellent student to teacher ratio,” he says.

Kevin Dickey’s interest in Imaging Science stemmed from being a casual photographer seeking a challenge.

What began with participation in the Freshman Imaging Project, grew to paid summer research after his first year, matured into a co-op with UTC Aerospace System’s Intelligence, Surveillance and Reconnaissance Systems group, and has so far culminated with being named a recipient of a Greater Research Opportunities undergraduate fellowship - all by his third year at RIT.

“I SUGGEST THAT ALL STUDENTS TAKE ADVANTAGE OF THE PROGRAM AND THE OPPORTUNITY TO LEARN MULTIPLE DISCIPLINES.”

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READ MORE STORIES ABOUT OUR STUDENTS: WWW.CIS.RIT.EDU/STORIES
Most undergraduates do not get to experience a summer working alongside Library of Congress preservation experts and curators in preserving 500-year-old documents. Maggie Castle got that opportunity.

For nine weeks last summer, Castle worked on a diary from the mid-15th century and a 1513 Ptolemy atlas that few people ever see, let alone examine in great detail. Castle applied for and received an internship in the Preservation and Testing Division at the Library of Congress in Washington, D.C. to work on three separate projects using spectral imaging at ultra violet, visible, and near-infrared wavelengths.

“The value of such an opportunity to an undergraduate student is incalculable, and she will find that the techniques she utilized are applicable in a wide range of disciplines, including medicine and environmental remote sensing.” - Dr. Roger Easton Jr., Professor