



**ROSE-HULMAN**  
INSTITUTE OF TECHNOLOGY



**Biology**



# Biology at Rose-Hulman

Biologists fill a critical role in addressing the variety of challenges we face in our modern society- everything from drug discovery and gene therapy to environmental restoration and agriculture management. A biology degree from Rose-Hulman will put you at the forefront of finding solutions to current and future biotechnical problems. Our program produces broadly educated and highly trained biologists who:

- Have a solid, highly sought-after background in mathematics, biochemistry and experimental design.
- Are skilled in scientific investigation, modern research techniques and scientific communication.
- Are competitive and ready for medical school, PhD programs and careers in a variety of industries without going onto graduate programs (health care, agricultural science, food safety).

Faculty support and mentorship is a hallmark of a RHIT education. Our low student-to-faculty ratio means you'll receive individual attention and support from expert faculty who will challenge you to exceed your potential. Our biology program emphasizes developing core scientific skills through hands-on experience and research opportunities built into the coursework beginning freshman year.

In the first term of the biology curriculum, students investigate the biodiversity in woodlands in West Central Indiana to practice data collection and analysis. In later courses, which are based around the Course Based Undergraduate Research Experience (CURE) model, students continue to engage in authentic research from planning to publishing. Projects include searching for novel antibiotics molecules, building computational models of populations, and testing cancer therapeutics on cell cultures.



## Courses

Rose-Hulman's biology program includes a laboratory-intensive core curriculum, along with a variety of elective courses that allow you to find and pursue your passions. Our program provides a solid foundation in chemistry, mathematics, and physics, all of which are needed to solve modern biological problems and provide the preparation necessary for success in further education, like medical or graduate school. These courses will create the foundational understanding you need for the GRE, MCAT, or other exams necessary for admittance into post-secondary education institutions.

The core biology program includes classes in: genetics, microbiology, cell biology, ecology, evolution, bioethics, chemistry, mathematical modeling, data analysis, statistics, and computer programming.

Students are able to customize their learning to fit their interests and future goals, for example:

- Taking electives in Applied Microbiology, where students learn about fermentation, bioremediation, pharmaceutical production, and other biological processes important to the economy.
- Taking electives in Genomics and Proteomics, where students learn to analyze DNA and protein data to make inferences about history, medicine, and the way life works.
- Taking electives in Cancer Biology, Virology, and Evolutionary Medicine, where students learn the underlying biological mechanisms of diseases to help develop new treatments in the future.
- Taking electives in Selfish Genetics, where students think about how genes seem to work in their own interests against one another and students learn to understand the makeup of the whole genomes of organisms.
- Biology students choose one of two mathematics tracks, one focuses on statistics and data analysis while the other focuses on mathematical modelling of biological phenomena.
- Biology students also choose a diverse set of electives in the Humanities Social Sciences and the Arts (9 courses), science or technology electives, and several free electives.



## Further Ways to Customize: Minors and Second Majors

As a biology major, you can customize your education by adding any of our 40+ minors or a second major in another field. A biology minor also is available for students who major in a different subject. Recently students in Mechanical Engineering, Computer Science, and other majors have decided to pursue a second major in Biology because of the increasing world of technology that depends on and interacts with living systems. Biology students benefit from the broad perspectives and new techniques these students bring to the classroom.

## Undergraduate Research Opportunities: The Thesis

A unique feature of our biology program enables all biology majors to complete a year-long independent research project pursuing an original research question. This experience closely matches the research flow in a master's or PhD program, giving students ownership over the work and preparing them to excel in future research oriented careers, providing them a leg up on biology majors from other institutions. Under the guidance of a faculty mentor, you'll gain valuable experience in the various steps in the research process, including: Preparing a research proposal, conducting experiments, analyzing results, and presenting research.

The senior research project also helps you develop valuable project management and professional communication skills that are necessary in the workplace. RHIT is the only school in Indiana to require an almost 2 year, five-quarter, extensive research project at the undergraduate level, and it is one reason our graduates are attractive to graduate schools and employers.





## Other Research

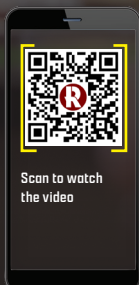
In addition to the senior research project, you'll have the opportunity to work on multi-disciplinary research with faculty and students from other departments. Recent projects have investigated alternative energy sources, the emergence of new viruses, and plant disease defense mechanisms.

Rose-Hulman also provides opportunities for engaged students to begin independent research early in their undergraduate career. Through programs like IPROP and R-SURF students can receive funding and other support to engage in research experiences with faculty and upper-year students. Rose students present work at regional and national conferences. For example students have presented work at conferences hosted by: Rice University, The Society for the Study of Evolution, The American Society of Naturalists, and the American Society of Microbiology.

## Internships

Our students are competitive for placement in internships, co-ops, and summer research experiences for undergraduates. Biology majors have found opportunities at:

- AG Metrics Group
- Archer Daniels Midland
- Cincinnati Children's Hospital
- Cornell University
- Corteva Agriscience
- DLZ Corp
- FDA Center for Veterinary Medicine
- Max Planck Institute
- Nationwide Children's Hospital
- Pfizer
- University of California, Irvine
- University of Michigan



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## Get in Touch!



Biology and  
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# Biology Students at Rose

## Careers

An RHIT biology degree leads to diverse career opportunities in such fields as medicine and health care, medical research, agribusiness, biotechnology, ecology, and quality assurance. Some of the companies that have hired recent graduates are:

- Bayer
- Boston Scientific
- Covance
- Elanco
- Eli Lilly
- Medimmune
- MIT Lincoln Laboratory
- Ossium Health
- Proctor & Gamble
- Southwest Research Institute

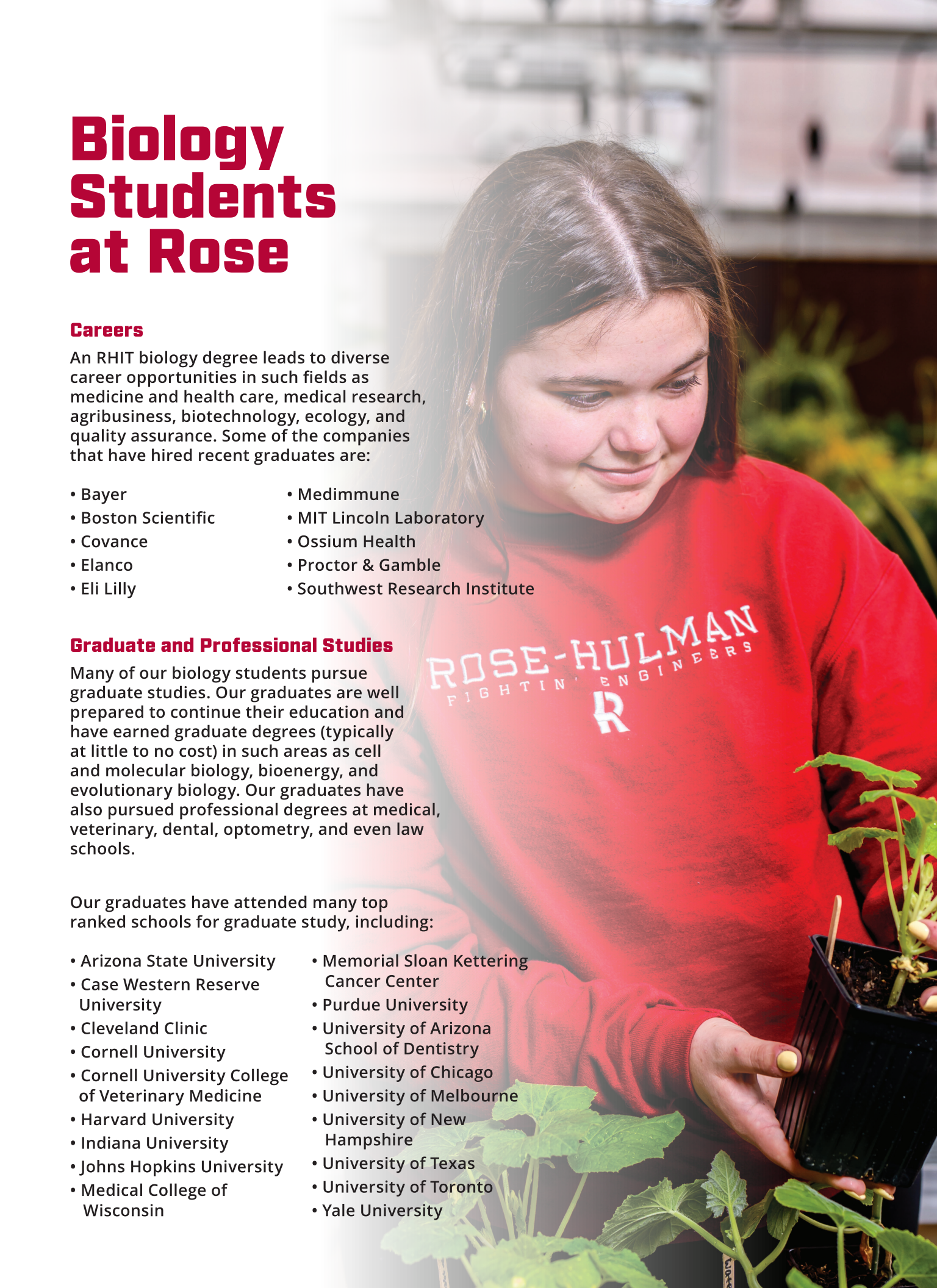
## Graduate and Professional Studies

Many of our biology students pursue graduate studies. Our graduates are well prepared to continue their education and have earned graduate degrees (typically at little to no cost) in such areas as cell and molecular biology, bioenergy, and evolutionary biology. Our graduates have also pursued professional degrees at medical, veterinary, dental, optometry, and even law schools.

Our graduates have attended many top ranked schools for graduate study, including:

- Arizona State University
- Case Western Reserve University
- Cleveland Clinic
- Cornell University
- Cornell University College of Veterinary Medicine
- Harvard University
- Indiana University
- Johns Hopkins University
- Medical College of Wisconsin
- Memorial Sloan Kettering Cancer Center
- Purdue University
- University of Arizona School of Dentistry
- University of Chicago
- University of Melbourne
- University of New Hampshire
- University of Texas
- University of Toronto
- Yale University

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## ABOUT ROSE-HULMAN

Rose-Hulman is one of the nation's top undergraduate engineering, science, and mathematics colleges. Our 1,300-acre scenic campus is home to more than 2,200 students with a passion for STEM and learning. We are consistently rated among the best colleges and universities in the country for return on investment, internships, and career placement.

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