Thank you for your interest in the School of Science, where we are driving the interdisciplinary frontiers of science through our research and educational activities. Our faculty and students work collaboratively to discover answers to humanity’s most compelling questions, to define new fields of study, and to invent solutions to global challenges. Our students engage in extensive hands-on, experiential learning, and most experience discovery firsthand through research.

If you are interested in bringing the best of all fields of study together to advance knowledge, and in taking discoveries from the laboratory and classroom to the real world to address serious challenges, then I hope you will consider joining us.

Students in the Rensselaer School of Science have the opportunity to do incredible things. Dive into a living, breathing environmental lab at our Darrin Fresh Water Institute on Lake George. Optimize the performance of the Internet. Investigate the cause of Alzheimer’s disease. Build an animated 3-D model of a new disease-fighting drug. Explore new approaches to renewable energy. Seek out the building blocks of life in space.

The School of Science degree programs encompass cutting-edge fields and include many free electives, enabling students to tailor a curriculum to their individual interests and talents. If all this sounds good, visit our website below for more great information, or better yet, come to campus for a visit. Come explore Science at Rensselaer!

**APPLIED PHYSICS**
Degree Offered: B.S.
Research/Concentrations
- Energy science
- Microelectronics
- Nanotechnology and materials
- Nuclear science
- Optics
- Space science

Recent Undergraduate Research
- Magnetic nanostructures
- Molecular dynamics
- Semiconductor light sources
- Terahertz spectroscopy and imaging
- Thin film evolution

Professor Peter D. Persans
persap@rpi.edu
www.rpi.edu/dept/phys

**BIOCHEMISTRY/BIOPHYSICS**
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
- Biochemistry
- Biophysics
- Enzymology
- Protein structure, chemistry, and proteomics

Recent Undergraduate Research
- NMR of intrinsically disordered proteins
- Rational protein design and re-design
- Transport of Na⁺ across the cell membrane of *Vibrio cholera*
- Volumetric properties of globular proteins
- Mechanochemical properties of kinesins

Professor George Makhatadze
makhag@rpi.edu
www.rpi.edu/dept/bcbp

Recent Undergraduate Research
- Fluorescent biosensor design
- Molecular dynamics simulation of membranes
- Simulating knot formation in proteins
- High throughput protein complementation
- Unfolding proteins by hierarchical bifurcation

Professor Chris Bystroff
bystrc@rpi.edu
www.rpi.edu/dept/bio/undergraduate/bsbioinfo.html

“One of the most exciting aspects of being a part of the School of Science is how cutting edge the fields are. It is incredible to be part of this ‘new age’ of science and be able to innovate in our state-of-the-art research, laboratory, and classroom settings.”

Alexandra Newman ’10  Biochemistry/Biophysics
BIOLOGY
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
• Cellular, molecular, and developmental biology
• Computational biology and bioinformatics
• Cancer and stem cell biology
• Aging in model organisms
• Molecular motors
• Nanobiology, nanotechnology, and biotechnology
• Biochemistry and bioenergetics
• Structural biology and biophysics
• Ecology and environment of the Adirondack Lakes and Hudson River
Recent Undergraduate Research
• Biochemical control of tumor cell migration
• Biochemistry of bacterial adaptation to diverse environments
• Microtubule modifications as cell polarity signals
• Myosin mutations and muscle consequences
• Role of kinesins in microtubule dynamics
• Structure-function analysis of protein folding diseases
Professor George Plopper
ploppg@rpi.edu
www.rpi.edu/dept/bio

CHEMISTRY
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
• Analytical and bioanalytical chemistry
• Biochemistry and biophysical chemistry
• Computer modeling/molecular design
• Inorganic and organometallic chemistry
• Cheminformatics and materials informatics
• Organic and medicinal chemistry
• Polymer and materials chemistry
Recent Undergraduate Research
• Prebiotic synthesis of peptides
• Materials informatics for high-performance dielectric composites
• Protein conformation structure and stability
• Heparin and glycomics
Professor Gerald Korenowski
koreng@rpi.edu
Professor Curt Breneman
brenec@rpi.edu
www.rpi.edu/dept/chem

COMPUTER SCIENCE
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
• Computational science
• Computer graphics
• Computer vision
• Cyber warfare
• Mobile and distributed computing
• Robotics
• Social networking
• Web and data sciences
Recent Undergraduate Research
• Building a distributed database of geologic information
• Computer vision for environmental applications
• ISP pricing strategy analysis
• Massively parallel algorithms for unstructured meshes
• Offloading smart phone computation to the cloud
• Simulation of social network formation
Professor David Goldschmidt
goldsd3@rpi.edu
www.cs.rpi.edu

ENVIRONMENTAL SCIENCE
Degree Offered: B.S.
Research/Concentrations
• Biogeochemistry
• Contaminant geochemistry
• Environmental chemistry
• Freshwater ecology
• Groundwater and surface hydrogeology
Recent Undergraduate Research
• Dating recent sediments from the Hudson River and its tributaries
• Quantifying sediment contamination in the Hudson River
• History of sediment and trace metal accumulation
• Soil core inventories of atmospheric deposition of natural and fallout radionuclides
• Geologic background for trace metals in “average shales”
Professor Richard Bopp
boppr@rpi.edu
www.rpi.edu/dept/envsci

GEOLOGY/HYDROGEOLOGY
Degrees Offered: B.S. (Geology), M.S. (Geology), Ph.D. (Geology)
Research/Concentrations
• Environmental geochemistry
• Geophysics
• Petrology
• Solid-earth geochemistry
• Tectonics
• Paleoclimatology and micropaleontology
• Geomicrobiology and the origin of life
• Planetary geology
Recent Undergraduate Research
• Grain boundary diffusion of noble gases and metals in solar-system materials
• Grain boundary diffusivity of carbon and carbon dioxide
• Reconstruction of sea-level changes in the geologic past
• Mapping post Hurricane Irene fluvial morphology evolution
Professor Frank S. Spear
spearf@rpi.edu
www.rpi.edu/dept/ees

MATHEMATICS
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
• Applied mathematics
• Computational science
• Inverse problems
• Operations research
Recent Undergraduate Research
• Computer adaptive systems
• Modeling cell division
• Geometry of animation
• Numerical solution of conservation laws
Professor Bruce Piper
piperb@rpi.edu
www.math.rpi.edu

PHYSICS
Degrees Offered: B.S., M.S., Ph.D.
Research/Concentrations
• Astronomy
• Astrophysics
• Biophysics
• Condensed matter physics
• Optical physics
• Particle physics
Recent Undergraduate Research
• Molecular spintronics
• Network computation
• Photonic nanodevices
• Structure of the Milky Way Galaxy
• Neutrino oscillation experiments
Professor Jim Napolitano
napol@rpi.edu
www.rpi.edu/dept/phys

Visit our online catalog for more detailed information at www.rpi.edu/academics/catalog