

PHYSICS

<http://www.rit.edu/cos/physics>

PROGRAM OVERVIEW FOR EMPLOYERS

The BS program in Physics offers a broad curriculum which prepares students for employment in research and industry after graduation, as well as for graduate study in physics and related areas. The structured core curriculum provides a broad and solid foundation in experimental, computational, and theoretical concepts, with emphasis on laboratory training and experience relevant to the requirements of the professional world of work and of advanced study in graduate or professional programs. It also is sufficiently flexible so that the student can plan a minor or an elective concentration in such areas as optics, engineering, astronomy, biology, chemistry, computer science, mathematics, business, or imaging science.

Degree(s) Awarded

Bachelor of Science

Enrollment

Approximately 140 students

Cooperative Education Component

- Optional; 2 or 3 quarters recommended
- All students eligible upon completion of second year courses
- Most co-ops are during spring and/or summer

Salary Information (Avg/Range)

Co-op: Insufficient data

BS: * \$50,775

* From the National Association of Colleges & Employers (NACE) for 2009-2010 graduates

Equipment & Facilities

- Condensed matter laboratory: nitrogen and helium cooling; closed-cycle helium refrigerator; high temperature process furnace; high and low temperature superconductor preparation
- Laser light scattering laboratory: complex and biological fluid studies; molecular basis of cataracts.
- Deposition by DC -sputtering, and by thermal evaporation; surface profilometer; high vacuum systems.
- Optics laboratory: various standard optical equipment; low-power lasers; one high-power laser; wavelength/frequency analysis; laser light communications and imaging applications.
- Magnetic materials laboratory: vibrating sample magnetometer; magnetic and electric field measurements for bulk and thin film materials.
- Observatory: 14-inch and 12-inch telescopes with CCD cameras, video cameras and GPS time-stamping capability.
- Granular Material Laboratory: dynamics and jamming of granular materials in a variety of geometries, including materials in a variety of geometries, including avalanches n rotating drums and jamming in hopper flow; video and mass flow data acquisition and analysis.
- Nanopower Research Laboratories (NPRL) – dedicated to the basic and applied nanotechnology research associated with the development of materials and devices for energy conversion and storage.

NPRL Equipment: TS Space Systems 18kW 300 mm dual source solar simulator, Agilent B1500 Semiconductor Parametric Analyzer, Cascade RF Probe Station, 514nm Arion laser, Horiba iHR320 Imaging Spectrometer, Ocean Optics HR2000 and NIR512 spectrometers, Janis ST-500 cryogenic probe station, ASD Fieldspec spectroradiometer, Kurt Lesker PVD75 and Nano38 thermal deposition systems. Hitachi S-900 High Resolution FE-SEM, FEI Phillips XL30 ESEM, PGT IMIX X-ray Microanalysis System, Nanoscope 3 Scanning Probe Microscope, Single Wall Carbon Nanotube Alexandrite Laser Vaporization Reactor, Multi-wavelength Jobin Yvon Horriba Raman Microscope, PE Lamda 900 UV-Vis-NIR Spectrophotometer, TA Instruments Q-series DSC and TGA, Zeiss Digital Microscopic Imaging System, Cressington 308 Multisource Deposition System, Micropen TM Direct Writing System, Arbin BT-2000 Electrochemical Testing System, Dual Manifold 6/Schlenk Line.

Student Skills & Capabilities

Effective oral and written technical/scientific communication
 Research methodologies
 Statistical analysis of laboratory data, including scaling and critical behavior
 Digital & analog electronics and applications
 Computer programming (high and low-level languages) & applications
 High vacuum technology & applications: thin film deposition and characterization
 Computer interfacing to laboratory instrumentation using LabVIEW
 Electron microscope operation and analysis
 Physical measurements involving: modern physics, thin films, low & high temperature superconductors, nanostructured materials, magnetic materials, optical phenomena, lasers and laser light scattering, magnetic and electric field measurements, low temperature phenomena, bulk materials and thin (film) characterization, chromatography, astronomical imaging and analysis, high speed video analysis.

Concentrations

- Elective in various other fields

Physics

Course Sequence BS degree

First & Second Years:

University Physics I-III (with labs)
Project-Based Calculus I-III
General & Analytical Chemistry (with labs)
Multivariable Calculus
Differential Equations
Intro to Computational Physics and Programming
Modern Physics I & II
Experiments in Modern Physics I
Electronic Measurements (with lab)
Vibrations & Waves
Sophomore Physics Seminar
Liberal Arts Courses
Cooperative Education (optional; following completion of second year courses)*

Third and Fourth or Fifth Years*:

Intermediate Mechanics I & II
Introduction to Laboratory Techniques
Thermal Physics
Mathematical Methods in Physics I
Electricity and Magnetism I & II
Experiments in Modern Physics II (with labs)
Physical Optics
Quantum Mechanics I & II
Capstone Preparation and Capstone Project I & II
Physics Electives (8 cr. hr.)
Technical and free electives
Liberal Arts Courses
Cooperative Education (optional)*

*Note: Students who elect to participate in co-op during the academic year require a fifth year to complete their coursework.

Employers of Physics Co-op and Graduating Students:

Argonne National Laboratory, Lockheed Martin Space Systems, National Institute of Standards & Technology, Nrg Energy, Univ. of Rochester Lab for Laser Energetics, Welch Allyn, Jet Propulsion Laboratory, Intel, Cypress Electronics, Fermilab, GE Inspection Technologies, RIT Carlson Center for Imaging Science, Motorola, University of Maryland, CFD Research Corporation, NASA Glenn Research Center, SCHOTT North America, Virtual Solutions, QED Technologies

Contact Us:

We appreciate your interest in hiring RIT co-op, graduating students or alumni. We will make every effort to make your recruiting endeavor a success. Call our office and ask to speak with Charles Dispenza, the program coordinator who works with the Physics program. For your convenience, you can access information and services through our web site at <http://www.rit.edu/recruit>.

Charles W. Dispenza

Program Coordinator

Office of Cooperative Education and Career Services

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