Nanoscale Physics

The Wiess School of Natural Sciences

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Degrees Offered: M.S.

Rice University will introduce a professional master's degree in Nanoscale Physics for the 2002–2003 academic year. This program combines a strong component in quantum theory, which governs the behavior of systems at the nanoscale, with the study of practical nano- and mesoscale devices. The program will provide the student the knowledge required to successfully navigate the emerging field of nanotechnology. New courses cover cutting-edge areas such as quantum behavior of nanostructures, quantum nanotechnology, nanoscale imaging, and the fabrication of nanostructures. In addition, a year-long course in methods of experimental physics ensures that students obtain the advanced practical skills valuable to industry.

The Nanoscale Physics degree is one of three tracks in the new Professional Master's Program at Rice housed in the Wiess School of Natural Sciences. These master's degrees are designed for students seeking to gain further scientific core expertise coupled with enhanced management and communication skills. These degrees instill a level of scholastic proficiency that exeeds that of the bachelor's level and create the cross-functional aptitudes needed in modern industry. This will allow students to move more easily into management careers in consulting or research and development, design, and marketing of new science-based products.

Degree Requirements for the M.S. in Nanoscale Physics

The 21-month professional master's program begins with two semesters of course work at Rice followed by a six-month industrial internship. After the internship, students return to Rice for a final semester of course work. In addition to taking technical courses, students in the Nanoscale Physics program will take management courses, a science policy and ethics course, and a seminar jointly with the students involved in the other professional master's tracks, No thesis is required; however, students are required to present their internship projects in both oral and written form in the Professional Master's Seminar. Students also are required to attend events organized by the Rice Alliance for Technology and Entrepreneurship and will be guided in courses by the efforts of the Cain Project in Engineering and Professional Communication.

For general university requirements for graduate studies, see pages 68–70, and see also Professional Degrees, page 63.

Year 1

Fall Semester
NSCI 501 *Professional Master's Seminar*
MGMT 750 *Management for Science and Engineering*
PHYS 533 *Nanostructures and Nanotechnology I*
PHYS 537 *Methods of Experimental Physics I*
PHYS 539 *Characterization and Fabrication at the Nanoscale*

Spring Semester
Elective
NSCI 501 *Professional Master's Seminar*
PHYS 534 *Nanostructures and Nanotechnology II*
PHYS 538 *Methods of Experimental Physics II*
PHYS 416 *Numerical Methods and Modeling*

Summer
Industrial Internship

Year 2

Fall Semester
NSCI 500 *Industrial Internship*
NSCI 501 *Professional Master's Seminar*

Spring Semester
3 electives
Science Policy and Ethics
NSCI 501 *Professional Master's Seminar*

Elective Courses: (Students will choose 4. At least 2 must be science or engineering at the 500 level or above.)

Biological Sciences
CAAM 378 *Introduction to Operations Research*
CHEM 630 *Molecular Spectroscopy and Group Theory*
ELEC 568 *Laser Spectroscopy*
ELEC 595 *Microlithography*
ELEC 603 *Nano-Optics and Nanophotonics*
ELEC 645 *Thin Films*
ELEC 685 *Fundamentals of Medical Imaging*
ENGI 303 *Engineering Economics and Management*
MGMT 617 *Managerial Decision Making*
MGMT 636 *Systems Analysis and Database Design*
MGMT 661 *International Business Law*
MGMT 674 *Production and Operations Management*
MGMT 676 *Project Management/Project Finance*
MGMT 721 *General Business Law*
MGMT 751 *New Venture Creation in Science and Engineering*
PHYS 569 *Ultrafast Optical Phenomena*
or other courses as specified by the program director and approved by the Oversight Committee