Graduate Study *at*

RICE

THE PROGRAM

The Wiess School of Natural Sciences offers professional master's degrees in the following five areas: Subsurface Geoscience, Environmental Analysis and Decision Making, Nanoscale Physics, Bioscience and Health Policy and Space Studies. These degrees equip students with the skills needed to bridge the gaps between science, business and government. Students are educated in the scientific approach to problems and are simultaneously trained in vital business concepts, policy issues and communication skills.

Each degree track is composed of science courses, a set of cohort courses and an internship. The cohort courses, required for students enrolled in all five tracks, focus on business and communication skills and prepare students for work in a nonacademic environment. The required internship allows students to apply the knowledge and skills acquired at Rice while gaining valuable work experience in an industrial setting. This combination of an interdisciplinary curriculum and hands-on experience enables graduates to hit the ground running in a business environment.

Students in the Professional Science Master's program will benefit from Rice's low student–faculty ratio and its collaborative culture that crosses disciplines and integrates teaching and research. Within the Wiess School of Natural Sciences are six departments, all with strong national reputations and excellent faculty. Wiess School faculty and staff members are active in their fields and professional societies and contribute significantly at national and international levels. Numbered among the faculty is a Nobel laureate, two members of the National Academy of Sciences and numerous fellows of the American Association for the Advancement of Science and the American Academy of Arts and Sciences. In addition to studying under Wiess School professors, students will be exposed to management issues, policy, ethics and communication curricula developed and taught by Rice professors in the George R. Brown School of Engineering, the Jesse H. Jones Graduate School of Business and the James A. Baker III Institute for Public Policy.

PROFESSIONAL SCIENCE MASTER'S FIFTH-YEAR DEGREE OPTION FOR RICE UNDERGRADUATES

Rice students have an option to achieve a Professional Master's Degree by adding a fifth year to the four undergraduate years of science studies. Advanced Rice students in good standing apply during their junior year, then start taking required core courses of the program during their senior year. A plan of study based on their particular focus area will need to be approved by the track director and the PSM director.

PSM/MBA JOINT DEGREE PROGRAM

In order to offer a deeper immersion into management and business acumen, the Professional Science Master's is collaborating with Rice's Jesse H. Jones Graduate School of Business to offer the dual PSM/MBA program. According to the Professional Science Master's track chosen, graduates are qualified for leadership roles in industries related to the environment, nanotechnology, energy and government.

SCIENCE COURSES

Each degree track includes a set of core science courses that provide students with the technical knowledge needed by industrial and governmental organizations. Students supplement these foundation courses by choosing electives in line with their areas of interest.

COHORT COURSES

Management for Science and Engineering

This course is designed to give students insights into how technology-oriented firms manage intellectual property, marketing, organizational behavior, strategy, accounting and finance.

PROFESSIONAL SCIENCE MASTER'S IN THE WIESS SCHOOL OF NATURAL SCIENCES

Rice University

Bioscience and Health Policy

Environmental Analysis and Decision Making

Nanoscale Physics

Subsurface Geoscience

Space Studies

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Science Policy and Ethics

This course provides students with a broader understanding of the ways that politics, policies and ethics interact with the world of business, science and technology. Topics include business ethics, ethics application, policy and politics, policy analysis and public policies.

Professional Master's Seminar

This weekly seminar serves to provide exposure to local industry leaders from all program tracks and to generate a forum for students to present internship project results and receive communication training.

INTERNSHIPS

The required internship is a unique feature of the degrees from the Professional Science Master's Program. Students are required to complete a three- to six-month internship with a company, government agency or national laboratory. Students may choose any internship in line with their interests and area of study, provided it is approved by the track director. Assistance in identifying potential internships will be provided. Students also will benefit from Rice's close ties with local and national industry and from personal contact with business executives speaking at the Professional Master's Seminar.

At the conclusion of this internship, students must present a summary of their internship project(s) in both oral and written form as part of the Professional Master's Seminar. This serves as the culmination of each student's academic program in science and industry.

Rice recognizes that many students may have previous industrial experience in their area of study. In lieu of an internship, these students may choose an appropriate project for their final report. Part-time students who already work in their area of study may fulfill the internship requirement by working on a special project with their current employer. All projects require approval from the appropriate track director.

BOARD OF AFFILIATES

Industry has played an important role in all stages of the development of the Professional Science Master's Program. Three to four managers or entrepreneurs in each of the industrial focus areas are members of the Board of Affiliates, which advises Rice on the entire program. Additionally, many of these members and others from the community participate in informal advisory groups, which provide feedback on the curriculum of each degree track. These members have national and international recognition in their fields and are able to assist in identifying future directions and needs within each of the focus areas so that the programs can be continuously updated.

MASTER'S DEGREE IN SUBSURFACE GEOSCIENCE

The Master of Science in Subsurface Geoscience is geared for students who would like to become proficient in applying geological knowledge and geophysical methods to finding and developing reserves of oil and natural gas. The core requirements for the degree are courses in geophysical exploration methods, management and policy, as well as an industrial internship. Students select a group of elective courses from two focus areas: geology and geophysics. The geology focus area prepares students to be "explorationists," with strong skills in using seismic and other geophysical methods along with geological principles to find oil and natural gas. The geophysics focus area prepares students to become technical experts in aspects of exploration seismology.

Courses in the earth science, statistics, computer science,

M.S. IN SUBSURFACE GEOSCIENCE

Required professional courses (9 credits):

NSCI 610	Management in Science and Engineering (F/S)
NSCI 501	Professional Master's Seminar (F/S) *[required for two semesters]*
NSCI 511	Science Policy and Ethics (S)
NSCI 512	Professional Master's Project (F/S)
NSCI 510	Internship

There are two focus areas in the Subsurface Geoscience Track: **Geology and Geophysics**

GEOLOGY FOCUS AREA

Required Courses (22 credits):

ESCI 334	Geological Field Methods (F)
ESCI 415	Petroleum Geology (S)
ESCI 417	Petroleum Industry Economics and Management (S)
ESCI 427	Sequence Stratigraphy (S)
ESCI 428	Seismic Reflection Data Interpretation (F)
ESCI 442	Exploration Geophysics I (F)
ESCI 436	Well Logging and Petrophysics (S)

Students will choose three electives (9 credits)

Suggested Electives:

ESCI 420	Modern Exploration Technology (S)
ESCI 444	Seismic Data Processing (S)
ESCI 463	Advanced Structural Geology I (S)
ESCI 504	Siliciclastic Depositional Systems (F)
ESCI 506	Carbonate Depositional Systems (S)
ESCI 544	Hydrocarbon Exploration (AAPG Imperial Barrel competition) (S)

... and others

Substitutions for required or elective courses may be approved by the Track Advisors.

GEOPHYSICS FOCUS AREA

Required Courses (22 credits):

ESCI 415	Petroleum Geology (S)
ESCI 417	Petroleum Industry Economics and Management (S)
ESCI 420	Modern Exploration Technology (S)
ESCI 428	Seismic Reflection Data Interpretation (F)
ESCI 440	Geophysical Data Analysis: Digital Signal Processing (F), **or**,
ESCI 441	Geophysical Data Analysis: Inverse Methods (F)
ESCI 442	Exploration Geophysics (F)
ESCI 444	Seismic Data Processing (S)
ESCI 445	Joint Inversion of Exploration Geophysical Data

... and others

Students will choose three electives (9 credits):

Suggested Electives:

ESCI 334	Geological Field Methods (S)
ESCI 426	Interpretation of Regional 2D Seismic Data
ESCI 427	Sequence Stratigraphy (S)
ESCI 445	Joint Inversion of Exploration Geophysical Data
ESCI 463	Tectonic Systems (F)
ESCI 436	Well Logging and Petrophysics (S)
ESCI 544	Hydrocarbon Exploration (AAPG Imperial Barrel competition) (S)

... and others

CEVE 322	Engineering Economics for Engineers (F)
COMP 429	Introduction to Computer Networks (S)
ECON 438	Business, Law and Economics (S)
ESCI 454	Geographic Information Science (F)
MGMT 610	Fundamentals of the Energy Industry (F)
MGMT 661	International Business Law (S)
MGMT 674	Production and Operations Management (F)
MGMT 676	Social Enterprise (S)
STAT 310	Probability and Statistics (F, S)
STAT 410	Introduction to Statistical Computing and Computer Models (F, S)
POST 401	Energy Policy (S)
... and others	

Substitutions for required elective courses may be approved by the Track Advisors.

Internship
A three- to six-month internship under the guidance of a host company, government agency or national laboratory is required. At the conclusion of this internship, students must present their internship project in both oral and written forms as part of the Professional Master's Project.

TOTAL REQUIRED CREDIT HOURS: 40 credits

chemical engineering, computational and applied mathematics and economics departments as well as the Jesse H. Jones Graduate School of Business have been incorporated into the curriculum. Students will enroll in two courses team-taught by industry leaders. Petroleum Industry Economics and Management introduces students to essential components of financial decision making in the energy business, emphasizing risk analysis, and Modern Industrial Exploration Techniques exposes students to advanced techniques currently used in the exploration industry.

THE FACULTY AND THEIR RESEARCH

Vitor Abreu. Adjunct Professor. Ph.D., Rice University. Senior Exploration Geologist, ExxonMobil Exploration Company. Sequence stratigraphy, evolution of passive margins and deep-water reservoirs.

John B. Anderson. Professor. Ph.D., Florida State University, 1972. Atratigraphy/sedimentology and Antarctic marine geology.

Andrew R. Barron. Professor. Ph.D., Imperial College of Science and Technology, University of London, 1986. Applications of inorganic chemistry to the materials science of aluminum, gallium and indium.

Steve H. Danbom. Adjunct Professor. Ph.D., University of Connecticut, 1975. Multicomponent seismology and shallow water acoustics.

Gerald R. Dickens. Professor. Ph.D., University of Michigan, 1996. Paleoceanography, marine geology and low-temperature geochemistry.

André W. Droxler. Professor. Ph.D., University of Miami, 1984. Carbonate sedimentology with emphasis on periplatform carbonate ooze.

Brandon Dugan. Associate Professor. Ph.D., Penn State, 2003. Hydrogeology and fluid flow, marine geology and sediment mechanics.

Richard Gordon. Earth Science Chair. Ph.D., Stanford University, 1979. Global tectonics and tectonophysics, marine geophysics, space geodesy, paleomagnetism.

Alan R. Levander. Professor. Ph.D., Stanford University, 1984. Lithospheric seismology and wave propagation.

Carrie Masiello. Associate Professor. Ph.D., University of California–Irvine, 1999. Carbon cycling, carbon sequestration, climate change, black carbon, terrestrial–river–ocean biosphere interactions.

Julia Morgan. Professor. Ph.D., Cornell University, 1993. Marine geology, neotectonics and structural geology.

Fenglin Niu. Professor. Ph.D., University of Tokyo, 1997. Global seismology, seismic structure of the earth's deep interior.

W. C. Rusty Riese. Adjunct Professor. Ph.D., University of New Mexico, 1980. Consulting Geologist. Reserves assessments, applied inorganic and bio-geochemistry.

Peter Rossky. Dean of Wiess School of Natural Sciences. Ph.D., Harvard University. Theoretical chemistry, computer simulation, solvent effects on chemical reactions, condensed phase quantum dynamics, photochemistry.

Dale S. Sawyer. Professor. Ph.D., Massachusetts Institute of Technology, 1982. Geodynamics, seismology, remote sensing and geomorphology.

Colin A. Zelt. Professor. Ph.D., University of British Columbia, 1989. Seismology and inverse methods.

MASTER'S DEGREE IN ENVIRONMENTAL ANALYSIS AND DECISION MAKING

The Environmental Analysis and Decision Making track will teach students rigorous methods that are needed by industrial and governmental organizations to deal with environmental issues. In addition to track courses, students will take a management course, a policy and ethics course and a seminar jointly with the students involved in the other tracks.

To ensure that all students obtain an excellent quantitative back-

M.S. IN ENVIRONMENTAL ANALYSIS AND DECISION MAKING

Required Science Core Courses
EBIO 570 Ecosystem Management and Conservation (S)
CEVE 510 Principles of Environmental Engineering (F)
or
CEVE 501 Chemistry for Environmental Engineering and Science (F)
STAT 685 Quantitative Environmental Decision Making (S)

Required Cohort Courses
NSCI 501 Master's Seminar (two semesters required) (F, S)
NSCI 511 Science Policy and Ethics (S)
NSCI 512 Professional Master's Project
NSCI 610 Management in Science and Engineering (F, S)

Elective Courses
Students will choose 21 credit hours elective courses from the following three focus areas and satisfying the following requirements:

one course (3 credits) from each of EBIO, CEVE and STAT,
one course (3 credits) from the Management and Policy focus area,
and three courses (9 credits) from one focus area.

Recommended courses include, but are not limited to, the following:

Environmental Sustainability

CEVE 307	Energy and the Environment (S)
CEVE 412	Hydrology and Watershed Analysis (S)
CEVE 415	Water Resources Engineering and Planning (F)
CEVE 501	Chemistry for Environmental Engineering and Science (F)
CEVE 502	Sustainable Design (F)
CEVE 511	Atmospheric Processes (F)
CEVE 512	Hydrologic Design Lab (S)
CEVE 518	Ground Water Contamination and Modeling (S)
CEVE 520	Environmental Remediation and Restoration (F)
CEVE 534	Fate and Transport of Contaminants in the Environment (F)
CEVE 536	Environmental Biotechnology and Bioremediation (S)
CEVE 550	Environmental Organic Chemistry (S)
EBIO 323	Conservation Biology (F)
EBIO 325	Ecology (F)
EBIO 336	Plant Diversity (S)
EBIO 563	Current topics in Ecology (F)
EBIO 568	Current topics in Conservation Biology (S)
EBIO 569	Core course in Ecology and Evolutionary Biology (F)

ESCI 340	Global Biogeochemical Cycles (F)
ESCI 424	Earth Science and the Environment (S)
ESCI 450	Remote Sensing (S)
ESCI 454	Geographic Information Science (F)
STAT 684	Environmental Risk Assessment and Human Health (F)
POST 411	Integrated Approach to Sustainability (S)

Management and Policy

CEVE 505	Engineering Project Management and Ethics (F)
CEVE 506	Global Environmental Law and Sustainable Development (S)
CEVE 528	Engineering Economics (S)
ESCI 417	Petroleum Industry Economics and Management (S)
ECON 437	Energy Economics (F)
ECON 480	Environmental Economics (F)
SOCI 367	Environmental Sociology (F)
MGMT 609	Managing in a Carbon Constrained World (S)
MGMT 610	Fundamentals of the Energy Industry (F)
MGMT 661	International Business Law (S)
MGMT 674	Production and Operations Management (F)
MGMT 676	Social Enterprise (F)
POST 401	Energy Policy (S)

Quantitative Decision-Making

EBIO 338	Design and Analysis of Biological Experiments (F)
CEVE 313	Uncertainty and Risk in Urban Infrastructures (S)
CEVE 528	Engineering Economics (S)
ESCI 450	Remote Sensing (S)
ESCI 454	Geographic Information Science (F)
ECON 480	Environmental Economics (F)
STAT 312	Probability and Statistics for Civil and Environmental Engineers (F)
STAT 405*	Statistical Computing (F)
STAT 410	Introduction to Linear Models (F)
STAT 553	Biostatistics (S)
STAT 606*	SAS Statistical Programming
STAT 684	Environmental Risk Assessment and Human Health (F)

*Only one of these two courses may be counted toward the degree.

TOTAL REQUIRED CREDIT HOURS: 39 hours

ground, each student will be required to take a set of core courses. If a student can demonstrate that he or she has learned the material elsewhere, he or she may be exempted. In addition to completing the core courses, the student will choose electives.

THE FACULTY AND THEIR RESEARCH

Katherine B. Ensor. Professor. Ph.D., Texas A&M University, 1986. Time series, including categorical time series, spatial statistics, spatial-temporal methods, and estimation for stochastic process and environmental statistics.

Pedro Alvarez. Professor, Chair of the Department of Civil and Environmental Engineering. Ph.D., University of Michigan. Biological processes in natural and engineered systems.

Andrew R. Barron. Professor. Ph.D., Imperial College of Science and Technology, University of London, 1986. Applications of inorganic chemistry to the materials science of aluminum, gallium and indium.

Phil Bedient. Professor. Ph.D., University of Florida, 1975. Surface and groundwater hydrology, geographical information and decision support systems, flood control and water quality strategies, modeling, contaminant transport mechanisms in groundwater, aquifer remediation strategies and modeling.

Jim Blackburn. Professor. Practice in Environmental Law. Sustainable development, air pollution control strategy, and nonstructured flood control.

Daniel Cohan. Associate Professor. Ph.D., Georgia Institute of Technology, Atlanta, GA, 2004. Photochemical modeling, atmospheric sensitivity analysis, pollutant impacts on human health and vegetation, and environmental policy and management.

Qilin Li. Associate Professor. Ph.D., University of Illinois at Urbana-Champaign, 2002. Advanced treatment technologies for water quality control, membrane processes, colloids and interface science, and environmental impact of nanomaterials.

Loren Raun. Faculty Fellow. Ph.D. Rice University, 1998. Environmental statistics, human health risk assessment (including stochastic), air, soil and ground water pollution fate and transport.

Peter Rossky. Dean of Wiess School of Natural Sciences. Ph.D., Harvard University. Theoretical chemistry, computer simulation, solvent effects on chemical reactions, condensed phase quantum dynamics, photochemistry.

Dale S. Sawyer. Professor. Ph.D., Massachusetts Institute of Technology, 1982. Geodynamics, seismology, remote sensing and geomorphology.

Evan H. Siemann. Professor. Ph.D., University of Minnesota, 1997. Population and community ecology, forests, grasslands, plant ecology, insect ecology, plant/herbivore interactions, biodiversity and conservation biology.

MASTER'S DEGREE IN NANOSCALE PHYSICS

The Nanoscale Physics track 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. This combination will provide students with the knowledge required to successfully navigate the emerging field of nanotechnology. In addition, a yearlong course in experimental physics will be offered to ensure that students obtain the advanced practical skills valuable to industry. Rice is a well-established center for nanoscience, with researchers active in several departments outside the physics core. The Richard E. Smalley Institute for Nanoscale Science and Technology includes among its faculty Nobel laureate Robert Curl, as well as esteemed faculty from the physics and astronomy, chemistry, electrical and computer engineering, chemical engineering, computational and applied mathematics, bioengineering, civil and environmental engineering, and mechanical engineering and materials science departments. It focuses on interdisciplinary studies in many areas of nanoscale science, including carbon nanotubes, nanoshells and nanobiology.

M.S. IN NANOSCALE PHYSICS

Required courses:

PHYS 533	Nanostructures and Nanotechnology I (F)
PHYS 534	Nanostructures and Nanotechnology II (S)
PHYS 537	Methods of Experimental Physics I (F)
PHYS 538	Methods of Experimental Physics II (S)
PHYS 539	Characterization and Fabrication at the Nanoscale (F)

Required Cohort Courses:

NSCI 610	Management in Science and Engineering (F)
NSCI 501	Professional Master's Seminar (F/S) (required for two semesters)
NSCI 511	Science Policy and Ethics (S)
NSCI 512	Professional Master's Project (F/S)

Elective Courses

Students will choose another five courses from electives as grouped below, at least two courses should be from a technical focus area.

FOCUS Electives:

Nano-Materials

PHYS 416	Computational Physics (S)
MSCI 535	Crystallography and Diffraction plus lab (S)
MSCI 580	Microscopy Methods in Material Science (S)
MSCI 614	Special Topics: Principles of Nanoscale Mechanics (F)
MSCI 650	Nanomaterials and Nanomechanics (S)

Nano-Optics and Nano-Photonics

ELEC 568	Laser Spectroscopy (F)
ELEC 521	High Performance Nanoscale Systems
ELEC 571	Imaging at the Nanoscale (S)
ELEC 573	Optical Spectroscopy of Nanomaterials (S)
ELEC 603	Nano-optics and Nano-photonics (F)
ELEC 685	Fundamentals of Medical Imaging (F)
PHYS 569	Ultrafast Optical Phenomena (S)

Nano-Bio

BIOE 342/442	Tissue Engineering (F)
BIOE 498	Biomems & Medical Microdevices (S)
CHEM 547	Supramolecular Chemistry (F)
CHEM 600	Biological Chemistry or Nanoscale Chemistry?
ELEC 571	Imaging at the Nanoscale (S)
ELEC 568	Laser Spectroscopy (F)
HI 5324	Nanomedicine in Healthcare (F)
PHYS 539	Characterization and Fabrication at the Nanoscale (F)

Management Electives (min 3 hrs)

CEVE 322	Engineering Economics and Management (S)
MGMT 609	Energy Constrained World (S)
MGMT 661	International Business Law (F)
MGMT 669	Business Strategy in Energy Industry (S)
MGMT 674	Production and Operations Management (F)
MGMT 676	Project Management / Project Finance (S)
MGMT 721	General Business Law (S)

TOTAL REQUIRED CREDIT HOURS: 41 hours

THE FACULTY AND THEIR RESEARCH

F. Barry Dunning. Professor. Ph.D., University College London, 1969. Experimental atomic and molecular physics, surface physics, spin dependent phenomena, surface magnetism, chemical physics, optics and instrumentation.

Douglas Natelson. Professor. Ph.D., Stanford University, 1998. Nanoscale physics, in particular the electrical and magnetic properties of systems with characteristic dimensions approaching the single-nm scale.

Andrew R. Barron. Professor. Ph.D., Imperial College of Science and Technology, University of London, 1986. Applications of inorganic chemistry to the materials science of aluminum, gallium and indium.

Vicki L. Colvin. Professor, Vice Provost for Research. Ph.D., University of California, Berkeley, 1994. Nanocrystals, confined liquids and glasses, porous solids and photonic band gap materials.

Rui-Rui Du. Professor. Ph.D. University of Illinois at Urbana-Champaign, 1990. Experimental condensed matter, nanophysics.

Jason H. Hafner. Associate Professor. Ph.D., Rice University, 1998. Carbon nanotube synthesis: chemical kinetics and device fabrication and lipid bilayer substrates for biological atomic force microscopy.

Thomas C. Killian. Physics and Astronomy Chair. Professor. Ph.D., Massachusetts Institute of Technology, 1999. Atomic, molecular, and optical physics: cold collisions, Bose-Einstein condensation, fundamental measurements, high-resolution spectroscopy, atom-photon interactions and low temperature plasmas.

Peter Rossky. Dean of Wiess School of Natural Sciences. Ph.D., Harvard University. Theoretical chemistry, computer simulation, solvent effects on chemical reactions, condensed phase quantum dynamics, photochemistry.

Frank R. Toffoletto. Professor. Ph.D., Rice University, 1987. Magnetospheric physics, numerical simulations and space weather.

MASTER'S DEGREE IN BIOSCIENCE AND HEALTH POLICY

The Bioscience Research and Health Policy track will give students a deep background in science complemented by courses in sociology, economics and policy studies to foster their understanding of the role of science in policy making and the role of public policy in science. Their coursework will provide research and study skills enabling students to develop specific policy recommendations. Students will also receive the tool-set to become knowledgeable in the formulation and execution of public policy. In addition to track courses, students will take an overview course in Science and Technology Policy, a management course and a seminar jointly with the students involved in the other tracks.

Direct access with the Baker Institute will allow students to work closely with policy scholars as well as meet with many of the leaders in science and technology policy.

This program focuses on training health policy analysts providing them with the tools to face the complex challenges inherent in the US bioscience research, public health, healthcare systems and health-related industry.

THE FACULTY AND THEIR RESEARCH

Janet Braam. Professor, Chair of the Department of Biosciences. Ph.D., Cornell Graduate School of Medical Sciences, 1985. Regulation and functions of genes encoding calmodulin-related proteins and cell wall modifying enzymes of plants. Control of gene expression in response to environmental stimuli. Calcium and nitric oxide signaling. Autophagy regulation.

Andrew R. Barron. Professor. Ph.D., Imperial College of Science and Technology, University of London, 1986. Applications of inorganic chemistry to materials science of aluminum, gallium and indium.

George Bennett. Professor. Ph.D., Purdue University, 1968. Genetic engineering of metabolic pathways of microbes for production of biofuels and chemicals. Molecular biology of prokaryotes.

Daniel D. Carson. Professor. Ph.D., Temple University, 1979. Cell surface components; study of effects of heparan sulfate proteoglycan, perlecan and enzymes during implantation process an din tumor cell contexts.

Elaine Howard Ecklund. Professor of Sociology. Ph.D., Cornell University, 2004. Religion, science, immigration, race and culture.

Peter Hartley. Professor of Economics. Ph.D., University of Chicago, 1980. Applied microeconomics, money and banking.

Katherine B. Ensor. Professor. Ph.D., Texas A&M University, 1986. Time series including categorical time series, spatial statistics, spatial-temporal methods, stochastic simulation, hierarchical modeling and information integration, stochastic process modeling and estimation. Application areas of financial modeling, risk management and environmental statistics.

Kathleen Matthews. Professor. Ph.D., University of California, Berkeley, 1970. Structure and function of genetic regulatory proteins.

Kirstin Matthews. Fellow in Science and Technology Policy at Rice University's Baker Institute for Public Policy. Ph.D., The University of Texas Health Science Center at Houston, 2003. Research on intersection between traditional biomedical research and public policy.

Peter Rossky. Dean of Wiess School of Natural Sciences. Ph.D., Harvard University. Theoretical chemistry, computer simulation, solvent effects on chemical reactions, condensed phase quantum dynamics, photochemistry.

Daniel Wagner. Associate Professor. The University of Texas Health Science Center, 1997. Developmental biology, genetic regulation of vertebrate development.

M.S. IN BIOSCIENCE AND HEALTH POLICY

Four Required Bioscience Classes:
The bioscience courses give indepth instruction in specialized areas of Bioscience. Four courses are required to obtain a broad understanding of diverse areas of cutting edge bioscience research.

BIOC 524	Microbiology and Biotechnology (S)
BIOC 563	Endocrinology (S)
BIOC 572	Immunology (S/F)
BIOC 585	Fundamentals of Cellular, Molecular, and Integrative Neuroscience (F)
BIOC 525	Plant Molecular Genetics and Development (F)
BIOC 544	Developmental Biology (S)
BIOC 545	Advanced Molecular Biology and Genetics (F)
BIOC 547	Biology and Medicine (S)
BIOC 560	Cancer Biology (S)
BIOC 364	Pediatric Global Health (F)
BIOC 498	Biomems and Biomedical Microdevices (S)

Required Cohort Courses:
NSCI 501 Master's Seminar (two semesters required) (S/F)
NSCI 511 Science and Technology Policy (S)
NSCI 512 Professional Master's Project (S)
NSCI 610 Management in Science and Engineering (S/F)

Four Statistics, Economics, and Policy Courses:
The analytical competency requirement provides career-enhancing, marketable skills in policy analysis, economics and statistics. Students will take courses from groups A, B and C as indicated below:

A – One Statistics Course

STAT 385 or 453	Methods of Data Analysis (S)
STAT 684	Environmental Risk Assessment and Human Health (F)

B – One Economics Course

ECON 446	Applied Econometrics (S)
ECON 450	World Economy and Social Development (S)
PH 3910	Introduction to Health Economics (S)
MGMT 679	Cost Quality in Healthcare

C – Two Policy Courses

POST 430	Shaping of Health Policy (F)
HEAL 498	Disparities in Health in America (F)
PHIL 336	Medical Ethics (S)

Required Internship:
A three- to six-month internship with a company, government agency or national laboratory. At the conclusion of this internship, students must present their internship project in both oral and written form as part of the Professional Master's Project.

Two Elective Courses:
The electives reflect individual academic interests and career goals. Any course from the above list of Bioscience courses can be taken as an elective, provided it was not taken as a required course. In addition, the following classes qualify as elective classes:

ANTH 381	Medical Anthropology
ECON 450	World Economy and Social Development (S)
GHLT 462	Global Health Design Challenges (S)
HEAL 407	Epidemiology (F)
HI 5324	Nanomedicine in Healthcare (F)
MGMT 678	U.S. Healthcare Management
MGMT 734	Technical Entrepreneurship
MGMT 961	Business Law (F)
SOSC 420	Health Care: Competition and Managed Care (F)
STAT 684	Environmental Risk Assessment and Human Health (F)
GS 120254	Cell and Systems Physiology (S)
GS 120043	Principles of Pathology (F)

Other courses can be submitted for approval by the faculty advisor.

Note: Each course may not be offered every year, and some courses may have pre-requisites or require instructor permission. Students can also choose electives from courses offered at UT Graduate School of Biomedical Sciences (GS) and UT School of Biomedical Informatics and UT Health Science Center, (HI) as listed above.

TOTAL REQUIRED CREDIT HOURS: 39 hours

MASTER'S DEGREE IN SPACE STUDIES

The Space Studies track is geared to help individuals increase their knowledge of space engineering, science, program management and policy. The program includes advanced engineering, biological and physical science classes and introduces students to economics, public policy, and management disciplines, which impact space commercialization and national policy. This program focuses on training scientists and engineers interested in program management providing them with the tools to face the complex challenges inherent in US space policy, human and robotic space exploration, and the role of science in space exploration and technology development.

THE FACULTY AND THEIR RESEARCH

David Alexander. Director, Rice Space Institute, Professor, Professor. Ph.D. University of Glasgow, UK., 1988. Physics and Astronomy; Solar activity, sunspots, flares and coronal mass ejections.

Andrew Meade. Professor and Chair, Department of Mechanical Engineering, Ph.D. University of California. George R. Brown School of Engineering. Experimental and numerical aerodynamics.

Erzsebet Merenyi. Professor , Departments of Statistics and Electrical and Computer Engineering. Ph.D. Szeged University, Hungary, 1980. Neural computation, machine learning, self-organized learning, manifold learning.

Stephen Bradshaw. Assistant Professor, Ph.D. Aberystwyth University, Wales, UK 2000. William V. Vietti Junior Chair of Space Physics; Heating in the solar atmosphere; energy transport processes; time-dependent ionization states; emission line spectroscopy. Electron and ion kinetics; non-equilibrium processes; non-local phenomena; hybrid fluid-kinetic models. Numerical modeling.

Christopher Michael Johns-Krull. Professor. Ph.D. UC Berkeley 1994. Physics and Astronomy. Astrophysics of lower mass stars, including the sun.

Ramon Gonzalez. William W. Akers Associate Professor, Chemical Engineering, and Chemical and Biomolecular Engineering. Ph.D. University of Chile, 2001. Metabolic Engineering , Functional Genomics: Transcriptomics, Proteomics, Metabolomics, and Fluxomics; Systems Biology; Microbial Fermentations.

Adrian Lenardic. Professor Earth Science. Ph.D. University of California at Los Angeles, 1995. Geodynamical modeling applied to problems of coupled mantle flow, heat loss, and tectonics.

Peter Rossky. Dean of Wiess School of Natural Sciences. Ph.D., Harvard University. Theoretical chemistry, computer simulation, solvent effects on chemical reactions, condensed phase quantum dynamics, photochemistry.

Tayfun Tezduyar. James F. Barbour Professor Mechanical Engineering, Ph.D. Caltech, 1982. Advanced Flow simulation and modeling.

Hadley Wickham. Adjunct Assistant Professor, Dobelman Family Junior Chair. Ph.D. Iowa State University 2008. Statistics. Statistical computing, focused heavily on statistical graphics

Frank R.Toffoletto. Professor. Ph.D. Rice University. 1987. Physics and Astronomy. Magnetospheric Physics, Numerical Simulations.

Marcia O'Malley. Associate Professor, Ph.D. Vanderbilt University, 2001. Mechanical Engineering and Materials science. Modeling, design, and control of haptic interfaces; Modeling, design, and control of telemanipulation and human augmentation systems; Study of human-robot interactions.

M.S. IN SPACE STUDIES

Cohort Courses:

NSCI 511	Science Policy and Ethics (S)
NSCI 610	Management for Science and Engineering (F/S)
NSCI 501	Professional Master's Seminar (F/S)
NSCI 502	Space Studios Seminar (F)
NSCI 512	Internship Project Report/Presentation

Five Science Courses:

ASTR 470	Solar System Physics (F)
STAT 410	Intro to Regression and Statistical Computing (F)
MECH 572	Aerospace Systems Engineering (S)

With two courses to be chosen from the list below:

ASTR 554	Astrophysics of the Sun (S)
ASTR 451	Astrophysics I: Sun and Stars (F)
BIOC 415	Experimental Physiology (S)
BIO 540	Metabolic Engineering (F)
ESCI 414	Physics and Chemistry for the Atmosphere (F)
ESCI 460	Geological and Geophysical Fluid Dynamics (F)
MECH 454	Computational Fluid Mechanics (F)

Two Statistics/Computation Courses: : The analytical competency requirement provides career-enhancing, marketable skills in in finance, economics and computation. Students can choose courses as follows:

Choose two courses from:

CEVE 528	Engineering Economics (S)
MECH 454	Computational Fluid Mechanics (F)
PHYS 416	Computational Physics (S)
STAT 310	Probability and Statistics (F)
STAT 405	Statistical Computing and Graphics (F)

Depending on background, other courses can be chosen.

3 Electives according to student's interest: These course electives reflect individual academic interests and career goals.

Focus: Engineering

CEVE 504	Atmospheric Particular Matter (S)
CEVE 505	Eng. Project Development& Management (F)
CEVE 511	Atmospheric Processes (F)
CEVE 576	Structural Dynamics and Control (S)
COMP/ELEC/MECH 498	Intro to Robotics (S)
COMP 551	Advanced Mobile Robotics/Lab
MECH 454	Computational Fluid Mechanics (F)
MECH 474	Advanced Computational Mechanics (S)
MECH 583	Convective Heat Transfer (F)
MECH 591	Gas Dynamics (S)
MECH 599	Human Factors in Space (S)
MECH 599/Sect 2	Spacecraft Navigation (S)
MECH 599/Sect 3	Design for Aerospace Environments
MECH 691	Hypersonic Aerodynamics (F)

and others …

Focus: Sciences (Astro Science/Earth Science/Life Sciences)

ASTR 542	Nebular Astrophysics
ASTR 551	Astrophysics I: Sun and Stars (F)
ASTR 552	Astrophysics II Galaxy and Cosmology (S)
ASTR 554	Astrophysics of the Sun (S)
ASTR 555	Protostars and Planets (S)
ASTR 565	Compact Objects (S)
ASTR 700	Independent Study Course

NOTE: *FOCUS AREAS IN EARTH SCIENCE, PHYSICS AND LIFE SCIENCES can be chosen - depending on student's background. Students will consult with academic advisor about appropriate selection of their elective science courses.*

Focus: Management

MGMT 734	Technology Entrepreneurship
MGMT 629	Business Plan Development (F)
MGMT 601	Financial Statement Analysis (F)
MGMT 618	Complexities of People and Organizations (F)
MGMT 658	Applied Risk Management (S)
MGMT 619	Corporate Governance (S)
MGMT 719	Thinking Strategically (S)

and others …

NOTE: *This listing doesn't reflect all courses available every year. Also note, not all courses are offered every year. Students are requested to consult with their academic advisors before enrolling.*

A 3 – 6 months internship: Practical experience is offered via a 3 – 6 month work immersion. The internship will be under the guidance of a host company, government agency, or non-profit organization. A summary of the internship project is required in both oral and written form as part of the Professional Master's Seminar.

TOTAL REQUIRED CREDIT HOURS: 39 hours

ADMISSION

Admission requirements for the Professional Master's Program degrees will vary with each track. All students must have a science bachelor's degree and submit general GRE scores, official transcripts, letters of recommendation and a completed application. Contact the program director or visit the program Web site at www.profms.rice.edu for specific admission information.

TUITION

Most students require three full semesters of courses to complete the Professional Master's Program. Graduate tuition for academic year 2014–15 is $14,500 per semester. At the present rate, the professional master of science degree would cost $43,500 in tuition. The student does not pay tuition during the internship period, but may need to pay a small fee to continue full-time student status. Although Rice does not offer financial assistance for these degrees, most U.S. citizens and permanent residents are eligible for federal student loans and work-study programs. Sources of additional financial assistance can be found at www.profms.rice.edu.

ABOUT RICE AND HOUSTON

Rice is a leading American research university — small, private and highly selective — distinguished by a collaborative, interdisciplinary culture and a global perspective. Only a few miles from downtown Houston, it occupies an architecturally distinctive, 285-acre campus shaded by nearly 4,000 trees. State-of-the-art facilities and laboratories, internationally renowned centers and institutes and one of the country's largest endowments support an ideal learning and living environment.

The university attracts a diverse group of highly talented students and faculty with outstanding graduate and professional programs in the humanities, social sciences, natural sciences, engineering, architecture, music and business. With just 2,567 graduate students and 3,920 undergraduates, it offers an unusual opportunity to forge close relationships with eminent faculty scholars and researchers and the option to tailor graduate programs to specific interests.

Houston offers all the expected educational, cultural and commercial advantages of a large urban center, and more. It's home of the Texas Medical Center, the largest concentration of medical schools, hospitals and research facilities in the world, as well as several other universities. Rice has cooperative programs with the University of Houston, Baylor College of Medicine, the University of Texas Health Science Center and Texas Southern University. Houston is one of the few U.S. cities with resident companies in all four major performing arts: drama, ballet, opera and symphony. It also boasts a museum district featuring exhibits of national and international prominence.

As urban as it is, Houston also is a surprisingly green city. Houstonians enjoy the outdoors in more than 300 municipal parks and 120 open spaces, and many frequent the beach at Galveston Island, only a 45-minute drive away. Other short trips include Austin, the state's capital, and historic San Antonio, both of which are a little more than three hours away.

FOR MORE INFORMATION

To receive more information about the Professional Master's Program:

Contact:
Dagmar K. Beck
Director, Professional Master's in Science and Engineering
713-348-3188
profms@rice.edu

or

Emalie Vann Thok
Program Administrator
713-348-3319

Dean of the Wiess School of Natural Sciences
Peter Rossky: 713-348-3350

Or fax: 713-348-3121

Or write to:
Rice University
Professional Science Master's Program
Wiess School of Natural Sciences–MS 103
P.O. Box 1892
Houston, Texas 77251-1892

Or visit the program Web site: www.profms.rice.edu

FOR ADDITIONAL INFORMATION:

Rice University homepage:
www.rice.edu
Rice University Office of Graduate and Postdoctoral Studies homepage:
graduate.rice.edu
Graduate Student Association homepage:
gsa.rice.edu
City of Houston homepage:
www.houstontx.gov
Houston information from the *Houston Chronicle:*
www.chron.com
Houston information from the Greater Houston Partnership:
www.houston.org
Houston information from Citysearch:
houston.citysearch.com

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