

## Subsurface Geoscience

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### The George R. Brown School of Engineering

#### Director

Alan Levander

#### Professors

John B. Anderson  
 Andrew R. Barron  
 Katherine B. Ensor  
 Hans G. Ave Lallemand  
 Neal F. Lane  
 Dale S. Sawyer  
 Manik Talwani  
**Associate Professors**  
 Gerald R. Dickens

André W. Droxler  
 Colin A. Zelt  
**Assistant Professor**  
 Michael B. Heeley  
 Julia Morgan  
**Adjunct Professor**  
 Stephan H. Danbom  
**Lecturer**  
 W. C. Rusty Riese

#### *Degrees Offered: M.S.*

Rice University will introduce a professional master's degree in subsurface geoscience for the 2003-2004 academic year. This degree is designed for students who wish to become proficient in applying geological knowledge and geophysical methods to finding and developing reserves of oil and natural gas. Students can specialize in one of three focus areas: information technology, geology, and geophysics. The information technology focus area prepares students to apply IT principles to the rapidly growing industry need to store, access, and interpret very large and diverse geological, geophysical, cultural, and infrastructural datasets. 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.

The subsurface geoscience 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 exceeds that of the bachelor's level, and they create the cross-functional aptitudes needed in modern industry. This program will allow students to move more easily into management careers in consulting or research and development, design, and/or marketing of new science-based products.

#### **Degree Requirements for M.S. in Subsurface Geoscience**

The 21-month professional master's program begins with two semesters of coursework at Rice followed by a six-month industrial internship. After the internship, students return to Rice for a final semester of coursework. In addition to technical courses, the students in the Subsurface Geoscience program will take management courses, one 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 project 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 Cain Project in Engineering and Professional Communication. Working professionals may be considered for part-time enrollment.

For general university requirements for graduate study, see pages 65–70, and see also Professional Degrees, page 66.

To ensure that all students obtain an excellent quantitative background, each student will be required to take the core courses listed below. If a student can demonstrate that s/he has learned the material elsewhere, s/he may be exempted. Students pursuing this degree part-time will meet with their assigned adviser to determine their course work schedule.

## **Year 1**

### ***Fall Semester***

1 elective

ESCI 441 *Geophysical Data Analysis*

ESCI 442 *Exploration Geophysics I*

MGMT 750 *Management for Science and Engineering*

NSCI 501 *Professional Master's Seminar*

### ***Spring Semester***

2 electives

ESCI 417 *Petroleum Industry Economics and Management*

ESCI 444 *Exploration Geophysics II*

NSCI 501 *Professional Master's Seminar*

### ***Summer***

*Industrial Internship*

## **Year 2**

### ***Fall Semester***

NSCI 510 *Industrial Internship*

### ***Spring Semester***

2 electives

XXXX ### *Modern Industrial Exploration Techniques*

NSCI 511 *Science Policy and Ethics*

NSCI 501 *Professional Master's Seminar*

### **Elective Courses:**

In addition to the core courses, the student will choose 5 electives from the list below. We recommend that three of the electives be in one focus area (Information Technology, Geology, or Geophysics).

### ***Information Technology***

COMP 429 *Introduction to Computer Networks*

ESCI 454 *Geographic Information Science*

STAT 310 *Probability and Statistics*

STAT 410 *Introduction to Statistical Computing and Computer Models*

**Geology Focus Area**

- ESCI 415 *Petroleum Geology*  
 ESCI 427 *Seismic Sequence Stratigraphy*  
 ESCI 428 *Interpretation of Reflection Seismograms*  
 ESCI 450 *Remote Sensing*  
 ESCI 463 *Advanced Structural Geology*  
 ESCI 504 *Clastic Sedimentary Environments, Processes, and Facies*  
 ESCI 505 *Applied Sedimentology*  
 ESCI 506 *Carbonate Depositional Systems*

**Geophysics Focus Area**

- CENG 571 *Flow and Transport through Porous Media I*  
 ESCI 427 *Seismic Sequence Stratigraphy*  
 ESCI 428 *Interpretation of Reflection Seismograms*  
 ESCI 454 *Geographic Information Science*  
 ESCI 461 *Seismology I*

ESCI 542 *Seismology II*STAT 310 *Probability and Statistics*XXXX *Advanced Statistics for Geoscientists***Additional Electives**

- CAAM 378 *Introduction to Operations Research*  
 ECON 486 *Energy Economics*  
 ENGI 303 / CIVI 322 *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 for Science and Engineering*