Rice University introduced the professional master’s degree in subsurface geoscience in fall 2003. 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 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.

The subsurface geoscience degree is one of four tracks in the 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 within oil-and-gas-related industries.

A joint MBA/SG degree is offered in conjunction with the Jesse H. Jones Graduate School of Business.

Degree Requirements for MS in Subsurface Geoscience

In addition to core science courses, students are required to complete a three- to six-month internship and take a set of cohort courses focusing on business and communication. Students select one of two focus areas: geology and geophysics. Instead of a thesis, students must present their internship project in both oral and written form in the Professional Master’s Seminar.

Part-time students who already work in their area of study may fulfill the internship requirement by working on an approved project with their current employer.

Admission

Admission to graduate study in subsurface geoscience is open to qualified students holding a bachelor’s degree in a related science that includes coursework in geoscience, general chemistry, physics, calculus, and differential equations.
Department faculty evaluate the previous academic record and credentials of each applicant individually.

**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 415  *Petroleum Geology* (F)
- ESCI 417  *Petroleum Industry Economics and Management* (S)
- ESCI 428  *Seismic Reflection Data Interpretation* (F)
- ESCI 442  *Exploration Geophysics* (F)
- ESCI 334  *Geological Field Methods* (S)
- ESCI 427  *Sequence Stratigraphy* (S)
- ESCI 4XX  *Well Logging and Petrophysics* (S)

Students will choose  three electives (9 credits):

**Suggested Electives:**

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

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

**GEOPHYSICS FOCUS AREA:**

**Required Courses (22 credits):**

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

Students will choose  three electives (9 credits):

**Suggested Electives:**

- ESCI 544  *Hydrocarbon Exploration (AAPG Imperial Barrel competition)* (S)
- ESCI 334  *Geological Field Methods* (S)
- ESCI 427  *Sequence Stratigraphy* (S)
- ESCI 4XX  *Well Logging and Petrophysics* (new course)
- ESCI 463  *Advanced Structural Geology I* (S)
- And others

Substitutions for required or elective courses may be approved by the Track Advisor.
**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 form as part of the Professional Master's Project.

Total Required Credit Hours: 40 credits

**Professional Science Master's Fifth Year Degree Option for Rice Undergraduates**

Rice students have an option to achieve the MS in subsurface geoscience by adding an additional 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 subsurface geoscience 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 coordinator.