MASTER OF SCIENCE IN SUBSURFACE GEOSCIENCE (MSSG) DEGREE

Program Learning Outcomes for the MSSG Degree

Upon completing the MSSG degree, students will be able to:

1. Become proficient in applying geological and geophysical knowledge and methods.
2. Develop business and management skills, and obtain practical skills valuable to the energy industry.
3. Develop written, oral, and visual communication skills to bridge the gap between science and business.

Requirements for the MSSG Degree

The MSSG degree is a non-thesis master’s degree. For general university requirements for non-thesis master’s degrees, please see Graduate Degrees (ga.rice.edu/graduate-students/academic-opportunities/degrees). Students pursuing the MSSG degree must complete:

- A minimum of 14 courses (39-41 credit hours) to satisfy degree requirements.
- A 3-6 month internship. 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.
- The requirements for one area of specialization (see below for areas of specializations). The MSSG degree offers two areas of specialization:
  - Geology
  - Geophysics
- A minimum of 30 credit hours at the 500-level or above.

The courses listed below satisfy the requirements for this degree program. In certain instances, courses not on this official list may be substituted upon approval of the PSM (Professional Science Masters) program director and the MSSG advisor (or official certifier). Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

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<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tr>
<td>Total</td>
<td>Credit Hours Required for the MSSG Degree</td>
<td>39-41</td>
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Degree Requirements

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Core Requirements

| NSCI 501 | PROFESSIONAL MASTER’S SEMINAR (required for 2 semesters, fall semester) | 1            |
| NSCI 511 | SCIENCE POLICY, AND ETHICS                 | 3            |
| NSCI 512 | PROFESSIONAL MASTER’S PROJECT              | 1            |
| NSCI 610 / ENGI 610 | MANAGEMENT FOR SCIENCE AND ENGINEERING | 3            |

Three to Six Month Internship

Practical experience is offered via a 3 to 6 month work immersion.

Area of Specialization

Select 1 of the following area of specializations (see below for areas of specialization):

- Geology Specialization
- Geophysics Specialization

Total Credit Hours 39-41

Footnotes and Additional Information

A 3 to 6 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 NSCI 512 Professional Master’s Project Cohort Course.

Area of Specialization: Geology

Students must complete a total of 10 courses (30-32 credit hours depending on course selection) to satisfy the requirements for the MSSG degree program’s Geology area of specialization.

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Core Requirements

Select 7 from the following:

- ESCI 334 GEOLOGICAL TECHNIQUES
- or ESCI 516 TOPICS ON CARBONATES
- ESCI 545 HYDROCARBON SYSTEMS ANALYSIS
- ESCI 558 3D SEISMIC REFLECTION DATA INTERPRETATION
- ESCI 615 DECISION MAKING AND ECONOMICS IN THE ENERGY INDUSTRY
- ESCI 626 INTERPRETATION OF REGIONAL 2-D SEISMIC DATA
- ESCI 627 SEQUENCE STRATIGRAPHY
- ESCI 642 EXPLORATION GEOPHYSICS

Elective Requirements

Select 3 from the following (see also Additional Electives course list below):

- ESCI 504 SILICICLASTIC DEPOSITIONAL SYSTEMS
- ESCI 507 APPLIED SEDIMENTOLOGY II
- ESCI 506 CARBONATE DEPOSITIONAL SYSTEMS
- ESCI 527 SEMINAR: QUANTITATIVE PETROLEUM SYSTEMS ANALYSIS
- ESCI 544 HYDROCARBON EXPLORATION
- ESCI 550 MODERN EXPLORATION TECHNOLOGY
- ESCI 564 SEISMIC REFLECTION DATA PROCESS
- ESCI 558 3D SEISMIC REFLECTION DATA INTERPRETATION
Master of Science in Subsurface Geoscience (MSSG) Degree

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<tr>
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<tr>
<td>ESCI 550</td>
<td>MODERN EXPLORATION TECHNOLOGY</td>
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<tr>
<td>ESCI 558</td>
<td>3D SEISMIC REFLECTION DATA INTERPRETATION</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 564</td>
<td>SEISMIC REFLECTION DATA PROCESS</td>
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<td>ESCI 615</td>
<td>DECISION MAKING AND ECONOMICS IN THE ENERGY INDUSTRY</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 626</td>
<td>INTERPRETATION OF REGIONAL 2-D SEISMIC DATA</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 640</td>
<td>GEOPHYSICAL DATA ANALYSIS: DIGITAL SIGNAL PROCESSING</td>
<td>3</td>
</tr>
<tr>
<td>or ESCI 641</td>
<td>GEOPHYSICAL DATA ANALYSIS: INVERSE METHODS</td>
<td>3</td>
</tr>
<tr>
<td>ESCI 642</td>
<td>EXPLORATION GEOPHYSICS</td>
<td>3</td>
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Footnotes and Additional Information

1. Substitutions for required or elective courses may be approved by the Track Advisor.
2. Taught at the University of Houston campus.

Area of Specialization: Geophysics

Students must complete a total of 10 courses (30-31 credit hours depending on course selection) to satisfy the requirements for the MSSG degree program's Geophysics area of specialization.

Total Credit Hours 30-32

Footnotes and Additional Information

1. Please contact the department for additional courses that can satisfy the requirements listed above. Substitutions for required or elective courses may be approved by the Track Advisor.

Policies for the MSSG Degree

Subsurface Geoscience Graduate Program Handbook

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, Subsurface Geoscience publishes a graduate program handbook, which can be found here: http://gradhandbooks.rice.edu/2017_18/Professional_Science_Masters_Handbook.pdf.

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.

Transfer Credit

For Rice University’s policy regarding transfer credit, see Transfer Credit (ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees). Some departments and programs have additional restrictions on transfer credit. Students are encouraged to meet with their academic program’s advisor when considering transfer credit possibilities.

For additional information, please see the Subsurface Geoscience website: https://profms.rice.edu/

Opportunities for the MSSG Degree

Fifth-Year MSSG Degree Option for Rice Undergraduate Students

Rice undergraduate students have an option to pursue the MSSG degree by adding an additional fifth year to their four undergraduate years of science studies. Advanced Rice undergraduate students in good academic standing may apply to the graduate program during their junior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may 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 PSM (Professional Science Masters) program director and the MSSG advisor.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for their bachelor’s degree and the MSSG degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware that there could be financial aid implications, if the conversion of undergraduate coursework to that of graduate-level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).

For additional information, please see the Subsurface Geoscience website: https://profms.rice.edu/