MASTER OF SCIENCE IN SPACE STUDIES (MSSpS) DEGREE

Program Learning Outcomes for the MSSpS Degree

Upon completing the MSSpS Degree, students will be able to:

1. Achieve advanced science, engineering, and computational skills and a broad understanding of the methodologies applied in the space industry.
2. Gain real life experience in solving technical problems in a science and technology environment.
3. Develop business and communication skills to bridge the gap between science and business.

Requirements for the MSSpS Degree

The MSSpS degree is a non-thesis master's degree. For general university requirements, please see Non-Thesis Master's Degrees (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-non-thesis-masters-degrees/). For additional requirements, regulations, and procedures for all graduate programs, please see All Graduate Students (https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/).

Students pursuing the MSSpS degree must complete:

- A minimum of 15 courses (minimum of 39 credit hours) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (graduate semester credit hours, coursework at the 500-level or above).
- A minimum of 24 graduate semester credit hours must be taken at Rice University.
- A minimum of 24 graduate semester credit hours must be taken in standard or traditional courses (with a course type of lecture, seminar, laboratory, lecture/laboratory).
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- A maximum of 2 courses (6 graduate semester credit hours) from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies (p. 2) tab.
- A 3-6 month internship. Instead of a thesis, at the conclusion of their internship, students must present their internship project in both oral and written form as part of the Professional Master's Project (NSCI 512). Part-time students who already work in their area of study may request approval to fulfill the internship requirement by working on a specific, pre-approved project with their current employer.
- A minimum overall GPA of 2.67 or higher in all Rice coursework.
- A minimum program GPA of 2.67 or higher in all Rice coursework that satisfies requirements for the non-thesis master's degree.

Note: Some of the listed courses are not offered every year, and some may also have prerequisites or require instructor permission.

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 program's academic advisor, or where applicable, the department or program's Director of Graduate Studies. Course substitutions must be formally applied and entered into Degree Works by the department or program's Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/). Additionally, these must be approved by the Office of Graduate and Postdoctoral Studies. Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the MSSpS Degree</td>
<td>39</td>
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Degree Requirements

Core Requirements

Core Technical Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ASTR 570</td>
<td>SOLAR SYSTEM PHYSICS</td>
<td>3</td>
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<tr>
<td>MECH 578</td>
<td>ORBITAL MECHANICS AND MISSION DESIGN</td>
<td>3</td>
</tr>
<tr>
<td>STAT 605</td>
<td>R FOR DATA SCIENCE</td>
<td>3</td>
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Core Science and Engineering Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>ASTR 554</td>
<td>ASTROPHYSICS OF THE SUN</td>
<td></td>
</tr>
<tr>
<td>BIOS 524</td>
<td>MICROBIOLOGY AND BIOTECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td>CHBE 640</td>
<td>METABOLIC ENGINEERING</td>
<td></td>
</tr>
<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>COMPUTATIONAL FLUID MECHANICS</td>
<td></td>
</tr>
<tr>
<td>PHYS 510</td>
<td>MAGNETOSPHERIC PHYSICS</td>
<td></td>
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<tr>
<td>PHYS 517</td>
<td>COMPUTATIONAL PHYSICS</td>
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Core Statistics/Computation Courses

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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CAAM 550</td>
<td>NUMERICAL ANALYSIS I</td>
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<tr>
<td>CEVE 528</td>
<td>ENGINEERING ECONOMICS</td>
<td></td>
</tr>
<tr>
<td>DSCI 535</td>
<td>APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS</td>
<td></td>
</tr>
<tr>
<td>EEPS 586</td>
<td>DATA SCIENCE METHODS AND DATA MANAGEMENT</td>
<td></td>
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<tr>
<td>EEPS 636</td>
<td>GIS FOR SCIENTISTS AND ENGINEERS</td>
<td></td>
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<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>COMPUTATIONAL FLUID MECHANICS</td>
<td></td>
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<tr>
<td>PHYS 517</td>
<td>COMPUTATIONAL PHYSICS</td>
<td></td>
</tr>
<tr>
<td>STAT 502 / COMP 502 / ELEC 502</td>
<td>NEURAL MACHINE LEARNING I</td>
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Cohort Courses

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<th>Credit Hours</th>
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<tbody>
<tr>
<td>NSCI 501</td>
<td>PROFESSIONAL MASTER'S SEMINAR</td>
<td>1</td>
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<tr>
<td>NSCI 502</td>
<td>SPACE STUDIES SEMINAR</td>
<td>1</td>
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<tr>
<td>NSCI 511</td>
<td>SCIENCE POLICY, AND ETHICS</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 512</td>
<td>PROFESSIONAL MASTER'S PROJECT</td>
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### Master of Science in Space Studies (MSSpS) Degree

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>NSCI 515</td>
<td>FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>NSCI 610 / ENGI 610</td>
<td>MANAGEMENT FOR SCIENCE AND ENGINEERING</td>
<td>3</td>
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### Three to Six Month Internship
A three to six month internship is required.  

### Elective Requirements
Select a minimum of 3 courses (minimum of 9 credit hours) from 1 of the following areas, depending on the student's individual interests and career goals:

#### Engineering
- CEVE 504: ATMOSPHERIC PARTICULATE MATTER
- CEVE 511: ATMOSPHERIC CHEMISTRY AND CLIMATE
- CEVE 576 / MECH 576: STRUCTURAL DYNAMIC SYSTEMS
- COMP 598 / ELEC 598 / MECH 598: INTRODUCTION TO ROBOTICS
- ENGI 515: LEADING TEAMS AND INNOVATION
- ENGI 614: LEARNING HOW TO INNOVATE?
- MECH 554 / BIOE 554 / CEVE 554: COMPUTATIONAL FLUID MECHANICS
- MECH 574: TURBULENCE
- MECH 578: ORBITAL MECHANICS AND MISSION DESIGN
- MECH 579: LAUNCH VEHICLE AND SPACECRAFT DESIGN
- MECH 590: AEROSPACE PROPULSION
- MECH 591: GAS DYNAMICS
- MECH 592: DESIGN FOR AEROSPACE ENVIRONMENTS
- MECH 594: INTRODUCTION TO AERONAUTICS
- MECH 596: INTRODUCTION TO FLIGHT MECHANICS
- MECH 691: INTRODUCTION TO HYPERSONIC AERODYNAMICS

#### Sciences (Astro Science/Earth Science/Life Sciences)
- ASTR 542: NEBULAR ASTROPHYSICS
- ASTR 554: ASTROPHYSICS OF THE SUN
- ASTR 555: PROTOSTARS AND PLANETS
- ASTR 565: COMPACT OBJECTS
- BIOS 524: MICROBIOLOGY AND BIOTECHNOLOGY
- BIOS 543: DEVELOPMENTAL NEUROBIOLOGY
- BIOS 570: COMPUTATION WITH BIOLOGICAL DATA
- EEPS 540: CRYOSPHERE
- EEPS 581: MODERN EXPLORATION TECHNOLOGY
- EEPS 667: GEOMECHANICS
- EEPS 672: EARTH SYSTEMS MODELING: NUMERICAL TECHNIQUES AND APPLICATIONS
- MGMT 633 / BIOE 633: ROLES OF PHYSICIANS, SCIENTISTS, ENGINEERS AND MBA'S IN HIGH-TECH STARTUPS
- PHYS 510: MAGNETOSPHERIC PHYSICS
- PHYS 541: RADIATIVE PROCESSES
- PHYS 580: INTRODUCTION TO PLASMA PHYSICS

### Management and Entrepreneurship
- ENGI 515: LEADING TEAMS AND INNOVATION
- ENGI 614: LEARNING HOW TO INNOVATE?
- MGMT 601: FINANCIAL STATEMENT ANALYSIS
- MGMT 618: BESTSELLERS: THE SCIENCE AND WISDOM
- MGMT 629: BUSINESS PLAN DEVELOPMENT
- MGMT 633 / BIOE 633: ROLES OF PHYSICIANS, SCIENTISTS, ENGINEERS AND MBA'S IN HIGH-TECH STARTUPS
- MGMT 658: APPLIED RISK MANAGEMENT
- MGMT 734: TECHNOLOGY ENTREPRENEURSHIP

### Interdisciplinary Interest Electives
Select 3 courses (9 credit hours) from any of the Electives listed in the areas above

### Total Credit Hours
39

### Footnotes and Additional Information
1. **Note:** Some of the listed courses are not offered every year, and other coursework may be offered that satisfies the stated requirements upon approval. Depending on the student's background or interest, course substitutions for any required or elective course may be approved by the program's academic advisor. Students should consult with their academic advisors before enrolling.

2. Practical experience is offered via a three to six month immersion. The internship will be under the guidance of a host company, government agency, or non-profit organization. At the conclusion of the internship, students must present a summary of their internship project in both oral and written form for the cohort course Professional Master's Project (NSCI 512). Part-time students who already work in their area of study may fulfill the internship requirements by working on an approved project with their current employer.

### Policies for the MSSpS Degree
**Professional Science Master's Graduate Program Handbook**

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, the Professional Science Master’s Program publishes a graduate program handbook, which can be found here: [https://gradhandbooks.rice.edu/2021_22/Professional_Science_Masters_Handbook.pdf](https://gradhandbooks.rice.edu/2021_22/Professional_Science_Masters_Handbook.pdf)

### Admission
Admission to graduate study in Space Studies is open to qualified students holding a bachelor's degree in a related science or engineering program that included course work in general physics, chemistry, calculus, linear algebra, and differential equations. Good scores from the general Graduate Record Examination (GRE), good critical thinking and communication skills, and strong quantitative abilities. Statistics, introductory economics, and computer skills preferred. Department faculty evaluate the previous academic record and credentials of each applicant individually and make admission decisions.

### Transfer Credit
For Rice University's policy regarding transfer credit, see [Transfer Credit](https://ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer). 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.

**Program Transfer Credit Guidelines**

Students pursuing the MSSpS degree should be aware of the following program-specific transfer credit guidelines:

- No more than 2 courses (6 credit hours) of transfer credit from U.S. or international universities of similar standing at Rice may apply towards the degree.
- Requests for transfer credit will be considered by the program director on an individual case-by-case basis.

**Additional Information**

For additional information, please see the Space Studies website: https://profms.rice.edu/

**Opportunities for the MSSpS Degree**

**Fifth-Year Master's Degree Option for Rice Undergraduate Students**

In certain situations and with some terminal master's degree programs, Rice students have an option to pursue a master's degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master's degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate major advisor and the master's degree program director.

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

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware 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).
- more information on this Undergraduate - Graduate Concurrent Enrollment opportunity, including specific information on the registration process can be found here (https://ga.rice.edu/undergraduate-students/academic-opportunities/graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science may have the option to pursue the Master of Science in Space Studies (MSSpS) degree. For additional information, students should contact their undergraduate major advisor, the faculty MSSpS program director, and the Professional Science Master's (PSM) program director.

**Additional Information**

For additional information, please see the Space Studies website: https://profms.rice.edu/