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 (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 (ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees). Students pursuing the MSSpS degree must complete:

- A minimum of 15 courses (39 credit hours) to satisfy degree requirements.
- A minimum of 30 credit hours of graduate-level study (coursework at the 500-level or above).
- A minimum of 24 credit hours must be taken at Rice University.
- A minimum residency enrollment of one fall or spring semester of part-time graduate study at Rice University.
- 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 Seminar. 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.
- A minimum GPA of 2.67 in required coursework.

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/degeworks/officialcertifier).) Students and their academic advisors should identify and clearly document the courses to be taken.

### Summary

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

#### Core Requirements

**Core Technical Courses**
- ASTR 570 SOLAR SYSTEM PHYSICS 3
- MECH 572 AEROSPACE SYSTEMS ENGINEERING 3
- STAT 605 R FOR DATA SCIENCE 3

**Core Science and Engineering Courses**
Select 2 courses from the following:
- ASTR 554 ASTROPHYSICS OF THE SUN 1
- BIOC 415 EXPERIMENTAL PHYSIOLOGY 1
- BIOC 540 / CHBE 640 METABOLIC ENGINEERING 1
- ESCI 540 EARTH’S ATMOSPHERE 1
- ESCI 660 GEOLOGICAL AND GEOPHYSICAL FLUID DYNAMICS 1
- MECH 554 / BIOE 554 / CEVE 554 COMPUTATIONAL FLUID MECHANICS 1

**Core Statistics/Computation Courses**
Select 2 courses from the following:
- CAAM 550 NUMERICAL ANALYSIS I 1
- CEVE 528 / ENGI 528 ENGINEERING ECONOMICS 1
- ESCI 650 REMOTE SENSING 1
- MECH 554 / BIOE 554 / CEVE 554 COMPUTATIONAL FLUID MECHANICS 1
- PHYS 517 COMPUTATIONAL PHYSICS 1
- STAT 310 / ECON 307 PROBABILITY AND STATISTICS 1
- STAT 502 / COMP 502 / ELEC 502 NEURAL MACHINE LEARNING I 1
- STAT 541 MULTIVARIATE ANALYSIS 1
- STAT 615 REGRESSION AND LINEAR MODELS 1

**Cohort Courses**
- NSCI 501 PROFESSIONAL MASTER’S SEMINAR 1
- NSCI 502 SPACE STUDIES SEMINAR 1
- NSCI 511 SCIENCE POLICY, AND ETHICS 1
- NSCI 512 PROFESSIONAL MASTER’S PROJECT 1
- NSCI 610 / ENGI 610 MANAGEMENT FOR SCIENCE AND ENGINEERING 3

#### Three to Six Month Internship

A three to six month internship is required.

### Elective Requirements
Master of Science in Space Studies (MSSpS) Degree

Select a 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 PROCESSES
- 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 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
- BIOC 524 MICROBIOLOGY & BIOTECHNOLOGY
- BIOC 540 / CHBE 640 METABOLIC ENGINEERING
- BIOC 544 ADVANCED CONCEPTS AND CRITICAL ANALYSIS IN MODERN DEVELOPMENTAL BIOLOGY
- BIOC 545 ADVANCED MOLECULAR BIOLOGY AND GENETICS
- BIOC 570 COMPUTATION WITH BIOLOGICAL DATA
- BIOC 580 / BIOE 580 / CHBE 580 PROTEIN ENGINEERING
- ESCI 540 EARTH'S ATMOSPHERE
- ESCI 581 TOPICS IN PLANETARY DYNAMICS AND MAGMATIC PROCESSES
- ESCI 667 GEOMECHANICS
- ESCI 672 EARTH SYSTEMS MODELING: NUMERICAL TECHNIQUES AND APPLICATIONS
- MGMT 633 / BIOE 633 ROLES OF PHYSICIANS, SCIENTISTS, ENGINEERS AND MBA'S IN HIGH-TECH STARTUPS

### Management and Entrepreneurship
- ENGI 515 LEADING TEAMS AND INNOVATION
- ENGI 614 LEARNING HOW TO INNOVATE?
- MGMT 601 FINANCIAL STATEMENT ANALYSIS
- MGMT 618 COMPLEXITIES OF PEOPLE AND ORGANIZATIONS
- MGMT 619 CORPORATE GOVERNANCE
- 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

Total Credit Hours: 39

Footnotes and Additional Information

1. Depending on the background, other courses can be chosen with permission of advisor.
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 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.
3. Courses vary. Some listed courses may not be offered every year, and others may be offered that satisfy the requirements with pre-approval. Students should consult with their academic advisors before enrolling.

### Policies for the MSSpS Degree

**Space Studies Graduate Program Handbook**

The General Announcements (GA) is the official Rice curriculum. As an additional resource for students, Space Studies publishes a graduate program handbook, which can be found here: [http://gradhandbooks.rice.edu/2018_19/Professional_Science_Masters_Handbook.pdf](http://gradhandbooks.rice.edu/2018_19/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 ([ga.rice.edu/graduate-students/academic-policies-procedures/regulations-procedures-all-degrees/#transfer](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.

**Additional Information**

For additional information, please see the Space Studies website: [https://profms.rice.edu/](https://profms.rice.edu/)
Opportunities for the MSSpS Degree
Fifth-Year Master's Degree Option for Rice Undergraduate Students

Rice students have an option to pursue the Master of Science in Space Studies (MSSpS) 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 MSSpS 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 advisor, the Professional Science Master's (PSM) program director, and the MSSpS 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 (ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment).

Additional Information

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