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

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### Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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</thead>
<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

<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>
</tr>
<tr>
<td>MECH 572</td>
<td>AEROSPACE SYSTEMS ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>STAT 605</td>
<td>R FOR DATA SCIENCE</td>
<td>3</td>
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</table>

#### Core Science and Engineering Courses

Select 2 courses from the following:

- ASTR 554  ASTROPHYSICS OF THE SUN
- BIOC 415  EXPERIMENTAL PHYSIOLOGY
- BIOC 540 / CHBE 640 METABOLIC ENGINEERING
- ESCI 540  EARTH'S ATMOSPHERE
- ESCI 660  GEOLOGICAL AND GEOPHYSICAL FLUID DYNAMICS
- MECH 554 / BIOE 554 / CEVE 554 COMPUTATIONAL FLUID MECHANICS
- MECH 592  DESIGN FOR AEROSPACE ENVIRONMENTS

#### Core Statistics/Computation Courses

Select 2 courses from the following:

- CAAM 550  NUMERICAL ANALYSIS I
- CEVE 528 / ENGI 528 ENGINEERING ECONOMICS
- ESCI 650  REMOTE SENSING
- MECH 554 / BIOE 554 / CEVE 554 COMPUTATIONAL FLUID MECHANICS
- PHYS 517  COMPUTATIONAL PHYSICS
- STAT 310 / ECON 307 PROBABILITY AND STATISTICS
- STAT 502 / COMP 502 / ELEC 502 NEURAL MACHINE LEARNING I
- STAT 541  MULTIVARIATE ANALYSIS
- STAT 615  REGRESSION AND LINEAR MODELS

#### Cohort Courses

- NSCI 501  PROFESSIONAL MASTER'S SEMINAR
- NSCI 502  SPACE STUDIES SEMINAR
- NSCI 511  SCIENCE POLICY AND ETHICS
- NSCI 512  PROFESSIONAL MASTER'S PROJECT
- NSCI 610 / ENGI 610 MANAGEMENT FOR SCIENCE AND ENGINEERING

#### Three to Six Month Internship

A three to six month internship is required.

#### Elective Requirements

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Select a minimum of 9 credit hours from 1 of the following areas, depending on the student's individual interests and career goals:

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Sciences (Astro Science/Earth Science/Life Sciences)</th>
<th>Management and Entrepreneurship</th>
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<tbody>
<tr>
<td>CEVE 504  ATOMSPHERIC PARTICULATE MATTER</td>
<td>ASTR 542  NEBULAR ASTROPHYSICS</td>
<td>ENGI 515  LEADING TEAMS AND INNOVATION</td>
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<tr>
<td>CEVE 511  ATMOSPHERIC PROCESSES</td>
<td>ASTR 554  ASTROPHYSICS OF THE SUN</td>
<td>ENGI 614  LEARNING HOW TO INNOVATE?</td>
</tr>
<tr>
<td>CEVE 576 / MECH 576  STRUCTURAL DYNAMIC SYSTEMS</td>
<td>ASTR 555  PROTOSTARS AND PLANETS</td>
<td>MECH 554 / BIOE 554 / CEVE 554  COMPUTATIONAL FLUID MECHANICS</td>
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<tr>
<td>COMP 598 / ELEC 598 / MECH 598</td>
<td>ASTR 565  COMPACT OBJECTS</td>
<td>MECH 591  GAS DYNAMICS</td>
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<tr>
<td>ENGI 515  LEADING TEAMS AND INNOVATION</td>
<td>BIOC 524  MICROBIOLOGY &amp; BIOTECHNOLOGY</td>
<td>MECH 592  DESIGN FOR AEROSPACE ENVIRONMENTS</td>
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<tr>
<td>ENGI 614  LEARNING HOW TO INNOVATE?</td>
<td>BIOC 540 / CHBE 640  METABOLIC ENGINEERING</td>
<td>MECH 594  INTRODUCTION TO AERONAUTICS</td>
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<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>BIOC 544  ADVANCED CONCEPTS AND CRITICAL ANALYSIS IN MODERN DEVELOPMENTAL BIOLOGY</td>
<td>MECH 596  INTRODUCTION TO FLIGHT MECHANICS</td>
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<tr>
<td>MECH 591  GAS DYNAMICS</td>
<td>BIOC 545  ADVANCED MOLECULAR BIOLOGY AND GENETICS</td>
<td>MECH 691  INTRODUCTION TO HYPersonic AERODYNAMICS</td>
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<tr>
<td>MECH 592  DESIGN FOR AEROSPACE ENVIRONMENTS</td>
<td>BIOC 570  COMPUTATION WITH BIOLOGICAL DATA</td>
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<td>MECH 594  INTRODUCTION TO AERONAUTICS</td>
<td>BIOC 580 / BIOE 580 / CHBE 580  PROTEIN ENGINEERING</td>
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<td>MECH 596  INTRODUCTION TO FLIGHT MECHANICS</td>
<td>ESCI 540  EARTH’S ATMOSPHERE</td>
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<td>MECH 691  INTRODUCTION TO HYPersonic AERODYNAMICS</td>
<td>ESCI 581  TOPICS IN PLANETARY DYNAMICS AND MAGMATIC PROCESSES</td>
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<tr>
<td>COMP 598 / ELEC 598 / MECH 598</td>
<td>ESCI 667  GEOMECHANICS</td>
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<tr>
<td>ENGI 515  LEADING TEAMS AND INNOVATION</td>
<td>ESCI 672  EARTH SYSTEMS MODELING: NUMERICAL TECHNIQUES AND APPLICATIONS</td>
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<tr>
<td>ENGI 614  LEARNING HOW TO INNOVATE?</td>
<td>MGMT 633 / BIOE 633  LIFE SCIENCE ENTREPRENEURSHIP &amp; ROLES OF FOUNDERS &amp; VENTURE CAPITAL IN HIGH-TECH STARTUPS</td>
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<tr>
<td>MGMT 601  FINANCIAL STATEMENT ANALYSIS</td>
<td>MGMT 618  COMPLEXITIES OF PEOPLE AND ORGANIZATIONS</td>
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<td>MGMT 618  COMPLEXITIES OF PEOPLE AND ORGANIZATIONS</td>
<td>MGMT 619  CORPORATE GOVERNANCE</td>
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<tr>
<td>MGMT 629  BUSINESS PLAN DEVELOPMENT</td>
<td>MGMT 658  APPLIED RISK MANAGEMENT</td>
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<tr>
<td>MGMT 633 / BIOE 633 &amp; ROLES OF FOUNDERS &amp; VENTURE</td>
<td>MGMT 734  TECHNOLOGY ENTREPRENEURSHIP</td>
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<tr>
<td>CAPITAL IN HIGH-TECH STARTUPS</td>
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</table>

**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 MSSpS Degree Option for Rice Undergraduate Students

Rice undergraduate students have an option to pursue the 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 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 Space Studies 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 MSSpS advisor.

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

- must complete the requirements for their bachelor’s degree and the MSSpS 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).

Additional Information

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