MASTER OF SCIENCE IN SPACEx 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 (minimum of 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 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 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

Total Credit Hours Required for the MSSpS Degree 39

### Degree Requirements

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

Core Science and Engineering Courses

Select 2 courses (minimum of 6 hours) from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 554</td>
<td>ASTROPHYSICS OF THE SUN</td>
<td></td>
</tr>
<tr>
<td>BIOC 540 / CHBE 640</td>
<td>METABOLIC ENGINEERING</td>
<td></td>
</tr>
<tr>
<td>ESCI 540</td>
<td>EARTH'S ATMOSPHERE</td>
<td></td>
</tr>
<tr>
<td>ESCI 660</td>
<td>GEOLOGICAL AND GEOPHYSICAL FLUID DYNAMICS</td>
<td></td>
</tr>
<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>COMPUTATIONAL FLUID MECHANICS</td>
<td></td>
</tr>
<tr>
<td>MECH 592</td>
<td>DESIGN FOR AEROSPACE ENVIRONMENTS</td>
<td></td>
</tr>
</tbody>
</table>

Core Statistics/Computation Courses

Select 2 courses (minimum of 6 credit hours) from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAAM 550</td>
<td>NUMERICAL ANALYSIS I</td>
<td></td>
</tr>
<tr>
<td>CEVE 528 / ENGI 528</td>
<td>ENGINEERING ECONOMICS</td>
<td></td>
</tr>
<tr>
<td>ESCI 650</td>
<td>REMOTE SENSING</td>
<td></td>
</tr>
<tr>
<td>MECH 554 / BIOE 554 / CEVE 554</td>
<td>COMPUTATIONAL FLUID MECHANICS</td>
<td></td>
</tr>
<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>
<td></td>
</tr>
<tr>
<td>STAT 541</td>
<td>MULTIVARIATE ANALYSIS</td>
<td></td>
</tr>
<tr>
<td>STAT 615</td>
<td>REGRESSION AND LINEAR MODELS</td>
<td></td>
</tr>
</tbody>
</table>

### Cohort Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSCI 501</td>
<td>PROFESSIONAL MASTER'S SEMINAR</td>
<td>1</td>
</tr>
<tr>
<td>NSCI 502</td>
<td>SPACE STUDIES SEMINAR</td>
<td>1</td>
</tr>
<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>
<td>1</td>
</tr>
<tr>
<td>NSCI 610 / ENGI 610</td>
<td>MANAGEMENT FOR SCIENCE AND ENGINEERING</td>
<td></td>
</tr>
</tbody>
</table>

### Three to Six Month Internship

A three to six month internship is required ²

### 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 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 574  TURBULENCE  
MECH 578  ORBITAL MECHANICS AND MISSION DESIGN  
MECH 579  LAUNCH VEHICLE AND SPACECRAFT DESIGN  
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  DEVELOPMENTAL NEUROBIOLOGY  
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  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

**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/2019_20/Professional_Science_Masters_Handbook.pdf](https://gradhandbooks.rice.edu/2019_20/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/