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. 3) tab.
- A 3-6 month full-time 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

Code	Title	Credit Hours
Total Credit Hours Required for the MSSpS Degree		39

Degree Requirements

Code	Title	Credit Hours
Core Requirements		
Core Technical Courses		
ASTR 570	SOLAR SYSTEM PHYSICS	3
MECH 578	ORBITAL MECHANICS AND MISSION DESIGN	3
Select 1 course (minimum of 3 credit hours) from the following:		*3*
COMP 614	COMPUTER PROGRAMMING FOR DATA SCIENCE	
EEPS 586	DATA SCIENCE METHODS AND DATA MANAGEMENT	
RCEL 506	APPLIED STATISTICS AND DATA SCIENCE FOR ENGINEERING LEADERS	
STAT 605	R FOR DATA SCIENCE	
Core Science and Engineering Courses		
Select 2 courses (minimum of 6 hours) from the following:		*6*
ASTR 554	ASTROPHYSICS OF THE SUN	
BIOS 524	MICROBIAL PHYSIOLOGY AND GENETICS	
CHBE 640	METABOLIC ENGINEERING	
MECH 554 / BIOE 554 / CEVE 554	COMPUTATIONAL FLUID MECHANICS	
MECH 592 / NSCI 591	DESIGN FOR AEROSPACE ENVIRONMENTS	
PHYS 510	MAGNETOSPHERIC PHYSICS	
PHYS 517	COMPUTATIONAL PHYSICS	
Core Statistics/Computation Courses		
Select 1 course (minimum of 3 credit hours) from the following: [1]		*3*
CEVE 528 / ENGI 528	ENGINEERING ECONOMICS	
CMOR 522	NUMERICAL ANALYSIS	
DSCI 535 / COMP 549	APPLIED MACHINE LEARNING AND DATA SCIENCE PROJECTS	
EEPS 586	DATA SCIENCE METHODS AND DATA MANAGEMENT	
EEPS 636	GIS FOR SCIENTISTS AND ENGINEERS	

MECH 554 / BIOE 554 / CEVE 554	COMPUTATIONAL FLUID MECHANICS	
PHYS 517	COMPUTATIONAL PHYSICS	
STAT 502 / COMP 502 / ELEC 502	NEURAL MACHINE LEARNING I	
Cohort Courses		
NSCI 501	PROFESSIONAL MASTER'S SEMINAR	1
NSCI 502	SPACE STUDIES SEMINAR	1
NSCI 511	SCIENCE POLICY, AND ETHICS	3
NSCI 515	FOUNDATIONS OF PROJECT AND PROGRAM MANAGEMENT	3
NSCI 610 / ENGI 610	MANAGEMENT FOR SCIENCE AND ENGINEERING	3
Elective Requirements		
Select a minimum of 3 courses (minimum of 9 credit hours) from 1 of the following focus areas, depending on the student's individual interests and career goals (see course list below): [1]		*9*
Engineering		
Sciences (AstroScience/Earth Science/Life Sciences)		
Management and Entrepreneurship		
Interdisciplinary Interest Electives		
Three to Six Month Full-Time Internship		
A three to six month full-time internship is required [2]		
NSCI 512	PROFESSIONAL MASTER'S PROJECT	1
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 **Three to Six Month Full-Time Internship:** Practical experience is offered via a three to six month full-time work 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.

Course List to Satisfy Requirements

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.

Code	Title	Credit Hours
Engineering		
CEVE 504	ATOMSPHERIC PARTICULATE MATTER	3
CEVE 511	ATMOSPHERIC CHEMISTRY AND CLIMATE	3
CEVE 576 / MECH 576	STRUCTURAL DYNAMIC SYSTEMS	3
COMP 598 / ELEC 598 / MECH 598	INTRODUCTION TO ROBOTICS	3
ENGI 515	LEADING TEAMS AND INNOVATION	3
ENGI 614	LEARNING HOW TO INNOVATE?	2
MECH 554 / BIOE 554 / CEVE 554	COMPUTATIONAL FLUID MECHANICS	3
MECH 578	ORBITAL MECHANICS AND MISSION DESIGN	3
MECH 590	AEROSPACE PROPULSION	3
MECH 591	GAS DYNAMICS	3
MECH 592 / NSCI 591	DESIGN FOR AEROSPACE ENVIRONMENTS	3
MECH 594	INTRODUCTION TO AERONAUTICS	3

Code	Title	Credit Hours
Sciences (AstroScience/Earth Science/Life Sciences)		
ASTR 542	NEBULAR ASTROPHYSICS	3
ASTR 554	ASTROPHYSICS OF THE SUN	3
ASTR 555	PROTOSTARS AND PLANETS	3
BIOS 524	MICROBIAL PHYSIOLOGY AND GENETICS	3
BIOS 543	DEVELOPMENTAL NEUROBIOLOGY	3
BIOS 570	COMPUTATION WITH BIOLOGICAL DATA	3
EEPS 540	CRYOSPHERE	3
EEPS 581	MODERN EXPLORATION TECHNOLOGY	3
EEPS 667	GEOMECHANICS	3
EEPS 672	EARTH SYSTEMS MODELING: NUMERICAL TECHNIQUES AND APPLICATIONS	3
MGMT 633 / BIOE 633	ROLES OF PHYSICIANS, SCIENTISTS, ENGINEERS AND MBA'S IN HIGH-TECH STARTUPS	1.5
PHYS 510	MAGNETOSPHERIC PHYSICS	3
PHYS 541	RADIATIVE PROCESSES	3
PHYS 580	INTRODUCTION TO PLASMA PHYSICS	3

Code	Title	Credit Hours
Management and Entrepreneurship		
ENGI 515	LEADING TEAMS AND INNOVATION	3
ENGI 614	LEARNING HOW TO INNOVATE?	2
MGMT 601	FINANCIAL STATEMENT ANALYSIS	3
MGMT 618	BESTSELLERS: THE SCIENCE AND WISDOM	1.5
MGMT 633 / BIOE 633	ROLES OF PHYSICIANS, SCIENTISTS, ENGINEERS AND MBA'S IN HIGH-TECH STARTUPS	1.5
MGMT 658	APPLIED RISK MANAGEMENT	1.5
MGMT 734	TECHNOLOGY COMMERCIALIZATION LAB	3

Code	Title	Credit Hours
Interdisciplinary Interest Electives		
Select 3 courses (9 credit hours) from any of the Electives listed in the three focus areas above		

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/2023_24/Natural_Sciences_Professional_Masters_Graduate_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 as 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/undergraduate-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/