

M.S. in Aviation (MSAV)

Introduction

The Master of Science in Aviation (MSAV) degree program is a broad-based, flexible degree program designed to provide both the aviation/aerospace professional and students who are interested in a career in aviation with a rigorous academic approach to an aviation/aerospace oriented multidisciplinary degree. It provides an unequalled opportunity for pilot flight crew members, air traffic control personnel, flight operations specialists, meteorologists, industry technical representatives, uncrewed aircraft systems operators, and aviation educators to enhance their knowledge and pursue additional career opportunities. The MSAV degree is designed to provide the student with a broad research background and technical knowledge in the core curriculum and the opportunity to select from six different specializations to pursue their chosen career path in the aviation field.

The MSAV program consists of 33 credits. Students must complete the MSAV core requirements consisting of 12 credits and then complete the 9 credits that make up the selected specialization in one of the following: Air Traffic Management, Aviation/Aerospace Management and Sustainability, Aviation/Aerospace Operations, Aviation/Aerospace Safety Systems, Space Operations, or Uncrewed Systems.

Students must also complete 12 credits of coursework that include either a Thesis (6 credits) or a Graduate Capstone Project (GCP) (3 credits). The remaining credits are made up of graduate-level aeronautical science electives. MSAV students can also complete courses leading to multiple specializations. Additional specializations must be declared prior to the completion of the degree program.

Students wishing to complete a dual specialization must have nine (9) unduplicated credits in each of the specializations and will complete a total of 33 (GCP) or 36 (Thesis) credit hours in order to graduate. Additional specializations may also be taken.

Admissions Criteria

Students will:

- Apply mathematics, science, and applied sciences at a level appropriate to aviation-related disciplines at the master's level, including an adequate foundation in statistics.
- Analyze and interpret data at the master's level.
- Work effectively on multi-disciplinary and diverse teams.
- Make professional and ethical decisions.
- Communicate effectively, using both written and oral communication skills.
- Engage in and recognize the need for life-long learning.
- Assess contemporary issues.
- Use the techniques, skills, and modern technology necessary for professional practice.
- Assess the national and international aviation environment.
- Apply pertinent knowledge in identifying and solving problems.
- Apply knowledge of business sustainability to aviation issues.
- Apply advanced qualitative and quantitative problem-solving skills.

Degree Requirements

Air Traffic Management Specialization

(For students with NO ATC experience)

MSAV Core Requirements

Required Courses	12
MSA 540 The Air Transportation System	3

MSA 545 Human Factors in the Aviation/Aerospace Industry	3
or MSA 554 Project Management in Aviation Aerospace	
MSA 662 Statistical Analysis for Aviation/Aerospace	3
MSA 670 Research Methods in Aviation/Aerospace	3

Specialization Requirements

Required Courses 9

MSA 520 Introduction to Air Traffic Control Tower	3
MSA 617 En route Radar Operations	3
MSA 623 Advanced Air Traffic Control Tower	3

Electives

MSA 508 Advanced Airport Modeling	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 547 Leadership and Critical Decision Making in the Aviation Industry	3
MSA 608 Aviation/Aerospace Accident Investigation and Analysis	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3

Select one of the following options: 12

Option I: Capstone

MSA 691 Graduate Capstone Research Project	3
MSA Electives from the above list of electives or any MSA electives (500-600)*	9

Option II: Thesis

MSA Electives from the above list of electives or any MSA Electives (500-600 Level).*	6
MSA 700 Thesis	6

Total Credits 33

• For students with no ATC experience or education and for AT-CTI students, the following undergraduate foundation prerequisite courses are required:

Required Undergraduate Foundation

AT 202 Introduction to Air Traffic Management	3
AT 305 Introduction to Terminal Radar Operations	3
AT 401 Advanced Terminal Radar Operations	3

Aviation/Aerospace Management and Sustainability Specialization

MSAV Core Requirements

Required Courses 12

MSA 540 The Air Transportation System	3
MSA 545 Human Factors in the Aviation/Aerospace Industry	3
or MSA 554 Project Management in Aviation Aerospace	
MSA 662 Statistical Analysis for Aviation/Aerospace	3
MSA 670 Research Methods in Aviation/Aerospace	3

Specialization Requirements

Select three of the following: 9

MSA 508 Advanced Airport Modeling	3
MSA 547 Leadership and Critical Decision Making in the Aviation Industry	3
MSA 573 Agent-based Modeling (ABM) for Aerospace and Aviation Systems	3
MSA 600 Sustainable Aviation and Aerospace Perspectives	3
MSA 609 Aircraft Maintenance Management	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3
MSA 641 Production and Procurement Management in the Aviation/Aerospace Industry	3

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MSA 642	International Aviation Policy	3
MSA 644	Integrated Logistics Support in Aviation/Aerospace	3

Note: Only one BA/MGMT courses may be selected with permission of the Program Coordinator.

Select one of the following options: **12**

Option I: Capstone

MSA 691	Graduate Capstone Research Project	3
MSA Electives (500-600 Level)*		9

Option II: Thesis

MSA Electives (500-600 Level)*		6
MSA 700	Thesis	6

Total Credits **33**

Aviation/Aerospace Operations Specialization

MSAV Core Requirements

Required Courses **12**

MSA 540	The Air Transportation System	3
MSA 545	Human Factors in the Aviation/Aerospace Industry	3
or MSA 554	Project Management in Aviation Aerospace	
MSA 662	Statistical Analysis for Aviation/Aerospace	3
MSA 670	Research Methods in Aviation/Aerospace	3

Specialization Requirements

Select three of the following: **9**

MSA 508	Advanced Airport Modeling	3
MSA 515	Aviation/Aerospace Simulation Systems	3
MSA 516	Applications in Crew Resource Management	3
MSA 547	Leadership and Critical Decision Making in the Aviation Industry	3

MSA 562	Situation Awareness and Performance in Aviation/Aerospace	3
MSA 573	Agent-based Modeling (ABM) for Aerospace and Aviation Systems	3
MSA 619	Airport Certification and Operations Safety	3
MSA 620	Air Carrier Operations	3
MSA 622	Corporate Aviation Operations	3

Note: One BA/MGMT Courses may be selected with permission of the Program Coordinator.

Select one of the following options: **12**

Option I: Capstone

MSA 691	Graduate Capstone Research Project	3
MSA Electives (500-600 Level)*		9

Option II: Thesis

MSA Electives (500-600 Level)*		6
MSA 700	Thesis	6

Total Credits **33**

Aviation/Aerospace Safety Systems Specialization

MSAV Core Requirements

Required Courses **12**

MSA 540	The Air Transportation System	3
MSA 545	Human Factors in the Aviation/Aerospace Industry	3
or MSA 554	Project Management in Aviation Aerospace	
MSA 662	Statistical Analysis for Aviation/Aerospace	3
MSA 670	Research Methods in Aviation/Aerospace	3

Specialization Requirements

Select three of the following: **9**

MSA 516	Applications in Crew Resource Management	3
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MSA 562	Situation Awareness and Performance in Aviation/Aerospace	3
MSA 608	Aviation/Aerospace Accident Investigation and Analysis	3
MSA 611	Aviation/Aerospace System Safety	3
MSA 619	Airport Certification and Operations Safety	3
MSA 621	Aviation/Aerospace Safety Program Management	3

Select one of the following options: **12**

Option I: Capstone

MSA 691	Graduate Capstone Research Project	3
MSA Electives (500-600 Level)*		9

Option II: Thesis

MSA Electives (500-600 Level)*		6
MSA 700	Thesis	6

Total Credit **33**

Space Operations Specialization

MSAV Core Requirements

Required Courses **12**

MSA 540	The Air Transportation System	3
MSA 545	Human Factors in the Aviation/Aerospace Industry	3
or MSA 554	Project Management in Aviation Aerospace	
MSA 662	Statistical Analysis for Aviation/Aerospace	3
MSA 670	Research Methods in Aviation/Aerospace	3

Specialization Requirements

Select three of the following: **9**

MSA 511	Earth Observation and Remote Sensing	3
MSA 512	Space Mission and Launch Operations	3
MSA 513	Space Habitation and Life Support Systems	3
MSA 601	Applications in Space: Commerce, Defense, and Exploration	3

Select one of the following options: **12**

Option I: Capstone

MSA 691	Graduate Capstone Research Project	3
MSA Electives (500-600 Level)*		9

Option II: Thesis

MSA Electives (500-600 Level)*		6
MSA 700	Thesis	6

Total Credits **33**

Uncrewed Systems Specialization

MSAV Core Requirements

Required Courses **12**

MSA 540	The Air Transportation System	3
MSA 545	Human Factors in the Aviation/Aerospace Industry	3
or MSA 554	Project Management in Aviation Aerospace	
MSA 662	Statistical Analysis for Aviation/Aerospace	3
MSA 670	Research Methods in Aviation/Aerospace	3

Specialization Requirements

Select three of the following: **9**

MSA 534	Application of Uncrewed Systems	3
MSA 535	Current Issues in Uncrewed Systems	3
MSA 538	Legal and Regulatory Issues in Uncrewed Systems	3
MSA 624	sUAS Operational Planning and Safety Management	3
MSA 625	Uncrewed Systems Interoperability and Control	3

MSA 635	Uncrewed Systems Operational Configuration	3
Select one of the following options:		12
Option I: Capstone		
MSA 691	Graduate Capstone Research Project	3
MSA Electives (500-600 Level)*		9
Option II: Thesis		
MSA Electives (500-600 Level)*		6
MSA 700	Thesis	6
Total Credits		33