

Master of Science in Aeronautics (MSA)

Department Chair: *Mark Friend*
 Program Coordinator: *Marvin Smith*

Introduction

The Master of Science in Aeronautics (MSA) degree program is designed to provide the aviation/aerospace professional with a rigorous academic approach to a generalist education oriented degree. It provides an unequalled opportunity for flight crew members, air traffic control personnel, flight operations specialists, industry technical representatives, and aviation educators to enhance their knowledge and pursue additional career opportunities.

Entry into the MSA program requires possession of an undergraduate foundation, with a minimum GPA of 3.0, in the areas of college-level mathematics, introduction to computers, economics, and behavioral science.

The program consists of a total of 36 credits. Students must complete the Advanced Aviation/Aerospace Science Core consisting of 12 credits and then complete the 12 credits that make up the selected specialization in one of five areas: Air Traffic Management, Aviation/Aerospace Education Technology, Aviation/Aerospace Management, Aviation/Aerospace Operations, or Aviation/Aerospace Safety Systems. Students must then complete 12 credits of coursework and a comprehensive examination or six hours of coursework and a thesis. MSA students can also complete courses leading to a multiple specialization. The multiple specialization must be declared prior to the completion of the degree

program. Students wishing to complete multiple specializations must have 12 unduplicated credits in each of the specializations and a minimum of 39 credit hours.

Degree Requirements

Air Traffic Management Specialization

Track 1: For students with no ATC experience or education.

Required Undergraduate Foundation
(18 Credits)

Course	Title	Credits
AS 120	Principles of Aeronautical Science	
	-OR-	
AS 132	Basic Aeronautics I	3
WX 201	Survey of Meteorology.	3
AT 200	Air Traffic Management I	
	-OR-	
MSA 606	Aviation/Aerospace Communications/ Control Systems	3
AT 302	Air Traffic Management II.	3
AT 305	Air Traffic Management III	3
AT 401	Air Traffic Management IV	3

MSA Core Requirements (12 Credits)

Required Course:

Course	Title	Credits
MSA 605	Research Methods and Statistics	3
	Core Courses (choose 3)	
MSA 602	The Air Transportation System.	3
MSA 604	Human Factors in Aviation/ Aerospace Industry	3
MSA 606	Aviation/Aerospace Communications/ Control Systems	3
MSA 610	Applied Aviation Safety Programs	3

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Specialization Requirements (12 Credits)

Course Title	Credits
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
MSA 508 Advanced Airport Modeling	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 520 Air Traffic Management-VFR Tower	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 615 Applied Aviation Research Methods	3
MSA 616 Air Traffic Management Leadership and Critical Decision Making	3
MSA 617 Air Traffic Management V	3
MSA 618 Air Traffic Management VI	3
MSA 627 Air Traffic Management in the NAS	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3
MSA 696 Graduate Internship in Aeronautical Science	1-3

Electives (12 Credits)

Option I

Course Title	Credits
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

Option II

MSA 700 Thesis	6
Electives	6
-OR-	
Comprehensive Examination and Electives	12
Total Required	36

Air Traffic Management Specialization

Track 2: For students with an Embry-Riddle undergraduate degree in Air Traffic Management.

MSA Core Requirements (12 Credits)

Required Course:

Course Title	Credits
MSA 605 Research Methods and Statistics	3
Core Courses (choose 3)	

Course Title	Credits
MSA 602 Air Transportation System	3

MSA 604 Human Factors in the Aviation/Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/Control Systems	3
MSA 610 Applied Aviation Safety Programs	3

Specialization Requirements (12 Credits)

Course Title	Credits
MSA 616 Air Traffic Management Leadership and Critical Decision Making	3
MSA 627 Air Traffic Management in the NAS	3

Core Courses

Course Title	Credits
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
MSA 508 Advanced Airport Modeling	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 608 Aviation/Aerospace Investigation and Safety Programs	3
MSA 615 Applied Aviation Research Methods	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3
MSA 696 Graduate Internship in Aeronautical Science	1-3

Electives (12 Credits)

Option I

Course Title	Credits
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

Option II

MSA 700 Thesis	6
Electives	6
-OR-	
Comprehensive Examination and Electives	12
Total Required	36

Course substitutions with approval of MSA Program Coordinator.

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Aviation/Aerospace Education Technology Specialization

MSA Core Requirements (12 Credits)

Required Course

Course Title	Credits
MSA 605 Research Methods and Statistics	3

Core Courses (choose 3)

Course Title	Credits
MSA 602 Air Transportation System	3
MSA 604 Human Factors in the Aviation/ Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/ Control Systems	3
MSA 610 Applied Aviation Safety Programs	3

Specialization Requirements (12 Credits)

Course Title	Credits
MSA 514 Computer-Based Instruction	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 518 Online Learning Environment	3
MSA 550 Aviation Education Foundations	3
MSA 614 Advanced Aviation/Aerospace Curriculum Development	3
MSA 654 Adult Teaching and Learning Techniques	3
MSA 663 Memory and Cognition	3

Electives (12 Credits)

Option I

Course Title	Credits
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

Option II

MSA 700 Thesis	6
Electives	6

-OR-	
Comprehensive Examination and Electives	12

Total Required	36
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Aviation/Aerospace Management Specialization

MSA Core Requirements (12 Credits)

Required Course

Course Title	Credits
MA 605 Research Methods and Statistics	3

Core Courses (choose 3)

Course Title	Credits
MSA 602 Air Transportation System	3
MSA 604 Human Factors in the Aviation/ Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/ Control Systems	3
MSA 610 Applied Aviation Safety Programs	3

Specialization Requirements (12 Credits)

Course Title	Credits
BA 511 Operations Research	3
BA 521 Global Information and Technology Management	3
BA 607 Human Resource Development	3
BA 632 Seminar in Aviation Labor Relations	3
BA 645 Airport Operations and Management	3
MSA 508 Advanced Airport Modeling	3
MSA 609 Aircraft Maintenance Management	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 612 Aviation/Aerospace Industrial Safety Management	3
MSA 615 Applied Aviation Research Methods	3
MSA 616 Air Traffic Management Leadership and Critical Decision Making	3
MSA 627 Air Traffic Management in the NAS	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3
MSA 641 Production and Procurement Management in the Aviation/ Aerospace Industry	3
MSA 643 Management of Research and Development for the Aviation/ Aerospace Industry	3
MSA 644 Integrated Logistics Support in Aviation/Aerospace	3

Electives (12 Credits)

Course Title	Credits
<i>Option I</i>	
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

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Option II

MSA 700 Thesis	6
Electives	6

-OR-

Comprehensive Examination and Electives	12
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Total Required	36
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(At least 18 credits must be MAS courses)

Aviation/Aerospace Operations Specialization

Advanced Aviation/Aerospace Science Core

Course Title	Credits
MSA 602 Air Transportation System	3
MSA 604 Human Factors in the Aviation/ Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/ Control Systems	3
MSA 610 Applied Aviation Safety Programs	3

Students must choose 12 credit hours from the following list.

Specialization Requirement

Course Title	Credits
BA 511 Operations Research	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
MSA 508 Advanced Airport Modeling	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 516 Applications in Crew Resource Management	3
MSA 519 Terrorism and Homeland Security	3
MSA 603 Aircraft and Spacecraft Development	3
MSA 606 Aviation/Aerospace Communication/ Control Systems	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 620 Air Carrier Operations	3
MSA 622 Corporate Aviation Operations	3

Electives (12 Credits)

Course Title	Credits
<i>Option I</i>	
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

Option II

MSA 700 Thesis	6
Electives	6

-OR-

Comprehensive Examination and Electives	12
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Total Required	36
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Aviation/Aerospace Safety Systems Specialization

Required Course:

Course Title	Credits
MA 605 Research Methods and Statistics	3

Core Courses (choose 3)

Course Title	Credits
MSA 602 The Air Transportation System	3
MSA 604 Human Factors in the Aviation/Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/ Controls Systems	3
MSA 610 Applied Aviation Safety Programs	3

Specialization Requirement (12 Credits)

Course Title	Credits
MSA 508 Advanced Airport Modeling	3
MSA 519 Terrorism and Homeland Security	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 612 Aviation/Aerospace Industrial Safety Management	3
MSA 613 Airport Operations Safety	3
MSA 634 Aviation/Aerospace Psychology	3

Electives (12 Credits)

Course Title	Credits
<i>Option I</i>	
MSA/BA Electives	6
-AND-	
MSA 700 Thesis	6
-OR-	
<i>Option II</i>	
MSA 700 Thesis	6
Electives	6
-OR-	
Comprehensive Examination and Electives	12
Total Required	36

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Aviation Meteorology Specialization

MSA Core Requirements (12 Credits)

Required Course:

Course Title	Credits
MSA 605 Research Methods and Statistics	3
Core Courses (choose 3)	

Course Title	Credits
MSA 602 Air Transportation System	3
MSA 604 Human Factors in the Aviation/ Aerospace Industry	3
MSA 606 Aviation/Aerospace Communications/ Control Systems	3
MSA 610 Applied Aviation Safety Programs	3

Specialization Requirement (12 Credits)

Option I: For students with no undergraduate Meteorology/Atmospheric Sciences degree (12 credits)

Required courses:

Course Title	Credits
MSA 517 Advanced Meteorology	3
MSA 525 Advanced Aviation Meteorology	3
MSA 530 Research Seminar in Aviation Meteorology	3
WX 422 Statistical Applications for Meteorological Data Analysis	
-OR-	
WX 480 Environmental Security	3
Total Credits	12

Option II: For students with undergraduate Meteorology/Atmospheric Sciences Degree (12 credits)

Required courses:

Course Title	Credits
MSA 525 Advanced Aviation Meteorology	3
MSA 530 Research Seminar in Aviation Meteorology	3
Electives*	6
Total Credits	12

Electives (12 Credits)

Option I

Course Title	Credits
MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

Option II

MSA 700 Thesis	6
Electives*	6
-OR-	
Comprehensive Examination and Electives	12
Total Required	36

*A combination of two selected elective courses in the WX 400 series that is offered for dual undergraduate/graduate credit, or a combination of one WX 400 elective course for dual undergraduate/graduate credit, and a course in another department that is offered for graduate credit. Examples of acceptable elective course areas are program/project management, human factors, air traffic management, safety science, and homeland security.