

B.S. in Aviation Maintenance Science

At the beginning and end of every flight carried out by every commercial, private, or military aircraft and spacecraft is the work of the professional aviation maintenance expert. Without the devotion of these highly skilled people, the air and space travel system would cease to function. The demand for degreed aircraft maintenance technicians in the aviation/aerospace world has never been greater than it is today. The Aviation Maintenance Science (AMS) program at Embry-Riddle Aeronautical University produces these aviation professionals, which are regarded by the industry as the best in the world.

The Aviation Maintenance Science Bachelor's degree consists of general education courses, technical courses, and laboratories, which prepare the student to obtain the FAA Airframe and Powerplant (A&P) mechanic's certification. Additionally, the Bachelor's degrees have four areas of concentration (AOC) classes which further trains students to excel in one of the below four disciplines. Each degree is composed of 126 or 127 total credit hours, which breakdown as follows: 36 hours of general education coursework, 48 hours of airframe and powerplant technical courses, 6 hours of upper-level open elective coursework, and 36 or 37 hours of AOC coursework. There are four AOC choices:

- Maintenance Management
- Flight
- Safety Science
- Avionics Cybertechnology and Security

The Maintenance Management AOC is optimized for those students who wish to use their maintenance skills as a platform for advancing into a management position in one of the many available aviation maintenance environments. The Flight AOC is for those students who wish to combine a maintenance background with the qualifications of a commercial pilot. The Safety Science AOC combines both occupational and aviation-specific safety courses, which cater to students who want to pursue a career in aviation safety. Finally, the Avionics Cybertechnology and Security AOC prepare students to obtain additional Federal and industry recognized licenses and certifications related to avionics and data transfer systems troubleshooting and repair and empowers them to meet the challenges of securing these systems from outside interferences.

The BSAMS program is a STEM degree accredited by the Southern Association of Colleges and Schools and the Aviation Accreditation Board International (AABI, formerly Council on Aviation Accreditation). Credit will be granted to any student who enters the university already in possession of their airframe, powerplant, airframe and powerplant certifications, or a certificate of completion for the general, airframe, or powerplant curriculum from an approved Part 147 school. International certifications, which may be equivalent to the Airframe and Powerplant certification, will be evaluated on a case-by-case basis and, if approved, may be used for academic credit only.

	Flight	Maintenance Management	Safety Science	Avionics Cybertechnology and Security
General Education Core	36	36	36	36
Area of Concentration	36*	36	36	37
A&P Technical Courses ¹	48	48	48	48
Upper Level Open Electives	6	6	6	6
Total	126	126	126	127

¹ If a student transfers to Embry-Riddle with the A&P mechanic's certification, 48 credit hours will be awarded and entered on the student's transcript, 36 as lower-level credits and 12 as upper-level credits.

* The Flight Area of Concentration in the AMS degree requires a student, once they have matriculated, to take their flight training with Embry-Riddle.

Students will:

- Evaluate aircraft performance using aviation mathematics and physics relevant to aircraft airworthiness.
- Interpret and analyze written and electronic technical instructions.
- Apply leadership and management principles in teamwork and supervisory roles.
- Demonstrate professional and ethical behavior as maintenance technicians and supervisors.
- Identify, analyze, and communicate trends in the aviation maintenance industry in written and spoken formats.
- Use their education and training to engage in lifelong learning relevant to their work environment.
- Apply knowledge of the aviation environment by accurately returning aircraft to service in various environments.
- Direct the use of special equipment and tools in aviation maintenance practice.
- Evaluate the efficiency of technical operations and recommend improvements.
- Use their skill and technical competence to solve complex aviation maintenance problems.

General Education Requirements

For a full description of Embry-Riddle General Education guidelines, please see the General Education section of this catalog. These minimum requirements are applicable to all degree programs.

Communication Theory and Skills (COM 122, COM 219, COM 221)	9
Lower-Level Humanities	3
Lower-Level Social Sciences (PSY 101)	3
Lower or Upper-Level Humanities or Social Sciences	3
Upper-Level Humanities or Social Sciences	3
Computer Science (CS 120)	3
Mathematics *	6
Physical Sciences **	6
Total Credits	36

* Mathematics required courses - Maintenance Management AOC, MA 111 or MA 140 and MA 222. Avionics Cybertechnology and Security, Flight and Safety Science AOCs, MA 111 and MA 112.

** Physical Sciences required courses - Avionics Cybertechnology and Security and Maintenance Management AOCs, any two lower level physical science courses with at least one laboratory. Flight and Safety Science AOC, PS 113 and PS 117 (One Laboratory required).

Aviation Maintenance Science Courses (leading to A&P certification)

AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4
AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2

AMS 261	Aircraft Metallic Structures	3
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
AMS 273	Propeller Systems	2
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
Total Credits		48

Tuition for AMS courses is less than the other courses in the degree and is billed separately from the University block tuition. Contact Student Financial Services for additional information.

Avionics Cybertechnology & Security Area of Concentration

AMSA 490	Aviation Technical Operations	3
AMS 380	Radio Communication Theory & Application	2
AMS 384	General Aviation Avionics Systems Integration	4
AMS 388	Air Transport Avionics Systems Line Maintenance	6
CS 223	Scientific Programming in C	3
CS 225	Computer Science II	4
CS 303	Cryptography and Network Security	3
CS 344	C Programming and UNIX	3
CS 427	System Exploitation and Penetration Testing	3
CYB 155	Foundations of Information Security	3
CYB 474	Issues in Aviation Cybersecurity	3
Total Credits		37

Flight Area of Concentration

FA 121	Private Single Flight	1
FA 221	Instrument Single Flight	1
FA 321	Commercial Single Flight	1
FA 323	Commercial Multi Add On	1
AMSA 490	Aviation Technical Operations	3
AS 121	Private Pilot Operations	5
AS 221	Instrument Pilot Operations	3
AS 309	Aerodynamics	3
AS 310	Aircraft Performance	3
AS 321	Commercial Pilot Operations	3
AS 350	Domestic and International Navigation	3
AS 357	Flight Physiology	3
WX 201	Survey of Meteorology	3
WX 301	Aviation Weather	3
Total Credits		36

Maintenance Management Area of Concentration

ACC 210	Financial Accounting	3
AMSA 490	Aviation Technical Operations	3
BA 201	Principles of Management	3
BA 225	Business Law	3
BA 232	Techniques in Business Analytics	3

BA 314	Human Resource Management	3
BA 320	Business Information Systems	3
BA 324	Aviation Labor Relations	3
BA 325	Social Responsibility and Ethics in Management	3
BA 411	Logistics Management for Aviation/Aerospace	3
FIN 332	Corporate Finance I	3
MK 220	Marketing	3
Total Credits		36

Safety Science Area of Concentration

AMSA 490	Aviation Technical Operations	3
SF 201	Introduction to Safety and Health	3
or SF 210	Introduction to Aerospace Safety	
SF 205	Principles of Accident Investigation	3
SF 315	Environmental Compliance and Safety	3
SF 316	Loss Control and Risk Management	3
SF 320	Human Factors in Aviation Safety	3
SF 345	Safety Program Management	3
SF 365	Fire Protection	3
SF 462	Health, Safety, and Aviation Law	3
Choose one focus from the options below:		9

Aviation Focus Course List:

SF 330	Aircraft Accident Investigation
SF 375	Propulsion Plant Investigation
SF 335	Mechanical and Structural Factors in Aviation Safety
or SF 435	Aircraft Crash Survival Analysis and Design

Occupational Safety Focus Course List:

HSI 215	Introduction to Industrial Security
SF 355	Industrial Hygiene and Toxicology
SF 410	Industrial Safety and Health
or SF 440	Construction Safety and Health

Total Credits	36
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Open Electives

Upper-Level Open Electives	6
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Total Degree Credits

Total Credits	126-127
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Suggested Plan of Study

Year One		Credits
COM 122	English Composition	3
COM 219	Speech	3
CS 120	Introduction to Computing in Aviation	3
CS 223	Scientific Programming in C	3
CS 225	Computer Science II	4
CYB 155	Foundations of Information Security	3
MA 111	Pre-Calculus for Aviation	3
PSY 101	Introduction to Psychology	3
	Lower-Level Humanities Elective	3
Credits Subtotal		28.0
Credits Total:		28.0

Year Two

		Credits
AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4
AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
CS 303	Cryptography and Network Security	3
MA 112	Applied Calculus for Aviation	3
	HU/SS Lower or Upper Level Elective	3
Credits Subtotal		30.0
Credits Total:		30.0

Year Three

		Credits
COM 221	Technical Report Writing	3
AMS 261	Aircraft Metallic Structures	3
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 273	Propeller Systems	2
CS 344	C Programming and UNIX	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
	HU/SS Upper Level Elective	3
	Physics and Life Science Lower Level Elective	3
Credits Subtotal		29.0
Credits Total:		29.0

Summer Session

		Credits
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
Credits Subtotal		10.0
Credits Total:		10.0

Year Four

		Credits
AMS 380	Radio Communication Theory & Application	2
AMS 384	General Aviation Avionics Systems Integration	4
AMS 388	Air Transport Avionics Systems Line Maintenance	6
AMSA 490	Aviation Technical Operations	3
CS 427	System Exploitation and Penetration Testing	3
CYB 474	Issues in Aviation Cybersecurity	3
	Physics and Life Science Lower Level Elective	3
	Open Electives	6
Credits Subtotal		30.0
Credits Total:		30.0

* Only one PS lab (1 credit) is required for graduation.

Year One

		Credits
AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4

AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2
COM 122	English Composition	3
COM 219	Speech	3
CS 120	Introduction to Computing in Aviation	3
MA 111	Pre-Calculus for Aviation	3
PSY 101	Introduction to Psychology	3
	Lower-Level Humanities Elective	3
Credits Subtotal		30.0
Credits Total:		30.0

Year Two

		Credits
AMS 261	Aircraft Metallic Structures	3
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
MA 112	Applied Calculus for Aviation	3
PS 113	Introductory Physics I	3
PS 113L	Introductory Physics I Laboratory	1
Credits Subtotal		31.0
Credits Total:		31.0

Year Three

		Credits
AMS 273	Propeller Systems	2
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
AS 121	Private Pilot Operations	5
AS 221	Instrument Pilot Operations	3
COM 221	Technical Report Writing	3
FA 121	Private Single Flight	1
FA 221	Instrument Single Flight	1
PS 117	Introductory Physics II	3
WX 201	Survey of Meteorology	3
	HU/SS Lower or Upper Level Elective	3
Credits Subtotal		34.0
Credits Total:		34.0

Year Four

		Credits
AMSA 490	Aviation Technical Operations	3
AS 309	Aerodynamics	3
AS 310	Aircraft Performance	3
AS 321	Commercial Pilot Operations	3
AS 350	Domestic and International Navigation	3
AS 357	Flight Physiology	3
FA 321	Commercial Single Flight	1
FA 323	Commercial Multi Add On	1
WX 301	Aviation Weather	3
	Upper-Level Open Electives	6

	Upper-Level Humanities or Social Science Elective	3
	Credits Subtotal	32.0
	Credits Total:	32.0

Year One

		Credits
AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4
AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2
COM 122	English Composition	3
COM 219	Speech	3
CS 120	Introduction to Computing in Aviation	3
MA 111	Pre-Calculus for Aviation	3
or MA 140	College Algebra	
PSY 101	Introduction to Psychology	3
	Lower-Level Humanities Elective	3
	Credits Subtotal	30.0
	Credits Total:	30.0

Year Two

		Credits
AMS 261	Aircraft Metallic Structures	3
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
MA 222	Business Statistics	3
PS 113	Introductory Physics I	3
	Credits Subtotal	30.0
	Credits Total:	30.0

Year Three

		Credits
ACC 210	Financial Accounting	3
AMS 273	Propeller Systems	2
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
BA 201	Principles of Management	3
BA 232	Techniques in Business Analytics	3
COM 221	Technical Report Writing	3
PS 117	Introductory Physics II	3
MK 220	Marketing	3
	HU/SS Lower or Upper Level Elective	3
	Credits Subtotal	33.0
	Credits Total:	33.0

Year Four

		Credits
AMSA 490	Aviation Technical Operations	3
BA 225	Business Law	3
BA 314	Human Resource Management	3
BA 320	Business Information Systems	3

BA 324	Aviation Labor Relations	3
BA 325	Social Responsibility and Ethics in Management	3
BA 411	Logistics Management for Aviation/Aerospace	3
FIN 332	Corporate Finance I	3
	Upper-Level Humanities or Social Science Elective	3
	Upper-Level Open Electives	6
	Credits Subtotal	33.0
	Credits Total:	33.0

Year One

		Credits
AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4
AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2
COM 122	English Composition	3
COM 219	Speech	3
CS 120	Introduction to Computing in Aviation	3
MA 111	Pre-Calculus for Aviation	3
PSY 101	Introduction to Psychology	3
	Lower-Level Humanities Elective	3
	Credits Subtotal	30.0
	Credits Total:	30.0

Year Two

		Credits
AMS 261	Aircraft Metallic Structures	3
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
MA 112	Applied Calculus for Aviation	3
PS 113	Introductory Physics I	3
	Credits Subtotal	30.0
	Credits Total:	30.0

Year Three

		Credits
AMS 273	Propeller Systems	2
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
COM 221	Technical Report Writing	3
PS 117	Introductory Physics II	3
SF 201	Introduction to Safety and Health	3
or SF 210	Introduction to Aerospace Safety	
SF 205	Principles of Accident Investigation	3
SF 315	Environmental Compliance and Safety	3
SF 330	Aircraft Accident Investigation	3
	HU/SS Lower or Upper Level Elective	3
	Credits Subtotal	33.0
	Credits Total:	33.0

Year Four

		Credits
AMSA 490	Aviation Technical Operations	3
SF 316	Loss Control and Risk Management	3
SF 320	Human Factors in Aviation Safety	3
SF 335	Mechanical and Structural Factors in Aviation Safety	3
or SF 435	Aircraft Crash Survival Analysis and Design	
SF 345	Safety Program Management	3
SF 365	Fire Protection	3
SF 375	Propulsion Plant Investigation	3
SF 462	Health, Safety, and Aviation Law	3
	Upper-Level Humanities or Social Science Elective	3
	Upper-Level Open Electives	6
Credits Subtotal		33.0
Credits Total:		33.0

Year One

		Credits
AMS 115	Aviation Mathematics and Physics	2
AMS 116	Fundamentals of Electricity	4
AMS 117	Tools, Materials and Processes	4
AMS 118	Aircraft Familiarization and Regulations	2
COM 122	English Composition	3
COM 219	Speech	3
CS 120	Introduction to Computing in Aviation	3
MA 111	Pre-Calculus for Aviation	3
PSY 101	Introduction to Psychology	3
	Lower-Level Humanities Elective	3
Credits Subtotal		30.0
Credits Total:		30.0

Year Two

		Credits
AMS 261	Aircraft Metallic Structures	3
AMS 262	Aircraft Composite Structures	3
AMS 263	General Aviation Aircraft Systems	3
AMS 264	General Aviation Aircraft Electrical and Instrument Systems	3
AMS 365	Transport Category Aircraft Systems	3
AMS 366	Transport Category Aircraft Electrical and Instrument Systems	3
AMS 271	Aircraft Reciprocating Powerplant and Systems	3
AMS 272	Powerplant Electrical and Instrument Systems	3
MA 112	Applied Calculus for Aviation	3
PS 113	Introductory Physics I	3
Credits Subtotal		30.0
Credits Total:		30.0

Year Three

		Credits
AMS 273	Propeller Systems	2
AMS 274	Aircraft Turbines Powerplants and Systems	4
AMS 375	Repair Station Operations	3
AMS 376	Powerplant Line Maintenance	3
COM 221	Technical Report Writing	3
HSI 215	Introduction to Industrial Security	3
PS 117	Introductory Physics II	3
SF 201	Introduction to Safety and Health	3

or SF 210	Introduction to Aerospace Safety	
SF 205	Principles of Accident Investigation	3
SF 315	Environmental Compliance and Safety	3
	HU/SS Lower or Upper Level Elective	3
Credits Subtotal		33.0
Credits Total:		33.0

Year Four

		Credits
AMSA 490	Aviation Technical Operations	3
SF 316	Loss Control and Risk Management	3
SF 320	Human Factors in Aviation Safety	3
SF 345	Safety Program Management	3
SF 355	Industrial Hygiene and Toxicology	3
SF 365	Fire Protection	3
SF 410	Industrial Safety and Health	3
or SF 440	Construction Safety and Health	
SF 462	Health, Safety, and Aviation Law	3
	Upper-Level Humanities or Social Science Elective	3
	Upper-Level Open Electives	6
Credits Subtotal		33.0
Credits Total:		33.0