B.S. in Aerospace Engineering

Degree Requirements

The Bachelor of Science in Aerospace Engineering program requires successful completion of a minimum of 129 credit hours. The program may be completed in eight semesters assuming appropriate background and full-time enrollment. A minimum cumulative grade point average of 2.00 is needed for all required AE, EGR, EP, ES, and ME courses, excluding technical electives. The courses necessary to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. **Students must have a C or better in all prerequisites for all required AE, EGR, EP, ES, COM 221, ME, and SYS courses.**

Program Requirements

General Education

Embry-Riddle degree programs require students to complete a minimum of 36 hours of General Education coursework. For a full description of Embry-Riddle General Education guidelines, please see the General Education section of this catalog.

Students may choose other classes outside of their requirements, but doing so can result in the student having to complete more than the degree's 129 credit hours. This will result in additional ***time and cost*** to the student.

Communication Theory and Skills	9
Computer Science/Information Technology Elective	3
Mathematics	6
Physical and Life Sciences (Natural Sciences)	6
Humanities and Social Sciences	12
3 hours of Lower-Level Humanities	
3 hours of Lower-Level Social Science	
3 hours of Lower-Level or Upper-Level Humanities or Social Science	
3 hours of Upper-Level Humanities or Social Science	
Total Credits	**36**

Aerospace Engineering Core (92 Credits)

The following course of study outlines the quickest and most cost-efficient route for students to earn their B.S. in Aerospace Engineering. Students are encouraged to follow the course of study to ensure they complete all program required courses and their prerequisites within four years.

Courses in the core with a # will satisfy your general education requirements.

AE 302	Aerodynamics II	3
AE 318	Aerospace Structures I	3
AE 430	Control System Analysis and Design	3
CHM 113	General Chemistry for Engineering #	3
COM 122	English Composition #	3
COM 221	Technical Report Writing (Must earn a C or better to pass COM 221) #	3
COM 420	Advanced Technical Communication I #	1
COM 430	Advanced Technical Communication II #	2
EC 225	Engineering Economics #	3
EE 335	Electrical Engineering I	2
EE 336	Electrical Engineering I Laboratory	1
EGR 101	Introduction to Engineering	2
EGR 115	Introduction to Computing for Engineers #	3
EGR 200	Computer Aided Design of Aerospace Systems	3
or EGR 201	Computer Aided Design of Mechanical Systems	
ES 201	Statics	3
ES 202	Solid Mechanics	3
ES 204	Dynamics	3
ES 206	Fluid Mechanics	3
ES 208	Thermodynamics	3
ES 320	Engineering Materials Science	2
ES 321	Engineering Materials Science Laboratory	1
ES 324	Measurements and Instrumentation	2
ES 325	Measurements and Instrumentation Lab	1
General Education - Humanities or Social Science Lower-Level or Upper-Level Elective #		3
General Education - Humanities Lower-Level Elective #		3
HU 330	Values and Ethics (OR Study Abroad in HU/SS Upper-Level) #	3
or HU 335	Technology and Modern Civilization	
MA 241	Calculus and Analytical Geometry I #	4
MA 242	Calculus and Analytical Geometry II #	4
MA 243	Calculus and Analytical Geometry III	4
MA 345	Differential Equations and Matrix Methods	4
Math or Natural Science Upper Level Elective ^		3
PS 161	Physics I & II for Engineers	4
PS 250	Physics for Engineers III #	3
PS 253	Physics Laboratory for Engineers #	1
Total Credits		**92**

Astronautics Option (31 Credits)

AE 313	Space Mechanics	3
AE 324	Experimental Space Sys Engineering	2
AE 326	Experimental Space Systems Engineering Lab	1
AE 414	Space Propulsion	3
AE 426	Spacecraft Attitude Dynamics	3
AE 427	Spacecraft Preliminary Design	4
or AE 420	Aircraft Preliminary Design	
AE 445	Spacecraft Detail Design	4
CEC 325	Fundamentals of Applied Microcontrollers	3
CEC 326	Fundamentals of Applied Microcontrollers Laboratory	1
CS 125	Computer Science I	4
EP 394	Space Systems Engineering	3
Total Credits		**31**

Aeronautics Option (31 Credits)

AE 301	Aerodynamics I	3
AE 314	Experimental Aerodynamics	1
AE 315	Experimental Aerodynamics Laboratory	1
AE 317	Aircraft Flight Mechanics and Performance	3
AE 420	Aircraft Preliminary Design	4
AE 421	Aircraft Detail Design	4
AE 423	Airplane Stability, Dynamics, and Control	3
EGR 310	Advanced Engineering Computation	3
ME 309	Airbreathing and Rocket Propulsion	3
Astronautics Elective		3
Structures Elective		3
Total Credits		**31**

Technical Electives (6 Credits)

Technical Electives	6
Total Credits	**129**

Three Technical Elective credits must be upper-level College of Engineering courses not specifically listed in the student's degree requirements.

AE		
Upper-level, except Directed Studies		
With prior approval from the Aerospace Engineering Department.		
Cooperative Education Courses		
With prior approval from the Aerospace Engineering department. See Career Advisor for more information.		
CEC		
Upper-level, except Directed Studies		
CS		
CS 325	Programming in ADA	3
CS 420	Operating Systems *	3
EE		
Upper-level, except Directed Studies		
EGR		
Upper-level		
EP		
Upper-level, except Directed Studies		
ES		
Upper-level, except Directed Studies		
MA		
MA 348	Numerical Analysis I	3
MA 412	Probability and Statistics	3
MA 432	Linear Algebra	3
MA 441	Mathematical Methods for Engineering and Physics I	3
MA 442	Mathematical Methods for Engineering and Physics II	3
MA 443	Complex Variables	3
ME		
Upper-level, except Directed Studies		
PS		
PS 303	Modern Physics **	3
PS 321	Classical Mechanics I *	3
PS 322	Classical Mechanics II **	3
PS 350	Quantum Mechanics I **	3
PS 375	Planetary Science	3
PS 420	Remote Sensing	3
SE		
SE 300	Software Engineering Practices **	3
SIS		
SIS 365	Project Management	3
SYS		
SYS 301	Introduction to Systems Engineering	3
SYS 304	Trade Studies, Risk and Decision Analysis	3
SYS 415	Systems Engineering Practices: Specialty Engineering	3

* Offered in Fall Only
** Offered in Spring Only
*** Structures Elective may be satisfied with AE 409, AE 418, ES 322/323, ES 412, ES 414 (or as approved by Department Chair).
**** UNIV 101 is taken in excess of degree requirements of meets open elective credits.
***** Astronautics Elective may be satisfied with AE 313 (or as approved by Department Chair).
^ This course could be filled by any 300/400 level MA/PS/CHM/BIO/WX course (or approved by the department chair).
# General Education Course

All Army ROTC students are required to complete SS 321 - U.S. Military History 1900-Present (3 credits) in order to commission.