

# MINOR COURSES OF STUDY

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Minor courses of study are academic programs designed to satisfy a student's personal interests and to meet their professional needs. Students explore, in some depth, the offerings in a field of study. A minor course of study provides the student with significant experience in a discipline organized around skills, methodology, and subject matter. To gain the greatest value from their academic experiences, students are encouraged to select minors that complement their degree program and/or other minors they are pursuing. A minor must be in a discipline outside the student's major field of study. Designed to include a minimum number of required courses, minors provide students, whenever possible, with flexibility in fulfilling program requirements.

- A minor consists of 15-24 semester hours of related courses, of which at least six hours must be completed in residence at Embry-Riddle. It includes six hours of upper-division hours; at least three of these must be completed in residence.
- Students should declare their minors as soon as possible, before the beginning of the senior year, by completing an Official Declaration form approved and signed by their academic advisor.
- Minor requirements are subject to the catalog in effect at the time it is officially declared.
- Students must earn a minimum GPA of 2.00 based on all courses in the minor.
- Courses cannot be shared between minors and no more than two substitutions are permitted in any one minor or in any combination of multiple minors. Substitutions must be approved by the department offering the minor.

In addition to specific minors described in this catalog, students may earn an interdisciplinary minor by completing the required courses approved by the department chair and the dean of the college offering the minor. Please see your academic advisor or the Records Office for more information. An interdisciplinary minor must have at least six credits hours in the discipline from courses that are not specifically required in the student's degree program. No substitutions are allowed in the interdisciplinary minor. A new form must be submitted with the appropriate signatures to make changes.

## The following minors are offered at the Prescott Campus.

- Aeronautical Studies
- Air Traffic Control
- Applied Meteorology
- Arabic and Middle Eastern Studies
- Asian Studies
- Aviation Safety
- Business Administration
- Computer Applications
- Computer Security
- Computer Science
- Electrical Engineering
- Environmental Studies
- Flight
- Helicopter Flight
- Helicopter Operations & Safety
- Humanities
- Mandarin Chinese
- Mathematics
- Psychology
- Security Studies
- Space Studies
- Technical Intelligence

## Minor Courses of Study

### Minor in Aeronautical Studies

This minor gives students in non-Aeronautical Science and non-Aeronautics programs an increased exposure to advanced aviation knowledge by taking a sequence of 18 hours of mostly upper-level Aeronautical Science courses. No more than nine of the 18 hours required for this minor can come from courses required for the student's degree. A minor in Aeronautical Studies can be earned by successfully completing six of the following:

Course	Title	Credits
AS 254	Aviation Legislation . . . . .	3
AS 309	Aerodynamics . . . . .	3
AS 310	Aircraft Performance . . . . .	3
AS 311	Aircraft Engines - Turbine . . . . .	3
AS 356	Aircraft Systems and Components . . . . .	3
AS 357	Flight Physiology . . . . .	3
AS 350	Domestic and International Navigation . . . . .	3
AS 402	Airline Operations . . . . .	3
AS 405	Aviation Law . . . . .	3
AS 408	Flight Safety . . . . .	3
AS 410	Airline Dispatch Operations . . . . .	3
AS 411	Jet Transport Systems . . . . .	3
AS 420	Flight Technique Analysis . . . . .	3
<b>Total Credits Required</b>		<b>18</b>

### Minor in Air Traffic Control\*

The Air Traffic Control (ATC) minor provides the fundamental traffic controller knowledge and technical competency through a mix of classroom instruction, computer-based instruction, and realistic ATC laboratory simulations.

Embry-Riddle has a formal partnership agreement with the FAA that designates the University as an FAA-approved air traffic control training school. This partnership ensures that the learning objectives and the standards of student achievement are relevant to the needs of the FAA.

To qualify for the ATC minor, students must successfully complete the required prerequisites, listed below, and the four ATC courses.

Course	Title	Credits
AT 200	Air Traffic Management I . . . . .	3
AT 305	Air Traffic Management III . . . . .	3
AT 401	Air Traffic Management IV . . . . .	3
AT 405	Air Traffic Management V . . . . .	3
WX 201	Survey of Meteorology . . . . .	3

One of the following is required:  
 AS 119 Private Pilot Operations . . . . . 4  
 -OR-  
 AS 120 Principles of Aeronautical Science . . . . . 3  
       FAA Private Pilot Certificate . . . . . 1

**Total Credits Required** **17-20**

\* Although AT 302 is not required for the ATC minor, those students who would like to be recommended for employment as an FAA Air Traffic Controller must also take AT 302.

### Minor in Applied Meteorology

The minor in Applied Meteorology introduces the student with an interest in weather to the intriguing world of meteorology. The minor requires nine hours of WX courses beyond the two required courses, WX 201 and WX 301, a total of 15 hours of WX courses. Six hours of these classes must be higher numbered classes than WX 301. Always check the catalog course descriptions for prerequisites.

Course	Title	Credits
WX 201	Survey of Meteorology . . . . .	3
WX 301	Aviation Weather . . . . .	3

Recommended Electives for flight students:  
 WX 261 Applied Climatology . . . . . 3  
 WX 363 Thunderstorms . . . . . 3  
 WX 364 Weather for Aircrews . . . . . 3  
 WX 365 Satellite and Radar Weather Interpretation . . . . . 3  
       Or any combination of WX courses . . . . . 9

**Total Credits Required** **15**

Note: Non-aviation students may take WX 252 in lieu of WX 201 and WX 301 plus another 12 hours of Weather (WX) courses. Six hours of upper-level courses are required for a minor.

### Minor in Arabic and Middle Eastern Studies

The Arabic and Middle Eastern Studies Minor

## Minor Courses of Study

introduces the student to the cultures and histories of Arab countries and languages. A student can earn this minor by successfully completing at least 18 related credit hours, with six upper-level credits in Middle Eastern Studies in residence at Embry-Riddle. These credits can be chosen from the following options.

**Option I:** Courses may be chosen from the list of Arabic language and Middle Eastern Studies.

**Option II:** May apply transfer credits in Arabic language and area studies for a minor in Arabic and Middle Eastern Studies with departmental approval. Six credits must be taken at Embry-Riddle.

Course	Title	Credits
LAR 101	Arabic I	3
LAR 102	Arabic II	3
LAR 201	Arabic III	3
LAR 202	Arabic IV	3
RS 306	Studies in Middle Eastern History & Cultures	3
RS 307	Islam and Arabic Culture	3
	-OR-	
RS 399	Directed Studies	3
<b>Total Credits Required</b>		<b>18</b>

### Minor in Asian Studies

The Asian Studies minor introduces a student to the cultures, histories, and languages of Asian countries, as well as cross-cultural comparisons between the U.S. and Asia. Any student can earn the minor by successfully completing at least 15 related credit hours, including six upper-level credits in Asian Studies earned at Embry-Riddle. These 15 credits can be earned from the following options:

**Option I:** Choose courses from the list of Asian Studies courses.

**Option 2:** Transfer up to nine credits in an Asian language or from Asian Studies courses or study abroad, and earn at least six upper-level Asian Studies credits from Embry-Riddle.

Course	Title	Credits
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LCH 101	Mandarin Chinese I	3
LCH 102	Mandarin Chinese II	3
LCH 199	Special Topics in Lower-Level Chinese Language	
	-OR-	
LCH 201	Mandarin Chinese III	3
LCH 202	Mandarin Chinese IV	3

Upper Level Courses:

RS 300	Observing Asian Cultures	3
RS 305	Asian Literature	3

**Total Credits Required** **15**

### Minor in Aviation Safety

This minor has a strong aviation focus. Through relevant course selection, students may either concentrate on aircraft accident investigation or aviation safety management.

Course	Title	Credits
SF 210*	Introduction to Aerospace Safety	
	-OR-	
SF 201	Introduction to Health, Occupational, and Transportation Safety	3
SF 320	Human Factors in Aviation Safety	3

AND any three of the following:

Course	Title	Credits
SF 330	Aircraft Accident Investigation	3
SF 335	Mechanical and Structural Factors in Aviation Safety	3
SF 341	Safety and Security of Airport Ground Operations	3
SF 345	Safety Program Management	3
SF 350	Aircraft Crash and Emergency Management	3
SF 375	Propulsion Plant Investigation	3
SF 435	Aircraft Crash Survival Analysis and Design	3
SF 445	System Safety in Aviation	3
SF 399/499	Special Topics in Aviation Safety	3

**Total Credits Required** **15**

NOTE: Students in the Aeronautical Science degree program pursuing the Safety minor who complete SF 210/320 and one other upper-level SF course will not be required to take AS 408. Students taking AS 408 are not required to take SF 210. Students selecting this option must still meet the minimum number of hours required for degree completion in their declared area of concentration.

### Minor in Business Administration

Students may earn a minor in Business

## Minor Courses of Study

Administration by successfully completing the following. This minor is not open to students pursuing the Aviation Business Administration degree.

Course	Title	Credits
BA 201	Principles of Management . . . . .	3
EC 210	Microeconomics	
	-OR-	
EC 211	Macroeconomics . . . . .	3
BA 210	Financial Accounting . . . . .	3
BA 311	Marketing . . . . .	3
	Specified Electives . . . . .	6
<b>Total Credits Required</b>		<b>18</b>

Specified Electives*		
BA 308	Public Administration . . . . .	3
BA 319	Managerial and Organizational Behavior	3
BA 320	Business Information Systems . . . . .	3
BA 324	Aviation Labor Relations . . . . .	3
BA 332	Corporate Finance I . . . . .	3
BA 333	Personal Financial Planning . . . . .	3
BA 335	International Business . . . . .	3
BA 342	International Finance . . . . .	3
BA 408	Airport Management . . . . .	3
BA 410	Management of Air Cargo . . . . .	3
BA 412	Airport Planning and Design Standards . . . . .	3
BA 415	Airline Management . . . . .	3
BA 418	Airport Administration and Finance . . . . .	3
BA 421	Small Business Management . . . . .	3
EC 225	Engineering Economics . . . . .	3
EC 312	Money and Banking . . . . .	3
<b>Total Credits Required</b>		<b>18</b>

\*Other substitutions for Specified Electives may be approved by the Business Department Chair.

### Minor in Computer Applications

The minor in Computer Applications is designed to provide utilitarian knowledge in a variety of common PC computer applications, including word processing, graphic presentations, database, programming, and web page design.

Course	Title	Credits
CS 117	Computer Configurations . . . . .	3
CS 118	Fundamentals of Computer Programming* . . . . .	3
IT 210	Web Page Authoring and Design	
	-OR-	
BA 221	Advanced Computer Based Systems . . . . .	3

BA 320	Business Information Systems** . . . . .	3
CS 308	Practicum (Capstone Project Course) . . . . .	3

\* Or equivalent programming course approved by the Chair of the Mathematics and Computer Science Department.

\*\* Or upper-level course approved by the Chair of the Mathematics and Computer Science Department.

<b>Total Credits Required</b>	<b>15</b>
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### Minor in Computer Science

Students may earn a minor in Computer Science by successfully completing the following:

Course	Title	Credits
CS 125	Computer Science I . . . . .	4
CS 225	Computer Science II . . . . .	4
SE 300	Software Engineering Practices . . . . .	3
XX 300-400*	CS/SE/CEC Electives . . . . .	6
<b>Total Credits Required</b>		<b>17</b>

\* XX 300-400. In addition to any 300-400 level CS/SE/CEC electives, students may take ES 405 or any computer-related course approved by the Mathematics and Computer Science Department.

### Minor in Computer Security

The minor in Computer Security is intended to provide an introduction to the technologies, issues, and limitations of Computer Security in the context of both computer science and information security in general. The minor consists of the six courses shown below. Students with prior programming experience are encouraged to customize this minor by proposing other technical courses in place of all or part of the lower-division sequence of EGR 115 followed by CS 225.

Course	Title	Credits
EGR 115	Introduction for Computing for Engineers . . . . .	3
CS 225	Computer Science II . . . . .	4
CS 303	Network Security . . . . .	3
CS 305	Database Systems and Data Mining . . . . .	3
CS 420	Operating Systems . . . . .	3
CS 432	Information and Computer Security . . . . .	3
<b>Total Credits Required</b>		<b>19</b>

## Minor Courses of Study

### Minor in Electrical Engineering

This minor will provide knowledge of analog or digital electronics and its application to the fields of aerospace and mechanical engineering. Not open to Electrical Engineering students.

Course	Title	Credits
EE 223	Linear Circuit Analysis I	3
EE 224	Electrical Engineering Laboratory I	1
EE 309	Signal and Linear System Analysis	4

Select either the Digital or Analog option:

#### Digital Option

Course	Title	Credits
CS 125	Computer Science I	4
CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1

#### Analog Option

Course	Title	Credits
EE 302	Electronic Devices and Circuits	3
EE 304	Electronic Circuits Laboratory	1
EE 4XX	Elective and Laboratory	4

Total Credits Required 16

### Minor in Environmental Studies

This course sequence is an interdisciplinary program designed to provide a fundamental knowledge of the natural environment and the dimensions of human impacts. It provides in-depth analysis of the relationship between the environment, culture, and law. Furthermore, it supplies knowledge about major environmental issues surrounding technology and technical careers. Not open to Aviation Environmental Science students.

Course	Title	Credits
PS 107	Elements of Biological Science	3
PS 101	Basic Chemistry	
	-OR-	
PS 105	General Chemistry I	
	-OR-	
PS 108	Contemporary Chemistry	
	-OR-	
PS 140	Chemistry for Engineers	.3/4
PS 142	Introduction to Environmental Science	3

PS 304	Environmental Science	
	-OR-	
PS 309	Principles of Ecology	3
SS 360	Environmental Law	
	-OR-	
COM350	Environmental Communication	3

Total Credits Required 15-16

### Minor in Flight

The Flight minor incorporates the courses required to obtain the FAA commercial pilot certificate with instrument and multi-engine ratings. In addition to the required flight courses, rigorous academic classes are included to provide professional pilot education in excess of the minimum FAA requirements for the associated FAA certificates. Included is instruction in CRM, team building, resource management, communication skills, and other topics associated with piloting multi-engine aircraft at the commercial level.

Course	Title	Credits
AS 119	Private Pilot Operations	4
AS 221	Instrument Pilot Operations	3
AS 321	Commercial Pilot Operations	3
	Upper-Level AS Course	3
	-AND-	

#### SINGLE ENGINE FLIGHT TRACK\*

FA 119	Private Single Flight	1
FA 221	Instrument Single Flight	1
FA 321	Commercial Single Flight	1
FA 323	Commercial Multi Add On	1
	-OR-	

#### MULTI ENGINE FLIGHT TRACK\*

FA 119	Private Single Flight	1
FA 122	Private Multi Flight with Laboratory	1
FA 222	Instrument Multi Flight	1
FA 322	Commercial Multi Flight	1

Total Credits Required 17

\*See the Advanced Standing section in the University Academic Regulations and Procedures and the Aeronautical Science Notes under the Aeronautical Science degree sections of this catalog for information pertaining to these courses and the awarding of credit for previously earned FAA certificates, and an explanation of the single-engine and multi-engine flight tracks.

## Minor Courses of Study

### Minor in Helicopter Flight

This minor incorporates courses required to obtain the FAA private and commercial pilot certificates and either the helicopter instrument rating or the helicopter flight instructor certificate. Rigorous academic classes are included to provide professional pilot education. Included is instruction in resource management, high-altitude helicopter operations, and other topics associated with piloting helicopters at the commercial level. The flight portion of the minor is taught by an FAA-approved 141 flight school. Advanced standing credit is awarded when the student completes each certificate/rating.

Course Title	Credits
AS 142 Private Helicopter Operations . . . . .	3
AS 252 Instrument Helicopter Operations . . . . .	3
AS 372 Commercial Helicopter Operations . . . . .	3
AS 442 Flight Instructor Helicopter Operations	
-OR-	
Any upper-level (300/400) AS, SF, or WX course . . .	3
Advanced standing for:	
Helicopter Private Pilot Certificate . . . . .	1
Helicopter Commercial Pilot Certificate . . . . .	1
Helicopter Instrument Rating . . . . .	1
-OR-	
Helicopter Flight Instructor Certificate . . . . .	1
<b>Total Credits Required</b>	<b>15</b>

### Minor in Helicopter Operations and Safety

This minor was developed with and for the helicopter industry. Students will develop an understanding of aviation safety, maintenance, personnel management and training, and operations management programs in use by the government and civil aviation. Additionally, learning about advanced technology used in the industry is an integral part of this program. This minor coincides with the Helicopter Flight Minor as a capstone

program. A minor in Helicopter Operations and Safety can be earned by successfully completing all of the following:

Course Title	Credits
SF 210 Introduction to Aerospace Safety . . . . .	3
SF 345 Safety Program Management . . . . .	3
AS 378 Environmental Helicopter Operations . . .	3
AS 388 Helicopter Flight Planning . . . . .	3
AS 428 FMS/Autopilots for Helicopters . . . . .	3
AS 438 Advanced Helicopter Operations . . . . .	3
<b>Total Credits Required</b>	<b>18</b>

### Minor in Humanities

Students may earn a minor in Humanities by successfully completing 18 hours. Within those 18 hours, students must select two courses from the HU 140-146 series for a subtotal of six credits.

Additionally, students must complete one or more courses selected from each of the lists below for a subtotal of 12 credits.

#### NARRATIVE

Course Title	Credits
HU 300 World Literature . . . . .	3
HU 305 Modern Literature . . . . .	3
HU 310 American Literature . . . . .	3
HU 325 Exploring Film . . . . .	3

#### SPECULATIVE

Course Title	Credits
HU 330 Values and Ethics . . . . .	3
HU 335 Technology and Modern Civilization . . . . .	3
HU 341 World Philosophy . . . . .	3

#### RELIGION AND FINE ARTS

Course Title	Credits
HU 320 Aesthetics of Visual and Musical Arts . . .	3
HU 345 Comparative Religions . . . . .	3
HU 355 Creative Writing . . . . .	3

**Total Credits Required** **18**

HU 399/HU 499, Special Topics in Humanities, may be included with advance permission of the department chair.

## Minor Courses of Study

### Minor in Mandarin Chinese

The Mandarin Chinese Language minor prepares students for intermediate proficiency in the languages defined by the American Council of Teachers of Foreign Languages and the Interagency Language Roundtable. Any student can earn this minor by successfully completing 15 credit hours, with at least 3 lower-level and 3 upper-level credits earned at Embry-Riddle. These 15 credits can be earned from the following options:

*Option 1: Take courses from the following list, provided that a student is not using the same course for the Asian Studies Minor.*

*Option 2: Pass Embry-Riddle course equivalency tests for up to 9 credits (provided that a student is not using the course equivalency test for credits in the Asian Studies Minor), and earn 6 credits at the upper level from the following list.*

Course Title	Credits
LCH 201 Mandarin Chinese III	3
LCH 202 Mandarin Chinese IV	3
LCH 301 Intermediate Chinese I	3
LCH 302 Intermediate Chinese II	3
LCH 401 Modern Chinese Films	
-OR-	
LCH 399 Special Topics in Chinese Language	3
<b>Total Credits Required</b>	<b>15</b>

### Minor in Mathematics

Students may earn a minor in Mathematics by completing the following:

Course Title	Credits
MA 241 Calculus and Analytic Geometry I	4
MA 242 Calculus and Analytic Geometry II	4
MA 243 Calculus and Analytic Geometry III	4
MA 245 Applied Differential Equations	
-OR-	
MA 345 Differential Equations and Matrix Methods	4
MA Electives (approved by department chair)	5-6
<b>Total Credits Required</b>	<b>21</b>

### Minor in Psychology

Students may earn a minor in Psychology by successfully completing the three specified courses and an additional two courses from the following list, totaling 15 credit hours.

#### Specified Courses

Course Title	Credits
PSY 101 Introduction to Psychology	3
PSY 350 Social Psychology	3
-AND-	
HF 201 Introduction to Human Factors	
-OR-	
HF 210 Human Factors I: Principles and Fundamentals	3

Two of the following courses are also required:

Course Title	Credits
BA 317 Organizational Behavior	3
HU 361 Interpersonal Communication	3
HU 363 Communication and Society	3
PSY 310 Sensation and Perception	3
PSY 315 Cognitive Psychology	3
PSY 320 Aviation Psychology	3
PSY 335 Physiological Psychology	3
PSY 340 Industrial-Organizational Psychology	3
PSY 345 Training and Development	3
PSY 400 Introduction to Cognitive Science	3
SS 310 Personality Development	3
SS 350 Psychology of Relationships	3
<b>Total Credits Required</b>	<b>15</b>

Three credits of HF 299, 399, or 499 or PSY 299, 399, or 499 (Special Topics in Psychology) may be substituted with advance permission of the department chair.

### Minor in Security Studies

This course sequence has the goal of enhancing students' knowledge and employability by giving them an understanding of basic principles of and issues in the process of policy-making; in-depth analysis of the relationships between security and globalization; and advanced knowledge of intelligence and criminal justice systems around the globe. Not open to Global Security and Intelligence Studies students.

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Course	Title	Credits
SS	327 International Relations . . . . .	3
SIS	317 Political Change, Revolution, and War . . .	3
SS	340 U.S. Foreign Policy . . . . .	3

Two courses selected from the following list:

Course	Title	Credits
SIS	312 Global Crime and International Justice System . . . . .	3
SIS	315 Studies in Global Intelligence I. . . . .	3
SIS	400 International Security and Globalization . . .	3
<b>Total Credits Required</b>		<b>15</b>

### Minor In Space Studies

The minor in Space Studies provides an introduction to most aspects of space exploration. It is intended to enhance the student's knowledge and employability by providing those basics of space exploration that will be important for understanding the role and impact of space exploration on society and the workplace. While a familiarity with algebra, geometry, trigonometry, and non-calculus-based physics is assumed, the necessary mathematical and science skills will be reviewed prior to their use. This minor is open to all majors. Students earn a minor in Space Studies by completing 15 credits from the following list of courses.

Course	Title	Credits
SP	110 Introduction to Space Flight . . . . .	3
PS	301 Astronomy . . . . .	3
SP	302 STS and ISS Operations . . . . .	3
SP	400 Introduction to Space Navigation . . . . .	3
SP	425 Selected Topics in Space Studies. . . . .	3
<b>TOTAL CREDITS REQUIRED</b>		<b>15</b>

### Minor in Technical Intelligence

This minor is primarily aimed at students in the Space Physics and Engineering programs with an interest in intelligence applications. The minor is also accessible to motivated students in the Global Security and Intelligence Studies program. This course of study emphasizes the global aspects of technical intelligence gathering and reviews the technologies involved. The minor will prepare students to work in intelligence-gathering fields and research.

#### Required Courses:

Course	Title	Credits
PS	330 Electricity and Magnetism I . . . . .	3
PS	420 Remote Sensing	
-OR-		
PS	490 Senior Research Thesis, Part I. . . . .	3
SIS	315 Studies in Global Intelligence I. . . . .	3
SIS	323 Intelligence and Technology	
-OR-		
SIS	400 International Security and Globalization . . . . .	3

Students must choose three of the following:

Course	Title	Credits
PS	221 Intermediate Physics Laboratory . . . . .	2
PS	331 Electricity and Magnetism II. . . . .	3
SIS	400 International Security and Globalization . . .	3
SIS	405 Environment and Security. . . . .	3
SS	325 International Relations. . . . .	3
<b>Total Credits Required</b>		<b>20/21</b>