

Standing Requirements

Program Mission Statement

The program builds on Embry-Riddle Aeronautical University's legacy in flight operations. Program graduates will be prepared to meet the workforce needs of the rapidly expanding commercial/private space sector including industries and agencies involved with NASA crew and cargo delivery initiatives, private human space flight, telecommunications and earth observation, and other emerging space technologies. The programs focuses upon the policy, regulation, safety, training, human factors, planning, analysis, and systems elements of commercial and private space operations.

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ERAU University Mission Statement

Our mission is to teach the science, practice and business of aviation and aerospace, preparing students for productive careers¹ and leadership roles in service around the world.²

Our technologically enriched, student-centered environment³ emphasizes learning through collaboration and teamwork,⁴ concern for ethical and responsible behavior,⁵ cultivation of analytical⁶ and management abilities,⁷ and a focus on the development of the professional skills needed for participation in a global community.⁸ We believe a vibrant future for aviation and aerospace rests in the success of our students. Toward this end, Embry-Riddle is committed to providing a climate that facilitates the highest standards of academic achievement⁹ and knowledge discovery,¹⁰ in an interpersonal environment that supports the unique needs of each individual.¹¹ Embry-Riddle Aeronautical University is the world's leader in aviation and aerospace education. The University is an independent, non-profit, culturally diverse institution providing quality education and research in aviation, aerospace, engineering and related fields leading to associate's, baccalaureate's, master's and doctoral degrees.

Program Alignment to University Mission

Select all that apply.

- ¹Preparing students for productive careers
- ²Preparing students for leadership roles in service around the world
- ³Technologically enriched environment
- ⁴Emphasize learning through collaboration and teamwork
- ⁵Concern for ethical and responsible behavior
- ⁶Cultivate analytical abilities
- ⁷Cultivate management abilities
- ⁸Develop the professional skills needed for participation in a global community
- ⁹Facilitating the highest standards of academic achievement
- ¹⁰Facilitating knowledge discovery
- ¹¹Providing an interpersonal environment that supports the unique needs of each individual

Standing Requirements

Program Outcomes

FL - Embry-Riddle General Education Competency Set (Copy 1)

General Education Competencies

Competency	Mapping
Critical Thinking (DB, PC, WW) The student will apply knowledge at the synthesis level to define and solve problems within professional and personal environments.	Embry-Riddle General Education Competency Set: Critical Thinking (DB, PC, WW)
Quantitative Reasoning (DB, PC, WW) The student will demonstrate the use of digitally-enabled technology (including concepts, techniques and tools of computing), mathematics proficiency & analysis techniques to interpret data for the purpose of drawing valid conclusions and solving associated problems.	Embry-Riddle General Education Competency Set: Quantitative Reasoning (DB, PC, WW)
Information Literacy (DB, PC, WW) The student will conduct meaningful research, including gathering information from primary and secondary sources and incorporating and documenting source material in his or her writing.	Embry-Riddle General Education Competency Set: Information Literacy (DB, PC, WW)
Communication (DB, PC, WW) The student will communicate concepts in written, digital and oral forms to present technical and non-technical information.	Embry-Riddle General Education Competency Set: Communication (DB, PC, WW)
Scientific Literacy (DB, PC, WW) The student will be able to analyze scientific evidence as it relates to the physical world and its interrelationship with human values and interests.	Embry-Riddle General Education Competency Set: Scientific Literacy (DB, PC, WW)

Cultural Literacy (DB, PC, WW)
The student will be able to analyze historical events, cultural artifacts, and philosophical concepts.

Embry-Riddle General Education Competency Set:
Cultural Literacy (DB, PC, WW)

Spaceflight Operations Program Outcomes (formerly CSO)

Outcome

Outcome	Mapping
Demonstrate understanding of commercial space program development and regulation that includes private space flight.	No Mapping
Plan and coordinate small space payloads and launchers for educational and commercial use.	No Mapping
Evaluate space policy development and decisions in industry settings using historical and contemporary analogs.	No Mapping
Provide training regimen recommendations with the knowledge gained from historical and contemporary space flight training programs. Regimen development should be in concert with human factors performance limitations.	No Mapping
Examine and recommend safety management practices to the high-risk commercial and private space operations industry.	No Mapping
Perform STEM outreach and training to enrich the next generation of space scientists, engineers, managers, and specialists.	No Mapping

2018-2019 Assessment Cycle

Assessment Plan

Measures

Spaceflight Operations Program Outcomes (formerly CSO)

Outcome

Outcome: Demonstrate understanding of commercial space program development and regulation that includes private space flight.

▼ **Measure:** CSO 101 Space Programs Seminar
Course level Direct - Exam

Details/Description:

Students will be asked to:

1. Examine the importance of space exploration in our current culture
2. Determine the available range of careers in private and commercial space
3. Identify the role of space agencies in public and private space programs

Criterion for Success:

An average score of 75 based upon the final scores for all of the CSO 101 quiz results.


Timeframe of Data Collection:

Fall 2018; Spring 2019

Key/Responsible Personnel:

Program Coordinator and faculty.

Supporting Attachments:

 CSO 101 Assessment Quiz (Adobe Acrobat Document)

▼ **Measure:** CSO 310 International Space Law & Policy

Course level Direct - Student Artifact


Details/Description: Position paper assignment graded using attached rubric.

Criterion for Success: An average grade of 75 for all student artifacts scored using the attached rubric.

Timeframe of Data Collection: fall 2018; spring 2019

Key/Responsible Personnel: Program coordinator and faculty

Supporting Attachments:

 CSO 310 Position Paper Assignment Rubric (Adobe Acrobat Document)

▼ **Measure:** CSO 351 Fundamentals of Spaceflight Regulation
Course level Direct - Exam

Details/Description: The exam asks students to:

1: Demonstrate understanding of the interaction between the legislative and executive branches of the federal government and exhibit in-depth understanding of the rule making process for administrative regulations.

3: Examine the evolution of commercial space operations regulation and display familiarity with the Commercial Space Launch Act of 1984, the Commercial Space Launch Amendments Act of 2004, and all components of 14 CFR 400 et seq

4: Understand the difference between permits, licenses, and certification and be able to define the various licenses available in the US and discern when needed.


Criterion for Success: An average score of 75 will be achieved based upon the final scores for all of the CSO 351 exam results.

Timeframe of Data Collection: fall 2018; spring 2019

Key/Responsible Personnel: Program coordinator and faculty

Personnel:

Supporting Attachments:

 CSO 351 Exam (Adobe Acrobat Document)

▼ **Measure:** CSO 460 Applied Spaceflight Regulation
Course level Direct - Student Artifact

Details/Description: Final Project - Students are asked to:
1. Apply a working understanding of the US legislative and rulemaking process.
2. Exhibit in depth knowledge of all elements and methodologies for US license reviews.
3. Apply safety concepts from CSO 350 to different permits and licenses.

Criterion for Success: An average score of 75 will be achieved based upon the the total of all CSO 460 final projects graded.


Timeframe of Data Collection: fall 2018; spring 2019

Key/Responsible

Program Coordinator and faculty

Personnel:

Supporting Attachments:

 CSO 460 Final Project Assessment (Adobe Acrobat Document)

Outcome: Plan and coordinate small space payloads and launchers for educational and commercial use.

▼ **Measure:** CSO390
Course level Direct - Student Artifact

Details/Description:	Students design, build and fly a payload on board Blue Origin's New Shepard spacecraft.
Criterion for Success:	Meeting milestones for design and building payload for which 75% of students will receive a passing score.
Timeframe of Data Collection:	Fall 2018, Spring 2019
Key/Responsible Personnel:	Dr Llanos and Dr Laskey

Outcome: Evaluate space policy development and decisions in industry settings using historical and contemporary analogs.

▼ **Measure:** CSO 101 Space - Programs Seminar
Course level Direct - Exam

Details/Description:	Students will be asked to: <ol style="list-style-type: none"> 1. Examine the importance of space exploration in our current culture 2. Determine the available range of careers in private and commercial space 3. Identify the role of space agencies in public and private space programs
Criterion for Success:	An average score of 75 based upon the final scores for all of the CSO 101 quiz results.
Timeframe of Data Collection:	Fall 2018; Spring 2019
Key/Responsible Personnel:	Program Coordinator and faculty.

Supporting Attachments:

[CSO 101 Assessment Quiz \(Adobe Acrobat Document\)](#)

▼ **Measure:** CSO 310 International Space Law & Policy
Course level Direct - Student Artifact

Details/Description: Position paper assignment graded using attached rubric.

Criterion for Success: An average grade of 75 for all student artifacts scored using the attached rubric.

Timeframe of Data Collection: fall 2018; spring 2019

Key/Responsible Personnel: Program coordinator and faculty

Supporting Attachments:

 CSO 310 Position Paper Assignment Rubric (Adobe Acrobat Document)

▼ **Measure:** CSO 351 Fundamentals of Spaceflight Operations
Course level Direct - Exam

Details/Description: The exam asks students to:

1: Demonstrate understanding of the interaction between the legislative and executive branches of the federal government and exhibit in-depth understanding of the rule making process for administrative regulations.


3: Examine the evolution of commercial space operations regulation and display familiarity with the Commercial Space Launch Act of 1984, the Commercial Space Launch Amendments Act of 2004, and all components of 14 CFR 400 et seq

4: Understand the difference between permits, licenses, and certification and be able to define the various licenses available in the US and discern when needed.

Criterion for Success: An average score of 75 will be achieved based upon the final scores for all of the CSO 351 exam results.

Timeframe of Data fall 2018; spring 2019
Collection:
Key/Responsible Program Coordinator and Faculty
Personnel:

Supporting Attachments:

 CSO 351 Exam (Adobe Acrobat Document)

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