B.S. in Uncrewed and Autonomous Systems

Once the domain of military and government agencies, uncrewed systems have entered the civilian and commercial sectors and are transforming the world as we know it. From the driverless cars roaming our streets over the uncrewed aircraft soaring through our skies to the robotic rovers operating on distant planetary bodies, leading enterprises all over the world rely on uncrewed systems for critical aspects of their operations.

The Bachelor of Science in Uncrewed and Autonomous Systems (BSUAS) focuses on the growth, innovative development, and effective use of uncrewed system technology across the respective domains (air, space, ground, and maritime), with a strong concentration on the Air Domain. The focused curriculum addresses major challenges within the industry, including business models and applications, autonomy, airspace integration, communications, education and training, propulsion and power, and regulation.

BSUAS graduates will be prepared to support, develop, and apply the advanced technologies necessary to support the growing and dynamic needs of the industry. They will also be qualified to help guide the policies and regulations that govern this emerging field.

Students are also eligible to engage in cooperative study/internships and may elect to seek out those enriching opportunities.

BSUAS students who wish to continue their education to a master's degree and fulfill requirements may enroll in the BSUAS to MSUAS 4+1 program as outlined in this program.

Estimated Cost of Attendance

Students will:

- Apply the fundamentals of uncrewed systems, including the technological, economical, legal, social, political, and environmental aspects of uncrewed systems operations.
- Explain uncrewed systems elements, configurations, and operational criteria supporting different applications within various environments.
- Apply performance criteria to solve basic operational problems such as task oriented asset and payload selection.
- Demonstrate appropriate selection and application of research to support program objectives and solving of identified problems specific to their course subject matter.
- Investigate managerial aspects and how they apply to different uncrewed systems applications and administrative functions between various organizations.
- Examine task requirements under varying operational circumstances to identify solutions during mission planning and execution to support employment of the platform, its sensors, and/or its payload.
- Apply operational knowledge and skills towards the design, development, and validation of uncrewed and autonomous systems and applications.

DEGREE REQUIREMENTS

General Education

General Education	
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, Social Sciences, Physical and Life Science, Mathematics, and Computer Science may be chosen from as listed, assuming prerequisites are met. Courses from other institutions are acceptable if they fall into these broad categories and are at the level specified.	
Communication Theory and Skills	
Any Communication Theory and Skills above ENGL 106	9
Humanities	
Lower-Level Humanities (Any Lower or Upper Level Humanities)	3
Upper-Level Humanities (Any Upper Level Humanities)	3
Social Sciences	
Any Social Science	6
Physical and Life Science	
Any Physical Science/Physics	6
Mathematics	
Any College Algebra or Higher Math Series	6
Computer Science	
Any Computer Science	3
Total Credits	**36**

Core/Major

Program Core		
ASCI 301	Introduction to Air Traffic Control	3
ASCI 309	Aerodynamics	3
ASCI 403	Air Traffic Management	3
UNSY 205	Applied Physics for Uncrewed Systems	3
UNSY 307	Uncrewed Systems Networking	3
UNSY 311	Uncrewed Ground Systems and Applications	3
UNSY 313	Uncrewed Maritime Systems and Applications	3
UNSY 315	Uncrewed Aircraft Systems and Operations	3
UNSY 316	Operational and Business Aspects of Uncrewed Aircraft Systems	3
UNSY 318	Uncrewed Aircraft Systems Robotics	3
UNSY 319	Cybersecurity and Countermeasure Considerations	3
UNSY 325	Uncrewed Systems Testing and Inspection	3
UNSY 329	Uncrewed Systems Computation and Programming	3
UNSY 331	Uncrewed Systems Legal and Regulatory Compliance	3
UNSY 405	Uncrewed Systems Operational Environments and Conditions	3
UNSY 410	Uncrewed Systems Sensing Technology	3
UNSY 415	Uncrewed Space Systems and Application	3
UNSY 421	Uncrewed Systems Mission Planning	3
UNSY 431	Uncrewed Systems Human Factors Considerations	3
UNSY 491	Operational Applications in Uncrewed Systems	3
STAT 211	Statistics with Aviation Applications	3
SCTY 400	Aviation Security	3
Total Credits		**66**

Minor or Open Electives:

The recommended Minor option for the BSUAS is the Minor in Small Uncrewed Aircraft Systems (sUAS) Operation. It provides an FAA Remote Pilot Certificate, hands-on training and offers an industry certification with the AUVSI Trusted Operator Program (TOP).

Part of this Minor is a mandatory two-day residency program with associated practical training and travel requirements. Each student must have their own sUAS to fly during the course. Please contact the advising team and program coordinators for details.

Students in the BSUAS degree program may choose an alternative to the sUAS-Ops minor according to their respective catalog and credit requirements with guidance of the program coordinators.

Open Electives	18

-OR-

Minor Course of Study	**18**
Choose Any Minor Course of Study (Except Uncrewed Autonomous Systems)	

Available Minors

Total Degree Requirements **	**120**

Plan of Study (BSUAS)

Year One

Term 1		Credits
	Any Communication Theory and Skills above ENGL 106	3
	Any College Algebra or Higher Math Series	3
	Credits Subtotal	**6.0**
Term 2		
	Any Communication Theory and Skills above ENGL 106	3
	Any College Algebra or Higher Math Series	3
	Credits Subtotal	**6.0**
Term 3		
	Any Communication Theory and Skills above ENGL 106	3
	Computer Science Elective	3
	Credits Subtotal	**6.0**
Term 4		
	Lower-Level Humanities	3
	Any Physical Science/Physics	3
	Credits Subtotal	**6.0**
Term 5		
STAT 211	Statistics with Aviation Applications	3
	Social Science	3
	Credits Subtotal	**6.0**
	Credits Total:	**30.0**

Year Two

Term 1		Credits
UNSY 316	Operational and Business Aspects of Uncrewed Aircraft Systems	3
	Any Physical Science/Physics	3
	Credits Subtotal	**6.0**
Term 2		
UNSY 205	Applied Physics for Uncrewed Systems	3
	Social Science	3
	Credits Subtotal	**6.0**
Term 3		
UNSY 307	Uncrewed Systems Networking	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
Term 4		
UNSY 315	Uncrewed Aircraft Systems and Operations	3
	Upper-Level Humanities (Any Upper Level Humanities)	3
	Credits Subtotal	**6.0**
Term 5		
UNSY 311	Uncrewed Ground Systems and Applications	3
UNSY 405	Uncrewed Systems Operational Environments and Conditions	3
	Credits Subtotal	**6.0**
	Credits Total:	**30.0**

Year Three

Term 1		Credits
UNSY 313	Uncrewed Maritime Systems and Applications	3
ASCI 309	Aerodynamics	3
	Credits Subtotal	**6.0**
Term 2		
UNSY 415	Uncrewed Space Systems and Application	3
UNSY 319	Cybersecurity and Countermeasure Considerations	3
	Credits Subtotal	**6.0**
Term 3		
UNSY 318	Uncrewed Aircraft Systems Robotics	3
UNSY 331	Uncrewed Systems Legal and Regulatory Compliance	3
	Credits Subtotal	**6.0**
Term 4		
UNSY 410	Uncrewed Systems Sensing Technology	3
	Specified Elective (from list)	3
	Credits Subtotal	**6.0**
Term 5		
UNSY 431	Uncrewed Systems Human Factors Considerations	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
	Credits Total:	**30.0**

Year Four

Term 1		Credits
	Specified Elective (from list)	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
Term 2		
	Specified Elective (from list)	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
Term 3		
	Specified Elective (from list)	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
Term 4		
	Specified Elective (from list)	3
	Minor or Open Elective	3
	Credits Subtotal	**6.0**
Term 5		
UNSY 491	Operational Applications in Uncrewed Systems	3
	Specified Elective (from list)	3
	Credits Subtotal	**6.0**
	Credits Total:	**30.0**

Total Degree Requirements	**120**

BSUAS-MSUAS 4+1 Program: A Unique Opportunity

This program is for exceptional students who are committed to continuing their education through the Master's degree. This fast-paced program allows qualifying students the opportunity to complete both the Bachelor of Science in Uncrewed and Autonomous Systems (BSUAS) and the Master of Science in Uncrewed and Autonomous Systems (MSUAS) in five academic years.

After spending three academic years in undergraduate-level study, BSUAS students who are accepted in the BSUAS-MSUAS 4+1 program option will be allowed to take up to three (3) MSUAS courses to replace an equal number of remaining BSUAS courses during their senior year. The selected courses can only replace BSUAS minor requirement or additional electives in each respective BSUAS track and may not replace program core or track support courses. Before selecting the courses to be taken, students must confer with an advisor to ensure that the courses selected are suitable and align with their selected MSUAS area of concentration. A grade level average of B or better must be maintained for selected MSUAS courses while enrolled in the BSUAS-MSUAS 4+1 program. Any final BSUAS credit hour requirements not accomplished through MSUAS course selection will have to be satisfied through upper level undergraduate electives. Upon successful BSUAS program requirement completion, students will be automatically enrolled in the MSUAS program and their chosen area of concentration and can complete their degree within one year.

Students who fail in any of their selected MSUAS courses or fail to maintain a grade average of B or better while still completing BSUAS degree requirements will be removed from the 4+1 program option, have credit awarded to the BSUAS degree only, and may continue to complete their BSUAS degree program. In this case, published BSUAS minor requirements and/or upper level electives can be used to fulfill remaining BSUAS credit requirements.

This special program will challenge students and develop their knowledge, skills, abilities, and attitudes in the concepts of uncrewed systems while integrating their gained experience in uncrewed systems applications. As a minimum to be considered for acceptance to this BSUAS-MSUAS 4+1 option, applicant students must hold at least a 3.00 GPA, completed at least 75 credit hours of the BSUAS program requirements to apply and demonstrated superior academic capability.

Students initiate program acceptance through their Academic Advisor or Campus Advisor; to help ensure program criteria are met. Student Advisor will complete the request for processing into the 4+1 program.