

B.S. in Uncrewed and Autonomous Systems

The Bachelor of Science in Uncrewed and Autonomous Systems provides students with the skills necessary for flying drones and working with autonomous robotics, with applications in administrative, operations and development roles involving uncrewed aircraft systems across a range of industries. The curriculum addresses the technologies and practices needed to support, develop and apply uncrewed and autonomous systems, as well as policy and regulatory considerations in the field. Emphasis is placed on the air domain, with additional coverage of space, ground and maritime applications.

At the **Daytona Beach Campus**, the Uncrewed and Autonomous Systems program includes access to automated technologies, facilities and faculty with subject matter expertise. Students complete flight training in operational environments, including Beyond-Visual Line of Sight (BVLOS) operations using Remote Split Operations techniques. The curriculum includes applied practicum experiences and opportunities to obtain FAA and industry certifications. The program is accredited by the Aviation Accreditation Board International (AABI).

At the **Prescott Campus**, the Uncrewed and Autonomous Systems program includes coursework focused on commercial and civil applications. The program is part of the UAS-Collegiate Training Initiative (UAS-CTI) and includes hands-on instruction. Students complete coursework in business, aviation regulations, technology, meteorology and security, with training conducted at the campus airfield. Students may also complete certificates such as Geographic Information Systems (GIS) and Remote Sensing and the FAA Remote Pilot In-Command (RPIC) Certificate.

At the **Worldwide & Online Campus**, the Bachelor of Science in Uncrewed and Autonomous Systems is offered in an online format. Coursework may be tailored through selected areas of focus within uncrewed aircraft systems. Students may obtain a Federal Aviation Administration (FAA) Part 107 Remote Pilot Certificate. The sUAS Operations Minor includes a required weekend residency during UNSY 435, conducted in Daytona Beach, Florida. The program may be completed as part of a Combined Program Pathway to a master's degree. The Uncrewed and Autonomous Systems program is recognized by the Royal Aeronautical Society (RAeS).

Program-Level Student Learning Outcomes

Students will:

- Exhibit professional and ethical responsibility, ensuring compliance with national and international laws, regulations, and management principles relevant to UAS and the aviation community.
- Communicate effectively using clear and properly formatted technical writing, verbal communication, and visual presentations, while making positive contributions in multidisciplinary and diverse team environments.
- Analyze data obtained through onboard sensors and other sources to create effective products, solve operational challenges, and support decision-making within the UAS industry.
- Apply mathematics, science, applied sciences, and contemporary issues to analyze, interpret, and solve problems within the uncrewed aircraft systems (UAS) and broader aviation industry.
- Apply operational knowledge to the design, development, and validation of UAS and autonomous systems, including evaluating configurations, performance criteria, and solutions tailored to task requirements in varying environments.
- Explain the value of lifelong learning to adapt to advancements and promote the commercial viability and sustainability of the UAS industry while building associated skills.

- Demonstrate the skills, techniques, and modern technologies required for the safe and effective operation of UAS, including mission planning, data collection, and responding to adverse or emergency situations.

Daytona Beach Program Requirements

General Education Requirements	37
Core Requirements	18
Specified Electives	38
Program Support Courses	15
Open Electives	12
Total Credits	120

General Education Requirements

Communication	9
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Humanities/Social Sciences - Lower or Upper Level	3
Humanities/Social Sciences - Upper Level	3
Computer Science/Information Technology	3
CPSC 118 Fundamentals of Computer Programming or CYBR 235 Computer and Network Technologies	
Mathematics	6
MATH 111 Pre-calculus for Aviation	
MATH 112 Applied Calculus for Aviation	
Physical/Life Sciences	7
PHYS 113 Introductory Physics I	
PHYS 117 Introductory Physics II	
PHYS 113L Introductory Physics I Laboratory or PHYS 117L Introductory Physics II Laboratory	
Total Credits	37

Core Requirements

UNSY 220	Uncrewed Aircraft Systems	3
UNSY 318	UAS Robotics	3
UNSY 322	Operational and Business Aspects of Uncrewed Aircraft Systems	3
UNSY 324	Global Uncrewed Aircraft Systems (UAS) Regulations	3
UNSY 403	Uncrewed Sensing Systems	3
UNSY 473	Operational Applications in Uncrewed Aircraft Systems	3
or UNSY 491	Operational Applications in Uncrewed Systems	
Total Credits		18

Specified Electives

UNSY 100	Remote Pilot Operations	2
UNSY 125	Private and UAS Pilot Operations	3
UNSY 201	Primary UAS Flight Operations	1
UNSY 222	Uncrewed Aircraft Systems Security	3
UNSY 236	Uncrewed Aircraft Systems Operation and Cross-Country Data Entry	3
or UNSY 241	UAS Systems Architecture and Integration	
UNSY 237	Dronealism and Cinematography	3
UNSY 238	Concepts of Advanced Urban Air Mobility	3
UNSY 301	UAS Mapping Applications and Data Collection	1
UNSY 323	Crew Resource Management for UAS	3
UNSY 390	UAS Practicum I	3
UNSY 391	Application of UAS Technology	3
UNSY 401	Advanced UAS Flight Operations	1

UNSY 416	UAS Field Service and Sustainment	3
UNSY 423	AAM Infrastructure Development and Modeling	3
UNSY 490	UAS Practicum II	3
Total Credits		38

Program Support Courses

ASCI 309	Aerodynamics	3
ATMG 202	Introduction to Air Traffic Management	3
or ASCI 301	Introduction to Air Traffic Control	
ENGR 120	Graphical Communications	3
or ENGR 115	Introduction to Computing for Engineers	
GEOS 210	Introduction to Geographic Information Systems	3
GEOS 310	Advanced Geographic Information Systems	3
Total Credits		15

Open Electives

Open Electives - Upper Level	6
Open Electives	6
Total Credits	12

Suggested Plan of Study

Year One

Requirements	Credits
COMM 122 - English Composition	3
MATH 111 - Pre-calculus for Aviation	3
UNSY 100 - Remote Pilot Operations	2
UNSY 125 - Private and UAS Pilot Operations	3
UNSY 220 - Uncrewed Aircraft Systems	3
Semester Hours	14

Requirements	Credits
COMM 219 - Speech	3
CPSC 118 - Fundamentals of Computer Programming or CYBR 235 - Computer and Network Technologies	3
Humanities - Lower Level	3
MATH 112 - Applied Calculus for Aviation	3
UNSY 222 - Uncrewed Aircraft Systems Security	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 29

Year Two

Requirements	Credits
COMM 221 - Technical Communication	3
Social Sciences - Lower Level	3
PHYS 113 - Introductory Physics I	3
UNSY 201 - Primary UAS Flight Operations	1
UNSY 238 - Concepts of Advanced Urban Air Mobility	3

UNSY 241 - UAS Systems Architecture and Integration	3
Semester Hours	16

Requirements	Credits
Humanities/Social Sciences - Lower or Upper Level	3
PHYS 117 - Introductory Physics II	3
PHYS 113L - Introductory Physics I Laboratory or 117L - Introductory Physics II Laboratory	1
UNSY 237 - Dronealism and Cinematography	3
Open Elective	3
ASCI 309 - Aerodynamics	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 32

Year Three

Requirements	Credits
Humanities/Social Sciences - Upper Level	3
ATMG 202 - Introduction to Air Traffic Management	3
GEOS 210 - Introduction to Geographic Information Systems	3
Open Elective	3
UNSY 301 - UAS Mapping Applications and Data Collection	1
UNSY 403 - Uncrewed Sensing Systems	3
Semester Hours	16

Requirements	Credits
UNSY 318 - UAS Robotics	3
UNSY 322 - Operational and Business Aspects of Uncrewed Aircraft Systems	3
GEOS 310 - Advanced Geographic Information Systems	3
ENGR 120 - Graphical Communications or 115 - Introduction to Computing for Engineers	3
Open Elective - Upper Level	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 31

Year Four

Requirements	Credits
UNSY 323 - Crew Resource Management for UAS	3
UNSY 324 - Global Uncrewed Aircraft Systems (UAS) Regulations	3
UNSY 390 - UAS Practicum I	3
UNSY 391 - Application of UAS Technology	3
Open Elective - Upper Level	3
Semester Hours	15

Requirements	Credits
UNSY 401 - Advanced UAS Flight Operations	1
UNSY 416 - UAS Field Service and Sustainment	3
UNSY 423 - AAM Infrastructure Development and Modeling	3
UNSY 473 - Operational Applications in Uncrewed Aircraft Systems	3
UNSY 490 - UAS Practicum II	3
Semester Hours	13

Total Credits

Total Hours for All Requirements: 28

Prescott Program Requirements

General Education Requirements	37
Core Requirements	18
Specified Electives	28
Program Support Courses	25
Open Electives	12
Total Credits	120

Program Details

The Bachelor of Science in Uncrewed Aircraft Systems program requires successful completion of a minimum of 120 credit hours. The program may be completed in eight semesters, or four years, assuming appropriate background and full-time enrollment. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University. The program provides students with the aeronautical, technical, business, and regulatory knowledge required for careers in the rapidly evolving uncrewed aircraft systems industry. The courses necessary to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. The UAS Capstone (UNSY 475) serves as the culminating experience for the program and is intended to be completed after UNSY 473 Operational Applications in Uncrewed Aircraft Systems. Students are responsible for ensuring that all prerequisite and degree requirements are met prior to enrollment in advanced coursework.

General Education Requirements

Communication	9
Humanities - Lower Level	3
Social Sciences - Lower Level	3
ECON 200 An Economic Survey	
Humanities/Social Sciences - Lower or Upper Level	3
PSYC 222 Introduction to Industrial/Organizational Psychology	
Humanities/Social Sciences - Upper Level	3
PSYC 326 Group and Team Behavior	
Computer Science/Information Technology	3
CPSC 118 Fundamentals of Computer Programming	
Mathematics	6
MATH 111 Pre-calculus for Aviation	
MATH 112 Applied Calculus for Aviation	
Physical/Life Sciences	7
PHYS 113 Introductory Physics I	
PHYS 117 Introductory Physics II	
PHYS 113L Introductory Physics I Laboratory	

or PHYS 117Introductory Physics II Laboratory	
Total Credits	37

Core Requirements

UNSY 220	Uncrewed Aircraft Systems	3
UNSY 318	UAS Robotics	3
UNSY 322	Operational and Business Aspects of Uncrewed Aircraft Systems	3
UNSY 324	Global Uncrewed Aircraft Systems (UAS) Regulations	3
UNSY 403	Uncrewed Sensing Systems	3
UNSY 473	Operational Applications in Uncrewed Aircraft Systems	3
or UNSY 491	Operational Applications in Uncrewed Systems	
Total Credits		18

Specified Electives

UNSY 125	Private and UAS Pilot Operations	3
UNSY 222	Uncrewed Aircraft Systems Security	3
UNSY 236	Uncrewed Aircraft Systems Operation and Cross-Country Data Entry	3
UNSY 237	Dronealism and Cinematography	3
UNSY 238	Concepts of Advanced Urban Air Mobility	3
UNSY 323	Crew Resource Management for UAS	3
UNSY 391	Application of UAS Technology	3
UNSY 402	Advanced UAS Videography	3
UNSY 475	UAS Mission Execution	3
UNIV 101	College Success	1
Total Credits		28

Program Support Courses

ASCI 309	Aerodynamics	3
ATMG 202	Introduction to Air Traffic Management	3
or ASCI 301	Introduction to Air Traffic Control	
ASCI 310	Aircraft Performance	3
AVSF 210	Introduction to Aerospace Safety	3
GEOS 210	Introduction to Geographic Information Systems	3
GEOS 310	Advanced Geographic Information Systems	3
WEAX 201	Introduction to Meteorology	3
WEAX 203L	Survey of Meteorology Laboratory	1
WEAX 301	Aviation Weather	3
Total Credits		25

Open Electives

Open Electives - Upper Level	3
Open Electives	9
Total Credits	12

Suggested Plan of Study

Year One

Requirements	Credits
COMM 122 - English Composition	3
CPSC 118 - Fundamentals of Computer Programming	3
MATH 111 - Pre-calculus for Aviation	3
UNIV 101 - College Success	1

Humanities - Lower Level	3
Semester Hours	13
Requirements	Credits
ECON 200 - An Economic Survey, 210 - Microeconomics, or 211 - Macroeconomics	3
PHYS 113 - Introductory Physics I	3
PHYS 113L - Introductory Physics I Laboratory	1
MATH 112 - Applied Calculus for Aviation	3
Communication	3
Open Elective	3
Semester Hours	16

Total Credits

Total Hours for All Requirements: 29

Year Two

Requirements	Credits
PHYS 117 - Introductory Physics II	3
PSYC 222 - Introduction to Industrial/Organizational Psychology	3
WEAX 301 - Aviation Weather	3
UNSY 220 - Uncrewed Aircraft Systems	3
Open Elective	3
Semester Hours	15

Requirements	Credits
ASCI 309 - Aerodynamics	3
ATMG 202 - Introduction to Air Traffic Management or ASCI 301 - Introduction to Air Traffic Control	3
UNSY 125 - Private and UAS Pilot Operations	3
UNSY 222 - Uncrewed Aircraft Systems Security	3
WEAX 201 - Introduction to Meteorology	3
WEAX 203L - Survey of Meteorology Laboratory	1
Semester Hours	16

Total Credits

Total Hours for All Requirements: 31

Year Three

Requirements	Credits
ASCI 310 - Aircraft Performance	3
PSYC 326 - Group and Team Behavior	3
UNSY 236 - Uncrewed Aircraft Systems Operation and Cross- Country Data Entry	3
UNSY 237 - Dronealism and Cinematography	3
UNSY 318 - UAS Robotics	3
Semester Hours	15

Requirements	Credits
GEOS 210 - Introduction to Geographic Information Systems	3
UNSY 322 - Operational and Business Aspects of Uncrewed Aircraft Systems	3
UNSY 324 - Global Uncrewed Aircraft Systems (UAS) Regulations	3
UNSY 238 - Concepts of Advanced Urban Air Mobility	3
UNSY 323 - Crew Resource Management for UAS	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
GEOS 310 - Advanced Geographic Information Systems	3
UNSY 391 - Application of UAS Technology	3
UNSY 403 - Uncrewed Sensing Systems	3
UNSY 473 - Operational Applications in Uncrewed Aircraft Systems or 491 - Operational Applications in Uncrewed Systems	3
Open Elective - Upper Level	3
Semester Hours	15

Requirements	Credits
AVSF 210 - Introduction to Aerospace Safety	3
UNSY 402 - Advanced UAS Videography	3
UNSY 475 - UAS Mission Execution	3
Communication	3
Open Elective	3
Semester Hours	15

Total Credits

Total Hours for All Requirements: 30

Worldwide Program Requirements

General Education Requirements	36
Core Requirements	18
Specified Electives	30
Program Support Courses	15
Open Electives or Minor	21
Total Credits	120

Program Details

The Bachelor of Science in Uncrewed and Autonomous Systems requires successful completion of a minimum of 120 credit hours. Students enrolled in the Worldwide Undergraduate Online program may complete the degree in 20 terms, or approximately four years, assuming full-time enrollment and continuous progress. Students pursuing this undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all work completed at the University. The courses required to earn this degree are listed below.

Students should be aware that many courses have prerequisites and/or corequisites. Students are responsible for ensuring that all prerequisite and degree requirements are satisfied prior to enrollment in advanced coursework. The suggested plan of study is provided as a guide. A student's actual plan of study may vary based on term of admission, course availability, transfer credit, and other academic considerations. Students should consult with their academic advisor to develop an individualized plan of study.

Students may complete either 21 credit hours of open electives or an approved minor. The recommended option is the Minor in Small Uncrewed Aircraft Systems (sUAS) Operation, which prepares students for the FAA Remote Pilot Certificate and includes industry-recognized training through the Association for Uncrewed Vehicle Systems International (AUVSI) Trusted Operator Program (TOP). The sUAS Operations minor includes a required two-day residency with associated travel expenses, requires students to provide their own small uncrewed aircraft system for flight activities, and requires students to be physically located in the United States while enrolled in UNSY 435 and UNSY 440. Students who choose an alternative minor should consult with their academic advisor and program coordinator to ensure all degree requirements are satisfied.

General Education Requirements

Communication	9
Humanities - Lower Level	3
Social Sciences - Lower Level	3
Social Sciences - Lower or Upper Level	3
Humanities - Upper Level	3
Computer Science/Information Technology	3
Mathematics	6
Any College Algebra or Higher Math Series	
Physical/Life Sciences	6
Physical Sciences/Physics	
Total Credits	36

Core Requirements

UNSY 220	Uncrewed Aircraft Systems	3
UNSY 318	UAS Robotics	3
UNSY 322	Operational and Business Aspects of Uncrewed Aircraft Systems	3
UNSY 324	Global Uncrewed Aircraft Systems (UAS) Regulations	3
UNSY 403	Uncrewed Sensing Systems	3
UNSY 491	Operational Applications in Uncrewed Systems	3
Total Credits		18

Specified Electives

UNSY 205	Applied Physics for Uncrewed Systems	3
UNSY 311	Uncrewed Ground Systems and Applications	3
UNSY 313	Uncrewed Maritime Systems and Applications	3
UNSY 317	UAS Networking	3
UNSY 325	Uncrewed Systems Testing and Inspection	3
UNSY 329	Uncrewed Systems Computation and Programming	3
UNSY 405	Uncrewed Systems Operational Environments and Conditions	3
UNSY 415	Uncrewed Space Systems and Application	3
UNSY 421	Uncrewed Systems Mission Planning	3
UNSY 431	Uncrewed Systems Human Factors Considerations	3
Total Credits		30

Program Support Courses

ASCI 309	Aerodynamics	3
ATMG 202	Introduction to Air Traffic Management	3
or ASCI 301	Introduction to Air Traffic Control	
ASCI 407	Air Traffic Management	3
STAT 211	Statistics with Aviation Applications	3
SCTY 401	Aviation Security	3
Total Credits		15

Open Electives or Minor

Open Electives or Minor *	21
Total Credits	21

* View Available Worldwide Minors (<https://catalog.erau.edu/campuses/worldwide/>)

Suggested Plan of Study

Year One

Requirements	Credits
Any Communication above COMM 106	3
Any College Algebra or Higher Math Series	3
Semester Hours	6

Requirements	Credits
Any Communication above COMM 106	3
Any College Algebra or Higher Math Series	3
Semester Hours	6

Requirements	Credits
Any Communication above COMM 106	3
Computer Science	3
Semester Hours	6

Requirements	Credits
Humanities - Lower Level	3
Physical Sciences/Physics	3
Semester Hours	6

Requirements	Credits
STAT 211 - Statistics with Aviation Applications	3
Social Sciences	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 30

Year Two

Requirements	Credits
UNSY 322 - Operational and Business Aspects of Uncrewed Aircraft Systems	3
Physical Sciences/Physics	3
Semester Hours	6

Requirements	Credits
UNSY 205 - Applied Physics for Uncrewed Systems	3
Social Sciences	3
Semester Hours	6

Requirements	Credits
UNSY 317 - UAS Networking	3
Minor or Open Elective	3
Semester Hours	6

Requirements	Credits
UNSY 220 - Uncrewed Aircraft Systems	3
Humanities - Upper Level	3
Semester Hours	6

Requirements	Credits
UNSY 311 - Uncrewed Ground Systems and Applications	3
UNSY 405 - Uncrewed Systems Operational Environments and Conditions	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 30

Year Three

Requirements	Credits
UNSY 313 - Uncrewed Maritime Systems and Applications	3
ASCI 309 - Aerodynamics	3
Semester Hours	6

Requirements	Credits
UNSY 415 - Uncrewed Space Systems and Application	3
ATMG 202 - Introduction to Air Traffic Management or ASCI 301 - Introduction to Air Traffic Control	3
Semester Hours	6

Requirements	Credits
UNSY 318 - UAS Robotics	3
UNSY 324 - Global Uncrewed Aircraft Systems (UAS) Regulations	3
Semester Hours	6

Requirements	Credits
UNSY 403 - Uncrewed Sensing Systems	3
ASCI 407 - Air Traffic Management	3
Semester Hours	6

Requirements	Credits
UNSY 431 - Uncrewed Systems Human Factors Considerations	3
Minor or Open Elective	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 30

Year Four

Requirements	Credits
Minor or Open Elective	3
SCTY 401 - Aviation Security	3
Semester Hours	6

Requirements	Credits
Minor or Open Elective	3
UNSY 325 - Uncrewed Systems Testing and Inspection	3
Semester Hours	6

Requirements	Credits
UNSY 329 - Uncrewed Systems Computation and Programming	3
Minor or Open Elective	3
Semester Hours	6

Requirements	Credits
UNSY 421 - Uncrewed Systems Mission Planning	3
Minor or Open Elective	3
Semester Hours	6

Requirements	Credits
UNSY 491 - Operational Applications in Uncrewed Systems	3
Minor or Open Elective	3
Semester Hours	6

Total Credits

Total Hours for All Requirements: 30

Estimated Cost of Attendance

Estimated Cost of Attendance: California Student Information (<https://catalog.erau.edu/student-life/student-affairs/california-student/>)