Unmanned Aircraft Systems Overview of Academic Degree Programs, Research, and Support Opportunities

EMBRY-RIDDLE Aeronautical University FLORIDA | ARIZONA | WORLDWIDE

About ERAU

Embry-Riddle Aeronautical University

- Independent, nonprofit, nonsectarian, and coeducational university
- <u>70+ undergraduate and graduate degrees</u> (Assoc. to Ph.D.)
- <u>32,000</u> undergraduate and graduate students
- Offers synchronous, asynchronous, and blended learning environments



About ERAU - UAS

Daytona Beach

- <u>BS in UAS Science</u> (250+ students)
- UAS minor
- <u>MS in Unmanned and Autonomous Systems</u>
 <u>Engineering</u>
- Professional Education <u>three-day UAS workshop</u>
- UAS Clubs

Prescott

- <u>BS in UAS (launched Aug 2015)</u>
- UAS minor
- UAS Club

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ERAU-Worldwide

Unmanned Systems (online)

- <u>BS in Unmanned Systems Applications</u> (Aug 2015; 135+ students)
- UAS minor and <u>UAS graduate specialization</u> (500+)
- <u>MS in Unmanned Systems</u> (Aug 2014; 275+)
- UAS Massive Open Online Course (Jan 2015)
- Professional Education
 - <u>Multirotor sUAS Familiarization</u> (DroneWorld, Nov 2016)
 - <u>Online Small UAS Professional Education</u> (three courses, 4 weeks each)
 - <u>UAS workshop</u>
 - Custom developed training
- Real-World Design Challenge (RWDC)
- Unmanned Systems related career options report
- ERAU Experience
- <u>sUAS Consumer Guide</u>

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ERAU UAS Research

- FAA UAS Center of Excellence (<u>ASSURE</u>)-Core
- <u>NextGen Advance Research (NEAR) Lab</u>
- UAS Simulation Lab
- <u>Aerial Robotics Virtual Laboratory</u>
- Numerous <u>UAS-specific pursuits</u>
 - Platform design and evaluation (competitions and coursework; AUVSI, IEEE, AIAA)
 - <u>Small UAS Consumer Guide</u> (student/faculty effort)
 - <u>UAS application analysis framework and database</u> (500 platforms)
- Produced multiple peer-reviewed publications and presentations (domestic and international)
 - Association for Unmanned Vehicle Systems International
 - Interservice/Industry, Training, Simulation and Training Conference
 - Unmanned Systems Canada
 - Journal of Unmanned Vehicle Systems International
 - International Conference on Control, Robotics, and Cybernetics
 - International Conference on Applied Human Factors and Ergonomics
 - Human-Computer Interaction International

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ERAU Funding Overview

- Sources
 - Internal
 - Federal (FAA, NSF, TRB, STTRs)
 - State
 - Private (resources, materials, services, financial, <u>crowdfunding</u>)
- Uses
 - UAS curriculum development and delivery
 - FAA/ASSURE UAS COE topics and other research
 - Public UAS educational outreach (expanding awareness and engagement)
 - <u>Dual-enrollment</u> (includes UAS coursework)
 - Expansion of the <u>Aerial Robotics Virtual</u> <u>Laboratory</u>
 - Acquisition of UAS related technology for exhibition/research

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Support-Methods

Collaboration

- Cooperative research and development agreements (CRADAs)
- External Funding
- Classroom development of solutions

Purchase or development of tools/resources

- Software tools (COTS, custom, data)
- Unmanned system platforms or components Multimedia (documentation, videos, imagery)

Support does not need to be financial

- Guidance, feedback, access to resources/data, and exhibition/observation achievable under partnership, collaboration, or mentorship would provide significant benefit
- Alignment of curricula to needs of industry
- Public UAS education and outreach
- Co-ops, internships, new-hire employment, and employee career development opportunities





Research Alignment Areas

- UAS/unmanned systems
 - Development, application, and operation
 - UAS-NAS integration and support
 - Emergency response and management
 - Platform-task suitability analysis
 - System integration->validation and verification
- Modeling and simulation
- Component/subsystem areas (coursework)
 - Engineering and design (systems, eng technology, aerospace, mechanical, and computer)
 - Operations and support (configuration, sensors, computational processing, communications, and flight training)
 - Command, control, and communication (C3)
 - Autonomy and automation
 - Sensing, perception, and processing
 - Power, propulsion, and maneuvering
 - Human factors
 - Robotics and control

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Contact

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