EMBRY-RIDDLE AERONAUTICAL UNIVERSITY – WORLDWIDE

UNDERGRADUATE / GRADUATE CATALOG 2018 - 2019

EMBRY-RIDDLE
Aeronautical University™
WORLDWIDE

Table of Contents

Worldwide Campus Catalog

Your guide to planning your academic future

As you explore programs of study at Embry-Riddle Aeronautical University – Worldwide, you can use this online catalog to view degree requirements, program and course descriptions, transfer credit information, grading policies, and much more.

Though you are bound to the catalog requirements of your program entry year, you still may want to refer to the catalog to track your progress.

The Embry-Riddle catalog is published annually and, as updates are made, it is important for you to remain aware of any changes that may affect you. Supplements to this catalog are listed in the Compliance and Supplements (p. 168) section of the catalog.

The **2018-2019** catalog is effective July 1, 2018 to June 30, 2019.

For access to previous catalogs, view the Catalog Archive (http://catalog.erau.edu/worldwide/archive).

The Worldwide Campus

Embry-Riddle Worldwide is known for more than just our highly regarded aviation and aerospace programs. We offer a range of associate, bachelor's and master's degrees, as well as Ph.D. and certificate programs in multiple sectors—from business to engineering to emergency services. Rigorous courses are taught by industry-leading experts who understand the demands of full-time work and military life because they have been there. Embry-Riddle Worldwide also offers flexible modes of learning that enable access to Embry-Riddle courses anytime, anywhere.

Led by a faculty comprised of industry professionals—many of whom come from military backgrounds—Embry-Riddle Worldwide's programs are designed specifically to suit demanding schedules. That is why we offer the ultimate experience in flexibility. Embry-Riddle Worldwide offers more than 125 campuses across the globe - more than 90 of which are located on military bases, 12 enrollment dates per year, five modes of learning and course work that can be completed as it fits into your busy life.

Chancellor's Welcome: A Message from Dr. John Watret (p. 6)

Worldwide Campus Mission Statement

The mission of Embry-Riddle Aeronautical University – Worldwide is to provide the highest quality education, training, and student services to aviation and aerospace professionals worldwide.

Visit Worldwide.erau.edu to learn more about the Worldwide Campus

- Find the latest news about the Worldwide Campus (http://worldwide.erau.edu)
- Find or learn more about a Worldwide Location near you (http://worldwide.erau.edu/locations)
- Learn more about the technology and learning modalities used by the Worldwide Campus (http://worldwide.erau.edu/online)

Contact the Worldwide Campus

Visit us in person at one of our more than **125 locations**, call us at 800-522-6787, or **email** us.

- Visit our contact page for additional listings (p. 8)

Accreditation, Associations, and State Authorizations

Embry-Riddle Aeronautical University, including the Daytona Beach Campus, the Prescott Campus, and the Worldwide Campus, is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACS-COC) to award degrees at the associate's, baccalaureate's, master's, and doctoral levels. Learn more about our Accreditation, Associations, and State Authorizations.

Chancellor's Welcome

A Message from Dr. John Watret

To our students,

Please allow me to congratulate you on being part of Embry-Riddle Aeronautical University. Your decision to become a student here reflects your commitment and dedication to achieving success both academically and professionally.

Our Worldwide Campus is comprised of more than 125 locations in the United States, Canada, Asia, South America, Europe, and the Middle East, and as a student, you will have the opportunity to interact with and learn from faculty, staff and students from across the globe. Our commitment to you is to support, encourage and assist you as you work to reach your goals.

I believe our strengths are many, but the following stand out:

- **Our commitment to student service and success.** Embry-Riddle Worldwide continues to be a place where anyone interested in aviation/aerospace — regardless of age, geography, family responsibilities or other circumstances — can attend and thrive at a first-class university.
- **Our commitment to academic quality.** Embry-Riddle Worldwide is dedicated to academic quality, to providing an exemplary teaching and learning experience, and to preparing our students for professional careers in the aviation industry.
- **Our commitment to innovation.** As a leader in distance education, Embry-Riddle Worldwide continues to develop and deliver online courses, EagleVision courses, and online/classroom blended courses, making quality higher education available to anyone — anywhere.
- **Our commitment to the military community.** Embry-Riddle Worldwide has a long-standing commitment to our servicemen and servicewomen, both active-duty and veteran, and we take pride in our ability to offer high quality education that is flexible to meet their specific requirements.

Thanks to the work and support of our faculty and staff, our alumni and students, and so many people in the communities we serve, Embry-Riddle Worldwide stands ready to help you achieve your educational and career goals. We welcome you to share in the great Embry-Riddle tradition and be part of our promising future. And whether you are a new student, a continuing student, or one of our many alumni, let me offer you a warm welcome to Embry-Riddle Worldwide.

John Watret, Ph.D., FRAeS
Chancellor
Worldwide Campus

Accreditation, Associations, and State Authorizations

Regional Accreditation

Embry-Riddle Aeronautical University, including the Daytona Beach Campus, the Prescott Campus, and the Worldwide Campus, is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACS-COC) to award degrees at the associate, baccalaureate's, master's, and doctoral levels.

Contact information for SACS-COC:
1866 Southern Lane
Decatur, Georgia, 30033-4097
(404) 679-4500

This information is provided to enable interested constituents to:

1. Learn about the accreditation status of the institution
2. File a third-party comment about the institution's decennial review of accreditation
3. File a complaint against the institution for alleged non-compliance with a standard or requirement
4. Provide a note of exemplary service or quality standards related to the institution

Normal inquiries, such as admissions requirements, financial aid, educational programs, etc., should be addressed directly to the Embry-Riddle Aeronautical University – Worldwide Campus by contacting (800) 522-6787 or worldwide@erau.edu.

Associations

Embry-Riddle Aeronautical University – Worldwide has developed creative, mutually beneficial partnerships and working relationships with numerous corporations, organizations, and government entities throughout the world. Relationship models include collaboration; sharing of vision, goals and resources; physical co-location arrangements; corporate training programs; research projects; and joint ventures, to name a few. Worldwide develops corporate and organization-specific relationships to meet the needs of aviation, aerospace, and related industries.

Embry-Riddle Aeronautical University, Worldwide Campus, offers the B.S. in Aeronautics which is a program accredited through the Aviation Accreditation Board International (AABI), a nonprofit 501(c)(3) organization that sets standards for all aerospace programs taught in colleges and universities around the United States and around the world.

The Bachelor of Science in Emergency Services program is Recognized by The National Fire Academy in accordance with the standards established by the Fire and Emergency Services Higher Education (FESHE) model core.

Worldwide's Bachelor of Science in Emergency Services has received accreditation from the International Fire Service Accreditation Congress (IFSAC) (https://ifsac.org). IFSAC accredited programs have been evaluated for their course offerings, institutional support and qualified faculty through a self-study and on-site review.

Embry-Riddle Aeronautical University is an approved Professional Development Provider (PDP) for the National Business Aviation Association (NBAA).

Embry-Riddle Aeronautical University – Worldwide has joined forces with the International Air Transport Association (IATA) to offer an online certificate in Supply Chain Management that leads to the Air Cargo Professional (ACP) designation from IATA and a Certificate in Aviation Management that leads to the Aviation Management Professional (AvMP) designation.

The Master of Science in Project Management program is accredited by the Project Management Institute Global Accreditation Center for Project Management Education Programs.

Embry-Riddle Aeronautical University – Worldwide offers several business programs accredited by the Accreditation Council for Business Schools & Programs (ACBSP). This achievement means that Embry-Riddles' accredited business programs have been peer-reviewed, scrutinized, and meet the stringent requirements set forth by the ACBSP.

State Authorization

It is the policy of Embry-Riddle Aeronautical University to administer its educational programs both on and off campus in a manner that is fair, equitable, academically sound, and in accordance with the regulations and criteria of its governing board, accrediting association, and federal and state laws and regulations.

Review specific state authorization information. (http://worldwide.erau.edu/locations/state-authorization)

Contact Worldwide

General Information (http://worldwide.erau.edu/about-worldwide)
Phone: (800) 522-6787 –OR- (800) 359-3728
Email: worldwide@erau.edu

Contact us at one of our 125 locations (http://worldwide.erau.edu/locations)

Worldwide Campus (http://worldwide.erau.edu)
Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900

Admissions (http://worldwide.erau.edu/admissions)
Phone: (800) 522-6787
Email: wwadmissions@erau.edu

Financial Aid (http://worldwide.erau.edu/finance/financial-aid)
Phone: (866) 567-7202
Email: wwfinaid@erau.edu

Registrar
(Log in to ERNIE (https://ernie.erau.edu/Departments/registrar-worldwide/Pages/Default.aspx))
Phone: (866) 393-9046
Email: worldwide.registrar@erau.edu

Disability Support Services
(Log in to ERNIE (http://ernie.erau.edu))
Phone: (386) 226-4911 or 1-888-292-5727
Email: wwdss@erau.edu

Office of Professional Education (http://proed.erau.edu)
Phone: (386) 226-7232
Toll free: (866) 574-9125
Email: training@erau.edu

Department of Online Education (http://worldwide.erau.edu/degrees-programs/online-campus)
Online Campus Advising
Phone: (800)359-3728
Email: wwadvise@erau.edu

Student Account Services
(Log in to ERNIE (http://ernie.erau.edu))
Phone: (386) 226-6280

Student Affairs
(Log in to ERNIE (http://ernie.erau.edu))
Phone: (386) 226-6727 or 1-888-292-5727
Email: wwstuaff@erau.edu

Worldwide Career Services
(Log in to ERNIE (http://ernie.erau.edu))
Phone: (386) 226-6092
Email: wwcarser@erau.edu
Website: http://worldwide.erau.edu/career-services/index.html

International Contact
Embry-Riddle Aeronautical University
APO, AE 09227
United States of America
Telephone number from U.S.: 011.49.631.303.27811
Email: europe.rdo@erau.edu

Military and Veteran Student Services (http://worldwide.erau.edu/about-worldwide/military-veterans)
Embry-Riddle Aeronautical University, Worldwide
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900
Phone: 1-855-785-0001
Fax: (386) 323-8816
Email: wwva@erau.edu

About the University

Embry-Riddle Aeronautical University is the world's largest, fully accredited university specializing in aviation and aerospace. A truly international institution, the University educates undergraduate and graduate students at its residential campuses in Daytona Beach, Florida, and Prescott, Arizona; at its more than 125 Worldwide Campus locations around the globe; and through online learning.

The University offers a wide array of more than 80 undergraduate and graduate degree programs in aviation, aerospace, business, engineering, safety, security and intelligence, transportation, and related high-tech fields.

Always moving forward in step with the aviation and aerospace industry, Embry-Riddle offers Ph.D. degree programs in Aerospace Engineering, Aviation, Aviation Business Administration, Electrical Engineering & Computer Science, Engineering Physics, Human Factors Psychology, and Mechanical Engineering.

These Ph.D. programs expand the applied research opportunities in which Embry-Riddle faculty and students collaborate with the industry, government agencies, and other universities in meeting real-world challenges. Frequent research partners include the FAA, NASA, the National Science Foundation, and the U.S. Air Force.

U.S. News & World Report, USA Today, Wall Street Journal and others rank Embry-Riddle highly in the categories of best undergraduate aerospace engineering programs, best undergraduate engineering programs, best bachelor's degrees in engineering, best colleges in Arizona and Florida, best regional university (South), best college astronomy observatories, top colleges for aerospace careers, and top colleges for internship and co-op programs.

Military Times, *Military Advanced Education & Transition, U.S. Veterans*, *Victory Media,* and *U.S. News & World Report* also name Embry-Riddle best for veterans, top military-friendly school, top veteran-friendly school, best online bachelor's programs for veterans, best regional university (South) for military and veterans, best online MBA programs for veterans, and best online non-MBA graduate business programs for veterans.

U.S. News & World Report gives Embry-Riddle's Worldwide Campus superior marks in the categories of best online bachelor's programs, best online graduate MBA program, best online graduate non-MBA program, and best online engineering degree programs.

Embry-Riddle is ranked highly among private colleges for best value, best starting salary, and best return on investment by Affordable Colleges Online, College Choice, PayScale, Smart Asset, Value Colleges, and the U.S. Department of Education.

Daytona Beach

The University's 185-acre eastern campus in Daytona Beach, Florida, is located next to Daytona Beach International Airport and Daytona International Speedway, only minutes from the Atlantic Ocean, and only an hour's drive from Kennedy Space Center and Orlando.

The new College of Arts & Sciences building includes an observatory with the largest university-owned research telescope in the Southeast. A new Student Center nearing completion will be the largest building on campus, consolidating most student services in one location.

Bachelor's degrees of note at the Daytona Beach Campus include Aerospace & Occupational Safety, Aerospace Physiology, Global Conflict Studies, Spaceflight Operations, and Unmanned Aircraft Systems Science. Master's degrees include Cybersecurity Engineering, Human Security & Resilience, and Unmanned & Autonomous Systems Engineering.

The new John Mica Engineering & Aerospace Innovation Complex, located in Embry-Riddle's Daytona Beach Research Park, is a hybrid research center and business incubator attracting scientists, entrepreneurs, and venture capitalists.

Student teams from the Daytona Beach Campus regularly take top honors in competitions hosted by the Society of Automotive Engineers and the Association for Unmanned Vehicle Systems International. Aeronautical Science students excel in annual flight competitions such as the women's Air Race Classic and the National Intercollegiate Flying Association's SAFECON regional and national events.

Prescott Campus

The University's mile-high, 539-acre western campus is located in Prescott, Arizona. Extensive recreational facilities and opportunities in and near the campus include hiking, mountain biking, kayaking, skiing, and snowboarding.

The new STEM (Science, Technology, Engineering, and Math) Education Center houses 20 state-of-the-art labs dedicated to robotic systems, satellites, unmanned aerial systems, commercial aircraft, military aircraft, physics, chemistry, biology, and more. The building also contains classrooms, a multimedia center, a supercomputer system, and the Jim and Linda Lee Planetarium. Elsewhere on campus is the nation's largest university-based Aircraft Accident Investigation Lab.

The campus is home to the nation's first College of Security & Intelligence. It offers bachelor's degrees in Cyber Intelligence & Security and in Global Security & Intelligence Studies as well as master's degrees in Cyber Intelligence & Security and in Security & Intelligence Studies.

Noteworthy degree programs at the Prescott Campus include Forensic Biology, Forensic Psychology, Forensic Accounting & Fraud Examination, Industrial/Organizational Psychology, Wildlife Science, and Simulation Science, Games, & Animation.

The College of Aviation offers degrees for professional pilots with fixed-wing and rotary-wing options. Student flight teams have won numerous national championships in NIFA SAFECON competitions and rank highly in the women's Air Race Classic.

Worldwide Campus

The Worldwide Campus provides educational opportunities for working professionals. Its academic programs are offered online and at more than 125 civilian and military learning centers in Germany, Italy, Japan, South Korea, Spain, Turkey, the United Kingdom, and the United States. With flexible course delivery systems, students can learn in the classroom, online, or a blend of the two, switching between instruction modes as needed -- of particular importance for deployed military students. In addition, via Worldwide's EagleVision technology, students at different geographical locations can receive instruction at the same time.

As the industries we serve continue to evolve, so does Embry-Riddle, accelerating into the future as an aerospace, business, science, engineering, and research powerhouse, producing graduates who are well-prepared to become leaders in their fields. Guiding the process of evolution are dedicated teachers, administrators, alumni, trustees, and advisory board members who share our students' love of aviation and who strive to ensure Embry-Riddle's continued position as the world's premier aviation and aerospace university.

Message from the President

To Our Students:

Welcome to Embry-Riddle Aeronautical University, a premier global institution serving more than 31,000 students at two residential campuses in Florida and Arizona, through the Worldwide Campus at 125 locations around the world, and through online programs. Now that you have made the decision to join the Embry-Riddle family, an exciting new world of learning and opportunities for innovation await you. As an Embry-Riddle graduate, you will be well-prepared to join an elite group of leaders across a wide variety of careers, whether you choose to pursue a life in aviation and aeronautics, business, engineering, security and intelligence, or any other field.

Embry-Riddle offers programs in a wide array of traditional as well as emerging fields. Our academic community – including faculty, staff and your fellow students – stand ready to help you identify your passion and pursue your learning goals. All of our academic programs undergo regular review to ensure they will effectively meet your needs and the highest possible educational standards. Our emphasis on experiential learning will provide hands-on learning opportunities as soon as you begin your studies. Nearly 90 percent of our students are directly connected with faculty members and industry partners through sophisticated research, capstone projects and internships. Many students at Embry-Riddle win awards and competitions and publish their research findings on a regular basis.

Embry-Riddle is well-known as the world's largest and oldest aviation institution, but we offer much more than flight instruction. The strength of our science, technology, engineering and mathematics programs makes it possible for students to master fields ranging from hybrid electric propulsion and autonomous flying vehicles to the human factors that affect operational efficiency. Students at Embry-Riddle are also competing and frequently winning on the athletic fields and courts, too. Combined Bachelor's and Master's degree programs are available to make it faster and less costly to earn degrees in two programs. Seven competitive Ph.D.-level programs are open to continuing Embry-Riddle students and others.

We are a truly inclusive institution, serving students and faculty from across the United States and 125 countries worldwide. Research at Embry-Riddle benefits from a rich diversity of perspectives and ideas, which contributes to transformative thinking and innovation. We have a goal to double our research enterprise within the next 5-10 years, and near our Daytona Beach Campus we have just opened a state-of-the-art research facility, the John Mica Engineering and Aerospace Innovation Complex, or MicaPlex. This facility and our surrounding research park will offer opportunities to collaborate with industry partners, opening new doors for student-researchers who will become tomorrow's problem-solvers.

More than 125,000 alumni are Embry-Riddle's greatest achievement. We are proud of our 90-year legacy of innovation, yet we remain steadfastly focused on the future, and your role in shaping it. You will advance human knowledge, quality of life, and economic prosperity for all. You will help us reach even greater heights. As an Embry-Riddle Eagle—now and forever—we will expect great things from you. We will learn from you. Whichever Embry-Riddle campus you choose, may you have a meaningful, exciting learning experience, make many new friends, and fly into the future with us.

P. Barry Butler, Ph.D.
President

Mission of the University

Our Mission

At Embry-Riddle, our mission is to teach the science, practice and business of aviation and aerospace, preparing students for productive careers and leadership roles in service around the world.

Our technologically enriched, student-centered environment emphasizes learning through collaboration and teamwork, concern for ethical and responsible behavior, cultivation of analytical and management abilities, and a focus on the development of the professional skills needed for participation in a global community. 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 achievement and knowledge discovery, in an interpersonal environment that supports the unique needs of each individual.

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, bachelor, master and Ph.D. degrees.

Our Vision

Embry-Riddle will be the world's source for innovation and excellence in aerospace education and applied research.

Our Values

The strength of our university is firmly rooted in our values. We expect that our students, faculty and staff share and demonstrate the values of student success, a positive learning environment and mind-set, safety first in all situations, personal growth, integrity, honesty, trust, diversity, open communication, teamwork, character, change for progress, fiscal soundness, healthy investments, and a can-do attitude.

"The strength of our university is firmly rooted in our values"

Embry-Riddle's History

Aviation and Embry-Riddle: The Lifelong Partnership

In 1903 Orville and Wilbur Wright made history with their sustained, controlled flight of a powered aircraft. Only a few short years later, the advent of regular passenger service and the start of World War I combined to produce a dynamic new industry to meet the demands of commercial and military aviation.

Unlike many other developments at the end of the Industrial Revolution, aviation required a special education — learning how to fly, learning about safety and weather, and learning about engines — from skilled maintenance to the outer limits of performance.

The need for trained pilots and mechanics quickly led to the establishment of a new type of school, one focused totally on aviation. In the beginning, these organizations were often a combination of airplane dealership, airmail service, flight training center, and mechanic school. The original Embry-Riddle operations fit that mold precisely.

On Dec. 17, 1925, exactly 22 years after the historic flight of the Wright Flyer, barnstormer John Paul Riddle and entrepreneur T. Higbee Embry founded the Embry-Riddle Company at Lunken Airport in Cincinnati, Ohio. The following spring the company opened the Embry-Riddle School of Aviation, coinciding with the implementation of the Air Commerce Act of 1926, which required, for the first time, the certification and medical examination of pilots.

Within three years the school had become a subsidiary of AVCO, the parent of American Airlines. Embry-Riddle remained dormant during most of the 1930s, mirroring the casualties of the Great Depression, and the Lunken Airport operation was phased out. By the end of the decade, however, World War II erupted in Europe and the demand for skilled aviators and mechanics grew significantly. Embry-Riddle's second life was about to begin.

In South Florida, Embry-Riddle opened several flight-training centers and quickly became the world's largest aviation school. Allied nations sent thousands of fledgling airmen to the Embry-Riddle centers at Carlstrom,

Dorr, and Chapman airfields to become pilots, mechanics, and aviation technicians. Some 25,000 men were trained by Embry-Riddle during the war years.

After the war, under the leadership of John and Isabel McKay, Embry-Riddle expanded its international outreach while strengthening its academic programs.

With Jack R. Hunt as president, in 1965 Embry-Riddle consolidated its flight, ground school, and technical training programs in one location by moving northward to Daytona Beach, Florida. This move, which proved to be a moment of singular importance, was made possible by Daytona Beach civic leaders who donated time, money, and the use of personal vehicles. The relocation signaled the rebirth of Embry-Riddle and the start of its odyssey to world-class status in aviation higher education.

In 1968, Embry-Riddle was accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award degrees at the associate, bachelor, and master levels, and in 1970 changed its name from “Institute” to “University.” Also in 1970, centers were established at U.S. military aviation bases to serve the educational needs of active-duty military personnel.

In 1978, under President Hunt’s leadership, Embry-Riddle opened a western campus in Prescott, Arizona, on the 511-acre site of a former college. With superb flying weather and expansive grounds, the Prescott Campus has been an outstanding companion to the University’s eastern campus in Daytona Beach.

Continuing Hunt’s legacy was Lt. Gen. Kenneth L. Tallman, president of Embry-Riddle for five years. He came to the University after a distinguished 35-year military career that included service as superintendent of the U.S. Air Force Academy. Under Tallman’s leadership, a school of graduate studies and the electrical engineering degree program were introduced. He led the University into research with the addition of the engineering physics degree program. He also developed stronger ties between Embry-Riddle and the aviation/aerospace industry.

Dr. Steven M. Sliwa led the University from 1991 through 1998. Sliwa, the University’s third president, is best known for creating an entrepreneurial environment and for developing strategic partnerships with industry. These partnerships included a joint venture with FlightSafety International; a partnership with Cessna Aircraft Company; a technology alliance with IBM; and an exclusive educational partnership with the Aircraft Owners and Pilots Association. He also spearheaded a $100+ million capital expansion program, which included an $11.5 million congressional line-item appropriation. In addition, new academic and research programs were created at his direction to respond to structural changes in the industry while increasing market share in the University’s core programs.

Embry-Riddle’s fourth president, Dr. George H. Ebbs, led the University from 1998 through 2005. During and following his tenure, the annual college guide produced by *U.S. News & World Report* has consistently ranked Embry-Riddle’s undergraduate Aerospace Engineering program No. 1 in the nation. Embry-Riddle’s Aerospace Engineering program is the largest in the nation, as is its Aeronautical Science (professional pilot) program.

Under the leadership of Dr. Ebbs, a new graduate degree program in Safety Science was introduced, as well as new undergraduate degree programs in Computer Science, Global Security and Intelligence Studies, Mechanical Engineering, Software Engineering, and Space Physics. In addition, major construction was initiated at the Daytona Beach and Prescott residential campuses.

Dr. Ebbs presided over three military contracts worth a total of more than $57 million. Under those contracts Embry-Riddle provides aviation-related degree programs to the U.S. military in Europe; trained Air Force, Air National Guard, and international flight safety officers at Kirtland Air Force Base in Albuquerque, N.M.; and trained Air Force pilots at the U.S. Air Force Academy in Colorado Springs.

Dr. John P. Johnson served the Universtiy as the fifth President. He previously served as Embry-Riddle’s Interim President and as Provost and Chief Academic Officer. Before joining Embry-Riddle, he was the Provost and Vice President for Academic Affairs at Texas A&M University, Texarkana, and served as Dean at the Medical University of South Carolina and at Northern Kentucky University.

Under Dr. Johnson’s leadership, Embry-Riddle expanded its research activity; developed a global strategy to take its aviation and aerospace expertise overseas; and launched Ph.D. degree programs in Aerospace Engineering, Aviation, Aviation Business Administration, Electrical Engineering and Computer Science, Engineering Physics, Human Factors, and Mechanical Engineering. Working with the FAA and industry leaders, Dr. Johnson positioned the University as one of the nation’s leaders in the development of next-generation air traffic management technology.

Dr. P. Barry Butler became the sixth president of Embry-Riddle in March 2017. His primary areas of focus are student success, research and innovation, corporate engagement, economic development, and continued global expansion. Before joining Embry-Riddle he was Executive Vice President and Provost at the University of Iowa. He joined the University of Iowa faculty in 1984 as an assistant professor in the Department of Mechanical Engineering and subsequently progressed to the rank of professor. Before entering administration in 1998, Dr. Butler was a member of the Engineering Faculty Council, as well as the University of Iowa’s Faculty Senate and Faculty Council. Other positions held by Dr. Butler at the University of Iowa include Department Executive Officer of the Department of Mechanical Engineering, Associate Dean for Academic Programs, and Interim Dean and Dean of Engineering, where he held the rank of full professor in the Department of Mechanical and Industrial Engineering. At the University of Iowa he was the coordinator of the Iowa Space Grant Consortium, a statewide organization funded by NASA for the past 21 years whose mission is to coordinate and improve the state’s future in aerospace science and technology and to stimulate aerospace research, education, and outreach activities throughout the state.

Admissions

Embry-Riddle considers all aspects of a student's qualifications and offers admission to the most competitive applicants, building a talented and diverse population of students motivated toward careers in aviation and aerospace. Applications for admission are valid for one year from date received. Admitted students must enroll and maintain enrollment beyond the add/drop period within one year of admission or must reapply. For the purpose of admission, transcripts are deemed official when issued directly from the issuing institution to Embry-Riddle.

To apply for admissions, go to worldwide.erau.edu/admissions/apply-now/index.html.

Current High School Students

The University defines a first-year applicant as one who is applying for degree status directly from high school. The University offers admission to applicants who present an academic record that demonstrates their ability to graduate. The following documentation is required for consideration of admission for all applicants currently enrolled in high school:

- Official high school transcript; home-schooled applicants must show an official document that is equivalent to high school completion and/or may be required to complete the GED, HiSET or TASC
  - Rigor of high school academic program and academic performance will be assessed at a 2.5 Unweighted GPA or higher on a 4.0 scale
- Two letters of recommendation from a school counselor, teacher, or employer
- Official transcripts from all postsecondary, accredited degree-granting institutions, if applicable
- Advanced Placement (AP) scores, if applicable

SAT and ACT scores are strongly recommended for admission. Applicants are also encouraged to submit an essay of 300-500 words outlining career goals and how Embry-Riddle will assist in attaining those goals.

The university expects all applicants to have completed by high school graduation the following course work, at a minimum:

- Four years of English
- Three years of mathematics, including Algebra I or Applied Math I & II, Formal Logic or Geometry
- Two years of history or social science
- Two years of science in at least two different areas, with at least one lab experience

Applicants will be considered for admission prior to high school graduation. Admitted students will be permitted to enroll in Embry-Riddle Worldwide coursework no sooner than the July term of their graduation year. An official, final high school transcript with all grades posted demonstrating continued academic progress and graduation must be submitted to Embry-Riddle within the first term of enrollment.

Admission into some degree programs may require an applicant to have a higher GPA, meet other special requirements, and/or submit additional documentation.

* For both undergraduate and graduate applicants, additional documentation may be required for admission and consideration of credit from military, licensure, or other documented experiential learning.

** All applicants who have educational experience outside the United States are required to provide an official course-by-course evaluation in English, to include the cumulative grade-point average, unless specifically exempted through a qualifying ERAU program. Refer to the International Admissions (http://catalog.erau.edu/worldwide/admissions/international) section of the catalog for details on foreign credential evaluations.

High School Graduates

Applicants Under the Age of 20

The following documentation is required for consideration of admission for all applicants under the age of 20, who have not served in the United States military and are not a transfer student:

- Official high school transcript or equivalent (GED, HiSET or TASC); home-schooled applicants must show an official document that is equivalent to high school completion and/or may be required to complete the GED, HiSET or TASC
  - Rigor of high school academic program and academic performance will be assessed at a 2.5 Unweighted GPA or higher on a 4.0 scale
- Two letters of recommendation from a school counselor, teacher, or employer
- Official transcripts from all postsecondary, accredited degree-granting institutions, if applicable
- Advanced Placement (AP) scores, if applicable

SAT and ACT scores are strongly recommended for admission. Applicants are also encouraged to submit an essay of 300-500 words outlining career goals and how Embry-Riddle will assist in attaining those goals.

The university expects all applicants to have completed by high school graduation the following course work, at a minimum:

- Four years of English
- Three years of mathematics, including Algebra I or Applied Math I & II, Formal Logic or Geometry
- Two years of history or social science
- Two years of science in at least two different areas, with at least one lab experience

Applicants Age 20 and Older

Applicants age 20 and older who are not classified as a transfer student or have not served in the US military must provide the following documentation:

- Official high school transcript or equivalent (GED, HiSET or TASC) with a 2.5 Unweighted GPA or higher assessed on a 4.0 scale
- Official transcripts from all postsecondary, accredited degree-granting institutions attended, if applicable, with a minimum of a 2.0 CGPA on a 4.0 scale
- Resume

Applicants with Military Experience

Applicants with United States military experience, but no college transfer credit must provide the following documentation:

- Official military transcripts showing documentation of service
- Additional documentation may be requested for advanced standing credit

Admission into some degree programs may require an applicant to have a higher GPA, meet other special requirements, and/or submit additional documentation.

* For both undergraduate and graduate applicants, additional documentation may be required for admission and consideration of credit from military, licensure, or other documented experiential learning.
** All applicants who have educational experience outside the United States are required to provide an official course-by-course evaluation in English, to include the cumulative grade-point average, unless specifically exempted through a qualifying ERAU program. Refer to the International Admissions (http://catalog.erau.edu/worldwide/admissions/international) section of the catalog for details on foreign credential evaluations.

Transfer Students

For the purposes of admission, a transfer student is defined as any student who has earned college-level credit from an accredited degree-granting institution after graduating from high school. Embry-Riddle considers each application for transfer admission individually, reviewing the student's academic record, grades received in all college-level courses and the rigor of the student's academic program. College courses completed as dual enrollment while concurrently enrolled in high school do not qualify applicants as transfer students.

To be considered for admission, a transfer applicant must have a minimum of a 2.0 cumulative grade point average (CGPA) on a 4.0 scale from an accredited degree-granting institution. When an applicant has attended more than one institution, a cumulative average for all previous college work attempted will be calculated to determine the overall CGPA.

Transfer students must also have:

- Official transcripts from all accredited degree-granting colleges and universities (post-secondary institutions) attended
- Military transcripts and documents, if applicable
- Official high school transcript, or equivalent (GED, HiSET or TASC) with a 2.5 Unweighted GPA or higher assessed on a 4.0 scale will be required of applicants who have not served in the United States military, if fewer than 12 semester hours of college level credit have been earned

Admission into some degree programs may require an applicant to have a higher CGPA, meet other special requirements, and/or submit additional documentation.

* For both undergraduate and graduate applicants, additional documentation may be required for admission and consideration of credit from military, licensure, or other documented experiential learning.
** All applicants who have educational experience outside the United States are required to provide an official course-by-course evaluation in English, to include the cumulative grade-point average, unless specifically exempted through a qualifying ERAU program. Refer to the International Admissions (http://catalog.erau.edu/worldwide/admissions/international) section of the catalog for details on foreign credential evaluations.

Former Embry-Riddle Students

For Undergraduate Students: A degree-seeking student whose attendance at the University is interrupted will be required to reapply for admission in any of the following circumstances:

- Enrollment at another institution without advanced, written approval
- A matriculated student who fails to enroll within one year from the ending date of their last course
- A student who fails to matriculate within one year of admission
- Academic suspension

Prior students with an Embry-Riddle undergraduate cumulative grade point average (CGPA) below a 2.0 may be considered for readmission. Previously suspended students must also satisfy the conditions for readmission as indicated in the letter of suspension before being considered for readmission. In both cases, files will be reviewed by the Admissions Office and/or Academic Standards and Admissions Committee (ASAC). A written petition for readmission, current resume and application fee must accompany the application for consideration of readmission.

For Graduate Students: A new application will be required for students whose attendance at the University is interrupted for any of the following reasons:

- Enrollment at another institution
- A matriculated student who fails to enroll within one year from the ending date of their last course
- A student who fails to matriculate within one year of admission
- Academic dismissal from the University
- Student does not complete the degree requirements of a graduate program within seven years from the date of initial enrollment in the graduate program

Prior students with an Embry-Riddle graduate cumulative grade point average (CGPA) below a 3.0 may be considered for readmission. Previously dismissed students must also satisfy the conditions for readmission as indicated in the letter of dismissal before being considered for readmission. In both cases, files will be reviewed by the Admissions Office and/or Academic Standards and Admissions Committee (ASAC). A written petition for readmission, current resume and application fee must accompany the application for consideration of readmission.

Undergraduate Conditional Admission

- Students who fail to satisfy the guidelines for full admission may be granted conditional admission under circumstances determined by the Admissions Office or Academic Standards and Admissions Committee (ASAC). A written petition for admission, current resume and other supporting documentation may be requested for consideration of admission.
- Students granted standard conditional admission due to academic deficiency should maintain a minimum of a 2.0 CGPA while in this status or risk being placed on warning, put on probation, or suspended, in compliance with university policy.
- Students granted custom conditional admission may have individual terms outlined in their letter of admission. Students will remain on conditional status until they have satisfied the terms of their conditional admission.
- Students with conditional admission questions should contact their academic advisor at their local campus. Students can find information on their campus using the Worldwide Location Finder (http://worldwide.erau.edu/locations/index.html?address=). Academic advisors for the Online Campus can be found on the Online Campus Advisors (http://worldwide.erau.edu/online-learning) page.

Readmission of Service Members: Higher Education Opportunity Act of 2008

In accordance with the HEO Act of 2008, service members will be readmitted to the institution, without penalty for having left because of military service, in order to minimize disruption to the lives of those serving in the uniformed services.

In reference to the Department of Education: Statute and regulations require institutions of higher education that participate in Federal student financial aid programs to promptly readmit with the same academic status a qualifying service member who did not continue to attend because of service in the uniformed services. The readmission requirements apply to service members who perform service in the uniformed services, whether voluntary or involuntary, in the Armed Forces, including service as a

member of the National Guard or Reserve, on active duty, active duty for training, or full-time National Guard duty under Federal authority (but not State authority).

Non-Degree Seeking and Transient Students

Undergraduate

Embry-Riddle recognizes that working adults may be interested in furthering their education for professional or self-enhancement purposes without pursuing a degree program. We also recognize that transient students and those pursuing a degree with another institution may wish to take a course or courses with Embry-Riddle. For these reasons, Embry-Riddle allows students who meet full admission requirements to take up to 24 semester hours as a non-degree seeking or transient student. Official or unofficial transcripts must be submitted to the University before the student is allowed to enroll in courses. Non-degree seeking and transient students must meet the same academic standards as degree seeking students. For students who subsequently apply for entry into a degree program, additional documentation may be required.

Graduate

Embry-Riddle recognizes that working adults may be interested in furthering their education for professional or self-enhancement purposes without pursuing a degree program. We also recognize that transient students and those pursuing a degree with another institution may wish to take a course or courses with Embry-Riddle. For these reasons, Embry-Riddle allows students who meet full admission requirements to take up to 12 semester hours as a non-degree seeking or transient student. Official or unofficial transcripts must be submitted to the University before the student is allowed to enroll in courses. Non-degree seeking and transient students must meet the same academic standards as degree seeking students. For students who subsequently apply for entry into a degree program, additional documentation may be required.

Certificate Seeking Students (UG)

Undergraduate

Embry-Riddle recognizes that working adults may be interested in furthering their education for professional or self-enhancement purposes without pursuing a degree with Embry-Riddle. For these reasons, Embry-Riddle allows students who meet full admission requirements to be admitted to an undergraduate certificate program. Undergraduate certificate program students may only enroll in those courses outlined in the certificate program. Official or unofficial transcripts must be submitted to the University before the student is allowed to enroll in certificate courses. Certificate seeking students must meet the same academic standards as degree-seeking students. For students who subsequently apply for entry into a degree program, additional documentation may be required.

Microsoft Software & Systems Academy (MSSA) Certificates of Completion: Applicants interested in pursuing a MSSA Certificate of Completion are required to meet the same admission criteria as degree seeking applicants and must pay the $50 application fee. Official documents will be required during the admission process. Applicants who fail to meet full admission criteria may be considered for possible conditional admission on a case by case basis.

First Time and Transfer Students

All graduate applicants must have earned a baccalaureate degree from an accredited degree-granting institution, with a cumulative grade point average (CGPA) of 2.5 or higher on a 4.0 scale from their degree-granting institution. Graduate applicants who already possess a master's degree or have completed graduate coursework from an accredited degree-granting institution must also have a 3.0 CGPA or higher at the graduate level.

Applicants with an undergraduate degree and no graduate course work are required to submit the following:

- Official transcript(s) from the accredited degree-conferring institution(s)
- Official or unofficial transcripts from other institutions attended may be requested to verify prerequisite knowledge for certain academic programs

Applicants with an undergraduate degree and graduate-level course work are required to submit the following:

- Official transcript(s) from the accredited degree-conferring institution(s)
- Official transcripts from all accredited degree-granting institutions showing graduate-level course work
- Official or unofficial transcripts from other institutions attended may be requested to verify prerequisite knowledge for certain academic programs

Applicants with a master's degree are required to submit the following:

- Official transcripts from all accredited degree-granting institutions showing graduate-level course work
- Official or unofficial transcript(s) from the undergraduate degree-conferring institution(s). Additional transcripts from other institutions attended may be requested to verify prerequisite knowledge for certain academic programs

Admission into some degree programs may require an applicant to have a higher CGPA, meet other special requirements, and/or submit additional documentation.

* For both undergraduate and graduate applicants, additional documentation may be required for admission and consideration of credit from military, licensure, or other documented experiential learning.

** All applicants who have educational experience outside the United States are required to provide an official course-by-course evaluation in English, to include the cumulative grade-point average, unless specifically exempted through a qualifying ERAU program. Refer to the International Admissions (p. 15) section of the catalog for details on foreign credential evaluations.

Certificate Seeking Students (GR)

Graduate

Embry-Riddle recognizes that working adults may be interested in furthering their education for professional or self-enhancement purposes without pursuing a degree with Embry-Riddle. For these reasons, Embry-Riddle allows students who meet full admission requirements to be admitted to a graduate certificate program. Graduate certificate program students may only enroll in those courses outlined in the certificate program. Official or unofficial transcripts must be submitted to the University before the student is allowed to enroll in certificate courses. Certificate seeking students must meet the same academic standards as degree-seeking students. For students who subsequently apply for entry into a degree program, additional documentation may be required.

Graduate Conditional Admission

- Students who fail to satisfy the guidelines for full admission may be granted conditional admission under circumstances determined by the Admissions Office or Academic Standards and Admissions Committee (ASAC). A written petition for admission, current resume and other supporting documentation may be requested for consideration of admission.
- Students granted standard conditional admission due to academic deficiency will remain on conditional status until they have completed nine hours of graduate coursework. Any course(s) taken in this initial

nine hours may not be repeated while on conditional status. During the conditional period students must maintain a 3.0 CGPA or risk being placed on academic warning or being dismissed in compliance with University policy.

- Students granted custom conditional admission may have individual terms outlined in their letter of admission. Students will remain on conditional status until they have satisfied the terms of their conditional admission.
- Students with conditional admission questions should contact the academic advisor at their local campus. Students can find information on their campus using the Worldwide Location Finder (http://worldwide.erau.edu/locations/index.html?address=). Academic advisors for the Online Campus can be found on the Online Campus Advisors (http://worldwide.erau.edu/online-learning) page.

International Admissions

An international student is defined as any non-United States citizen intending to study at campuses located outside the United States, students who live outside of the United States and are enrolled through the Embry-Riddle Worldwide Online Campus, as well as non-residents and non-immigrants planning to study in the United States. This school is authorized under federal law to enroll non-immigrant students.

International applicants must submit the application for admission 90 days prior to their intended term start date. The following items are also required.

Foreign Credential Evaluation

All undergraduate and graduate applicants who have educational experience outside the United States are required to provide an official course-by-course evaluation in English, that includes the cumulative grade-point average, unless specifically exempted through a qualifying ERAU program. A copy of the foreign transcript must accompany the official credit evaluation. The evaluation must be certified by one of the Foreign Credential Evaluation Services (FCE) approved by Embry-Riddle. A fee is charged for the translation service and must be paid by the applicant directly to the FCE.

If a student has graduate-level work (either transfer or advanced standing) that is indicated on the foreign credential evaluation as meeting the requirements for an undergraduate degree, it will not be reviewed for applicability toward an ERAU graduate degree.

Educational systems differ country by country. The following services are versed in providing a comparison of a country's education system to the system in the United States. This comparison includes education levels, credits, and grades.

The report is considered official only if mailed from the agency directly to ERAU. We prefer all applicants use the foreign credential evaluation services provided by World Education Services. We will also accept evaluations from the following agencies: ECE, IERF, Josef Silny & Associates and ACEI.

World Education Services, Inc.
Bowling Green Station
P.O. Box 5087
New York, NY 10274-5087
Phone: (212) 966-6311
Fax: (212) 739-6100
www.wes.org (http://www.wes.org)

Educational Credential Evaluators (ECE)
P.O. Box 514070
Milwaukee, WI 53203-3470
Phone: (414) 289-3400
www.ece.org (http://www.ece.org)

International Education Research Foundation, Inc.
P.O. Box 3665
Culver City, CA 90231
Phone: (310) 258-9451
Fax: (310) 342-7086
www.ierf.org (http://www.ierf.org)

Josef Silny & Associates, Inc.
International Education Consultants
7101 SW 102 Avenue
Miami, FL 33173
Phone: (305) 273-1616
Fax: (305) 273-1338
Translations: (305) 273-1984
www.jsilny.com (http://www.jsilny.com)

Academic Credentials Evaluation Institute, Inc. (ACEI)
P.O. Box 6908
Beverly Hills, CA 90212
Phone: (310) 275-3530
Fax: (310) 275-3528
www.acei-global.org (http://www.acei-global.org)

English Language Requirements

1. Applicants for whom English is not the primary language must:
   a. Attain a minimum score on the Test of English as a Foreign Language (TOEFL) of 550 (paper based), 213 (computer based) or 79-80 (Internet based) **– OR –**
   b. Attain a minimum score on the International English Language Testing System (IELTS) of 6.0 **– OR –**
   c. Attain a minimum score on the Cambridge English Language Assessment of 170 **– OR –**
   d. Successfully complete a college-level English Composition course with a grade of "C" or better from an accredited degree-granting institution**.**
2. TOEFL, IELTS, and Cambridge Exam scores must be sent directly to Embry-Riddle by the testing agency.
   For testing dates and locations, please use the contact information below:

   TOEFL Services - Worldwide Campus school code 2860
   Educational Testing Service
   P.O. Box 6151
   Princeton, NJ 08541-6151
   1-609-771-7100 (worldwide)
   1-877-0863-3546
   www.toefl.org

   IELTS International Services - Worldwide Campus school code 5190
   825 Colorado Boulevard, Suite 201
   Los Angeles, CA 90041 USA
   Telephone: 323-255-2771
   Email: **ielts@ieltsintl.org**
   www.ielts.org

   Cambridge English Language Assessment
   1 Hills Road
   Cambridge
   CB1 2EU
   United Kingdom
   Tel: +44 1223 553997
   Email: **helpdesk@cambridgeenglish.org**
   www.cambridgeenglish.org/helpdesk

Embry-Riddle Europe

International students interested in attending our Europe Campus (http://berlin.erau.edu) may contact:

Embry-Riddle Aeronautical University Europe
Kurfürstenstraße 56
10785 Berlin
GERMANY

Phone: +49 (0)30 53063549
Email: berlin@erau.edu

Embry-Riddle Asia

International students interested in attending our Asia Campus (http://asia.erau.edu) may contact:

Embry-Riddle Aeronautical University
Asia Campus
75 Bukit Timah Road
#02-01/02 Boon Siew Building
Singapore 229833
Phone: +65 6933 9580
Email: asia@erau.edu

F-1 Student Visas

F-1 Student Visas

For international students intending to study in the U.S. on an F-1 student visa, an official bank letter, loan letter, or scholarship letter must be provided with an affidavit of financial support. Upon acceptance for admission and receipt of financial documentation, the Worldwide Principal Designated School Official (PDSO) will issue the Certificate of Eligibility form (I-20) allowing the student to apply for an F-1 visa. A Designated School Official (DSO) is located at each approved location to assist an F-1 student in maintaining immigration status.

F-1 Visa Process

1. Apply to an F-1 approved location and program at Embry-Riddle Worldwide.
2. Submit documentation for admission as outlined in the current catalog (http://worldwide.erau.edu/degrees-programs/catalogs).
3. Receive admissions decision.
4. Sign the Form I-20 Certificate of Eligibility mailed to you by your International Student Counselor.
5. Submit the Form I-901 SEVIS fee at www.fmjfee.com (http://www.fmjfee.com). To obtain the I-901 receipt, you will need to pay the SEVIS Fee (I-901). This is a $200 fee that can be paid using one of three methods: Online with a credit card (http://www.ice.gov/sevis/i901/faq4.htm#credit_card), check or money order (http://www.ice.gov/sevis/i901/faq4.htm#_Toc81222058), or at a Western Union (http://www.ice.gov/sevis/i901/wu_instr.htm).
6. Contact the nearest U.S. Embassy or U.S. Consulate in your country of residence to apply for an F-1 visa: http://travel.state.gov.
7. Attend your visa interview. The consular officer determines your eligibility for issuance of the F-1 visa.
8. Purchase health insurance to cover you during the duration of your stay in the United States before you arrive.
9. Review your International Student Guide on how to maintain your F-1 status and study at Embry-Riddle Aeronautical University Worldwide.
10. Email the F-1 student agreement to the DSO or PDSO at wwintstc@erau.edu.
11. Secure housing and transportation prior to arriving in the United States.
12. Arrive at the U.S. Port of Entry within 30 days of the term start date.

The PDSO serves as point of contact for all international students with the processing of forms and documentation of status required by foreign governments, sponsors, the U.S. Government, and the University. For further information, contact an International Student Counselor in the Admissions Office toll free at (800) 522-6787 Option 2, or by email at wwintstc@erau.edu.

Department of Homeland Security/Student Exchange Visitor Program

This school is authorized under Federal law to enroll nonimmigrant alien students. The following campuses are approved to enroll students who have obtained an F-1 student visa:

Ft. Lauderdale, Florida (http://worldwide.erau.edu/locations/fort-lauderdale)

Houston, Texas (http://worldwide.erau.edu/locations/houston)

Los Angeles, California (http://worldwide.erau.edu/locations/los-angeles)

Miami, Florida (http://worldwide.erau.edu/locations/miami)

San Francisco Bay Area, California (http://worldwide.erau.edu/locations/san-francisco)

Oklahoma City, Oklahoma (http://worldwide.erau.edu/locations/oklahoma-city)

Orlando, Florida (http://worldwide.erau.edu/locations/orlando)

Phoenix-Mesa, Arizona (http://worldwide.erau.edu/locations/phoenix-mesa)

Phoenix-Sky Harbor, Arizona (http://worldwide.erau.edu/locations/phoenix-sky-harbor)

Portland, Oregon (http://worldwide.erau.edu/locations/portland)

San Diego, California (http://worldwide.erau.edu/locations/san-diego)

Seattle, Washington (http://worldwide.erau.edu/locations/seattle)

International Student Services

The Worldwide International Student Services Counselors serve as the central point of contact for issues concerning international students. The counselors provide services that include, but are not limited to, advising students on immigration regulations, as well as financial and personal matters.

The counselors also assist international students with the processing of forms and documentation of status required by foreign governments, sponsors, the U.S. government, and the University.

International students should contact the International Counselors toll free at (800) 522-6787 Option 2, or by email at wwintstc@erau.edu.

For additional information, visit the International Student Services website in ERNIE (https://ernie.erau.edu/Departments/international-student-services-worldwide/Pages/Default.aspx) under Departments > Worldwide > Student Resources.

Computer Requirements and Email

Computer Use

Each student must have access to a computer, and any course offered may require computer-based work. Students are also required to have access to a webcam and a broadband Internet connection to access e-mail, online course materials, library databases, ERAU's Intranet, and the World Wide Web. In many courses, various types of software must be installed as a requirement to complete course work; therefore, students should have administrative rights on the computers they are using for class in order to install these programs. For certain online courses, students will be required to use a webcam to perform identity verification checks throughout the term.

Review the computer requirements (http://trainme.erau.edu/acadtech/Computer-Requirements-for-Worldwide-Courses.pdf) for Worldwide students and faculty.

It is the responsibility of each student to ensure he/she meets all of the technology requirements listed above and in the attached document prior to attending class.

ERAU Student Email Account

ERAU issues both an email and Embry-Riddle Network for Information Exchange (ERNIE) account to provide access to online services when an application for admission has been submitted. These accounts are made available to students via ERNIE at ernie.erau.edu. Please check your ERAU email frequently, as the University will use this account to send official notification on University matters after a student is admitted.

The University does not provide support for forwarding email from the erau.edu domain to an external service provider (e.g. Gmail, Yahoo!, Outlook.com, etc.), however doing so is not explicitly prohibited by policy. Additionally, employees and students should be cognizant of the security implications associated with submitting or forwarding any sensitive messages via a third-party email service provider. The security of those third-party solutions cannot be assessed, as they are not within the University's administrative control. Students may review ERAU's Email Policy at: https://myerauedu.sharepoint.com/teams/APPM/section-7/Pages/7-9-policy.aspx

Your ERAU email account will remain active for up to two years after your last ERAU course. If you have not registered for a course, your system access will be terminated one year from your date of admission or one year from your application date if you have not yet been admitted.

Financial Aid and Services

Embry-Riddle participates in a number of federal, state, and University-administered programs that help students and their families meet educational costs.

Embry-Riddle believes the primary responsibility for financing education lies with the student and the student's family. Therefore, the student should apply for financial aid early, save money, look for ways to reduce costs, and become aware of specific program requirements by reading all financial aid publications. Financial aid awards are meant to supplement what the student and family can contribute toward costs and rarely cover all educational expenses. All financial assistance will be limited to Embry-Riddle's established cost of attendance.

Eligibility and Application

Eligibility Requirements

To be considered eligible to apply for most financial programs students must verify your eligibility (https://worldwide.erau.edu/admissions/financial-aid/apply)):

1. Show you're qualified to obtain a college or career school education by
   - having a high school diploma or a recognized equivalent such as a General Educational Development (GED) certificate;
   - completing a high school education in a homeschool setting approved under state law (or—if state law does not require a homeschooled student to obtain a completion credential—completing a high school education in a homeschool setting that qualifies as an exemption from compulsory attendance requirements under state law);
2. Be a U.S. citizen or eligible noncitizen (https://studentaid.ed.gov/sa/eligibility/non-us-citizens). ***PLEASE NOTE:*** *The citizenship status you report on your Free Application for Federal Student Aid* (https://fafsa.ed.gov) *(FAFSA) must match with the Social Security Administration (SSA). If your citizenship does not match with the Social Security Administration you will be required to update your information with the SSA and/or provide original documentation in person to the Financial Aid Office before Federal Aid can be disbursed.*
3. Be accepted in a degree program (Associate's, Bachelor's, Master's or Doctorate).
4. Be enrolled or accepted for enrollment as at least a half-time student in a degree program.
5. Be making satisfactory academic progress (https://worldwide.erau.edu/admissions/financial-aid/academic-eligibility/standards-academic-progress) toward a degree.
6. Be registered with Selective Service (https://www.sss.gov), if required to do so.
7. Not be in default on a loan or owe a repayment on a previous financial aid award received at any institution.
8. Certify that financial aid be used for educational purposes only.
9. Certify that if the student purposely gives false or misleading information, the student may be fined up to $20,000, sent to prison, or both.
10. If you are incarcerated, have a conviction (https://studentaid.ed.gov/sa/eligibility/criminal-convictions) for a drug offense, or are subject to an involuntary civil commitment after completing a period of incarceration for a sexual offense, your eligibility for federal student aid may be limited.

Additional information is available on the Federal Student Aid website. (https://studentaid.ed.gov/sa/eligibility)

The Application Process

After applying for admission to the University, students are encouraged to complete the Free Application for Federal Student Aid (FAFSA) on the web at www.fafsa.ed.gov (http://www.fafsa.ed.gov). The FAFSA must be completed each year. Students should renew their aid application each year through the Internet at www.fafsa.ed.gov (http://www.fafsa.ed.gov).

Academic Eligibility to Maintain Financial Aid Eligibility

In order to maintain Financial Aid eligibility, you must understand all polices pertaining to Federal Financial Aid. Please review the policies below to have a better understanding of the specific requirements to maintain financial aid eligibility.

Standards of Academic Progress

Federal regulations require Embry-Riddle to define minimum standards of satisfactory academic progress to determine your eligibility for financial aid. Embry-Riddle must set certain quantitative and qualitative standards to ensure you are progressing toward degree completion. If you do not meet the **Standards of Academic Progress**, you will not be able to receive financial aid.

- The qualitative standard is your grade point average (GPA).
- This requirement is explained in detail in the University catalog under the Academic Regulations and Procedures section.
- If you are suspended, dismissed, or not permitted to continue your enrollment, you will not be able to receive financial aid.
- There are two quantitative standards. First, you must successfully complete 67% of the courses you attempt. Grades A, B, C, D, and P are considered successfully completed. Second, the overall time it takes to complete your program is considered.
- You are allowed 150% of the length of your program to complete your degree. The maximum number of credits you could attempt depends on your degree program.
- These maximum credit hours may vary depending on your specific program. If you change degrees or are a transfer student, the maximum credit hours may be extended by the number of credit hours required to complete your degree.
- The Standards of Academic Progress is reviewed once each academic year and are updated at the end of the last term in academic year. For **Worldwide programs** the academic year ends with the last term of a track (see Financial Aid Tracks (https://worldwide.erau.edu/admissions/financial-aid/terms-conditions) for terms associated with Tracks). The April and May Terms are optional terms and are not calculated until the following academic year. If you are failing the Standards of Academic Progress and have questions please contact a Financial Aid Counselor toll free 866-567-7202.

Consequences of Withdrawal

Students who withdraw, receive an "F" for *non-attendance or *non-participation from **all** of their classes are subject to the **Return of Title IV Federal Financial Aid Programs Policy**. Please review the **Return of Title IV Funds Policy** as it contains important information for students who withdraw or *ceases to attend all registered classes with in a term and receive Financial Aid. The Embry-Riddle **Return of Title IV Funds Policy** and **Standards of Academic Progress,** in accordance with federal regulations, will determine the amount of financial aid funds to be returned.

Scholarship funds will be reversed in their entirety for any student that drops/withdrawals/audits a course associated with a Worldwide Scholarship. Any balance created from the reversal will be the student's responsibility.

*If a student ceases to attend ALL registered classes and/or ceases to participate in an academically related activity at any point during their Term of enrollment the faculty will use their discretion to assign an appropriate grade and supporting last date of attendance. For more information please review **Student Services & Academic Affairs** policies and procedures.

Repeated Courses and Financial Aid Eligibility

Federal regulation limits the number of times a student may repeat a course and receive financial aid for that course.

- A student may receive financial aid when repeating a course that was previously failed, regardless of the number of times the course was attempted and failed. Also check your campus catalog for academic policies regarding course repeats.
- A student may receive aid for repeating a previously passed course as long it is the first repeat of the course.
- Once a student has completed any course twice with a passing grade, he/she is no longer eligible to receive aid for that course.
- If a student retakes a course that is not aid eligible, those credits will be excluded when calculating financial aid eligibility.
- Please understand that for federal aid eligibility, a passing grade is D or above. Academic requirements may differ.

Examples:

	1st Attempt	2nd Attempt/ first repeat	3rd Attempt/ second repeat	Is the class eligible for Financial Aid?
Course 1	F	D	Enrolled	Yes
Course 2	C	Enrolled	--	Yes
Course 3	D	C	Enrolled	No
Course 4	D	F	Enrolled	No
Course 5	W	F	Enrolled	Yes

Explanation of the Above Examples:

1. Yes-course is eligible. These credits are included in the financial aid enrollment because the student is allowed to repeat any failed or withdrawn course until a passing grade is received. Once a passing grade is received, financial aid can pay for the course again. If a grade of A, B, C, D, or F is made on the third attempt; the course will not count again in the calculation for financial aid enrollment.

2. Yes-course is eligible. These credits may be counted, even though it was previously passed, because it is the first time the class is being repeated.

3. No-course is not eligible. This course was previously passed and this is the third attempt. Two attempts is the maximum attempts these credits can count towards financial aid eligibility, because the course has been passed.

4. No-course is not eligible. The class credits are no longer considered for financial aid eligibility because it has been previously passed and this is the second time it is being repeated.

5. Yes-course is eligible. This course has never been passed so may still be counted towards financial aid eligible credits.

Financial Assistance: Grants, Loans, Scholarships

The major categories of financial assistance programs include grants, scholarships, and loans. Loans from federal or private lenders must be repaid; the interest rate, however, is usually low and the repayment period is extended. Grants and scholarships do not have to be repaid. Most of these programs are based on the student's financial need. For more information visit the Worldwide Financial Aid Website (https://worldwide.erau.edu/admissions/financial-aid).

A complete description of financial aid assistance and optional financing programs are available to students and their parents. Types of financial assistance are detailed online in the Finance section at http://worldwide.erau.edu/finance/index.html. This includes information about eligibility criteria, application procedures, and deadline dates.

Grants

- Federal Pell Grant
- Florida Resident Access Grant
- Florida Bright Futures Scholarship Program
- Georgia Hope Scholarship, Zell Miller Scholarship and TEG (Tuition Equalization Grant)
- Kentucky Scholarships and Grants
- Ohio National Guard

Loans

- Federal Direct Loans
- Federal Direct Graduate Plus Loans
- Federal Parent Loan for Undergraduate Students
- Private Educational Loans

Scholarships

Embry-Riddle donor scholarships (https://worldwide.erau.edu/admissions/financial-aid/scholarships/institutional) are funds that are generously donated to help students pay for their education. If you are selected for a scholarship it will be paid in the Fall and Spring semesters of the following academic year. Completing the application does not guarantee that you will receive a scholarship and you must reapply for these awards each year.

The scholarship award amounts vary, ranging from $500 to $5,000, and scholarship criteria also vary. Some scholarships are specific whereas others are more general although most scholarships require a FAFSA application (http://worldwide.erau.edu/finance/financial-aid/applying-for-aid). Completing a FAFSA application does not require you to use Federal aid.

Embry-Riddle Worldwide students are eligible for University Institutional Scholarship Opportunities (https://worldwide.erau.edu/admissions/financial-aid/scholarships/worldwide-opportunities). Students can apply during the months of January and August each year. The application will open in January and will remain open through 5 p.m. EST on August 31. Recipients are chosen by the Worldwide Scholarship Committee during the months of August and September and notifications will be sent via ERAU email by the end of September for the academic year.

Embry-Riddle Worldwide recognizes the investment students and their families make when choosing a private college so providing financial assistance to aid students who have demonstrated academic achievement is important. By offering scholarship opportunities ERAU Worldwide would like to alleviate some of that burden. Students must be admitted into a degree-seeking program of study to receive any Worldwide scholarship opportunities (https://worldwide.erau.edu/admissions/financial-aid/scholarships/worldwide-opportunities).

- Project Management
- External Scholarship Opportunities - not sponsored by Embry-Riddle.

Payments

Payments

Payment for tuition charges are expected no later than 7 days prior to the first day of the respective term. Payment or payment arrangements must

be made no later than first day of the term, which can be accepted in the following manner:

- Electronic Check/ACH debit
- Credit Card: MasterCard, Visa, Discover, and American Express
- Third-party Sponsorship
- Payment Plan
- A combination of any of the above payment methods is also acceptable

Third-Party Sponsorship

Students who have a third-party sponsor paying all or a portion of their University tuition charges must provide their campus or advisor sufficient proof of sponsorship prior to the first day of the respective term. Proof of sponsorship may include a military TA, VA documentation, or employer sponsorship documentation. Any portion not covered by a sponsor must also be paid in full by the student prior to the start of the term. All third-party invoices have a net 30 due date.

In the event a third-party sponsor denies payment or has not paid by the end of the term, the tuition balance becomes the responsibility of the student.

Payment Plan

Students who are requesting to defer payment have the option of signing up for a Tuition Payment Plan.

The plan offered requires a $20 set-up fee and one-third of the term's tuition at the time of enrollment. In 30 days, the next one-third payment will be automatically debited via the pay method the student chose at the time of enrollment. The final one-third payment will be automatically debited 30 days later.

Students may enroll in one payment plan at a time. In the event of a late payment, a fee of $25 will be assessed to the student account. Repeated occurrences of late payments will result in the revocation of the use of a payment plan for one year.

The Payment Plan agreement can be accessed online by logging into ERNIE (http://ernie.erau.edu); click on Campus Solutions (under tools) then Student Services tab and choosing Student Center. Once on the student home page, scroll down to Finances and select My Student Account.

The payment plan is intended for the deferment of the cost of tuition only. Payment for the cost of books, course materials, and shipping fees may not be deferred.

Delinquent Accounts

When a student's account is delinquent, registration for any subsequent semesters will be denied. A delinquent student account will result in suspension of all academic procession, and information on class performance, grades, and transcripts will be withheld.

If the delinquent status is not resolved, the University may place the account with a commercial collection agency for further collection and/or litigation action. The student is also subject to the costs of collection, which may be based on a percentage at a maximum of 33.3% of the debt, and all costs and expenses, including reasonable attorney's fees, we incur in such collection efforts.

Delinquent accounts may be reported to one or all three major credit bureaus.

Tuition and Fees

Payment in full or payment arrangements are required on or before the session start date of each month.

Cost and Tuition

Detailed tuition rates are published on the web at https://worldwide.erau.edu/admissions/cost-tuition/.

User Fees

Application Fee (nonrefundable)	$50
Late Registration Fee	$25
Transcript Fee (includes service charge)**	$15
Graduation Fee (nonrefundable)	$100
Duplicate Diploma	$60
Previously Earned Diploma	$60
Credit Card/Online Debit Card Transaction Fee	2.85% of Transaction

**Credit card/online debit card transaction fee does not apply to transcript orders.

University Withdrawal/Refund Schedule

First week	100%*
After first week	0%*

* Unless specified by Memorandum Of Understanding (MOU), contract, or state regulations.

Students who withdraw from a course when the effective date of the withdrawal does not fall under a refund period are responsible for their tuition. Request for refunds due to circumstances clearly beyond the student's control, such as illness, required military service, etc., must be in writing and accompanied by appropriate documentation, such as a physician's statement, military orders, etc.

For nonmilitary students enrolled in Alaska, California, Indiana, Kentucky, Maryland, North Dakota, Oregon, and Tennessee, refund tables are available at local Worldwide locations or on the State Authorization and Compliance site (http://worldwide.erau.edu/locations/state-authorization).

PhD in Aviation Cancellation and Refund Policy

PhD in Aviation Cancellation and Refund Policy	
First Week	100%*
Second Week	75%*
Third Week	50%*
Fourth Week	25%*
After Fourth Week	0%*

* Unless specified by Memorandum of Understanding (MOU), contract, or state regulations.

PhD in Aviation course terms are offered three times per year and are 12-weeks in length.

Arizona Students Cancellation and Refund Policy

An applicant rejected by the school is entitled to a refund of all monies paid.

An applicant who provides written notice of cancellation within three days (excluding Saturday, Sunday, and federal and state holidays) of signing an enrollment agreement is entitled to a refund of all monies paid. No later than 30 days after receiving the notice of cancellation, the school shall provide the 100% refund.

An applicant requesting cancellation more than three days after signing an enrollment agreement and making an initial payment, but prior to entering the school, is entitled to a refund of all monies paid (minus an administrative or registration fee, not to exceed $200, if applicable).

Nevada Students Cancellation and Refund Policy

2017/2018 Catalog Addendum, effective date July 1, 2017.

The minimum refund that shall be paid to a Nevada student who withdraws or is terminated after completing only a portion of a course, program, or term within the applicable billing period is a follows:

1. Each postsecondary educational institution shall have a policy for refunds which at least provides:

(a) That if the institution has substantially failed to furnish the training program agreed upon in the enrollment agreement, the institution shall refund to a student all the money the student has paid.

(b) That if a student cancels his or her enrollment before the start of the training program, the institution shall refund to the student all the money the student has paid, minus 10 percent of the tuition agreed upon in the enrollment agreement or $150, whichever is less, and that if the institution is accredited by a regional accrediting agency recognized by the United States Department of Education, the institution may also retain any amount paid as a nonrefundable deposit to secure a position in the program upon acceptance so long as the institution clearly disclosed to the applicant that the deposit was nonrefundable before the deposit was paid.

(c) That if a student withdraws or is expelled by the institution after the start of the training program and before the completion of more than 60 percent of the program, the institution shall refund to the student a pro rata amount of the tuition agreed upon in the enrollment agreement, minus 10 percent of the tuition agreed upon in the enrollment agreement or $150, whichever is less.

(d) That if a student withdraws or is expelled by the institution after completion of more than 60 percent of the training program, the institution is not required to refund the student any money and may charge the student the entire cost of the tuition agreed upon in the enrollment agreement.

2. If a refund is owed pursuant to subsection 1, the institution shall pay the refund to the person or entity who paid the tuition within 15 calendar days after the:

(a) Date of cancellation by a student of his or her enrollment;

(b) Date of termination by the institution of the enrollment of a student;

(c) Last day of an authorized leave of absence if a student fails to return after the period of authorized absence; or

(d) Last day of attendance of a student, whichever is applicable.

3. Books, educational supplies or equipment for individual use are not included in the policy for refund required by subsection 1, and a separate refund must be paid by the institution to the student if those items were not used by the student. Disputes must be resolved by the Administrator for refunds required by this subsection on a case-by-case basis.

4. For the purposes of this section:

(a) The period of a student's attendance must be measured from the first day of instruction as set forth in the enrollment agreement through the student's last day of actual attendance, regardless of absences.

(b) The period of time for a training program is the period set forth in the enrollment agreement.

(c) Tuition must be calculated using the tuition and fees set forth in the enrollment agreement and does not include books, educational supplies or equipment that is listed separately from the tuition and fees.

Oklahoma Students Cancellation and Refund Policy

If a student receiving Veterans Administration (VA) funds withdraws from a course, a debt between the student and VA may be created as a result. VA funds remaining in the student's account after a drop, late drop or withdrawal will be returned to the VA. Any credit created by a student payment, Title IV funds, or non-tuition specific scholarship after the VA portion of the student's tuition has been deferred will be refunded to the student after the drop period.

Department of Education Withdrawal/Refunds Policy

Standards of Academic Progress for Federal Financial Aid

Federal regulations require ERAU to define minimum standards of satisfactory academic progress (SAP) to determine your eligibility for financial aid. ERAU must set certain standards to ensure you are progressing toward degree completion. If you do not meet the standards, you will not be able to receive financial aid.

How is SAP measured?
The following measurements will be reviewed to determine good standing for continued financial aid eligibility:
Qualitative: College level grade point (Cumulative GPA)
Quantitative (Pace): College credits completed and time frame needed to complete the degree

What are the standard requirements?
Qualitative:
- Undergraduate students: Minimum cumulative GPA of 2.0
- Graduate students: Minimum cumulative GPA of 3.0

Quantitative /Pace:
- College credits hours completed: required to complete 67% of total credit hours attempted.

How to calculate PACE
Cumulative number of credit hours student successfully completed
Cumulative number of credit hours student attempted

Application of Grades and Credit Hours
Credit hours attempted are all course credit hours for which you are enrolled as of the end of add/drop period.
For calculating credit hours, grades of "F" (failure), "I" (incomplete), "IP" (in progress), "W" (withdrawn), "WP" (withdrawn passing), "WF" (withdrawn failing), "U" (unsatisfactory), AU (audited), FX (ceased attendance) and repeated courses, are counted as hours attempted but not as credit hours completed.

For example, a sophomore that has attempted 60 credit hours and has satisfactorily completed 48 of those credit hours would have completed 80% of attempted credits hours.

- Time frame needed to complete the degree: You are not allowed to attempt more than 1.5 times, or 150%, of the number of hours in your degree program of study.

A sample of the maximum allowable attempted hours is noted below:

No. Credit Hours in Degree Program		150% of Degree Program Credit Hours		Maximum Allowable Attempted
120	x	1.5 (150%)	=	180 hours
129	x	1.5 (150%)	=	194 hours

These maximum credit hours may vary depending on your specific program.

Repeat Courses
For courses repeated during your program of study, both the original and repeated credit hour will be counted as attempted hours in rate of progress calculations.

Transfer Credit Hours/Change of Degree Program
Transfer credits that are accepted toward your educational program count as both attempted and completed credits.

Withdrawing from courses

Withdrawing from courses may impact your financial aid awards. Before withdrawing from class, you should contact the Financial Aid Office to determine the consequences.

Withdrawing from the university or dropping all courses in a term

Students who totally withdraw or drop all courses in a term, and receive aid may owe the university money. Before withdrawing from the university, you should contact the Financial Aid Office to determine the consequences

When are these standards reviewed?

The standards are reviewed once each academic year at the end of the spring semester. Email notifications will be sent to your ERAU email account, if you fail to meet the SAP standards.

What happens if I'm not meeting the standards?

Financial Aid Suspension

Students who fail to meet satisfactory academic progress are placed on financial aid suspension. You will not receive federal or institutional aid during this suspension.

Can I appeal my suspension?

You have the option to appeal the suspension. An appeal must be based on extenuating circumstances that seriously affected academic performance such as student or parent injury or illness, death of a relative or other special circumstances.

The Appeal Process

Contact the Financial Aid Office to begin processing an appeal. We will supply you with the appeal form and required steps. You will need to explain what type of circumstances contributed to the academic problem and what plans you have to eliminate those problems in the future. We realize that sharing personal information can be difficult. Be assured that your statement will remain confidential. An academic plan approved by an academic advisor may be required.

Financial Aid Probation

For students who are successful in their appeal, aid will be reinstated; however, placed on probation for one payment period/term. At the conclusion of the probation term, you must be meeting the school's SAP standard in order to qualify for further Federal Title IV Funding. If you are academically suspended, dismissed, or not permitted to continue your enrollment, you will not be eligible to receive financial aid.

Reinstatement

You may reestablish your eligibility for financial assistance by achieving the satisfactory academic progress standards. Keep in mind this will be **at your own expense as you are ineligible for aid**. Once you have earned the required grade point average or completed the required credit hours, **you must contact your Financial Aid Counselor at your Campus to request the reinstatement of your financial aid eligibility.**

Please note: For Worldwide Programs (https://worldwide.erau.edu) the academic year ends with the last term of a track (see Financial Aid Tracks (https://worldwide.erau.edu/admissions/financial-aid/terms-conditions) for terms associated with Tracks). The April and May Terms are optional terms and are not calculated until the following academic year. If you are failing the Standards of Academic Progress and have questions please contact a Worldwide Financial Aid Counselor toll free 866-567-7202.

Do these standards apply to every financial aid program?

These standards are related directly to the Federal Financial Aid programs. However, state, institutional and private sources of aid have other standards that must be considered. Refer to your state web sites to review the specific criteria for each program. Contact the Financial Aid staff to determine the specific requirements of each type of aid that you receive.

Return of Federal Financial Aid Funds

Students who withdraw, receive an "F" for *non-attendance or *non-participation from all of their classes are subject to the Return of Title IV Federal Financial Aid Programs Policy.

*If a student ceases to attend ALL registered classes and/or ceases to participate in an academically related activity at any point during their Semester or Term of enrollment the faculty will use their discretion to assign an appropriate grade and supporting last date of attendance. For more information, please review your campus catalog for grading and academic policies.

How does ERAU determine the Return of Title IV Funds amount?

Students earn a percentage of their federal financial aid each day they are enrolled. When a student withdraws from all their courses or ceases attendance or non-participation in all courses in a semester/term, this percentage is calculated by the number of days attended divided by the number of days in the semester/term.

The amount of federal aid you received and your institutional charges will also be used to determine the amount of federal funds to be returned.

Students withdrawing beyond 60% of the semester/term will have 100% of Title IV programs funds earned.

Who is responsible for the Return of Funds?

Both the university and/or the student could be responsible for the return of funds. The financial responsibility is determined as part of the Return of Title IV funds calculations. If the university is responsible, the funds are returned to the appropriate program.

If the student is responsible, direct loans are returned according to the promissory note. If any portion of the return of funds is due to a grant program, the university will return the funds, on behalf of the student. In some cases, the student may have a balance owed to the university.

How will the money be returned?

The money will first be returned to the loan and/or grant programs that you received during the semester. ERAU must follow a specific order in returning the money. The order is:

1. Federal Unsubsidized Direct/Stafford Loan
2. Federal Subsidized Direct/Stafford Loan
3. Federal Parent PLUS Loan for Undergraduate Students
4. Federal Perkins Loan
5. Federal Pell Grant
6. Federal Supplemental Educational Opportunity Grant (SEOG)
7. Other Federal Programs

Is there anything else I should know if I withdraw from the university?

Yes, if you must withdraw from ERAU, you should contact your campus or online advisor who will guide you through the process.

In addition to the Return of Title IV Funds Policy, the Student Financial Services Department will apply an institutional Refund Policy as defined in the catalog, to determine if you are eligible for a tuition credit. For more information concerning the Institutional Refund Policy, contact the Student Financial Services Department.

***Circumstances may necessitate withdrawal from the University for a semester or term in which you are already registered. Withdrawal from all sites and locations impacts your financial aid differently depending on when the withdrawal is initiated and the type of financial aid you received. However, in all cases, your financial aid must be recalculated.

Student Services & Academic Affairs

Mission Statement

Our mission is to provide comprehensive student services that are coordinated and personalized for financial, academic, and career needs. These resources are geared toward addressing specific academic needs and contribute to the quality of each student's overall University experience. We strive for continuous improvement that extends through a culture of caring with the highest educational practices and professional standards. We are here to serve you.

Academic Advisement

A student's Academic Advisor is responsible for orientation and continued guidance, which includes advising students of University regulations and procedures. These responsibilities include, but are not limited to:

- Discussing academic programs to help students understand what each program offers
- Discussing possible credit transferability for incoming students
- Assessment of required foundational knowledge (skills assessment for Undergraduate degree-seeking students)
- Providing information involving course and program prerequisite requirements
- Support involving enrollment, course materials, financial assistance, and payment requirements
- Discussion of class attendance expectations
- General student support

A student's primary point of contact is the Campus Director at their Worldwide Campus home location (http://worldwide.erau.edu/locations/index.html?address=). For Online students not associated with a Worldwide Campus location, their primary contact is their Online Academic Advisor at the Online Campus (https://worldwide.erau.edu/online-learning/advisors).

Books, Library and Supplies

Textbook Purchase

Students may search for textbook information by term on the Worldwide Master Textbook & Materials List site. This list should be checked first when searching for course materials. Online, EagleVision Home, and classroom books may be purchased through our Worldwide Bookstore (http://www.bkstr.com/erauworldwidestore/home) site operated through Follett Higher Education Group. Please consult your advisor, campus or the Worldwide Bookstore directly at supportb@erau.edu for any course material questions. You may also contact Follett Customer Service for any order related questions at erauworldwide@bkstr.com .

Identification Cards

Applying for a student identification card, known as the EAGLEcard, is done through your ERNIE (http://ernie.erau.edu) login under Student Services (https://webforms.erau.edu/private/eagle-card/eagle-card-application/daytona). These identification cards may be required to use the library facilities of other universities and might be used for student discounts wherever a student identification card is honored.

Hunt Library: Bringing the Library to You

Hunt Library, located on the Daytona Beach Campus, is the library for all Worldwide students, faculty, and staff, regardless of location. The library's mission is to provide information resources and services to students, faculty, and staff in support of the University's commitment to excellence in teaching, learning, and research. Hunt Library's slogan, "Bringing the Library to You" defines our commitment to the Worldwide community.

The library's website is: huntlibrary.erau.edu. Here you can use EAGLEsearch (http://library.erau.edu/find/eaglesearch.html) to explore much of the library's electronic collection and print holdings simultaneously. Researchers may also directly search subject-specific subscription databases (http://guides.erau.edu/databases) (some of which are predominantly full-text). Library resources are in many formats: online journal articles, books and eBooks, government documents, conference proceedings, streaming videos, and more.

Research Help

Hunt Library is the researcher's primary resource provider. Regardless of location, members of Embry-Riddle's Worldwide community may receive librarian assistance, utilize electronic resources and self-help tools, and gain access to large portions of the print collection through an online document delivery system.

The *Ask a Librarian* service can be reached at 800-678-9428 or 386-226-7656, by chat (http://huntlibrary.erau.edu/Assets/huntlibrary/data/chat.html), by texting us at 386-968-8843, or by emailing us at library@erau.edu. Research Librarians will provide detailed advice on research strategies, referrals to relevant reference sources, assistance with literature searches, and help navigating the library's databases. The *Ask a Librarian* service is highly rated and always staffed by professional librarians during posted hours.

An overview of Hunt Library's help features and tutorials is available from: http://huntlibrary.erau.edu/help/.

How to Contact Hunt Library

Phone: 800-678-9428 or 386-226-7656
Email: library@erau.edu
Text: 386-968-8843
Chat (http://huntlibrary.erau.edu/Assets/huntlibrary/data/chat.html)
Website (http://huntlibrary.erau.edu)
Hours (http://huntlibrary.erau.edu/about/hours)

Embry-Riddle Asia Students

Students participating in academic programs offered through Embry-Riddle Asia may be subject to variations in academic program content or University regulations, as appropriate to individual locations.

Please consult the Executive Director, Enrollment & Campus Operations for any specifics regarding ERAU Asia.

Visit the asia.erau.edu site and online catalog (http://catalog.erau.edu/asia) to learn more about the Embry-Riddle Asia Campus.

Student Responsibilities

All Embry-Riddle Aeronautical University students are responsible for knowing and abiding by the academic regulations and procedures required for continued attendance at the University.

Academic regulations and procedures are detailed in University publications. A student who requires clarification of any policy or regulation should seek help from his/her academic advisor at their local campus (local campuses can be found on the Worldwide Locations page (http://worldwide.erau.edu/locations)) or their advisor in the Online Campus (http://worldwide.erau.edu/online-learning/advisors).

University regulations will not be waived because a student is unaware of established policies and procedures. The University reserves the right to change curricula and academic regulations and procedures without notice or obligation.

Registration

Students are responsible for initializing enrollment each term by contacting their home location/campus. For contact information, find your location on the Worldwide Locations (http://worldwide.erau.edu/locations) page.

At all campus locations, students are allowed to register online if they meet the required criteria. Registration must be completed according to instructions published by the Office of Enrollment Management.

Payment in full or payment arrangements are required on or before the session date of each month. Students are not officially enrolled until they complete all phases of registration, including financial requirements.

Enrollment may be restricted by the Campus Director, the Vice Chancellor - Online Education, or the Office of the Registrar for reasons including, but not limited to, students on a conditional admission status, on an academic probationary status, or who have outstanding incompletes or a history of incompletes.

EAGLET Communication Lab

EAGLET (Electronic Access to Grammar, Language, and Essay Tutoring) is an online communication lab for Embry-Riddle students. It provides assistance with writing and presenting via two- to five-minute videos, infographics, and short articles. EAGLET covers all aspects of the writing process, from brainstorming through organizing and drafting, to editing and proofreading. It also contains advice on presentations including content, delivery, and design.

Access EAGLET in ERNIE (https://ernie.erau.edu).

Articulations & Educational Academic Agreements

Articulation and Educational Academic Agreements are two distinct types of cooperative agreements that facilitate the transfer of students from other institutions to Embry-Riddle Aeronautical University.

Articulation Agreements provide for formal evaluation and guaranteed acceptance of courses within specific degree programs from other institutions to ensure that their content and course objectives are equivalent to those at the University. The primary benefits of an Articulation Agreement for the student are guaranteed acceptance of courses completed at the other institution to satisfy specified degree requirements at the University, and locking students into curriculum requirements specified in the catalog at the time of enrollment. As long as the student has completed and signed the Articulation Agreement Enrollment Form, he/she is assured that the courses taken will apply, even though the curriculum may have undergone significant change before the student has transferred to the University (subject to matriculation and continuous enrollment requirements).

Educational Academic Agreements seek to link specific programs for transfer into the University, but without the same level of evaluation and guaranteed, program-specific, credit acceptance under a specific catalog year.

For more information regarding either of these types of curricular agreements, please contact the Worldwide Campus location (http://worldwide.erau.edu/locations/index.html?address=) that you plan to attend. For online students, contact the Vice Chancellor, Online Education.

Credit: Transfer, Military, Time Limits, and Advanced Standing

Unit of Credit

Semester credits are used throughout the University system.

Transferred quarter hours will be converted to semester credit hours on the following basis: A quarter hour equals two-thirds of a semester hour. Converted credit totals are not rounded to the nearest whole credit.

Release of Student Transcripts From Previous Institutions

Student transcripts from previous institutions that were provided for consideration become the property of ERAU. ERAU does not release copies of transcripts from other institutions that are part of a student's education record. A student must contact the originating school for a copy of any transcript.

Transferability of ERAU Credit to Other Institutions

The transferability of credits you earn at Embry-Riddle Aeronautical University is at the complete discretion of the institution to which you may seek to transfer. Acceptance of the degree, diploma, or certificate you earn at Embry-Riddle Aeronautical University is at the complete discretion of the institution to which you may seek to transfer. If the credits or degree, diploma, or certificate that you earn at ERAU are not accepted at the institution to which you seek to transfer, you may be required to repeat some, or all, of your coursework at that institution. For this reason, you should make certain that your attendance at any institution subsequent to ERAU will meet your educational goals. This may include contacting any institution to which you may seek to transfer after attending Embry-Riddle Aeronautical University to determine if your credits or degree, diploma or certificate will transfer.

Veterans Transfer Credit

Prior academic work and courses taken at other institutions by veteran students and/or eligible students receiving Veterans Education Benefits will be evaluated and credit granted as appropriate and reported to the U.S. Department of Veterans Affairs (VA) as required by law.

Transcribing Transfer and Advanced Standing Credit

Students are eligible for an Embry-Riddle transcript showing credit awarded from other sources toward their degree after they have matriculated.

Matriculation occurs when an applicant has been officially accepted for admission, has enrolled in an Embry-Riddle course within one year of the date of admission, and has maintained that enrollment beyond the drop period. If an applicant fails to maintain enrollment beyond the drop period, he/she will need to reapply for admission.

Continuing-student status is maintained through enrollment beyond the drop period in at least one course within a one-year period. If a student fails to maintain enrollment beyond the drop period, he/she will forfeit active-student status, will need to reapply for admission, and the matriculation process will begin again.

Courses previously taken with ERAU will not immediately matriculate a returning student.

Undergraduate Students:

Once admitted to the University as degree candidates, students are expected to complete all work to be applied toward their degrees with the University unless advance written authorization is granted.

After initial matriculation, students may not earn more than a total of 18 semester credit hours, or that equivalent, at other institutions. It is required that the last 30 credits of a bachelor’s degree, or the last 15 credits of an associate degree, be completed in residence with ERAU.

Active-duty undergraduate military students may transfer more than 18 credits after matriculation and can complete academic residency

requirements at any time, to include the last 15 credits of an associate degree and last 30 credits of a bachelor's degree.

When an undergraduate military student with a Servicemembers Opportunity Colleges (SOC) student agreement is unable to take a required course at Embry-Riddle Aeronautical University – Worldwide, they should follow the process as detailed in SOC Degree Network System-4 Handbook (http://supportsystem.livehelpnow.net/resources/23351/soc_dns4_handbook.pdf) and/or the Guaranteed-Transfer Courses tool (https://www.gosoced.org/search-the-network) to find a current course from another DNS member institution that is guaranteed to transfer to Embry-Riddle Worldwide.

If a course from another institution is listed in the transferability table in the current SOC DNS-4 Handbook as transferable for an Embry-Riddle Worldwide course, and which satisfies a degree requirement, then the student does not require prior approval before taking that course.

Students should submit transcripts upon completion of the course for credit application. If a course from another academic institution is not listed in the DNS-4 handbook as having guaranteed transferability, students are advised to take the course at Embry-Riddle Worldwide, if possible. If the course cannot be taken from Embry-Riddle, students should obtain prior approval from Embry-Riddle for a specific course that will satisfy the degree course requirement and transfer to Embry-Riddle Worldwide.

Embry-Riddle Aeronautical University limits academic residency to no more than 25 percent of the degree requirements for all undergraduate degrees for active-duty service members (no more than 30 percent for completely online delivery). Per state regulations, for undergrad degree completion, all Virginia Campus students are required to complete a minimum of 30% coursework at Embry-Riddle Aeronautical University in order to achieve residency.

Academic residency can be completed at any time while active-duty service members are enrolled. Reservists and National Guardsmen on active duty are covered in the same manner.

Students applying prior academic work toward their Embry-Riddle degree program requirements must submit appropriate documentation for such credit as part of the admission process.

Previous academic credit is evaluated on a course-by-course basis. Acceptable transfer work will be recorded on the Embry-Riddle transcript. Embry-Riddle does not accept life-experience credit as transferrable credits towards degree completion.

If courses are not applicable to the student's degree program at Embry-Riddle, they will be considered as electives in excess of minimum degree requirements. The level of credit (upper- or lower-division) is determined by evaluation of the course at Embry-Riddle.

It is the student's responsibility to have official transcripts sent to Embry-Riddle Aeronautical University. Transcripts that have been in the possession of a student are not considered official.

Transfer credit may be granted under the following conditions:

1. Appropriate coursework completed with a grade of A, B, C, pass, satisfactory (or equivalent) will be accepted.
2. Credits earned at institutions listed as degree-granting institutions in the Accredited Institutions of Postsecondary Education (AIPE) as recognized by the Council for Higher Education Accreditation (CHEA) will be considered for transfer credit. Undergraduate academic credit is generally accepted without regard to the date the course was completed. Embry-Riddle has sole discretion in determining which and how many transfer credit hours will be accepted toward degree requirements.

Consideration for transfer credit is available only to degree-seeking students. Certificate-only or non-degree-seeking students are not eligible for transfer credit. The only exception to this policy is for specific established corporate agreements. Transfer credit is not included in GPA/CGPA calculation for any purpose.

Embry-Riddle may, at its discretion, require an evaluation examination for any course submitted for transfer credit if there is doubt concerning the equivalency of the transfer course with a similar course offered at Embry-Riddle.

Embry-Riddle cannot guarantee that courses are transferable unless otherwise established by any contract or memorandum of understanding/agreement currently in effect. Courses are accepted at the discretion of the University.

The transfer student's records (transcripts, etc.) will be evaluated according to the rules and regulations as described in the catalog and in accordance with University policies in effect at the time of the student's admission to a degree program.

After evaluation, the student will be notified that an official evaluation has been completed, which details all applicable transfer credit that has been accepted by the University.

Advanced Standing Credit

Advanced standing credit for prior learning may be awarded for postsecondary education, work and/or training experience, or from programs completed before enrollment at Embry-Riddle. Embry-Riddle does not accept life-experience credit as transferrable credits towards degree completion.

It is the student's responsibility to ensure that all documentation of previous course work, military learning experiences, credit by examination, and all FAA certificates are submitted for evaluation, along with the formal application for admission as a degree-seeking student.

Just as official transcripts are required to transfer credit from one university to another, documentation of prior learning through professional training and experience must be official.

1. Embry-Riddle will accept the minimum scores recommended by the American Council on Education (ACE) on all exams offered by CLEP, DSST/DANTES, and Excelsior College Examinations-ECE (formerly REC or ACT-PEP) for the award of undergraduate academic credit. In addition, the amount of academic credit and the academic level (upper- or lower-level) designation recommended by ACE for a passing score on each of the exams will be accepted by the University. As per University policy, credit earned by examination (including CLEP, DSST/DANTES, etc.) must be completed prior to the time the student reaches the last 30 credits of a bachelor's degree, or the last 15 credits of an associate degree. The number of credits accepted via exam (including CLEP, DSST/DANTES, etc.) is limited by ERAU to 15 credit hours. Active-duty undergraduate military student exceptions are noted below. University issued challenge exams (not including CLEP, DSST/DANTES, etc.) were discontinued at ERAU-Worldwide as of June 30, 2013.
2. Embry-Riddle will generally follow the recommendations of ACE for courses listed in the National Guide to Educational Credit for Training Programs (http://www2.acenet.edu/credit/?fuseaction=browse.main) and the Guide to the Evaluation of Educational Experiences in the Armed Forces (http://www.acenet.edu/news-room/Pages/Military-Guide-Online.aspx).
3. Credit may be granted on the basis of certain FAA licenses with appropriate rating.
4. Advanced placement may be granted, based upon the existence of earned credit at a postsecondary institution that is determined by the University to demonstrate a higher level of competency than a particular English, math, or accounting course requirement. Under the advanced placement ruling, a course may be waived and considered for the purpose of student advisement to be "met"; however, the student must make up the credit deficit. The deficit may be made up in electives unless otherwise specified by the Department Chair. An

advisement report will be maintained in the student information system.

Course Equivalency Exams

As per University policy, exams (including CLEP, DSST/DANTES, etc.) must be completed prior to the time the student reaches the last 30 credits of a bachelor's degree, or the last 15 credits of an associate degree.

Active-duty undergraduate military students may complete national exams (CLEP, DSST/DANTES, etc.) at any time while pursuing their undergraduate degree and are not restricted to applying exam credits within their last 15 credits for associate degrees or 30 credits for bachelor's degrees.

Graduate Students:

Credits earned at institutions listed as degree-granting institutions in the Accredited Institutions of Postsecondary Education (AIPE) as published by the Council for Higher Education Accreditation (CHEA) will be considered.

Credit may be received for certain graduate courses taken as non-degree graduate work or as part of another (completed or incomplete) Embry-Riddle graduate degree program. Only relevant coursework will be applied to an applicant's graduate degree program at Embry-Riddle. Transfer credit is not included in GPA/CGPA calculation for any purpose.

The content of the applicable course or other program will be used to determine the nature of the credit to be applied to the student's degree requirement. The appropriate department chair and program chair will make these determinations.

When transferring from one Embry-Riddle graduate program to another, this credit may include prior work on a Graduate Capstone Project (GCP). The combined total credit applied to an Embry-Riddle graduate degree for most programs is 12 credit hours.

Specifics regarding transferring from a completed Embry-Riddle master's program to the MBAA program are detailed in the Graduate Academic Programs (p. 83) section of the catalog.

Transfer credit will be granted only if the student demonstrates academic performance expected of a graduate student at Embry-Riddle, meaning that the course was completed with a "B" or better (3.0 on a 4.0 system). Credit for academic work used to satisfy the requirements of an ERAU undergraduate degree will not be accepted toward the requirements of a graduate degree, unless in a program designed to facilitate shared credit.

Seven Year Degree Completion Time Limit

Graduate students are expected to complete their ERAU program of study within seven years to assure course and program currency. All requirements for an Embry-Riddle master's degree must be completed within seven years from the date of initial course enrollment following admission to the University regardless of degree change, catalog change, or campus changes. If a student must reapply for admission, the seven years commences from the start date of the first course enrollment after the most recent admission to the University. A student who completes an ERAU master's degree and still maintains continuing student status may add another ERAU graduate degree program. The seven-year degree completion time limit for this student will begin with the start date of the first course enrollment after the add-a-program request date.

Exceptions to this policy are not permitted, other than those considered for military students readmitted under the provisions of the Higher Education Opportunity Act. The seven-year time limit will not be applied to advanced standing credit for academic work at eligible senior military service schools if the service member is on active duty when accepted for admission. The seven-year limit for such applicants commences on the date the service member separates from active military service.

Seven Year Graduate Course Currency

Prior graduate credit earned with ERAU, as well as any transfer credit, is permitted to satisfy program requirements only if courses were completed within the seven-year period immediately preceding the date the most recent application for admission is received at Worldwide Headquarters. Credit awarded on the initial evaluation after admission is generally applied to a new program or catalog curriculum version when students request a change of program/catalog, however, courses over seven years old at the time of the request are generally ineligible to satisfy degree programs requirements.

Validated Advanced Placement (VAP)

Graduate students who believe their knowledge and prior learning experience qualify them for master's level credit for a specific Embry-Riddle graduate course may submit the Petition for Award of Validated Advanced Placement (VAP).

To be eligible for an award of VAP credit, students must be admitted to an ERAU graduate degree completion program and have received the completed evaluation of previous credit. Students may petition for VAP credit only once, and this must be done within one year of the first term of enrollment.

The student must submit a VAP petition form, a detailed comparison of the training to the learning outcomes in the outline of the course(s) in question, and creditable supporting documentation to substantiate the petition, which is then retained by the University in the student's academic file.

ERAU chairpersons will review the petition and make the determination of credit.

There are eligibility maximums established for VAP credit awards. Credits awarded through the VAP process are generally minimal.

Contact the Office of the Registrar at worldwide.registrar@erau.edu or (866) 393-9046 to request additional information regarding the Validated Advanced Placement process.

Courses: Add/Drop, Load, Classification, Withdrawal, GPA

Course Load

Undergraduate Students: Due to compressed term length at the Worldwide Campus, six semester hours constitute the minimum load for full-time student status. Students carrying less than the minimum full-time load are classified as part-time students.

The maximum load for students is 12 hours per term. A student whose cumulative GPA is 3.00 or higher may enroll for an overload of three credit hours with advance approval from the Campus Director or Director of Undergraduate Advising for Worldwide Online students. Requests for overloads in excess of three credits must be approved by the College Dean or designee.

Graduate Students: The maximum course load for graduate students is nine credit hours per term. Three semester credit hours constitute a full-time load for courses of nine weeks or less; six semester credit hours constitute a full-time load in courses of 10-15 weeks. If a student demonstrates exceptional academic performance, a maximum of a one-course overload may be approved by the Campus Director or Director of Graduate Advising for Worldwide Online students.

A student's enrollment may be restricted when deemed in the best interest of the student.

Classification of Undergraduate Students

Students are classified at the end of each term based on the number of credit hours earned in accordance with the following schedule:

Freshman	fewer than 28 hours
Sophomore	28-57 hours
Junior	58-87 hours
Senior	88 hours or more

Repeating a Course

Undergraduate Students: With the exception of flight courses, which may be repeated only once, a student may attempt a course three times, including the initial grade, and repeat grades. Students who fail to successfully complete a course on a third attempt are subject to suspension from the University.

In determining the Cumulative Grade Point Average (CGPA), the grade for a second course attempt replaces the first, and the grade for a third course attempt replaces the second. The grade(s) and credit hours for the third and any approved subsequent attempts will be used in calculating the CGPA.

All course attempts are recorded on the University transcript.

Graduate Students: A graduate student may repeat any University course without limit, subject to the standards for continuing academic eligibility at the graduate level.

All course attempts are included in the computation of the Cumulative Grade Point Average (CGPA), with one exception. Graduate students may petition to repeat one course in which a grade of less than "B" was earned for the purpose of maintaining academic standards. Both grades earned are recorded on the University transcript, but, in this instance, only the replacement grade is included in the calculation of the grade point average.

Additional repeated coursework beyond that approved petition will not be used to revise the student CGPA.

All course attempts are recorded on the University transcript.

Dropping a Course

Students may drop a course with no notation of course enrollment on their transcripts or financial penalty during the drop period only. Due to the compressed term schedules at Worldwide locations, the drop period extends through the first week of each term. Tuition is not refunded after the conclusion of the drop period, unless required by state law or via an approved exception.

A late drop is defined as any drop after the completion of add/drop week and prior to the mid-point of the course, and is reviewed as an exception to policy. Students petitioning for a late drop from a course must provide a written petition along with third-party documentation explaining their extenuating circumstances, such as military assignment, medical emergency, etc. Each petition is considered individually; not all petitions are approved, nor all waivers granted.

Students are not permitted to drop a course while an academic integrity violation is pending.

Withdrawal from a Course (W) / Failure to Withdraw from a Course (FX)

The authorized withdrawal period extends to the middle of the term, unless otherwise established by any contract or memorandum of understanding/agreement currently in effect. Students may withdraw and receive a "W" grade up to the middle of the term. Tuition is not refunded for course withdrawals, as they occur after the conclusion of the drop period, unless required by state law or via an approved exception.

A late withdrawal is defined as any withdrawal after the mid-point of a course, and is reviewed as an exception to policy. Students petitioning for a late drop or withdrawal from a course must provide a written petition along with third-party documentation explaining their extenuating circumstances, such as military assignment, medical emergency, etc. Each petition is considered individually; not all petitions are approved, nor all waivers granted.

If a student fails to complete the formal withdrawal process during the allowed withdrawal period (after add/drop week concludes up to the course mid-point), a grade of "F" will be assigned for the course.

Students who do not participate in a course, but do not drop or withdraw from the course will be issued a grade of "FX" by their instructor, which designates failure due to non-attendance. Students who initially participate in a course, but who then cease to participate and do not withdraw from the course will be issued a grade of "FX" by their instructor, which designates failure due to non-attendance. Students are charged for courses in which they earn an "FX" grade, as they have not fulfilled their obligation to either complete the course, or complete the necessary steps to drop/withdraw from the course. "FX" grades are noted on the official transcript as "F" grades.

Students are not permitted to withdraw from a course while an academic integrity violation is pending.

Late Drop/Late Withdrawal Requests for Active Duty Military Students

Personnel covered under this section of the catalog are uniformed members of the U.S. Armed Forces who do not exercise a military withdrawal option through their military service, who are registered or enrolled in a class at Embry-Riddle Worldwide, and who must drop or withdraw from a class for reasons related to their military service.

Drop or withdrawal requests will be reviewed and if approved, will be processed based on the type of request and the information submitted.

The student submits the request for a late drop or late withdrawal **within 30 days of receiving notification of the deployment or the start of service related travel** which prevents continued enrollment in courses.

All requests will be reviewed on a case by case basis.

Auditing a Course (AU)

Academic credit is not granted toward degree requirements for audited courses.

Students may change their registration from audit to credit during the "add" period only. They may change from credit to audit until the last day of the withdrawal period.

When a student auditing a course fails to maintain satisfactory attendance, as determined by the instructor, a grade of "W" will be assigned.

All audited courses are added to courses taken for credit in determining the student's course load for a term.

Incomplete Grades (I)

Students who are unable to complete course requirements due to extenuating circumstances may complete and submit a written request to their instructor for an incomplete grade. An incomplete grade must be completed no later than 30 days after the end of the term in which the course was taken. An incomplete grade does not extend the end date of a course. A student working to complete an incomplete grade is not granted continuing enrollment status for the period of time given to complete the course.

The instructor may require a student to complete the course requirements earlier than 30 days following the end of the term.

If the student fails to complete the course and government tuition assistance (TA) funding was used, the government will determine if the funds expended must be repaid by the student. If Department of Veterans Affairs (VA) funds were used, similar restitution of Veterans Educational Benefits may have to be made to the VA if a course is not completed.

Students not completing their courses within the time limit will receive a failing grade (F) in the course.

Grade Point Averages (GPA, CGPA)

Undergraduate Students: A term grade point average (GPA) and cumulative grade point average (CGPA) are computed for each student after every term.

The GPA is calculated by dividing the number of grade points earned during the term by the number of credit hours attempted in that term. The CGPA is determined by dividing the total number of grade points by the total number of hours attempted at the University.

For undergraduate students, grade points and hours attempted are accrued in courses graded A, B, C, D, F and WF.

Graduate Students: A term grade point average (GPA) and cumulative grade point average (CGPA) are computed for each student after every term.

The GPA is calculated by dividing the number of grade points earned during the term by the number of credit hours attempted in that term. The CGPA is determined by dividing the total number of grade points by the total number of hours attempted at the University.

For graduate students, grade points and hours attempted are accrued in courses graded A, B, C, F, and WF. For graduate students, the following grades are issued by the graduate faculty: A, B, C, F, and Incomplete.

The GPA is computed each semester on the 4-point scale: A = 4.00, B = 3.00, etc. The Graduate Capstone Course is given a letter grade and is calculated into the GPA.

A graduate student must maintain a 3.00 GPA to graduate.

Dean's List, Honor Roll, Warning, Probation, Suspension, and Dismissal

Dean's List and Honor Roll

For Undergraduate Students: Any full-time student who demonstrates academic excellence is recognized by being named to the Dean's List or Honor Roll and is notified in writing by the Office of the Registrar, via ERAU email.

Students who are enrolled at a full-time status and earn a GPA of 3.500-4.00 for a term and maintain a minimum 2.0 cumulative GPA will be named to the Dean's List. Students who are enrolled at a full-time status and earn a GPA of 3.200-3.499 for a term and maintain a minimum 2.0 cumulative GPA will be named to the Honor Roll.

Academic Warning, Probation, Undergraduate Suspension, and Graduate Dismissal

Undergraduate Students:

Warning: A Worldwide Campus student whose cumulative or term GPA falls below 2.0 for a term will be placed on academic warning.

Probation: A student on academic warning whose cumulative or term GPA remains or falls below 2.0 for an additional term will be placed on academic probation.

Suspension: A student on academic probation whose cumulative or term GPA remains or falls below 2.0 for an additional term will be suspended from the University.

When a change of grade or the conversion of the grade "I" changes a student's academic status, the previous academic status of warning, probation, or suspension is removed and does not become part of the student's permanent record.

All ERAU coursework taken at the undergraduate level applies to a student's CGPA, whether applicable to the current degree plan or not.

For students who have been academically suspended from the University, a written petition for readmission detailing the existence of any exceptional mitigating circumstances must accompany the application for readmission and fees. Suspended students are eligible to reapply for admission **after** completing a minimum of 15 semester hours of academic credit with a CGPA of 2.500 on a 4.00 scale or higher from an accredited degree-granting institution. A suspended student who wishes to be readmitted to another ERAU campus should apply for readmission to that campus through its Office of the Registrar or the equivalent office. Unless readmitted to the University, suspended students will not be permitted to take any further courses with the University. Questions regarding undergraduate suspension procedure should be directed to the Office of the Registrar, at worldwide.registrar@erau.edu. Student questions regarding next steps and/or reinstatement after a suspension should be directed to the campus or online advisor.

Undergraduate students returning to the University on conditional-admission status who are placed on warning, probation, or suspension should speak with their academic advisor, who will work with the Office of the Registrar if status adjustments are necessary. A student on conditional-admission status who fails to satisfy the conditions of his/her admission will be suspended.

Undergraduate students on conditional-admission status should refer to the Undergraduate Conditional Admission section (p. 13) of the catalog for further information.

Graduate Students:

Warning: Students with full graduate status whose cumulative or term (GPA) falls below 3.00 are placed on academic warning. Students on academic warning must raise their cumulative grade point average (CGPA) to 3.00 within the next term of graduate work.

Dismissal: Students will be dismissed from their graduate program whenever any of the following conditions occur:

1. Student is on conditional status and fails to satisfy the conditions of his/her admission.
2. Student earns a final grade of less than a "B" in three graduate courses.
3. Student earns a final grade of "F" in any two graduate courses.
4. Student earns a final grade of "F" in any course worth 6 credit hours or more.
5. Student is on academic warning and fails to achieve a 3.00 CGPA after the completion of 12 subsequent credit hours.

All ERAU coursework taken at the graduate level applies to a student's CGPA, whether applicable to the current degree plan or not.

Students may appeal their academic dismissal from the University by submitting a petition in writing detailing the existence of any exceptional mitigating circumstances to the Office of the Registrar within 30 days of receipt of the dismissal notice. A dismissed student who wishes to be readmitted to another ERAU campus should apply for readmission to that campus through its Office of the Registrar or the equivalent office. Unless readmitted to the University, dismissed students will not be permitted to take any further courses with the University. Questions regarding graduate dismissal procedure should be directed to the Office of the Registrar, at worldwide.registrar@erau.edu. Student questions regarding next steps and/or reinstatement after a suspension should be directed to the campus or online advisor.

Graduate students hoping to return to the University on conditional-admission status who are on warning or dismissal should speak with their academic advisor, who will work with the Office of the Registrar if status adjustments are necessary. A student on conditional-admission status who fails to satisfy the conditions of his/her admission may be dismissed.

Graduate students on conditional-admission status should refer to the Graduate Conditional Admission section (p. 14) of the catalog for further information.

Suspension and Dismissal for Cause

The University reserves the right to suspend or dismiss a student at any time and without further reason if the student exhibits the following undesirable conduct:

1. Actions that pose a risk to the health, safety, or property of members of the University community, including, but not limited to, other

students, faculty, staff, administrative officers, or the student himself/herself.

2. Conduct that disrupts the educational process of the University.
3. Any other just cause.

Academic Integrity

Embry-Riddle is committed to maintaining and upholding intellectual integrity.

All students, faculty, and staff have obligations to prevent violations of academic integrity and take corrective action when they occur. The adjudication process will involve imposing sanctions that may include, but are not limited to, a failing grade on the assignment, a failing grade in a course, suspension, or dismissal from the University, upon students who commit the following academic violations:

1. **Plagiarism:** Presenting the ideas, words, or products of another as one's own. Plagiarism includes use of any source to complete academic assignments without proper acknowledgement of the source. Reuse or resubmission of a student's own coursework, if previously used or submitted in another course, is considered self-plagiarism and is also not allowed under University policy.
2. **Cheating:** A broad term that includes, but is not limited to, the following:
   a. Giving or receiving help from unauthorized persons or materials during examinations.
   b. The unauthorized communication of examination questions prior to, during, or following administration of the examination.
   c. Collaboration on examinations or assignments expected to be, or presented as, individual work.
   d. Fraud and deceit that include knowingly furnishing false or misleading information or failing to furnish appropriate information when requested, such as when applying for admission to the University.

Review the ERAU Worldwide Campus Honor Code. (https://ernie.erau.edu/Departments/student-affairs-worldwide/Documents/ERAU-Worldwide-Campus-Honor-Code.pdf)

Transfer or Change in Degree Program

Change of Degree Program

Students may apply to change their degree program if they meet academic qualifications.

When a student elects to change a program or minor, the requirements of the catalog in effect at the time the request was initiated apply. When a student elects to change a specialization/concentration or undergraduate level (AS to BS or BS to AS) within a degree program, the catalog year remains the same.

Students considering such changes should contact the Campus Director at their campus location (campuses can be found on the Worldwide Locations (http://worldwide.erau.edu/locations) page), or for online students, Online Advising (http://worldwide.erau.edu/online-learning/advisors), to determine how they will be affected.

Transfer Between Graduate Degree Programs

Only relevant coursework will be applied to an applicant's graduate degree program at Embry-Riddle. The content of the applicable course or other program will be used to determine the nature of the credit to be applied to the student's degree requirement. The appropriate department chair and program chair will make these determinations.

When transferring from one Embry-Riddle graduate program to another, this credit may include prior work on a Graduate Capstone Project (GCP). The combined total credit applied to an Embry-Riddle graduate degree for most programs is 12 credit hours.

Specifics regarding transferring from a completed Embry-Riddle master's program to the MBAA program are detailed on the Graduate Academic Programs (p. 83) page.

Earning Multiple Degrees and Minors

Two Degrees of the Same Rank

To earn a second baccalaureate degree, students must complete a minimum of 30 non-duplicating, degree applicable credit hours of course work over and above that required for the declared primary degree. At least 60 credit hours must be completed in residence at the University, and at least 20 of the 30 additional credit hours must be courses at the 300-400 level.

To earn a second associate degree, students must complete a minimum of 15 non-duplicating, degree applicable credit hours of course work over and above that required for the primary degree. At least 30 credit hours must be completed in residence.

Students may not simultaneously pursue degrees of different levels (such as a bachelor's and master's) at ERAU Worldwide.

Declaration of a Concurrent Second Undergraduate Degree or Minor

Students must declare their intention to seek an associate's degree concurrently with a bachelor's degree as early as possible, preferably at the time of admission.

Students may declare their intention to seek an associate's degree later in their baccalaureate studies with ERAU, but not after the date on which their application for graduation in the bachelor's degree program is received by the Office of the Registrar.

For university policy regarding earning a second degree at the same academic level, please refer to the catalog section titled: "Two Degrees of the Same Rank".

Students must declare their intention to seek their minor(s) as early as possible, preferably at the time of admission.

Students may declare their intention to seek a minor later in their academic career with ERAU, but not after the date on which their application for graduation is received by the Office of the Registrar.

The student is subject to the requirements of a second degree track or minor as stated in the catalog in effect at the time the request is made. Students must complete each degree or minor with a 2.0 GPA or higher.

Both degree programs will be reflected on the student transcript, and each will generate an individual diploma. A minor is reflected on the student transcript but is not noted on the diploma.

At least six hours in each minor must be completed with ERAU courses. Of the six hours completed at ERAU, three hours must be from an upper-level course.

Students may request a substitution of one course for another in the minor, however; the maximum number of course substitutions allowed in minors is two, regardless of the number of minors pursued.

When a student is pursuing multiple minors and the same course is required in both or all, the course may apply to all, and the student does not have to make up additional hours for the shared course.

Additional Graduate Degrees

A graduate student is allowed to apply up to 12 applicable credit hours from one graduate degree program to meet the requirements of another graduate degree program. In order to pursue a second graduate degree, the student must satisfy all the requirements of the first degree sought.

Specifics regarding transferring from a completed Embry-Riddle master's program to the MBAA program are detailed in the MBAA degree program (p. 83).

Matriculation, Continuous Student Status, Catalog Applicability

Matriculation

Matriculation is the process by which an applicant becomes an Embry-Riddle student. This occurs when an applicant has been officially accepted for admission, has enrolled in an Embry-Riddle course within one year of the date of admission, and has maintained that enrollment beyond the drop period.

If an applicant fails to maintain enrollment beyond the drop period within that year, he/she will need to reapply for admission. Students are eligible for an Embry-Riddle transcript showing credit awarded from other sources toward their degree after they have matriculated.

Continuous Student Status

Continuous student status is maintained through enrollment beyond the drop period in at least one course within a one-year period. If a student fails to maintain enrollment beyond the drop period, he/she will forfeit active-student status, will need to reapply for admission, and the matriculation process will begin again. Courses previously taken with ERAU will not immediately matriculate a returning student.

Students remain in continuous student status unless they:

1. Enroll at another institution without advance written approval. Once admitted to Embry-Riddle as degree candidates, students are expected to complete all work with the University unless advance written authorization is granted. If applicants fail to disclose on their applications for admission that they are currently attending another school, or if they decide to take courses outside of Embry-Riddle after they have applied and been admitted, that credit won't be considered for transfer unless they have obtained prior written authorization from Embry-Riddle.
2. Fail to enroll and maintain enrollment beyond the add/drop period, in at least one course at Embry-Riddle in any one-year period from the end date of last course.
3. Have been suspended or dismissed from the University.
4. Have completed an Embry-Riddle bachelor's, master's, or Ph.D. degree. Students who pursue an additional degree of the same rank (undergraduate/graduate) may be permitted to do so without reapplying.
5. Are graduate students who do not complete the degree requirements of a graduate program within seven years from the date of initial course enrollment or seven years from the start date of first course enrollment after readmission.

Students failing to maintain continuous enrollment for any reason are required to reapply for admission under the catalog in effect at the time of their readmission. An exception to this policy may apply to active duty servicemembers. These exceptions will be considered on a case-by-case basis.

Continuous Student Status For Active Duty Military Students

Active-duty military students must maintain continuous student status as detailed above; however, active duty undergraduate military students may also maintain continuous student status by submitting National Exam results, or transcripts within a one-year period showing that the student has done one of the following to maintain continuous student status:

1. Enrolled in a course at a Degree Network System-4 member school that can be applied toward degree completion
2. Passed a nationally recognized exam (ie. CLEP, DSST/DANTES) that can be applied toward degree completion
3. Completed any non-traditional education (military course or updated occupational skill as listed on the service transcript and reviewed by the American Council on Education) that can be applied toward degree completion
4. Completed a course at another institution to be used toward an ERAU degree after receiving prior written approval

*Active duty military students may complete a waiver to establish continuous student status.

Catalog Applicability

The academic provisions of the catalog in effect at the time of a student's initial academic evaluation remain applicable as long as the student remains in the original degree program, major, or area of concentration and maintains continuous enrollment status. Revisions to university policies, rules, and regulations are in immediate effect for all students with the publication or revision of each new catalog.

Students enrolled through an active-duty military degree completion program or Servicemembers Opportunity Colleges are under the catalog upon which the applicant's evaluation and letter of acceptance were based.

If a student does not maintain continuous enrollment at the University, the student must apply for readmission. The provisions of the catalog in effect at the time of readmission then become applicable to the student.

Course prerequisites are catalog-year specific from the implementation date forward.

Curricular requirements stated in the applicable catalog will not be affected by subsequently published addenda to that catalog or by later catalogs unless the student elects to graduate under the provisions of a later catalog. Students electing to graduate under the provisions of a later catalog must meet all requirements (admission, transfer, graduation, etc.) contained in that catalog.

Transcript Requests

Embry-Riddle transcripts are provided through the Credentials Solutions TranscriptsPlus® service.

- Current students may request an official transcript via the ERAU Online Student Services Portal at ERNIE (http://catalog.erau.eduHTTP://ernie.erau.edu). To access portal services, a student will need a current username and password. As logging into ERNIE satisfies federal requirements for establishing identity, students may then complete the Credentials Solutions TranscriptsPlus® online request form; there is no need to submit an additional signed request. Unofficial transcripts are available to current students only and may be obtained directly through ERNIE at no cost.
- Prior students and alumni may request an official transcript by visiting the Credentials Solutions TranscriptsPlus® website (https://www.credentials-inc.com/CGI-BIN/DVCGITP.pgm?ALUMTRO666089) and completing the consent form that will allow its release. The consent form must be completed only the first time the service is used; it will be maintained by TranscriptsPlus® for future requests. Unofficial transcripts are not available to prior students and alumni who no longer have a current username and password for ERNIE.

Transcripts are available for delivery either in traditional paper form or electronically. The format must be selected by the student during the ordering process.

Transcripts issued by the University will reflect the academic record of the student in its entirety, including all undergraduate and graduate coursework. Student may not select, or suppress, specific terms of attendance or levels of study from their record when ordering transcripts.

There is a fee for either official paper or electronic transcripts. The fee is the same regardless of the format in which the transcript is issued.

The Office of the Registrar does not provide unofficial transcripts. Electronic transcripts may be obtained through the TranscriptsPlus® service only. Transcripts are not available via fax.

Skills Assessments

The purpose of the English and Mathematics Skills Assessments is to ensure that students are initially enrolled in English and Mathematics courses where they can successfully learn required concepts while simultaneously preparing for subsequent courses.

There is no pass or fail on these assessments, only proper placement in the appropriate English or Mathematics course. Additionally, completion of a skills assessment does not guarantee admission to the university. To be admitted, students must meet the full terms of admission which include submitting all required documentation needed to render an official decision.

Students may access pre-assessment refresher tools located in ERNIE on the Worldwide Skills Assessments (https://ernie.erau.edu/Departments/worldwide-skills-assessment/Pages/Default.aspx) site.

ERAU Worldwide English and Mathematics Skills Assessment policies are as follows:

All undergraduate students seeking to register for Worldwide courses starting with any of the following prefixes will need to complete the indicated skills assessment prior to registering for those courses. Skills Assessment exams may be taken one time only; there will be no opportunity to retake an examination after the first time it is completed and scored.

- ENGL courses require the English Skills Assessment.
- ENGR and ESCI courses require both the English Skills Assessment and the Mathematics Skills Assessment.
- PHYS 150/160/250/253 (Engineering Physics) and MATH and STAT courses require the Mathematics Skills Assessment.

English

After completing the English Skills Assessment, the course(s) for which a student should register will be displayed in their Campus Solutions Student Center To-Do list.

1. For students who do not possess transfer credit equivalent to ENGL 106 or more advanced ENGL courses, the following placement criteria apply:
   a. Students who score 70% or above on the Skills Assessment may enroll in ENGL 123.
   b. Students who score at least 50% but less than 70% on the Skills Assessment must take ENGL 106.
   c. Students who score less than 50% on the Skills Assessment must take both GNED 104 and ENGL 106.
2. Students who possess transfer credit equivalent to ENGL 106 or above and score less than 70% on the Skills Assessment *should* take ENGL 106. Likewise, students who score less than 50% on the Skills Assessment *should* take both GNED 104 and ENGL 106.
3. ENGL 106 cannot be used to satisfy General Education Communication Theory and Skills requirements.

Mathematics

After completing the Mathematics Skills Assessment, the course(s) for which a student should register will be displayed in their Campus Solutions Student Center To-Do list.

1. Students who do not possess transfer credit equivalent to GNED 103 (p. 31), MATH 106 (p. 31) or more advanced MATH courses are required to complete the recommended courses listed in the Student Center To-Do list.
   a. The Mathematics Skills Assessment consists of four blocks of questions covering algebra and trigonometry. Students will be presented with three of the four based on the proportion of correct responses to the first block.
   b. Course recommendations combine the results of the assessment with the student's degree program listed in Campus Solutions at the time of the assessment.
2. Students who place into GNED 103 (p. 31), MATH 106 (p. 31) or above and yet possess transfer credit equivalent to GNED 103 (p. 31), MATH 106 (p. 31) or above *should* take the recommended course(s) listed in the Student Center To-Do list.
3. MATH 106 (p. 31) cannot be used to satisfy General Education Mathematics requirements.

Privacy of Student Records (FERPA)

The University respects the rights and privacy of students in accordance with the Family Educational Rights and Privacy Act (FERPA). The University may disclose certain items of directory information without the consent of the student, unless the student submits a written non-disclosure request, verified by University personnel or a notary.

Students are required to file requests for non-disclosure with the Office of the Registrar. Non-disclosure requests remain in place permanently, unless the office is notified otherwise. Students may grant online access to select individuals via the student information system; requests to grant online access cannot be processed by the Office of the Registrar.

Directory information consists of:

- Student name
- Permanent or local mailing addresses and telephone numbers*
- ERAU e-mail or box address
- Non-ERAU email addresses or account information*
- Date of birth*
- Major courses of study and areas of specialization
- Dates admitted, attended, and graduated
- Enrollment and class status
- Campus, school, or college attended
- Degrees sought or earned, and dates received or anticipated
- Awards, honors, and special programs or recognitions
- Most recent previous school attended
- For student-athletes and scholarship recipients, the ERAU ID and photograph
- Information from public sources

* Though directory information may be released without student consent, information of this nature is only released for compelling reasons.

The University shall obtain written consent from students before disclosing any personally identifiable information from their education records with the exception of the directory information.

The receipt of a written request to release an education record electronically satisfies this requirement. Such written consent must specify:

1. The records to be released
2. The purpose of the disclosure
3. Identify the party or class of parties to whom disclosure may be made and their address
4. Do not designate a recipient fax number for requests, including academic transcripts; transcripts are not available via fax. If urgency exists, students are advised to request the delivery of an electronic transcript, via Transcripts on Demand (http://iwantmytranscript.com)® (TOD) from Credentials eScrip-Safe (http://iwantmytranscript.com)
5. Must be signed and dated by the student or former student

An institution may release personally identifiable information from a student's educational record without the student's written consent

as required under federal law if the disclosure meets one or more of the conditions as defined under the *Exceptions to Written Consent Requirement (*§99.31).

The law authorizes students and former students the right to inspect and review information contained in their education records.

Students can submit written requests to the Office of the Registrar. Once a request is received, The Office of the Registrar is required to make the records available for inspection and review within 45 days.

FERPA allows disclosure of educational records or components thereof under certain conditions. Students desiring additional information regarding FERPA may review the ERAU Worldwide FERPA Notification in ERNIE (http://ernie.erau.edu) or contact the Registrar's Office.

Grades

Grading System

Undergraduate indicators below are used on grade reports and transcripts.

Letter Grade	Student Performance	Grade Points Per Credit Hour
A	Superior	4
B	Above Average	3
C	Average	2
D	Below Average	1
F	Failure	0
FX	Failure due to non-attendance (notated on official transcript as "F" grade)	0
WF	Withdrawal from the University Failing	0
W	Withdrawal from a course	N/A
AU	Audit	N/A
I	Passing but incomplete	N/A
P	Passing grade (credit)	N/A
S	Satisfactory (noncredit)	N/A
T	Transfer credit	N/A
N	No grade submitted by instructor/No grade required	N/A
X	Credit by means other than course equivalency exam	N/A
XP	Credit by course equivalency exam	N/A

Graduate indicators below are used on grade reports and transcripts.

Letter Grade	Student Performance	Grade Points Per Credit Hour
A	Excellent	4
B	Satisfactory	3
C	Passing	2
F	Failure	0
FX	Failure due to non-attendance (notated on official transcript as "F" grade)	0
WF	Withdrawal from the University Failing	0
W	Withdrawal from a course	N/A
AU	Audit	N/A
I	Passing but incomplete	N/A
N	No grade submitted by instructor/No grade required	N/A
X	Credit by means other than course equivalency exam	N/A
P	Passing grade (credit)	N/A
IP	In Progress	N/A
S	Satisfactory (noncredit)	N/A
T	Transfer credit	N/A

Grades

Final grades are issued at the end of each term. Students can access their grades immediately after they are posted by the faculty, via ERAU Online Services (Log in to ERNIE (http://ernie.erau.edu), click on the Services link in the upper right, click on Campus Solutions in left menu, then Campus Solutions Student Center.)

The University is prohibited by federal law (FERPA) from releasing grade information without the express written authorization of the student. Students may grant online auxiliary access to any designated individuals via the student information system.

Grade Appeals

Students who wish to appeal the final course grade must first communicate with the instructor to discuss and attempt to resolve the issue. The meeting must be arranged as soon as possible after final course grades have been issued.

The grounds for appeal may include suspected mathematical errors in computing the final grade or interpretation of the weighing of course performance elements. Except for the most unusual of circumstances, appeals challenging the academic judgment of the faculty are not acceptable.

If the dispute cannot be resolved within 30 days between the student and instructor, the student may initiate a written appeal to the appropriate college designee. Review and final ruling for unresolved grade appeal cases resides in the office of the Chief Academic Officer (CAO), who will communicate the final decision to the Office of the Registrar.

The campus to which the petitioning student is assigned is notified of final grade appeal rulings at the conclusion of the process, who will advise the student as to next steps.

Graduation

Graduation Requirements

Undergraduate students are required to complete at least 25% of semester credit hours through ERAU instruction to achieve residency. Per state regulations, for undergrad degree completion, all Virginia Campus students are required to complete a minimum of 30% coursework at Embry-Riddle Aeronautical University in order to achieve residency. Students pursuing any undergraduate degree must earn a minimum cumulative grade point average (CGPA) of 2.00 for all courses completed at the undergraduate level at the University. Students seeking the MSSA/AIT certificate of completion must complete program requirements as specified.

Graduate students are required to complete all graduate course work with Embry-Riddle with a maximum of 12 credit hours of transfer work permitted for most programs. Students pursuing any graduate degree must earn a minimum cumulative grade point average (CGPA) of 3.00 for all courses completed at the graduate level at the University.

All students must complete the general graduation requirements as prescribed by the University, as well as all degree requirements specified in the degree program being pursued. Graduation requirements are not subject to petition or waiver.

Students must initiate an application for graduation online by accessing Campus Solutions and selecting "Apply for Graduation" from the drop down area under Academics. A qualified student will not be graduated by ERAU until a graduation application has been received and processed by the University, and the graduation fee has been remitted. Undergraduate students must be within 12 credit hours of program completion before submitting a graduation application; MSSA/AIT certificate of completion

and masters students must be within 6 credit hours of program completion before submitting a graduation application. Graduation applications are canceled after one year if all program requirements are not met. Graduation application fees are non-refundable.

Graduation Honors

Undergraduate Students:

Graduation honors status recognizes degree-seeking students who have demonstrated excellent performance throughout their academic careers. Statuses are only awarded to students who complete bachelor's degree programs. In order to be eligible, the student must have completed at least 45 credit hours in residence at ERAU. The level of graduation honors will be based on the cumulative grade point average for all undergraduate courses taken at Embry-Riddle at the time the degree is conferred. The honors level will appear on the student's diploma and academic transcript with the degree information.

Graduation honors (baccalaureate only) will be awarded in accordance with the following criteria:

Honors Level	CGPA
Summa cum laude	3.900-4.000
Magna cum laude	3.700-3.899
Cum laude	3.500-3.699

Graduate Students:

Graduate students are recognized through inclusion of the notation "With Distinction" on diplomas and transcripts. To be eligible, students must have completed their graduate studies with a CGPA of 4.0, based on grades received in **all** ERAU graduate coursework.

Diplomas

Diplomas are issued upon successful fulfillment of all academic and financial requirements. Diplomas will be mailed to the student at the address specified on the graduation application. Diplomas will not be forwarded if the address is incorrect but will be returned to the Office of the Registrar.

Diplomas are mailed weekly from the Office of the Registrar, and are not distributed at the graduation ceremony.

Graduation Ceremony

Any eligible student may participate in any of Worldwide's global graduation ceremonies held annually in: Daytona Beach and Pensacola, Florida; Germany; Japan; San Diego, California; Seattle, Washington; Dallas, Texas; and, Oahu, Hawaii.

Eligible students may also choose to attend the formal graduation ceremony held at the residential campus in Prescott, AZ. Worldwide students are not permitted to participate in the Daytona Beach residential campus student ceremony.

Undergraduate students must be within 12 credit hours of degree completion to participate. Graduate students must be degree complete to participate. Any applicable honors status will not be awarded or recognized in a program or ceremony unless the candidate is degree complete. Students who petition to participate in a graduation ceremony prior to degree completion are not permitted to wear honor cords/ distinction medallions, regardless of their in-progress GPA. Honor cords/ distinction medallions are awarded to graduation ceremony participants at the time of the ceremony.

The cost of regalia for any Worldwide student who attends a Worldwide graduation ceremony in Daytona Beach, Prescott, or at a recognized regional ceremony is paid through the Worldwide Office of the Registrar. Students are responsible for ordering their regalia via the Project Graduation website, and it is shipped to the campus hosting the ceremony they select. Students who wish to participate in the Prescott ceremony must notify the Worldwide Office of the Registrar of their intent via the graduation application and must work with the Prescott campus bookstore to obtain appropriate graduation regalia. Students may be subject to additional graduation fees for participation in the Prescott ceremony.

The Worldwide student ceremony, held in Daytona Beach, is generally about a week prior to the Daytona Beach residential campus student ceremony. Please consult ERNIE (http://ernie.erau.edu) for graduation ceremony schedules.

Graduation ceremony deadline dates are:

Ceremony	Location	Deadline
Spring	Worldwide @ Daytona Beach	February 28
Spring	Prescott	March 01
Winter	Prescott	November 01

Classroom Rules and Regulations

Classroom Facilities

Classes are held at a variety of locations on military installations and at civilian sites. You should confirm where your class will be held when registering for a course.

Class Attendance

Regular attendance and punctuality are expected in all classes. Worldwide faculty members determine the attendance policy that is appropriate for their individual class, and must share the criteria for attendance/participation with their students. Student physical attendance is required for classroom based face-to-face instruction, EagleVision Classroom, and/or any modality that has a classroom element with specific meeting days and times. Real-time, virtual attendance is required in EagleVision Home courses. Watching playbacks is not considered class attendance. For students taking classes via online or asynchronous modalities, attendance may include criteria such as class participation, postings in discussion threads and responses to classmate postings in discussion threads. Faculty may weigh these elements as they deem appropriate to calculate final grades. Faculty will record the last date of attendance for each student in each class.

- **Academic Calendar** (Holidays that Embry-Riddle Aeronautical University – Worldwide is Closed)

  Christmas Eve/Christmas Day/New Year's
  Martin Luther King Day
  President's Day
  Memorial Day
  Independence Day
  Labor Day
  Veterans Day
  Thanksgiving

Student Class Participation

Students enrolled in any class modality are expected to log in to their courses through the Worldwide Learning Management System (LMS) beginning the first day of the term and frequently throughout the term, up to and including the last day of the term.

On the first day of the term, students are expected to log in to review course materials, including the syllabus, as well as any announcements from the instructors. Instructors may post updates during the term. Posting on discussion threads, responding to other students' posts, and other criteria may be counted for participation in any or all modalities. Logging-in on the last day of the term for review of final assignments, and to review any final changes/announcements from the instructor is also expected. Individual state regulation requires specific campus locations to document student class activity, independent of any attendance criteria determined by course instructional staff. Activity reporting in response to individual state regulations is not considered in grade calculations for any course.

Flexible Classroom Instruction

Class times vary according to local students' needs. At many teaching locations, classes meet once a week in the evenings; however, other scheduling arrangements, such as meeting weekends or twice a week, are not uncommon.

To enhance learning in the regular classroom, some courses are offered through a blend of classroom and online delivery. While the majority of the instruction occurs in the classroom, a portion of the course takes place online through activities such as guided discussion, group projects, and online assignments. Students have expressed high praise for the flexibility, reflection, and interaction that this instruction affords.

Classroom Rules

For classes held on military installations and at most civilian sites, the general rule is no eating, drinking, or tobacco use in the classroom. Please abide by rules posted in the classroom, conveyed by the instructor, or communicated by your local campus staff.

Bringing children or guests to class is not permitted. Specific questions related to service animals on campus can be directed to the Director of Disability Support Services via e-mail, dbdss@erau.edu or phone (386) 226-7916.

Classroom Security

Because classroom security conditions vary from location to location, students should be aware of their surroundings at all times. Please check with your local campus staff for any known security issues in the area. All security or safety issues and/or incidents should be reported immediately to your instructor or the campus location staff. Worldwide Emergency Preparedness Plans are posted in ERNIE (https://ernie.erau.edu). Information pertaining to the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics may be found on the ERAU-Worldwide website (https://erau.edu/administration/consumer-information/worldwide-campus-crime-statistics-reports).

Late Policy

Each instructor is entitled to post and enforce their own late policy.

Student Affairs

The Worldwide Student Affairs Office (https://ernie.erau.edu/Departments/student-affairs-worldwide/Pages/Default.aspx) advocates and provides oversight of student development and services. In addition to the adjudication of non-academic student conduct violations, the Office of Student Affairs also listens to student concerns, clarifies policies and procedures, and strives to resolve student issues.

The Student Affairs Office is comprised of the following student services: Management and oversight of Student Grievances, Career Services, Coop/Internship (COIN) Program, Alpha Sigma Lambda National Honor Society, Disability Support Services, Counseling Support, Ombudsman, Study Abroad, Student Conduct, Students Rights and Responsibilities, Students of Concern, and Title IX Coordinator.

Additional information regarding student affairs can be found on the Worldwide Student Affairs (https://ernie.erau.edu/Departments/student-affairs-worldwide/Pages/Default.aspx) website in ERNIE at http://ernie.erau.edu.

Student Affairs Contact Information:
Email: wwstuaff@erau.edu
Phone: 386-226-4911 or 888-292-5727

- Alumni Services (p. 37)
- Surveys (p. 38)
- Military (p. 38)
- Veteran Student Services (p. 39)

Orientation

Orientation is required for all students that are newly admitted (both non-degree seeking and degree-seeking), returning students who have not previously completed the orientation within one year, and permanent IntraUniversity Transfer (IUT) students **on or after July 17, 2017.**

The Orientation must be completed in advance of a student enrolling in their first course upon admission, readmission, or permanently transferring to the Worldwide Campus. Orientation provides students with exposure to and the opportunity to navigate the Learning Management System (Canvas) used to support courses before they enroll in their first course(s). Students will learn tips for success, expectations, available resources, and points of contact for assistance.

Honor Society, Social Networking, and Study Abroad

Alpha Sigma Lambda National Honor Society

We highly recommend that qualified students apply to become a member of the Alpha Sigma Lambda National Honor Society (ASL) Nu Kappa Chapter. Alpha Sigma Lambda's purpose is to recognize the achievements of adults who accomplish academic excellence while facing the competing interests of home and work. Alpha Sigma Lambda is the premier National Honor Society created exclusively for nontraditional undergraduate students. To learn more about the benefits of Alpha Sigma Lambda, other Honor Societies, and scholarship opportunities, visit the website via ERNIE at ernie.erau.edu and the National Honor Society (https://ernie.erau.edu/Departments/student-affairs-worldwide/national-honor-society/Pages/Default.aspx) website.

Social Networking

The Student Affairs Office provides Worldwide students with the opportunity to enhance their academic learning experiences through development of, exposure to, and participation in social, cultural, and intellectual programs. Students are encouraged to become a member of the Worldwide Campus Facebook Pages, to follow ERAU Worldwide Campus on Twitter (@ERAUWorldwide (https://twitter.com/erauworldwide?lang=en)), and join the ERAU Worldwide Career Services (https://www.linkedin.com/groups/ERAU-Worldwide-Career-Services-5190837?trk=groups_career_discussion-h-dsc&goback=%2Egna_5190837) LinkedIn, which connects students, faculty, and staff.

Study Abroad

Study Abroad is an academic program which embraces and provides the unquestionable benefits of cultural exposure through international travel in today's increasing globalization. Embry-Riddle offers its students a wealth of opportunities to study abroad with unique experiences which enhance their academic, professional, and personal lives. Motivated students in good academic standing who meet the qualification criteria have unique opportunities to take a variety of two to six week summer programs throughout the world. In addition, students may be able to participate in a semester or year-long student exchange program through partner schools that will be directly applicable to their degree programs at Embry-Riddle. Additional information can be found in ERNIE at ernie.erau.edu and the Study Abroad (https://ernie.erau.edu/Departments/student-affairs-worldwide/Pages/Study-Abroad.aspx) website.

Disability Support Services

Embry-Riddle Aeronautical University recognizes its responsibility under the mandates of Section 504 of the Rehabilitation Act of 1973 and Title III of the Americans with Disabilities Act of 1990 to provide equal access to its programs and services for students with a documented disability. To assure nondiscrimination, the University is prepared to make reasonable accommodations to promote students' effective participation in their academic and co-curricular objectives.

Disability support services for Worldwide students are coordinated through the Worldwide Student Affairs Office and needs are addressed on an individual basis. The Student Affairs Office will collaborate with the University Disability Support Services Office to identify resources, examine and clarify academic issues, and develop a strategy to deliver optimum student service. All information is confidential and not for inclusion in the students' University records.

Students interested in learning more about our Disability Support Services are encouraged to visit the Disability Support Services (https://ernie.erau.edu/Departments/student-affairs-worldwide/disability-support-services/Pages/Default.aspx) website via ERNIE at ernie.erau.edu.

In order to register or request accommodations, students should contact the Worldwide Student Affairs (https://ernie.erau.edu/Departments/student-affairs-worldwide/Pages/Default.aspx) office either by telephone (1-888-292-5727) or by e-mail (wwdss@erau.edu).

Student Grievance

Student Grievance

It is the policy of Embry-Riddle Aeronautical University to administer its educational programs both on and off campus in a manner that is fair, equitable, academically sound and in accordance with the appropriate regulations and criteria of its governing board, accrediting association, and federal and state laws and regulations. To this end, Worldwide students are provided an opportunity to express any complaints, grievances, or disputes.

Students are encouraged to first address any issues with the faculty or staff member for which the grievance is based. If unresolved, the student should complete the Grievance (Complaint) form (https://cm.maxient.com/reportingform.php?EmbryRiddleWorldwide&layout_id=2). The Student Affairs Office (https://ernie.erau.edu/Departments/student-affairs-worldwide/Pages/Default.aspx) will review the grievance and ensure that it is forwarded to the appropriate department or college if necessary for their review and action. The department or college will communicate back to the Student Affairs Office their decision, or recommended action.

The Student Affairs Office will communicate with the student and provide further guidance if appropriate.

If a satisfactory resolution cannot be reached through the Institution, please see the State Authorization (https://worldwide.erau.edu/locations/state-authorization) page for your State's specific process for filing a grievance. Students will not be subject to adverse action by the Institution as a result of filing a grievance.

At any time, students may contact the Student Ombudsman (https://ernie.erau.edu/Departments/student-affairs-worldwide/worldwide-student-ombudsman/Pages/Default.aspx) to gain advice and specific direction in seeking a resolution.

Distance Education Student Grievance Process

Out-of-state distance education students participating under the National Council for State Authorization Reciprocity Agreements (NC-SARA) (http://nc-sara.org/), who have completed the internal institutional grievance process and the applicable state grievance process, may appeal non-instructional complaints to the FL#SARA PRDEC Council. For additional information on the complaint process, please visit the FL-SARA Complaint Process page http://www.fldoe.org/sara/complaint-process.stml.

The State of California is not a member of NC-SARA. AS such, residents of this state may not appeal through these means and should consult their home state grievance process.

Student Ombudsman

The Worldwide Student Ombudsman is available to listen to concerns, clarify issues and offer assistance in defining options by referring students to the appropriate services within the Worldwide Campus. The Ombudsman is a confidential source of information and assistance to students concerning university policies and procedures. The Ombudsman may also make recommendations to the appropriate authorities about changes to University policy and procedures.

How the Ombudsman can help you

The Ombudsman provides confidential and informal assistance to the student body and is responsible to:

- Discuss any university-related issue
- Determine what attempts have already been made to resolve the issue
- Listen, clarify issues and offer assistance in defining options
- Define university policies and procedures.
- Refer students to the appropriate student services within the campus such as:
  - Local campus staff
  - Colleges
  - Admissions
  - Financial Aid
  - Veterans' Affairs
  - Student Affairs
  - Career Services
- Define and offer options for resolution; it is the student's responsibility to take action.
- Identify and report trends, while maintaining the confidentiality of individual communications.
- Communication with the Ombudsman is confidential unless permission is granted from the student or the Ombudsman feels there appears to be imminent risk of serious harm to self or others.

When the Ombudsman does not get involved

- When you want legal advice or legal representation. The Ombudsman can advise you of your rights within the University, but will not provide legal advice or represent you in a legal matter.
- When you have a disagreement or problem not related to the University.
- When you want someone to represent you in a University grievance procedure. The Ombudsman will discuss the process and clarify the options available before and after the proceedings.

Additional Information

For additional information regarding the Worldwide Student Ombudsman, and up to date contact information, please visit the Worldwide Student Ombudsman (https://ernie.erau.edu/Departments/student-affairs-worldwide/worldwide-student-ombudsman/Pages/Default.aspx) website in ERNIE.

Student Conduct

If an enrolled or continuing student is found to be responsible for an infraction of any of the following rules or regulations, they will be subject to disciplinary action through the University Judicial System. Any applicant found to violate the Student Code of Conduct during the application process may be denied admission. Any student who leaves the University prior to the disposition of an alleged violation(s) will not be allowed to register for future semesters until the matter has been adjudicated through the normal judicial process. Sanctions imposed will depend on the severity of the violation(s) and/or the student's previous disciplinary record. The following is a list of violations:

Student Code of Conduct

1. **Abusive/Threatening Behavior:** Any conduct that threatens or endangers the health and/or safety of a member of the University community (including oneself) on or off University property; any place that the University conducts business, or at a University sponsored or supervised activity. Behavior including but not limited to threats, intimidation, profanity, discrimination, harassment, coercion, bullying, cyberbullying, blackmail, sexual misconduct, and/or stalking.
   a. **Verbal:** Communications made in person, over the phone, left on voicemail, or other auditory means.
   b. **Physical:** Includes but not limited to assault, battery, fighting, false imprisonment, alcohol poisoning, prohibiting a person from freely entering or departing a room, car, event through physical force or presence or otherwise confining a person and any unwanted physical contact between individuals or attempts of physical threat.
   c. **Written:** Includes but not limited to instant messaging, internet usage, email, cell phone (texting, etc.), social networking sites, letters, signs, chalkboards, whiteboards, discussion boards.
   d. **Retaliation:** Action taken against another member of the community who has been identified as a reporter (complainant), victim or University representative alleging misconduct.
   e. **Implied:** Includes but not limited to gestures, taunting comments, intimidation, or any behaviors that are deemed to create a threatening environment.
   f. **Harrassment:** Willful, intentional or a persistent act that knowingly and maliciously harms or annoys another individual. Bullying, intimidating and stalking may be considered forms of harassment and under Abusive/Threatening Behavior.
   g. **Sexual Misconduct:** Includes but is not limited to, sexual harassment, sexual discrimination, non-consensual sexual contact, nonconsensual sexual intercourse, sexual exploitation, stalking, dating violence, domestic violence, intimate partner violence.
2. **Alcohol/Drugs/Tobacco Use:** Use and/or possession of alcohol, illegal drugs, or tobacco on University owned property with the exception of approved designated areas or events is prohibited. Policies may differ regarding tobacco usage on military installations

and on property that ERAU leases. It is advisable to check directly with those facilities

3. **Computer Use & Security Violations (including attempted violations):** Any misuse of computing facilities, software, hardware; unauthorized use of another individual's computer account; misuse of one's own computer account to include but not limited to giving/ providing passwords to unauthorized persons to access courses, assignments, etc.; or any violation of the policies for using University computers, equipment or computing network resources at ERAU or through the ERAU system.
4. **Criminal Violation:** Violation of any State or Federal Criminal Code while on or off University owned or leased property.
5. **Disorderly Conduct:** Behavior that can be deemed inappropriate for a University setting to include but not limited to excessively loud, lewd, indecent, obscene, disruptive or disrespectful conduct and/or disturbing the peace, or inciting others.
6. **False Information:** Knowingly providing false information or withholding information.
7. **False Representation & Forgery:** Forging, altering, falsifying, destroying, misuse, or unauthorized use of reproduction of a University document, the signature or computer login of university personnel, record or identification; or using Embry-Riddle stationary, business cards, or logo.
8. **Military Installations**: Students taking courses on a U.S. military installation must adhere to the Department of Defense and base regulations and requirements, as applicable, concerning standards of conduct on the installation and access to the base. The university must report all disruptive behavior to the U.S. Government, and students may be barred from access to a military installation.
9. **Theft:** Theft or attempted theft, unauthorized possession, misuse or wrongful appropriation of property, vandalism or malicious destruction, or sale of property not belonging to oneself.
10. **Unauthorized Entry or Use:** Unauthorized entry or attempted entry or use of University facilities and/or equipment, including unauthorized possession, duplication, or use of University keys, access codes, or unauthorized access to information, property, or person.
11. **Vandalism:** Includes but not limited to the misuse, attempted or destruction of University owned or leased equipment, building, or emergency equipment.
12. **Weapons Possession:** The possession of weapons or replicas including but not limited to firearms, BB guns, air guns, knives, swords, machetes, blow darts, spears, compound bows/arrows, Tasers, brass knuckles, sling shots, martial arts devices, dangerous chemicals, incendiary devices or other explosive substances, including fireworks, or any device capable of firing or launching a projectile or other objects classified or used as weapons with potential for danger or harm.**
13. **Other:** Any other just cause, including behavior deemed inappropriate, unethical, or not conducive to the learning environment.

Important Notes

* Because the safety of our students and employees is paramount, all employees and students have an affirmative duty to immediately report to local or military police agencies should a student or other employee exhibit behavior at any University-sponsored activity that is deemed to threaten or endanger the health or safety of others.

** All employees and students have an affirmative duty to immediately report to local or military police agencies the presence of dangerous weapons on any premises owned or controlled by ERAU.

Sanctions

Disciplinary sanctions may be imposed for violations under the Student Code of Conduct. All disciplinary sanctions are noted in the student's non-academic student file and may be kept indefinitely, including those of suspended or dismissed students.

1. **Warning:** A disciplinary warning is a verbal or written notice given to a student whose behavior is in violation of University policy.
2. **Probation:** University Conduct Probation is an intermediate sanction imposed for a specific period. The probationary period allows a student to demonstrate acceptable behavior in order to continue enrollment at Embry-Riddle. Guidelines for a student's behavior may be included as conditions of the probation. If an offense is committed during the probation period, actions may be instituted that result in suspension or dismissal.
3. **Suspension:** Suspension is an involuntary separation of the student from the University for a specific period. Readmission to the University may be granted after the suspension period or after conditions have been satisfactorily met.
4. **Dismissal:** Dismissal is the involuntary and permanent separation of the student from the University.

Criminal Convictions and Violations

Unless specifically exempted from disclosure by law or order of court, students and applicants have an affirmative duty to immediately disclose any criminal convictions or charges against them for violent offenses, offenses against minors, and/or offenses that are punishable as a felony, as well as any drug related convictions, or any arrests.

The presence on campus or on any property where Embry-Riddle Aeronautical University conducts business (to include parking lots associated with doing business at ERAU), of students or applicants who commit serious violations of University rules, regulations, and procedures, or have unacceptable character, academic or behavioral record, criminal record, or other aspects may be inconsistent with the safety and other business and academic interests of the University.

Accordingly, the University may, in the University's sole discretion, deny an applicant admission, temporarily or permanently bar an applicant or student from all or any part of University-owned or University-controlled property (to include parking lots at our WW campuses). The University may also impose reasonable conditions upon any student or applicant who violates University rules, regulations, and procedures, or whose character, academic or behavioral record, or criminal record is determined by the University to pose an unreasonable risk to the interests of the University, its students, employees, or visitors.

No adverse action based on conduct shall under normal circumstances be taken against admitted students until the student has been afforded due process consistent with applicable policies and procedures. Nonetheless, the University reserves the right to take immediate reasonable action to protect the health or safety of people or property.

The applicable rules and regulations may be modified or updated from time to time, and shall be binding as of the date published. Students and applicants are bound by the terms in effect at the time of any event or occurrence. The electronic version of applicable rules, regulations, and procedures shall be the official current version.

Applicants and students should report information directly to Student Affairs at wwstuaff@erau.edu or 1-888-292-5727, and to their home campus location.

Alumni Services

Alumni Engagement

Your Embry-Riddle degree makes you an important member of the global Alumni Network — and membership has its benefits! All alumni benefits are no cost to you. Take advantage of the perks you've earned as a full-fledged Embry-Riddle Eagle!

Network with Us

Embry-Riddle alumni are everywhere! When you graduate, you automatically become a member of the global Alumni Network, which makes you eligible to attend hundreds of **free events around the world**, including behind-the-scenes airport tours, receptions at expos and conferences, networking opportunities and happy-hour socials. Be sure to attend your local Alumni Network events to take advantage of career-building and social opportunities. Find a **local network** near you.

Keep your contact information up-to-date and we'll send you an invitation by email when we're hosting an event near you. Update your information using **this online form,** or email **ERupdate@erau.edu**.

Your university email address will expire two years after graduation. In the meantime, take advantage of your ERNIE account benefits: Lynda courses, Office 365 applications and other ERNIE tools, and use your Embry-Riddle-branded email address to help you land that first job.

Get Social

Between events, catch up with fellow Eagles online in our ***official*** alumni networking groups on **LinkedIn** and **Facebook**. You can also follow the Alumni Network on **Facebook**, **Twitter**, and **Instagram**.

Stay in the Know

Graduates also receive *eagleNEWS*, our free monthly electronic newsletter, and qualify for a free print subscription to ***Lift***, Embry-Riddle's alumni magazine. **Subscribe** to *Lift* today! Be sure to keep your contact information **up-to-date**, so you can receive notices of upcoming events, too. If in doubt, visit the **alumni website** – our alumni news hub.

Career Connection

Looking for a new job? Embry-Riddle's free online job board, **EagleHire**, can connect you to hundreds of possible employers. Our annual **Industry/ Career Expos** are also great opportunities to make your next career move. **CareerShift,** a job hunting resource, is also offered free to alumni.

And when you land our next job, let us know! We love to share career moves, family and marriage updates with your fellow alumni in our **Class Notes.**

Carry the Card

With your **Eagle Alumni Card** you'll receive discounts on Eagle spirit gear at our campus bookstores. You are also eligible for **discounts from our partners** and special rates on **hotels and rental cars**. Plus, with your card, you get unlimited access to campus fitness centers and libraries.

Show Your Eagle Spirit

Our free Embry-Riddle-themed wallpapers and social media banners are exclusively for alumni. **Download** yours today and show your Eagle pride on your mobile device, desktop and your social media pages. And, don't forget to wear your alumni lapel pin, tag @ERAU_Alumni and show us your #ERAUpin on social media.

Come 'Home'

Remember to join your friends at our **Homecoming** events at the Prescott and Daytona Beach campuses, held in October each year. Alumni are encouraged to attend and all homecoming activities, regardless of their campus affiliation.

Next Generation Eagles

The children of Embry-Riddle graduates are automatically eligible to receive **the Alumni Legacy Scholarship** – a $1,500 award that may be renewed annually. Check the "Parents attend ERAU option" on your child's admissions application. You also have the opportunity to help any incoming Embry-Riddle student with an **Alumni Endorsement Grant**. Give the gift of education. Your endorsement is worth $4,000 over a four-year period for first-time Embry-Riddle students. Interested in supporting students – but just don't know how. The **Alumni Endowed Scholarship** is another great way to support the next generation of Eagles.

As you move on in your careers and lives, we invite you to stay involved with your alma mater and remember the acronym **ERAU**:

Engage

Get involved with your local Alumni Network and connect with Eagles in your area.

Represent

Be a positive ambassador for Embry-Riddle in your profession and in your community.

Act

Support future Eagles through a **gift to the university.** Every gift – no matter the size – makes an impact.

Unite

Build a stronger Alumni Network by hiring and mentoring graduates and offering internships for students.

Questions? Visit our **Alumni Engagement offices** at the Daytona Beach and Prescott campuses, or call us toll-free at 800-727-3728.

You may have graduated, but you are *Forever an Eagle*.

Surveys

Student surveys provide essential information in assessing the effectiveness of Embry-Riddle academic programs and services. Four basic types of student surveys are administered to most or all students: end-of-course evaluations, an Alumni Survey, a student satisfaction survey, and participation in national surveys.

The end-of-course evaluations are completed at or near the end of each course, the alumni survey is sent to all graduates approximately one year after graduation, a student satisfaction survey is typically conducted every two years, and periodically the University will participate in national student surveys such as: The National Survey of Student Engagement, the Adult Student Priorities Survey, and the College Senior Survey.

Additionally, some degree programs or departments will survey certain students periodically for the purposes of planning and assessment. The survey information you provide is essential for continuous quality improvement and increased institutional effectiveness.

Military

Servicemembers Opportunity Colleges (SOC)

Servicemembers Opportunity Colleges (SOC) was created in 1972 to provide educational opportunities to servicemembers who, because they frequently moved from place to place, had trouble completing college degrees. SOC functions in cooperation with the Department of Defense, and Active and Reserve Components of the Military Services to expand and improve voluntary postsecondary education opportunities for servicemembers worldwide. Additional SOC information can be found at the SOC website (https://www.gosoced.org).

Degree Network System (DNS)

Embry-Riddle Aeronautical University – Worldwide is a core member of the SOC Degree Network System-4 for bachelor's degrees. The SOC Degree Network System consists of institutions selected by the Military Services to deliver specific bachelor's degree programs to service members and their families.

As a member of the DNS, we have agreed to adhere to academic policies intended to support military students in their academic endeavors toward degree completion.

Additional DNS information can be found at the SOC website (https://www.gosoced.org).

Residency Requirement For SOC Students

Embry-Riddle Aeronautical University – Worldwide limits academic residency to no more than 25 percent of the degree requirements for all undergraduate degrees for active-duty service members (no more than 30 percent for completely online delivery). Per state regulations, for undergrad degree completion, all Virginia Campus students are required to complete a minimum of 30% coursework at Embry-Riddle Aeronautical University in order to achieve residency.

Academic residency can be completed at any time while active-duty service members, Reservists or National Guardsmen on active-duty are enrolled.

Veteran Student Services

Embry-Riddle degree programs are approved by the appropriate State Department of Veterans Affairs (State Approving Agency) for enrollment of persons eligible to receive education benefits from the Department of Veterans Affairs (VA).

Students must be admitted into an approved degree or certificate program to be eligible to receive benefits. Admission procedures for veterans and other eligible persons are the same as those for other students.

The VA will be appropriately notified of the unsatisfactory progress. The student must submit a written request to reinstate education benefits. The request must include proof of academic counseling and the conditions for continued enrollment or re-entrance. The VA will determine eligibility for reinstatement of benefits, based in part on the school's recommendations.

Veterans' progress will be measured according to University standards as published in the catalog, and the rules and regulations of the VA apply. The criteria used to evaluate progress are subject to change. Application and interpretation of the criteria are solely at the discretion of Embry-Riddle. Students using VA Education Benefits to pursue a certificate program who do not maintain a minimum GPA of 2.0 are permitted one probationary term to raise their GPA before VA benefits are terminated.

Students are responsible for notifying the Veterans Certifying Official of any change in their enrollment or change in personal information affecting their eligibility. Students also must remain in compliance with University and Department of Veterans Affairs requirements.

Students may receive education benefits only for courses that are required for their designated degree or certificate program. Students who receive VA benefits are subject to strict academic regulations and should be aware of how auditing courses, repeating a course, changing degree programs or enrollment status, and other actions may affect their eligibility to receive benefits.

Air University Associate-to-Baccalaureate Cooperative (AU-ABC)

Embry-Riddle Aeronautical University, Worldwide has partnered with the Community College of the Air Force (http://www.au.af.mil/au/barnes/ccaf) (http://www.au.af.mil/au/barnes/ccaf)(CCAF) (http://www.au.af.mil/au/barnes/ccaf) to offer active duty Air Force, Air Force Reserve, and Air National Guard members who have completed an AAS degree in specified, approved CCAF degree programs which map to specified, approved ERAU-WW degree programs which are eligible for participation in AU-ABC. Please see our AU-ABC landing page (http://worldwide.erau.edu/admissions/military-students) for more information.

General Education Mobile (GEM)

Embry-Riddle Aeronautical University, Worldwide has partnered with the Community College of the Air Force (CCAF (http://www.au.af.mil/au/barnes/ccaf)) to provide online general education courses for active duty Air Force, Air Force Reserve, and Air National Guard members who want to complete the CCAF Associate in Applied Science (AAS) degree requirements through the General Education Mobile (GEM) Program.

As a GEM partner, we offer online courses to meet all five general education disciplines required in a nine week format to complete CCAF's 15 semester hours of general education — Oral Communication, Written Communication, Mathematics, Social Science, and Humanities. Please see our GEM landing page (http://worldwide.erau.edu/admissions/military-students) for more information.

Complaint Policy for Students Receiving VA Education Benefits

Any complaint against the school should be routed through the VA GI Bill Feedback System by going to the following link: http://www.benefits.va.gov/GIBILL/Feedback.asp. The VA will then follow up through the appropriate channels to investigate the complaint and resolve it satisfactorily.

Contact

For further information concerning approved programs of study and the application process, eligible persons should contact the Worldwide Military & Veteran Student Services Office (http://worldwide.erau.edu/admissions) in Daytona Beach, Florida.

Worldwide Military & Veteran Student Services
Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900
Telephone: 1-855-785-0001
Fax: 386-323-8816
Email: wwva@erau.edu

For additional information concerning Veterans Education Benefits administered by the Department of Veterans Affairs, go to www.gibill.va.gov (http://www.gibill.va.gov).

Career Services and Co-op/Internship (COIN) Program

Career Services

Worldwide Career Services provides Embry-Riddle students and alumni around the globe with access to a network of career resources and limited one-on-one assistance through scheduled phone or Skype appointments. From individualized reviews of resumes submitted through Handshake, the ERAU career services management system, to connecting students and alumni directly to quality employers, the Worldwide Career Services Office (http://worldwide.erau.edu/career-services) offers a wealth of career resources. Students are also highly encouraged to take advantage of co-op/internship (COIN) opportunities to maximize their hiring and salary potential after degree completion. Contact WW Career Services to learn about Handshake (https://erau.joinhandshake.com), CareerShift (http://www.careershift.com/?sc=embry), and GoinGlobal for students interested in U.S. and international career opportunities.

All Embry-Riddle students and alumni (regardless of campus affiliation) are invited to network face-to-face with top industry employers at ERAU Industry/Career Expo events in Daytona Beach, FL; Prescott, AZ; San Diego, CA; Seattle, WA and Fort Walton Beach, FL. Business professional attire is highly recommended. Contact your local ERAU office or Worldwide Career Services for registration at these free career events at wwcarser@erau.edu or visit the ERAU Worldwide Career Services (http://worldwide.erau.edu/career-services) website.

Co-op/Internship (COIN) Program

Embry-Riddle's Cooperative Education (COIN) Program bridges the gap between academic theory learned in the classroom and its practical application in a real-world environment within various industries. Co-op/Internship experiences are only available to degree-seeking students and must be relevant to the student's academic degree program to receive University credit. A student's current employment is not eligible for co-op/internship credit and all degree programs may not be eligible to apply open electives gained from the COIN program. However, if a co-op/internship is assessed and approved by the appropriate College authority to be in alignment with the degree program curriculum and meets the

requirements of a specific course, a course substitution may be possible. All course substitutions must be approved prior to the start of a qualifying Co-op/Internship. Students may also receive University credit in excess of degree requirements if a co-op/internship meets the standards for credit, but is not degree applicable of the acquired knowledge and skill in industry. This program bridges the gap between student life and the work world, combining students' academic and career interests with work experiences in business, industry, and government.

Undergraduate students must be current or active full-time students with a cumulative GPA of 2.5+ and the completion of 30 college credit hours. Transfer students must complete 30 college credit hours, with at least 12 credit hours with Embry-Riddle. Undergraduate students may earn a maximum of 12 semester credit hours toward their degree program through the COIN Program (if applicable), although no more than three (3) consecutive terms of co-op/internship experience will be considered.

Graduate students must be current, active full-time students with a cumulative GPA of 3.0+ and the completion of nine (9) credit hours with Embry-Riddle. Students may receive academic credit for a maximum of three (3) semester credit hours at the graduate level.

*Due to state authorization requirements, co-op/Internships must be conducted in approved states only.

International Students

International students studying on an F1 visa must be enrolled as a full-time student and meet the above requirements plus the following: International students studying on an F1 visa must have the approval of the Principal Designated School Official (PDSO). If approved, the PDSO will update the student's I-20 with the start/end dates of the training experience and the number of hours allowed each week (part or full-time). The I-20 will reflect Curricular Practical Training (CPT). Co-op/internships must be an integral part of the student's field of study and must be completed for academic credit only, not for "experience only" purposes. According to the Student and Exchange Visitor Program (SEVP) "There is no set limit to the amount of time a student may engage in CPT. However, if a student engages in full-time CPT for 12 months or more, the student becomes ineligible for post-completion Optional Practice Training (OPT). Engaging in part-time CPT (20 hours or less) does not affect eligibility for post-completion OPT."

Title IX

Title IX of the Education Amendments of 1972 ("Title IX")

Title IX of the Education Amendments of 1972 ("Title IX") is a Federal civil rights law that prohibits colleges and universities that receive federal funds, from discrimination on the basis of sex. Discrimination under Title IX can include sexual harassment or sexual violence, such as rape, sexual assault, sexual misconduct, sexual battery, sexual coercion, and stalking.

Title IX requires that any school receiving federal funding have a designated Title IX coordinator. Any incidents of sexual violence should be reported to the Title IX coordinator immediately, even if a complaint was initially filed with another individual or office. Title IX requires that a school take prompt and effective steps to reasonably end sexual harassment and sexual violence that creates a hostile environment.

Title IX complaints should be directed to wwtitle9@erau.edu or dammerl@erau.edu or to 386-226-7971.

Degrees and Programs

Associates Degrees

A.S. in Aeronautics (p. 42)
A.S. in Aviation Business Administration (p. 74)
A.S. in Aviation Maintenance (p. 42)
A.S. in Engineering Fundamentals (p. 43)
A.S. in Logistics and Supply Chain Management (p. 74)
A.S. in Technical Management (p. 75)

Bachelor's Degrees

B.S. in Aeronautics (p. 43)
B.S. in Aviation Business Administration (p. 76)
B.S. in Aviation Maintenance (p. 45)
B.S. in Aviation Security (p. 46)
B.S. in Communication (p. 65)
B.S. in Engineering (p. 47)
B.S. in Engineering Technology (p. 48)
B.S. in Emergency Services (p. 66)
B.S. in Homeland Security (p. 67)
B.S. in Interdisciplinary Studies (p. 68)
B.S. in Leadership (p. 77)
B.S. in Logistics and Supply Chain Management (p. 78)
B.S. in Project Management (p. 79)
B.S. in Safety Management (p. 49)
B.S. in Technical Management (p. 79)
B.S. in Unmanned Systems Applications (p. 50)

Master's Degrees

M.S. in Aeronautics (p. 52)
M.S. in Aerospace Engineering (p. 55)
Master of Aviation Maintenance (p. 56)
Master of Entrepreneurship in Technology (p. 56)
Master of Systems Engineering (p. 59)
M.B.A. in Aviation (p. 83)
M.S. in Aviation and Aerospace Sustainability (p. 55)
M.S. in Engineering Management (p. 85)
M.S. in Human Factors (p. 57)
M.S. in Cybersecurity Management and Policy (p. 70)
M.S. in Human Security and Resilience (p. 70)
M.S. in Information Security and Assurance (p. 86)
M.S. in Leadership (p. 86)
M.S. in Logistics and Supply Chain Management (p. 87)
M.S. in Management (p. 88)
M.S. in Management Information Systems (p. 89)
M.S. in Occupational Safety Management (p. 58)
M.S. in Project Management (p. 89)
M.S. in Unmanned and Autonomous Systems Engineering (p. 60)
M.S. in Unmanned Systems (p. 60)

Doctorate Degrees

Ph.D. in Aviation (p. 96)
Ph.D. in Aviation Business Administration (p. 97)

Certificate of Completion

Aviation Cybersecurity Management and Policy (p. 72)
Aviation Maintenance Technology Type 65 (p. 64)
Applied Information Technology (AIT) Certificates (p. 92)
Microsoft Software and Systems Academy (MSSA) Certificates (p. 93)

Partnership Certificate

International Society of Transport Aircraft Trading (ISTAT) (p. 94)

College of Aeronautics

The mission of the College of Aeronautics is to develop and provide graduate and undergraduate academic programs that enable students to excel in the multi-disciplinary field of aerospace; in the aeronautics industry, in the military, and in the local, state and federal government organizations connected to aerospace programs.

The mission also includes assessing program outcomes and using these assessments to update courses and programs.

For Faculty lists and other information view the College of Aeronautics (http://worldwide.erau.edu/degrees-programs/colleges/aeronautics) website.

Certificate of Completion

Aviation Maintenance Technology Part 65 (p. 64)

A.S. in Aeronautics

Take your future to new heights!

Whether you want to break into an aeronautical career, break away from the competition, or advance your current position and earnings potential, the Associate in Science in Aeronautics degree opens the door to new opportunities in the dynamic aviation/aerospace industry.

Aeronautics curriculum is closely mapped to the needs and demands of the aviation/aerospace industry and to general education guidelines.

You'll be exposed to a multidisciplinary program with courses of study in human factors, security, aviation safety, occupational safety and health, air traffic control, aircraft maintenance, and aeronautical science. Within that broad base, electives and minors allow you to tailor your degree to your particular interests and career goals.

Aviation Area of Concentration

The Aviation Area of Concentration is the degree area where credit for prior aviation learning is noted or where students can take courses to learn about aviation. Many students bring in all or part of this credit based on prior aviation training or experience. However, shortages in the minimum credit required can be made up by taking courses in the following aviation-related disciplines: Aeronautical Science, Aviation Maintenance, Aviation History, and aviation/aerospace related coursework in Safety, Security, Transportation, Engineering, and Unmanned Systems.

Sources of prior learning credit include:

1. Transfer credit earned at accredited degree-granting colleges and universities.
2. The recommendations published by the American Council on Education for U.S. Military training and experience, as well as training conducted by other government agencies and private organizations.
3. Prior-learning credit established by the University for certain aviation licenses and ratings as they relate to this degree.

Duplicate Credit

Many Embry-Riddle courses are designed to teach the same skills and knowledge that Aeronautics students have acquired through experience and training. Students who complete courses in the same aviation specialty for which they were granted Aviation Area of Concentration credit would be duplicating coverage of the same subject matter. Credit for completion of such courses will not be applied to degree requirements.

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		
ENGL 123	English Composition	3
Speech/English		6
Humanities		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
WEAX 201	Meteorology I	3
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Aviation Area of Concentration		9

Make up shortages with non-duplicating courses from the following disciplines: Aeronautical Science, Aviation Maintenance, and related aviation/aerospace coursework in Transportation, Safety, Security, History, Engineering, and Unmanned Systems.

Program Support		9
ASCI 202	Introduction to Aeronautical Science	3
ASCI 254	Aviation Legislation	3
STAT 211	Statistics with Aviation Applications	3

Electives

Open Electives (Upper or Lower-Level)	6

Total Degree Requirements	60

A.S. in Aviation Maintenance

Education is the key to getting more out of life — whether you're looking for a higher salary, greater job satisfaction, or a soaring sense of personal pride. If you work in the aircraft maintenance field and are ready for advancement, Embry-Riddle can help. Our Associate in Science in Aviation Maintenance degree lets you build on the skills you already possess, while laying the foundation for greater accomplishments.

If you hold an FAA Airframe & Powerplant Maintenance Certificate, you may be awarded up to 18 credit hours toward the associate degree or up to 30 credit hours toward the bachelor's degree. Students may also earn maintenance credit as part of the overall curriculum.

Plus, you'll gain a solid core of courses in general education, which prepares graduates for success in any industry, not just aviation.

In the aviation industry, the most crucial task is to keep the planes flying safely. That's why people with aircraft maintenance skills and knowledge will continue to be in high demand by aviation and aeronautical employers.

In today's competitive workforce, however, it takes something extra to move up the career ladder. Aviation professionals can get that edge with an Associate in Science in Aviation Maintenance degree from Embry-Riddle Aeronautical University — Worldwide.

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 the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
Physical/Life Science elective		3
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Aviation Maintenance Core Courses		
AMNT 240	General Aeronautics and Applications	3
AMNT 260	Aircraft Electrical Systems Theory	3
AMNT 270	Airframe Structures and Applications	3
AMNT 271	Airframe Systems and Applications	3
AMNT 280	Reciprocating Engine Theory and Applications	3
AMNT 281	Turbine Engine Theory and Applications	3
Total Credits		18

Program Support		
ASCI 202	Introduction to Aeronautical Science	3
STAT 211	Statistics with Aviation Applications	3
Total Credits		6

Total Degree Requirements	60

Associate of Science in Engineering Fundamentals

The Associate of Science in Engineering Fundamentals program is Embry-Riddle Aeronautical University's latest offering for aspiring engineering students who want world-class educational opportunities that meet their needs in new and innovative ways.

Through this program, you can complete your associate's degree online with an opportunity to apply to an Embry-Riddle residential campus in Florida or Arizona to continue your studies and earn your bachelor's degree. Embry-Riddle professors and program development experts carefully researched every aspect of this offering, creating a curriculum that features short nine-week terms which ultimately result in the 65 credit hours necessary to obtain your degree.

DEGREE REQUIREMENTS

General Education

General Education		15
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
SPCH 219	Speech	3
ENGL 221	Technical Report Writing	3
Humanities elective (HUMN 140 Series)		3
Humanities/Social Science elective (lower level)		3

Core/Major

ENGR 101	Introduction to Engineering	3
ENGR 115	Introduction to Computing for Engineers	3
ENGR 120	Graphical Communications	3
ECON 225	Engineering Economics	3
ESCI 201	Statics	3
ESCI 202	Solid Mechanics	3
ESCI 204	Dynamics	3
ESCI 206	Fluid Mechanics	3
MATH 241	Calculus and Analytical Geometry I	4
MATH 242	Calculus and Analytical Geometry II	4
MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
PHYS 150	Physics I for Engineers	3
PHYS 160	Physics II for Engineers	3
PHYS 250	Physics III for Engineers	3
PHYS 253	Physics Laboratory for Engineers	1
Total Hours		50

Total Degree Requirements	65

B.S. in Aeronautics

Take your future to new heights!

Whether you want to launch into an aviation career, break away from the competition, or advance your current position and earnings potential, the Bachelor of Science in Aeronautics (BSA) opens the door to new opportunities in the dynamic aviation/aerospace industry.

Aeronautics curriculum is closely mapped to the needs and demands of the aviation/aerospace industry and to general education guidelines. The BSA is a multidisciplinary program with courses of study in human factors, security, aviation safety, occupational safety and health, air traffic control, aircraft maintenance, and aeronautical science. Within that broad base, electives and minors allow you to tailor your degree to your particular interests and career goals.

It doesn't have to take long, either. You can receive transfer credit, advance standing, and FAA or military ratings and certifications, which may lead to receiving your degree in a shorter time.

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

The Bachelor of Science in Aeronautics is accredited by the Aviation Accreditation Board International (AABI)

Minor Courses of Study

One key and essential element of this degree is the ability to enhance and strengthen your academic program by adding any Minor Course of Study. Students may use courses from a minor and place them into Aviation Area of Concentration, Professional Development Electives and/or Open Electives (all as appropriate). Students are strongly encouraged to add a Minor to their degree.

Available Minors (p. 95)

Aviation Area of Concentration

The Aviation Area of Concentration is the degree area where credit for prior aviation learning is housed or where students can take aeronautical science courses. Many students bring in all or part of this credit based on prior aviation training or experience or add a Minor Course of Study. However, shortages in the minimum credit required can be made up by taking courses in the following aviation-related disciplines: Aeronautical Science, Aviation Maintenance, Aviation History, and aviation/aerospace related coursework in Safety, Security, Transportation, Engineering, and Unmanned Systems.

Sources of prior learning credit include the following:

1. Transfer credit earned at accredited degree-granting colleges and universities.
2. The recommendations published by the American Council on Education for U.S. Military training and experience, as well as training conducted by other government agencies and private organizations.
3. Prior-learning credit established by the University for certain aviation licenses and ratings as they relate to this degree.

Duplicate Credit

Many Embry-Riddle courses are designed to teach the same skills and knowledge that Aeronautics students have acquired through experience and training. Students who complete courses in the same aviation specialty for which they were granted Aviation Area of Concentration credit would be duplicating coverage of the same subject matter. Credit for completion of such courses will not be applied to degree requirements.

B.S. in Aeronautics students who wish to continue on to a master's degree may enroll in the BSA-MSA 4+1 program as outlined in this program.

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 this list, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
WEAX 201	Meteorology I	3
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Hours		36

Core/Major

Aviation Area of Concentration		18
Make up shortages with non-duplicating courses from the following disciplines: Aeronautical Science, Aviation Maintenance, and related aviation/aerospace coursework in Transportation, Safety, Security, History, Engineering, and Unmanned Systems..		
Program Support		24
ASCI 202	Introduction to Aeronautical Science	3
ASCI 254	Aviation Legislation	3
ASCI 404	Applications in Aviation/Aerospace Law	3
STAT 211	Statistics with Aviation Applications	3
MGMT 201	Principles of Management	3
MGMT 210	Financial Accounting	3
MGMT 221	Introduction to Management Information Systems	3
RSCH 202	Introduction to Research Methods	3
Professional Development Core		12
ASCI 309	Aerodynamics	3
ASCI 490	Aeronautical Science Capstone Course	3
MGMT 420	Management of Production and Operations	3
SFTY 409	Aviation Safety	3

Electives

Professional Development Electives (Upper-Level)		21
Select from courses in available Minor Courses of Study or as accepted in these related disciplines, and Technology.		
Open Electives (Upper or Lower-Level)		9
Total Degree Requirements		120

BSA-MSA 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 Aeronautics (BSA) and the Master of Science in Aeronautics (MSA) in five academic years.

Students who are accepted in the BSA-MSA 4+1 program, will spend three academic years in undergraduate-level study and then, during their senior year, will be allowed to take up to three graduate-level courses from their selected MSA specialization to replace an equal number of elective courses in the BSA degree. MSA core courses cannot be selected as one of the three (3) MSA courses selected. Before selecting the 3 courses to be taken, students must confer with an advisor to ensure that the courses selected are suitable and align with their selected MSA specialization (a grade of B or better must be achieved). Upon completion of the BSA requirements, students will be enrolled in the MSA and can complete their degree in one year. In any graduate course taken by an undergraduate

student, a grade of B or better must be earned. If a grade of C or F is earned in any of the courses taken in lieu of the elective courses in the BSA degree, the student will be removed from the program, have credit awarded to the BSA degree only, and may continue to complete the BSA degree.

This special program will challenge students and develop their knowledge and understanding of concepts in aeronautical science while integrating their skills in aviation and aerospace applications. As a minimum, the applicant must have at least a 3.00 GPA and have demonstrated superior academic capability.

Students will use the virtual forms application (https://vforms.erau.edu/forms/private/student-services/recommendation/4plus1) site to work through the application, recommendation, and approval process.

Footnotes*

Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Aviation Maintenance

Education is the key to getting more out of life — whether you're looking for a higher salary, greater job satisfaction, or a soaring sense of personal pride. If you work in the aircraft maintenance field and are ready for advancement, Embry-Riddle can help. Our Bachelor of Science in Aviation Maintenance degree lets you build on the skills you already possess, while laying the foundation for greater accomplishments.

If you hold an FAA Airframe & Powerplant Maintenance Certificate, you may be awarded up to 18 credit hours toward the associate degree or up to 30 credit hours toward the bachelor's degree. Students may also earn maintenance credit as part of the overall curriculum.

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

In addition to gaining critical skills needed to succeed in an aviation maintenance career, students will specialize in one of two maintenance functions: Management or Safety. Plus, students gain a solid core of courses in general education, which prepares graduates for success in any industry, not just aviation.

In the aviation industry, the most crucial task is to keep the planes flying safely. That's why people with aircraft maintenance skills and knowledge will continue to be in high demand by aviation and aeronautical employers. In today's competitive workforce, however, it takes something extra to move up the career ladder. Aviation professionals can get that edge with a Bachelor of Science in Aviation Maintenance from Embry-Riddle Aeronautical University — Worldwide.

Although the program is geared toward aviation and aerospace, its curriculum prepares graduates for success with companies in any industry. The total degree requirements are 120 credit hours.

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 the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
Physical/Life Science elective		3
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Aviation Maintenance Courses		
AMNT 240	General Aeronautics and Applications	3
AMNT 260	Aircraft Electrical Systems Theory	3
AMNT 270	Airframe Structures and Applications	3
AMNT 271	Airframe Systems and Applications	3
AMNT 280	Reciprocating Engine Theory and Applications	3
AMNT 281	Turbine Engine Theory and Applications	3
Total Credits		18

Program Support		
ASCI 202	Introduction to Aeronautical Science	3
MGMT 201	Principles of Management	3
STAT 211	Statistics with Aviation Applications	3
RSCH 202	Introduction to Research Methods	3
Total Credits		12

Program Core		
ASCI 327	Aviation Work Force Management in a Global Environment	3
ASCI 404	Applications in Aviation/Aerospace Law	3
ASCI 416	Aviation Maintenance Management: A Global Perspective	3
MGMT 210	Financial Accounting	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 317	Organizational Behavior	3
MGMT 325	Social Responsibility and Ethics in Management	3
AMNT 490	Aviation Maintenance Capstone Course	3
Total Credits		24

Program Specialization	18
Choose one specialization	

Electives

Aviation Maintenance Electives	12
Aviation Maintenance, Aeronautical Science, Management, Computer Science, and Engineering Technology.	

Total Degree Requirements	120

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

Specializations:

Management

In aviation maintenance, there is a continual need for the comprehensive management of maintenance programs. The Management specialization provides students of Aviation Maintenance an integrated understanding of the theories, concepts, and practical applications of logistics, procurement, production, life cycle analysis, and project management.

ASCI 315	Unmanned Aerial Systems and Operations	3
ASCI 322	Aircraft Inspection and Scheduled Maintenance Programs	3
ASCI 424	Maintenance Repair and Overhaul in Aviation	3
ASCI 433	Aviation Logistics and Supply Chain Management	3
MGMT 391	Introduction to Project Management	3
Upper-Level Management Electives		3
Total Credits		18

-OR-

Safety

In aviation maintenance, there is a recognized need for safety professionals. The Safety specialization provides students of Aviation Maintenance an opportunity to complement their practical experience with a study of aviation safety, focusing on the theories and concepts of human factors, mechanical and structural factors, system safety, and maintenance-related safety practices.

SFTY 320	Human Factors in Aviation Safety	3
SFTY 335	Mechanical and Structural Factors in Aviation Safety	3
SFTY 341	Occupational Safety and Health Program Management	3
SFTY 409	Aviation Safety	3
SFTY 440	System Safety Management	3
Upper-Level Safety Electives		3
Total Credits		18

B.S. in Aviation Security

Embry-Riddle Aeronautical University has developed the first-ever online Bachelor's Degree in Aviation Security to help meet the growing demand for skilled professionals.

This program is offered through Embry-Riddle Worldwide and is ideal for high school and two-year college graduates, security professionals, and active or transitioning military with career interests in: Transportation Security Administration; Homeland Security; federal intelligence and law enforcement agencies; United States Air Force Security Police; airline or airport security; airport management; airport security coordinator; airport police; aerospace contractor security; corporate aviation security; law enforcement and other security-specific disciplines.

Curriculum is designed to meet the needs and demands of the aviation and aerospace industry, as well as the security profession as a whole. Students will be introduced to both the science and practical application of aviation security, along with a well-rounded selection of general study courses. Students are also eligible to engage in cooperative study/internships and may elect to seek out those enriching opportunities.

Completion of this degree program can prepare students to test for the ASIS International (formerly American Society for Industrial Security, International) Certified Protection Professional (CPP) exam and for (CPP) recertification credits. It also prepares the students for the American Association of Airport Executives Transportation Security Administration approved Airport Security Coordinator exam.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from the list below, assuming prerequisite requirements are met. Courses from other institutions are acceptable if they fall into these broad categories and are at the level specified.		
Communication Theory & Skills		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Sciences		
PHYS 102	Explorations in Physics	3
Physical/Life Science elective		3
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Program Support		21
ASCI 202	Introduction to Aeronautical Science	3
ASCI 254	Aviation Legislation	3
RSCH 202	Introduction to Research Methods	3
STAT 211	Statistics with Aviation Applications	3
MGMT 201	Principles of Management	3
MGMT 210	Financial Accounting	3
MGMT 221	Introduction to Management Information Systems	3
Aviation Security Core		42
ASCI 412	Corporate and Business Aviation	3
ASCI 406	Airborne Law Enforcement	3
MGMT 408	Airport Management	3
BSAB 415	Airline Management	3
SCTY 310	Introduction to Security	3
SCTY 312	Global Crime and Criminal Justice Systems	3
SCTY 385	Intelligence Collection and Analysis	3
SCTY 400	Airport Security	3
SCTY 485	Corporate Security	3
SCTY 488	National Security Issues and Terrorism	3
SCTY 410	Physical Security	3
SCTY 420	General Aviation Security	3
SCTY 430	Counterterrorism for Aviation	3
SCTY 490	Aviation Security Capstone Course	3
Aviation Security Area of Concentration		21
ASCI 315	Unmanned Aerial Systems and Operations	3
SFTY 311	Fundamentals of Occupational Safety and Health	3

SCTY 315	Studies in Intelligence I	3
SCTY 415	Studies in Intelligence II	3
SFTY 345	Aviation Safety Program Management	3
SFTY 409	Aviation Safety	3
TRAN 421	Transportation Safety and Security	3
Total Degree Requirements		120

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Engineering

The Bachelor of Science in Engineering (BSE) degree is designed from a multidisciplinary perspective with subject matter from mechanical engineering, electrical engineering, aeronautical, and systems engineering. The educational focus is anticipated to support the growth and innovative development of aerospace technologies and systems and address current industry challenges. The program educational outcome is to graduate engineers that can enter into research, development, and design positions, function effectively on multidisciplinary teams, and contribute to the advancement in engineering-related projects upon graduation.

The BSE targets the high-school graduate, in addition to non-traditional and transfer students, to provide knowledge, skills, and abilities (KSAs) correlating to comprehension and application of essential engineering concepts. The curriculum features: 19 hours of mathematics, 10 hours of calculus-based physics, 66 hours of engineering, 6 hours of a senior level design project, and 27 hours of economics, communications, social sciences, and humanities.

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 this list, 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		
ENGL 123	English Composition	3
ENGL 221	Technical Report Writing	3
SPCH 219	Speech	3
Mathematics		
MATH 241	Calculus and Analytical Geometry I	4
MATH 242	Calculus and Analytical Geometry II	4
Computer Science/Information		
ENGR 115	Introduction to Computing for Engineers	3
Physical and Life Sciences		
PHYS 150	Physics I for Engineers	3
PHYS 160	Physics II for Engineers	3
Humanities/Social Sciences**		
Humanities Lower Level		6
Humanities Upper Level		3
Social Sciences Lower Level		3
Social Sciences Upper Level		3
ECON 225	Engineering Economics	3
Total Credits		44

Core

Aeronautical Engineering		
AERO 309	Aerodynamic Performance of Flight Vehicles	3
ENGR 350	Project Management for Engineered Systems	3
Total Credits		6
Engineering		
ENGR 101	Introduction to Engineering	3
ENGR 120	Graphical Communications	3
ENGR 330	Signals & Systems	3
ENGR 331	Signals & Systems Laboratory	1
ENGR 400	Fundamentals of Energy Systems	3
ENGR 430	Control System Analysis and Design	3
Total Credits		16
Engineering Science		
ESCI 201	Statics	3
ESCI 202	Solid Mechanics	3
ESCI 204	Dynamics	3
ESCI 206	Fluid Mechanics	3
ESCI 305	Thermodynamics	3
ESCI 320	Engineering Materials Science	2
ESCI 321	Engineering Materials Science Laboratory	1
Total Credits		18
Computer Engineering		
CESC 220	Digital Circuit Design	3
CESC 222	Digital Circuit Design Laboratory	1
Total Credits		4
Electrical Engineering		
ELEC 220	Circuits	3
ELEC 221	Circuits Laboratory	1
ELEC 230	Electronics	3
ELEC 231	Electronics Laboratory	1
Total Credits		8
Physical Science		
PHYS 250	Physics III for Engineers	3
PHYS 253	Physics Laboratory for Engineers	1
Total Credits		4
Mechanical Engineering		
MECH 302	Introduction to Robotics	3
MECH 303	Robotics Laboratory	1
MECH 313	Instrumentation and Data Acquisition	2
MECH 314	Instrumentation and Data Acquisition Laboratory	1
MECH 404	Mechatronics	3
MECH 404L	Mechatronics Laboratory	1
Total Credits		11
Mathematics		
MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
STAT 412	Probability and Statistics	3
Total Credits		11
Capstone		
ENGR 490	Capstone Design Project I	3
ENGR 491	Capstone Design Project II	3
Total Credits		6

Total Degree Requirements	128

** Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Engineering Technology

With the rapid advancement of science and technology in today's world, every industry needs highly qualified engineers who can keep innovation moving forward. Offered entirely online through Embry-Riddle Aeronautical University Worldwide, this specialized degree program will prepare you to put your engineering skills to work in a variety of industries.

Through the use of cutting-edge virtual labs and simulation methods, students will develop the skills to design, refine and apply engineering technologies across a range of industries. You can also choose to target your studies with a particular concentration including Aeronautical Science, Aviation Safety, Helicopter Operations and Safety, Logistics Management, Management Information Systems, Occupational Safety and Health, Project Management, Security and Intelligence, Transportation and Unmanned Aerial Systems.

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

Engineering Technology Area of Concentration

The Engineering Technology Area of Concentration is the degree area where credit for prior engineering technology learning is housed or where students can take courses to learn about engineering technology. Many students bring in all or part of this credit based on prior engineering or engineering technology training or experience. However, shortages in the minimum credit required can be made up by taking courses in the following related disciplines: Aeronautical Science, Aviation Safety, Helicopter Operations and Safety, Unmanned Aerial Systems, Transportation, Logistics Management, Management Information Systems, Occupational Safety and Health, Project Management, Security and Intelligence.

Sources of Prior Learning Credit include the following:

1. Transfer credit earned at accredited degree-granting colleges and universities.
2. The recommendations published by the American Council on Education for U.S. Military training and experience, as well as training conducted by other government agencies and private organizations.
3. Prior-learning credit established by the University for certain engineering and aviation licenses and ratings as they relate to this degree.

Duplicate Credit

Many Embry-Riddle courses are designed to teach the same skills and knowledge that engineering technology students have acquired through experience and training. Students who complete courses in the same engineering specialty for which they were granted credit would be duplicating coverage of the same subject matter. Credit for completion of such courses will not be applied to degree requirements.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, and Humanities and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
English/Speech electives		6
Mathematics		
MATH 241	Calculus and Analytical Geometry I	4
MATH 242	Calculus and Analytical Geometry II	4
Computer Science / Information		
ENGR 115	Introduction to Computing for Engineers	3
Physical and Life Sciences		
CHEM 139	General Chemistry I	3
CHEM 141	General Chemistry I Laboratory	1
PHYS 150	Physics I for Engineers	3
PHYS 160	Physics II for Engineers	3
Humanities		
HUMN 330	Values and Ethics	3
Humanities lower level elective		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
General Electives		
General Open Electives		9
Total Credits		51

Core/Major

Business		
STAT 222	Business Statistics	3
Total Credits		3
Leadership and Management		
MGMT 201	Principles of Management	3
MGMT 203	Management for Aeronautical Science	3
Total Credits		6
Technical Core		
ENGR 101	Introduction to Engineering	3
ENGR 120	Graphical Communications	3
ESCI 201	Statics	3
CESC 220	Digital Circuit Design	3
CESC 222	Digital Circuit Design Laboratory	1
ESCI 204	Dynamics	3
ESCI 202	Solid Mechanics	3
ESCI 206	Fluid Mechanics	3
RSCH 202	Introduction to Research Methods	3
ETEC 310	Material Science for Engineering Technology	3
ETEC 315	Circuit Analysis	3
ETEC 410	Thermodynamics for Engineering Technology	3
ETEC 415	Control Systems	3
ETEC 420	Applications of Engineering Technology	3
ETEC 485	Professional Seminar	1
ETEC 490	Engineering Technology Capstone	3
Total Credits		44

Electives/Concentration

Concentrations	18
Following concentration areas are available to BSET students. Students may choose at least 3 courses each from two concentration areas.	
Total Degree Requirements	122

Concentrations:

Aeronautical Science

Aeronautical Science Concentration		
ASCI 309	Aerodynamics	3
ASCI 429	Advanced Technologies in Design and Production of Aircraft Structures & Systems	3
ETEC 409	Applied Aeronautics	3

Aviation Safety

Aviation Safety Concentration		
SFTY 320	Human Factors in Aviation Safety	3
SFTY 330	Aircraft Accident Investigation	3
SFTY 409	Aviation Safety	3

Facilities and Construction Management

Facilities and Construction Management Concentration		
MGMT 453	Construction Scheduling & Control	3
MGMT 455	Construction Systems	3
MGMT 456	Economics for Facilities & Construction Managers	3

Helicopter Operations and Safety

Helicopter Operations and Safety Concentration		
ASCI 317	Rotorcraft	3
ASCI 378	Helicopter Flight Environments	3
ASCI 388	Helicopter Flight Planning	3

Unmanned Aerial Systems

Unmanned Aerial Systems Concentration		
ASCI 315	Unmanned Aerial Systems and Operations	3
ASCI 318	Unmanned Aerial Systems Robotics	3
ASCI 410	Unmanned Systems Sensing Technology	3

Transportation

Transportation Concentration		
TRAN 274	Transportation Science	3
TRAN 351	Urban Transportation and City Planning	3
TRAN 401	Transportation and the Environment	3

Logistics Management

Logistics Management Concentration		
MGMT 331	Transportation Principles	3
BSAB 410	Management of Air Cargo	3
MGMT 411	Logistics Management for Aviation/Aerospace	3

Management Information Systems

Management Information Systems Concentration		
MGMT 221	Introduction to Management Information Systems	3
MGMT 392	Database Management	3
MGMT 494	Aviation Information Systems	3

Occupational Safety & Health

Occupational Safety & Health Concentration		
SFTY 311	Fundamentals of Occupational Safety and Health	3
SFTY 321	Ergonomics	3
SFTY 355	Industrial Hygiene and Toxicology	3

Project Management

Project Management Concentration		
MGMT 391	Introduction to Project Management	3
MGMT 424	Project Management in Aviation Operations	3
MGMT 461	Global Project Management	3

Security and Intelligence

Security and Intelligence Concentration		
SCTY 315	Studies in Intelligence I	3
SCTY 385	Intelligence Collection and Analysis	3
SCTY 488	National Security Issues and Terrorism	3

B.S. in Safety Management

The Bachelor of Science in Safety Management (BSSM) program is designed to provide students with knowledge and skills to allow them to operate as competent leaders, managers, and practitioners within the field of safety management. Students will develop not only technical understanding and expertise, but also a practical and analytical approach to problem solving that will allow them to address a range of industry-related safety challenges.

The BSSM program offers students with the opportunity to apply principles of safety and health in a non-academic setting through an intern, cooperative, or supervised experience. Students are eligible to engage in cooperative study/internships and may elect to seek out those enriching opportunities.

The Worldwide Campus is appropriately positioned to offer the Bachelor of Science in Safety Management program; the Worldwide Campus has expertise in multi-modal curriculum delivery, as well as experience delivering graduate programs to a widely dispersed student population.

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 the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
BIOL 120	Foundations of Biology I	3
Mathematics		
MATH 140	College Algebra	3
MATH 142	Trigonometry	3
Computer Science		

CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Safety Management Core		
SFTY 201	Introduction to Health, Occupational, and Transportation Safety	3
SFTY 205	Principles of Accident Investigation	3
SFTY 311	Fundamentals of Occupational Safety and Health	3
SFTY 315	Environmental Compliance and Safety	3
SFTY 321	Ergonomics	3
SFTY 326	System Safety	3
SFTY 355	Industrial Hygiene and Toxicology	3
SFTY 365	Fire Protection	3
SFTY 440	System Safety Management	3
SFTY 450	Loss Control & Insurance	3
FIRE 201	Fire-Related Human Behavior	3
FIRE 305	Fire Prevention Organization and Management	3
EMGY 310	Fundamentals of Emergency Management	3
BSSM 490	Safety Management Capstone Course	3
Total Credits		42

Safety Management Program Support		
PSYC 220	Introduction to Psychology	3
STAT 222	Business Statistics	3
MGMT 201	Principles of Management	3
MGMT 317	Organizational Behavior	3
MGMT 325	Social Responsibility and Ethics in Management	3
MGMT 371	Leadership	3
CHEM 139	General Chemistry I	3
CHEM 141	General Chemistry I Laboratory	1
RSCH 202	Introduction to Research Methods	3
Total Credits		25

Specialization		18
Select one of the four Safety Management Specializations		

Total Degree Requirements		121

Specializations:

Occupational Safety Management

Occupational Safety Management		
SFTY 341	Occupational Safety and Health Program Management	3
SFTY 410	Design of Engineering Hazard Controls	3
SFTY 420	Systems Design for Fire & Life Safety	3
SFTY 470	Advanced Occupational Safety and Health Technology	3
SFTY 421	Ergonomics II	3
SFTY 415	Human Reliability and Safety Analysis	3
Total Credits		18

Aviation Safety Management

Aviation Safety Management		
SFTY 320	Human Factors in Aviation Safety	3
SFTY 330	Aircraft Accident Investigation	3
SFTY 345	Aviation Safety Program Management	3
SFTY 350	Aircraft Crash and Emergency Management	3
SFTY 409	Aviation Safety	3
SFTY 462	Health, Safety and Aviation Law	3
Total Credits		18

Construction Safety Management

Construction Safety Management		
BSSM 410	Safety and Health Regulations for Construction	3
SFTY 360	Construction Safety	3
SFTY 410	Design of Engineering Hazard Controls	3
SFTY 420	Systems Design for Fire & Life Safety	3
MGMT 453	Construction Scheduling & Control	3
MGMT 457	Facilities & Construction Safety Systems	3
Total Credits		18

Emergency Management

Emergency Management		
EMGY 400	Introduction to Incident Command System	3
EMGY 405	Disaster Policy and Management	3
EMGY 430	Emergency Management and Contingency Planning	3
ESVS 301	Community Risk Reduction for the Fire and Emergency Services	3
ESVS 403	Disaster Planning and Control	3
ESVS 404	Managerial Issues in Hazardous Materials	3
Total Credits		18

B.S. in Unmanned Systems Applications

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

As one of the first degree programs to focus on this burgeoning field, the Bachelor of Science in Unmanned Systems Applications (BSUSA) focuses on the growth, innovative development, and effective use of unmanned system technology across the respective domains (air, space, ground, and maritime). The focused curriculum addresses major challenges within the industry, including interoperability, autonomy, airspace integration, communications, education and training, propulsion and power, teaming, and regulation. Students will choose from three distinct learning tracks:

- **Administration -** Focuses on managerial aspects of unmanned systems applications.
- **Operations** - Focuses on task oriented mission planning and execution in unmanned systems operations.
- **Development** – Focuses on engineering and design aspects of unmanned systems.

BSUSA graduates will be prepared to help 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.

BSUSA students who wish to continue on to a master's degree may enroll in the BSUSA to MSUS 4+1 program as outlined in this program.

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 this list, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
Social Science elective		3
Physical and Life Science		
PHYS 102	Explorations in Physics	3
Physical Science Elective		3
Mathematics		
MATH 140	College Algebra	3
MATH 142	Trigonometry	3
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Hours		36

Core/Major

Program Core		
ASCI 309	Aerodynamics	3
ASCI 315	Unmanned Aerial Systems and Operations	3
ASCI 316	Operational and Business Aspects of Unmanned Aerial Systems	3
ASCI 318	Unmanned Aerial Systems Robotics	3
ASCI 410	Unmanned Systems Sensing Technology	3
UNSY 205	Applied Physics for Unmanned Systems	3
UNSY 307	Unmanned Systems Networking	3
UNSY 311	Unmanned Ground Systems and Applications	3
UNSY 313	Unmanned Maritime Systems and Applications	3
UNSY 331	Unmanned Systems Legal and Regulatory Compliance	3
UNSY 405	Unmanned Systems Operational Environments and Conditions	3
UNSY 415	Unmanned Space Systems and Application	3
UNSY 431	Unmanned Systems Human Factors Considerations	3
UNSY 490	Unmanned Systems Application Capstone Course	3
STAT 211	Statistics with Aviation Applications	3
RSCH 202	Introduction to Research Methods	3
Total Credits		48

Tracks of Study

Tracks of Study **		36

Students will select from one of three available tracks of study, each containing a total of 12 courses (36 credit hours). Students will fulfill six (6) required support courses (18 credit hours) within the track of study and will fulfill six (6) additional courses (18 credit hours) by selecting one of the available minors and making up remaining credit shortage with upper level electives (300 or 400 level courses). ** Students who select the Development Track will complete 19 credits and will complete 121 total degree requirements.

Students will chose from the respective list of available minor (selection of existing minor within the WW catalogue) to complete their chosen track requirements. Course requirements for the selected minor are as outlined in the minor description (within the Worldwide catalog), with which students will have to comply. The depicted number (in parenthesis) of additional electives that result from each choice of minor is for reference only and is based on current course/credit requirements for the minor and course/credits requirements already accomplished in the BSUSA Program Core and/or Track support. (This number of remaining electives may be subject to changes with catalogue changes to a minor).

Total Degree Requirements **	120

Administration Track

Administration		
MATH 112	Applied Calculus for Aviation	3
SFTY 311	Fundamentals of Occupational Safety and Health	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 391	Introduction to Project Management	3
MGMT 390	Business Law	3
Total Credits		18

Available Minor for the Administration Track (with courses from existing minors)	18

Aviation Management (p. 91) *(no electives) (Note: BSAB 415 has a prerequisite requirement of MGMT 201. If enrolled in the Administration Track with the Aviation Management minor, MGMT 201 must be taken to fulfill the prerequisite requirement for BSAB 415.)*
Aviation Safety (p. 62) *(no electives)*
Emergency Services (http://catalog.erau.edu/worldwide/arts-sciences/minors/fire-science) *(1 elective)*
Logistics Management (p. 91) *(1 elective)*
Management (p. 91) *(4 electives)*
Management Information Systems (p. 92) *(1 elective)*
Marketing (p. 92) *(2 electives)*
Occupational Safety and Health (p. 62) *(1 elective)*
Project Management (p. 92) *(2 electives)*
Small Unmanned Aircraft System (sUAS) Operation (p. 63) *(1 elective)*
Technical Management (p. 92) *(1 elective)*

Operations Track

Operations		
MATH 112	Applied Calculus for Aviation	3
SFTY 311	Fundamentals of Occupational Safety and Health	3
UNSY 319	Unmanned Systems Operational Interaction and Control	3
UNSY 321	Unmanned Systems Localization and Path Planning	3
UNSY 325	Unmanned Systems Testing and Inspection	3

UNSY 421	Unmanned Systems Mission Planning	3
Total Credits		18

Available Minor for the Operations Track (with courses from existing minors) 18

Aviation Maintenance Operations (p. 62) *(no electives)*
Aviation Safety (p. 62) *(no electives)*
Emergency Services (http://catalog.erau.edu/worldwide/arts-sciences/minors/fire-science) *(1 elective)*
Helicopter Operations and Safety (p. 62) *(no electives)*
Logistics Management (p. 91) *(1 elective)*
Occupational Safety and Health (p. 62) *(1 elective)*
Project Management (p. 92) *(1 elective)*
Security and Intelligence (p. 63) *(no electives)*
Small Unmanned Aircraft System (sUAS) Operation (p. 63) *(1 elective)*
Transportation (p. 63) *(no electives)*

Development Track

Development **		
MATH 241	Calculus and Analytical Geometry I	4
CESC 220	Digital Circuit Design	3
ESCI 105	Fundamentals of Engineering	3
ENGR 115	Introduction to Computing for Engineers	3
ETEC 310	Material Science for Engineering Technology	3
UNSY 329	Unmanned Systems Computation and Programming	3
**Students who select the Development Track will complete 19 credits and will complete 121 total degree requirements.		
Total Credits		19

Available Minor for the Development Track (with courses from existing minors) 18

Engineering Sciences (p. 62) *(1 elective - students are encouraged to take ETEC 409 in combination with this Minor)*
Marketing (p. 92) *(1 elective)*
Occupational Safety and Health (p. 62) *(no electives)*
Project Management (p. 92) *(1 elective)*
Small Unmanned Aircraft System (sUAS) Operation (p. 63) *(1 elective)*
Technical Management (p. 92) *(1 elective)*

BSUSA-MSUS 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 Unmanned Systems Applications (BSUSA) and the Master of Science in Unmanned Systems (MSUS) in five academic years.

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

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

This special program will challenge students and develop their knowledge, skills, abilities, and attitudes in the concepts of unmanned systems while integrating their gained experience in unmanned systems applications. As a minimum to be considered for acceptance to this BSUSA-MSUS 4+1 option, applicant students must hold at least a 3.00 GPA, completed at least 88 credit hours of the BSUSA program requirements to apply and demonstrated superior academic capability.

M.S. in Aeronautics (MSA)

The Master of Science in Aeronautics (MSA) degree program is a broad-based, flexible degree program designed to provide both the aviation/aerospace professional and students who are interested in a career in aviation with a rigorous academic approach to an aviation/aerospace oriented multidisciplinary degree. It provides an unequaled opportunity for pilot flight crew members, air traffic control personnel, flight operations specialists, meteorologists, industry technical representatives, unmanned aircraft systems operators, and aviation educators to enhance their knowledge and pursue additional career opportunities.

The MSA degree is designed to provide the student with a broad research background and technical knowledge in the core curriculum and the opportunity to select from eleven different specializations to pursue their chosen career path in the aviation field.

The MSA program consists of 33 credits. Students must complete the MSA core requirements consisting of 12 credits, and then complete the 9 credits that make up the selected specialization in one of the following: Air Traffic Management, Aviation/ Aerospace Education Technology, Aviation/ Aerospace Management, Aviation/Aerospace Operations, Aviation/ Aerospace Safety Systems, Human Factors, Aeronautics, Space Studies, Unmanned Aerospace Systems, or small Unmanned Aircraft Systems.

The four (4) core courses should be taken as the first four courses in the degree program.

Students must also complete 12 credits of coursework that includes either a Thesis (6 credits), or a Graduate Capstone Project (GCP) (3 credits). Remaining credits are made up of graduate level aeronautical science electives. MSA students can also complete courses leading to a multiple specializations. Additional specializations must be declared prior to the completion of the degree program.

Students wishing to complete a dual specialization must have 9 unduplicated credits in each of the specializations and will complete a total of 33 (GCP) or 36 (Thesis) credit hours in order to graduate. Additional specializations may also be taken.

The MSA degree may be taken through the Worldwide or Daytona Beach Campus. Consult your Academic Advisor for information regarding courses offered only through the Daytona Beach Campus or common courses that may be taken at either campus to satisfy degree requirements. For courses taken at the Daytona Beach Campus, term length and availability may vary.

Thesis Option:
Students may complete a thesis in place of a capstone. Students electing the thesis option must take the GRE. Refer to Master of Science in Aeronautics Thesis Guide for minimum GRE scores and additional guidance.

Program-Specific Criteria

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. Graduate level prerequisite courses taken with ERAU must be completed with a grade of B or better.

*Applicants for admission to the **Master of Science in Aeronautics (MSA)** program must have prerequisite knowledge in the following areas:*

- *Quantitative Methods*

Students should assume responsibility to see that prerequisites are satisfied. The prerequisite subject knowledge for a specific graduate course must be satisfied before enrollment in that specific course is permitted. Students may enroll in other graduate level courses as they meet any specific prerequisite knowledge required.

The prerequisite knowledge can be validated through one of the following:

1. *Completed an undergraduate or graduate course in each of the specific subject areas and upon validation of the course from an official transcript; **-OR-***
2. *Completed a course listed in either the National or ACE Guide for which academic credit in one of the specific subject areas is recommended; **-OR-***
3. *Received at least the minimum recommended score on a CLEP, DSST/DANTES, PEP, etc. exam in each of the subject areas as required.*

DEGREE REQUIREMENTS

Major/Core - Capstone Option

MSA Core Requirements	
MSA/ASCI 602 The Air Transportation System	3
MSA/ASCI 662 Statistical Analysis for Aviation/Aerospace	3
MSA/ASCI 670 Research Methods for Aviation/Aerospace	3
MSA/ASCI 604 Human Factors in the Aviation/Aerospace Industry	3
-OR-	
MSA/ASCI 674 Project Management in Aviation/Aerospace	
MSA/ASCI 602, MSA/ASCI 662, MSA/ASCI 670 and MSA/ASCI 604 -or- MSA/ASCI 674 must be taken as the first four (4) courses of the degree program.	
Total Credits	12

Areas of Specialization	
Choose at least one of the eleven (11) specializations. MSA students may complete courses leading to multiple specializations. Students wishing to complete multiple specializations must have unduplicated credits in each of the specializations. Students must submit an evaluation request form to declare the desired specializations.	
Total Credits	9

Electives

Electives	9
MSA/ASCI Aeronautical Science Graduate Courses (500-600 level)	

Capstone Option:	
MSA/ASCI 691 Graduate Capstone Course	3

Total Degree Requirements - Capstone Option	33

Major/Core - Thesis Option

MSA Core Requirements	
MSA/ASCI 602 The Air Transportation System	3
MSA/ASCI 662 Statistical Analysis for Aviation/Aerospace	3
MSA/ASCI 670 Research Methods for Aviation/Aerospace	3
MSA/ASCI 604 Human Factors in the Aviation/Aerospace Industry	3
-OR-	
MSA/ASCI 674 Project Management in Aviation/Aerospace	
MSA/ASCI 602, MSA/ASCI 662, MSA/ASCI 670 and MSA/ASCI 604 -or- MSA/ASCI 674 must be taken as the first four (4) courses of the degree program.	
Total Credits	12

Areas of Specialization	
Choose at least one of the eleven (11) specializations. MSA students may complete courses leading to multiple specializations. Students wishing to complete multiple specializations must have unduplicated credits in each of the specializations. Students must submit an evaluation request form to declare the desired specializations.	
Total Credits	9

Electives

Electives	6
MSA/ASCI Aeronautical Science Graduate Courses (500-600 level)	

Thesis Option:		6
ASCI 700A	Thesis I	3
ASCI 700B	Thesis II	3
-OR-		
MSA 700 Thesis (Available at Daytona Beach Campus Only)		

Total Degree Requirements - Thesis Option	33

Specializations:

Specialization 1

Aeronautics

Complete three of the following courses:		9
ASCI 509	Advanced Aerodynamics	
ASCI 517	Advanced Meteorology	
ASCI 623	Aircraft Design and Development	
UNSY 501	Application of Unmanned Systems	

Specialization 2

Aviation/Aerospace Education Technology

Complete three of the following courses:	9
MSA/ASCI 514 Computer Based Instruction	
MSA/ASCI 550 Aviation Education Foundations	
MSA/ASCI 614 Advanced Aviation/Aerospace Curriculum Development	
MSA/ASCI 654 Adult Teaching and Learning Techniques	
MSA 518 Online Learning Environment (Available at Daytona Beach Campus Only)	

Specialization 3

Aviation/Aerospace Management

Complete three of the following courses:	9
MSA/ASCI 609 Aircraft Maintenance Management	
MSA/ASCI 641 Production and Procurement Management in the Aviation/Aerospace Industry	

MSA/ASCI 644 Integrated Logistics Support in Aviation/ Aerospace

MSA/ASCI 642 International Aviation Policy

MSA 508 Advanced Airport Modeling (Available at Daytona Beach Campus Only)

MSA 616 Leadership and Critical Decision Making in the Aviation Industry (Available at Daytona Beach Campus Only)

MSA 636 Advanced Aviation/Aerospace Planning Systems (Available at Daytona Beach Campus Only)

The MSA/ASCI 674 core requirement option must be taken for students who select the Aviation/Aerospace Management specialization.

Note: One MGMT/BA course may be selected with permission of the Program Chair/Coordinator.

Specialization 4

Aviation/Aerospace Operations

Complete three of the following courses:	9

MSA/ASCI 515 Aviation/Aerospace Simulation Systems

MSA/ASCI 516 Applications in Crew Resource Management

MSA/ASCI 620 Air Carrier Operations

MSA/ASCI 619 Airport Certification and Operations Safety

MSA 508 Advanced Airport Modeling (Available at Daytona Beach Campus Only)

MSA 616 Leadership and Critical Decision Making in the Aviation Industry (Available at Daytona Beach Campus Only)

MSA 622 Corporate Aviation Operations (Available at Daytona Beach Campus Only)

Note: One MGMT/BA course may be selected with permission of the Program Chair/Coordinator.

Specialization 5

Aviation/Aerospace Safety Systems

Complete three of the following courses:	9

MSA 608/ASCI 615 Aviation/Aerospace Accident Investigation and Analysis

MSA/ASCI 611 Aviation/Aerospace System Safety

MSA/ASCI 621 Aviation/Aerospace Safety Program Management

MSA/ASCI 619 Airport Certification and Operations Safety

MSA/ASCI 516 Applications in Crew Resource Management

The MSA/ASCI 604 core requirement option must be taken for students who select the Aviation/Aerospace Safety Systems specialization.

Specialization 6

Human Factors in Aviation Systems

Complete the following three courses:		9
ASCI 516	Applications in Crew Resource Management	
ASCI 634	Aviation/Aerospace Psychology	
MSHF 606	Human Cognition	

The MSA/ASCI 604 core requirement option must be taken for students who select the Human Factors in Aviation Systems specialization.

Specialization 7

Space Studies

MSA/ASCI 601 Applications in Space: Commerce, Defense, and Exploration	3
Complete two of the following courses:	6

MSA/ASCI 511 Earth Observation and Remote Sensing

MSA/ASCI 512 Space Mission and Launch Operations

MSA/ASCI 513 Space Habitation and Life Support Systems

Specialization 8

Unmanned Aerospace Systems

Complete three of the following courses:	9

MSA 533/ASCI 530 Unmanned Aerospace Systems

MSA/ASCI 531 Robotics and Control

MSA/ASCI 637 Unmanned Aerospace Systems Operations and Payloads

MSA/ASCI 638 Human Factors in Unmanned Aerospace Systems

Specialization 9

Air Traffic Management (Non CTI ATC Students)

ASCI 606	Global Air Traffic Control and Management	3
Complete two courses from the following:		6
ASCI 624	Global Aviation Leadership: Critical Decision Making in Air Traffic Systems	
ASCI 625	The Role of Airports in Global Air Traffic Management	
ASCI 626	Air Traffic Control Human Factors	

Specialization 10

Air Traffic Management (CTI ATC Students)

(Available through Daytona Beach Campus Only)

The Air Traffic Management Specialization for CTI ATC students is offered at the Daytona Beach Campus only.	18

Prerequisite undergraduate required courses for this specialization include:

AT 202 Introduction to Air Traffic Management (Available at Daytona Beach Campus Only)

AT 305 Introduction to Terminal Radar Operations (Available at Daytona Beach Campus Only)

AT 401 Advanced Terminal Radar Operation (Available at Daytona Beach Campus Only)

Specialization Requirements:

MSA 520 Introduction to Air Traffic Control Tower (Available at Daytona Beach Campus Only)

MSA 617 En route Radar Operations (Available at Daytona Beach Campus Only)

MSA 618 En route Non-Radar Operations (Available at Daytona Beach Campus Only)

Electives: Choose 6-9 credit hours from the courses below if the Air Traffic Management (CTI ATC Students) specialization is selected.:

MSA/ASCI 515 Aviation/Aerospace Simulation Systems

MSA 608/ASCI 615 Aviation /Aerospace Accident Investigation and Analysis

MSA 508 Advanced Airport Modeling (Available at Daytona Beach Campus Only)

MSA 616 Leadership and Critical Decision Making in the Aviation Industry (Available at Daytona Beach Campus Only)

MSA 636 Advanced Aviation/Aerospace Planning Systems (Available at Daytona Beach Campus Only)

Specialization 11

Small Unmanned Aircraft System (sUAS) Operation

Students declaring the sUAS Operation Specialization or registering for courses within it must be U.S. citizens or permanent residents and must be physically located within the U.S. when registering for and while participating in the UNSY 520 course. Students must contact their Academic Advisor regarding additional cost, possible travel, and FAA Testing, prior to enrolling in the first course of this specialization, UNSY 515. Those already in possession of an FAA Part 107 Remote Pilot certificate, prior to starting the specialization, may complete ASCI 530, in lieu of UNSY 515 to ensure sufficient credit, research experience, and topical exposure.

Complete the following three courses:		9
UNSY 515	sUAS Operation Fundamentals	
UNSY 520	sUAS Practical Application and Assessment	
UNSY 620	sUAS Operational Planning and Safety Management	

M.S. in Aerospace Engineering

Aerospace engineers are in huge demand for industries from military services to space travel, and the right degree from a prestigious institution can open doors for a lifetime. Embry-Riddle's Master of Science in Aerospace Engineering (MSAE) has been one of the field's most sought-after degrees for decades.

You will develop the skills to conquer challenges currently facing military and commercial air and spacecraft technology. You'll be prepared to participate in and lead cutting-edge research projects. You'll gain entry into the highest levels of private and government operations.

And now, you'll be able to get your MSAE from the convenience of your home. No commute, no classroom, no rigid schedule. It's education designed around your life.

After completing the MSAE, you will be prepared to participate in the development of military and commercial aircraft, spacecraft designs, and government projects. You will also be positioned to continue your studies with advanced research through programs such as Embry-Riddle's Ph.D. in Aerospace Engineering.

Program-Specific Criteria

Admissions Criteria

Applicants for admission to the MSAE Degree Program must meet the following criteria:

- Provide evidence of an undergraduate Bachelor of Science degree in Aeronautical or Aerospace Engineering, or equivalent with a cumulative grade point average (CGPA) of 3.0 or higher, on a 4.0 scale. If earned in the United States, the degree must be from an ABET-accredited program (accredited by the Engineering Accreditation Commission, EAC). Applicants with graduate coursework must meet the established graduate transfer CGPA. Students with a Bachelor of Science or equivalent degree in other engineering disciplines, who otherwise meet the requirements for full admission, may also be admitted to the MSAE program.
- The Graduate Records Examination (GRE) is required.
- Submit (3) letters of recommendation, including (2) from a recent instructor.
- Submit a current resume outlining your education, work experience, special activities and awards.
- Prepare a type-written *Statement of Objectives*, demonstrating strong capacity for written communication and elucidating the following topic areas:
  - A description of the applicant's reasons for wishing to do graduate work in the field chosen
  - A description of the applicant's interests and background
  - A description of the applicant's long-term professional goals, defining how Embry-Riddle's MSAE program supports those interests and goals

Note: Graduates of Embry-Riddle Aeronautical University with at least a 3.2 undergraduate GPA may be excused from the GRE, letters of recommendation, and Statement of Objectives requirements.

Download the MSAE Program Recommendation Form (http://worldwide.erau.edu/Assets/worldwide/forms/WW_graduate-reference.pdf)

DEGREE REQUIREMENTS

Major/Core

AENG 502	Strength and Fatigue of Materials	3
AENG 510	Aircraft Structural Dynamics	3
AENG 511	Engineering Materials Selection	3
AENG 514	Introduction to the Finite Element Method	3
AENG 522	Analysis of Aircraft Composite Materials	3
AENG 534	Smart Materials in Engineering	3
AENG 540	Structural Health Monitoring	3
AENG 612	Analysis of Aircraft Plate and Shell Structures	3
AENG 525	Structural Design Optimization	3
MATH 502	Boundary Value Problems	3
Total Credits		30

M.S. in Aviation and Aerospace Sustainability

The Master of Science in Aviation and Aerospace Sustainability (MSAAS) degree program is designed to provide students with knowledge and comprehensive decision making skills to act as forward thinking managers of aviation and aerospace industry programs. In the program aviation/aerospace sustainability is examined from two perspectives: 1) aviation and aerospace industries as business entities needing to remain viable and 2) as value added partners in the pursuit of sustainable solutions for conservation or renewability of the world's resources. Today many aviation and aerospace industries operate on a global scale and require an in depth understanding of both viewpoints to sustain as well as advance operations. The MSAAS will provide a collaborative learning environment rich with opportunities to challenge current thought processes, work in autonomous or group settings and connect with diverse populations across the world.

DEGREE REQUIREMENTS

Core/Major

ASCI 602	The Air Transportation System	3
AASI 600	Sustainable Aviation and Aerospace Perspectives	3
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
AASI 691	Aviation and Aerospace Sustainability Graduate Capstone	3
Total Credits		15

Electives

Electives	9

Take 3 College of Aeronautics (COA) Graduate Level Courses. Students may take no more than 2 of 4 suggested courses outside of COA: MHSR 530, MBAA 514, MGMT 653, LGMT 682.

Specialization	12
Select one Specialization from the list below:	
Total Degree Requirements	36

Specializations:

Aviation/Aerospace Sustainable Management		
AASI 605	Aviation and Aerospace Sustainable Organizations	3
AASI 610	Aviation and Aerospace Workforce Development and Diversity	3
AASI 630	Sustainable Aviation and Aerospace Organizational Communications	3
MBAA 518	Managerial Finance *	3

* Note: For enrollment in the MBAA 518 course, the BUSW 500 prerequisite is not required for students in the MSAAS Program.

Aviation/Aerospace Sustainable Systems		
AASI 615	Sustainable Technical Systems Communications	3
AASI 620	Aviation and Aerospace Sustainable Techniques	3
AASI 625	Sustainability Associated Legal Topics in Aviation and Aerospace	3
ASCI 611	Aviation/Aerospace System Safety	3

Master of Aviation Maintenance

The Master of Aviation Maintenance (MAM) degree program is designed to provide students with the knowledge and skills to function as competent supervisors and managers of aviation maintenance programs in a dynamic and highly complex aviation global industry.

Students will develop a practical and analytical approach to problem-solving that will meet the challenges of managing and leading an aviation maintenance organization. The objective of the MAM is to provide the skills necessary for students to become professionals in the aviation maintenance industry. Within this context, the main goals of the MAM program are to provide the opportunity for students to acquire the knowledge, skills, and abilities central to aviation maintenance and related industries. The program will provide knowledge, skills, and abilities necessary for students to become effective professionals, leaders, team members, managers, and undertake lifelong learning for continuing professional development.

DEGREE REQUIREMENTS

Major/Core

ASCI 609	Aircraft Maintenance Management	3
ASCI 621	Aviation/Aerospace Safety Program Management	3
ASCI 644	Integrated Logistics in Aviation Management	3
SFTY 530	Safety, Health and Environmental Legislation, Litigation & Compliance	3
MBAA 517	Managerial Accounting for Decision Making	3
MAVM 601	Leadership in Global Aviation Maintenance Organizations	3
MAVM 605	Global Maintenance Resource Management	3
MAVM 615	Strategic Management of Global Maintenance, Repair and Overhaul (MRO) Operations	3
MAVM 620	Project Management for Aviation Maintenance	3
MAVM 691	Aviation Maintenance Graduate Capstone	3
Total Credits		30

Master of Entrepreneurship in Technology

Take your future to new heights!

The Master of Entrepreneurship in Technology (MoET) is a program designed to provide graduate students the knowledge necessary to take new technological innovations to market within the aviation/aerospace industry. The purpose is to provide a global understanding of entrepreneurship and technology-based ventures while using effectual reasoning principles to bring those new ventures to market relevant to the aviation/aerospace environment. Knowledge can be directed toward new company ventures or the collaboration of bringing new ideas into existing companies. The process will be accomplished through education in entrepreneurship and technology: exploration, identifying and development of technology-based ideas/ventures, analyze opportunities and business model design/development, ethical and legal issues, and technology commercialization in a global environment. As a partner with ERAU's Research Park, the MoET will provide students the tools to incubate viable entrepreneurial ideas. The program goal is to produce successful problem solving entrepreneurs who are qualified as individuals or through collaboration to create opportunities in the global aviation/aerospace industry.

DEGREE REQUIREMENTS

Core/Major

MOET 601	Entrepreneurship: Exploration, Opportunity and Effectuation	3
MOET 606	Entrepreneurship Ethics, Sedulity and Solutions	3
MOET 611	Technology Commercialization and Entrepreneurship in the Global Environment	3
ASCI 643	Management of Research and Development for the Aviation/Aerospace Industry	3
MGMT 671	Entrepreneurship and Leadership	3
MOET 691	Entrepreneurship Technology Capstone	3
Total Credits		18

Specialization	12
Select one specialization from the following areas:	
Total Degree Requirements	30

Specializations:

Unmanned Aerospace Systems		
UNSY 501	Application of Unmanned Systems	
ASCI 530	Unmanned Aerospace Systems	
ASCI 531	Robotics and Control	
ASCI 637	Unmanned Aerospace Systems Operations and Payloads	
Space Systems		
ASCI 511	Earth Observation and Remote Sensing	
ASCI 512	Space Mission and Launch Operations	
ASCI 513	Space Habitation and Life Support Systems	
ASCI 601	Applications in Space: Commerce, Defense, and Exploration	
System Engineering		
SYSE 500	Fundamentals of Systems Engineering	
SYSE 530	System Requirements Analysis and Modeling	
SYSE 610	System Architecture Design and Modeling	
SYSE 653	Cognitive Systems Engineering	
Information Systems Security		

MISA 531	Secure Information Systems Design
MISA 532	Integrated Threat Warning and Attack Assessment for Enterprise Information Systems
MISA 533	Product and Systems Safety and Reliability: Issues for Information Assurance
MISA 534	Aviation / Aerospace Issues for Information Security

Management Information Systems	
MMIS 503	Data & Information Modeling & Management
MMIS 504	Knowledge Management: Quality Management for the IS Enterprise
MMIS 505	Information Analytics and Visualization in Decision Making
MMIS 531	Information Systems Project Management

M.S. in Human Factors

The Master of Science in Human Factors (MSHF) is an online program tailored to working professionals who want to better understand the interrelationship between human performance and technology. The degree is focused on application, development, and leadership in a wide variety of industries concerned with human performance, system design and safety.

Students have the opportunity to pursue either an Aerospace or Systems Engineering track to tailor the learning experience to your specific needs. Along either track, you can expect to study: the way humans perceive and think about the world around them; human performance limitations and errors; virtual, robotic, and simulation environments and the human experience; and the impact of ergonomics, biomechanics, and anthropometrics on human effectiveness.

You will also delve into current and past events in which human error led to operational failures, and conduct a Capstone Research Project (or Thesis Research Project) as a core element of the curriculum in both the Aerospace and Systems Engineering tracks. Our goal is for you to emerge from the MS in Human Factors program with the ability as an industry leader with the knowledge to identify trends, analyze requirements, develop strategies, recommend solutions, and recognize opportunities for innovation in this field.

Some students will be offered the opportunity to complete a thesis in place of a capstone. This option will allow the student to complete original human factors research near the end of the MSHF degree program. It will also allow the student to complete the MSHF degree with 30 credits rather than 36 credits. The thesis option is offered to the student by the MSHF Program Chair based upon an evaluation of the student's early program performance in the criteria of analysis, evaluation, synthesis, critical thought, and writing skills. If the thesis option is offered the student must then qualify by taking the Graduate Record Examination (GRE) and earn scores in the top 50th percentile in the three areas of Verbal Reasoning, Quantitative Reasoning, and Analytic Writing. Optionally, students may present these same results for a GRE taken within the preceding five years.

The MSHF degree program does not include any elective courses and it follows a carefully prescribed prerequisite course progression. The Human Performance Core courses must be successfully completed before a student may progress to the Track Specialization courses. Similarly, both the Human Performance Core courses and the Track Specialization courses must be successfully completed before progressing to the Capstone or Thesis courses. Please see the individual course descriptions in this catalog for the specific prerequisites.

DEGREE REQUIREMENTS

Major/Core

Capstone Option

Human Performance Core:

MSHF 606	Human Cognition	3
MSHF 612	Human Performance, Limitation, and Error	3
MSHF 618	Virtual Environments, Simulation and Robotics	3
MSHF 624	Ergonomics and Biomechanics	3
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
Total Credits		18

Human Factors Specializations (select one):

Aerospace:		
ASCI 634	Aviation/Aerospace Psychology	3
MSHF 640	Human Physiology and Adaptation in Aerospace Environments	3
MSHF 646	Industrial Applications in Aerospace	3
MSHF 652	Crew Platform Automation, Design, and Integration	3
SYSE 653	Cognitive Systems Engineering	3
- OR-		
Systems Engineering:		
SYSE 500	Fundamentals of Systems Engineering	3
SYSE 641	Systems Psychology	3
SYSE 647	Human Factors in Complex Systems	3
SYSE 653	Cognitive Systems Engineering	3
MSHF 646	Industrial Applications in Aerospace	3
Total Credits		15

Research Completion:

MSHF 691	MSHF Graduate Capstone Course	3
Total Credits		3

Total Degree Requirements	36

Thesis Option

Human Performance Core:

MSHF 606	Human Cognition	3
MSHF 612	Human Performance, Limitation, and Error	3
MSHF 624	Ergonomics and Biomechanics	3
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
Total Credits		15

Human Factors Specializations (select one):

Aerospace		
ASCI 634	Aviation/Aerospace Psychology	3
MSHF 646	Industrial Applications in Aerospace	3
MSHF 652	Crew Platform Automation, Design, and Integration	3
- OR-		
Systems Engineering		
SYSE 641	Systems Psychology	3
SYSE 647	Human Factors in Complex Systems	3
SYSE 653	Cognitive Systems Engineering	3
Total Credits		9

Research Completion:

MSHF 700A	MSHF Thesis I	3
MSHF 700B	MSHF Thesis II	3
Total Credits		6

Total Degree Requirements	30

* The thesis topic will be required to be focused in the student's specialization track (Aerospace or Systems Engineering) and with a thesis committee chair from the same specialization.

** Students desiring to can follow a dual track option and specialize in both Aerospace and Systems Engineering by successfully completing the courses required for both specializations (though only one thesis will be required).

M.S. in Occupational Safety Management

The risk of workplace injuries, illnesses, and fatalities presents a serious threat in any industry. Organizations rely heavily upon safety and health professionals to help them mitigate these risks and maintain a safe and healthy work environment. This graduate-degree program helps students develop the skills and knowledge they need to effectively anticipate, recognize, evaluate, prevent, and control workplace safety and occupational health hazards within numerous industries.

Through the focused curriculum – which includes case studies, writing safety policies and initiatives, and participating in collaborative projects – the student will gain a solid foundation in the critical aspects of occupational safety and health, including:

- Safety Management
- Occupational Safety and Health Management
- Fire Safety
- Safety Legislation
- Human Factor and Ergonomics
- Disaster Management
- Systems Safety
- Regulatory Compliance
- Industrial Hygiene
- Environmental Protection

The intensive research component will expose you to statistics and research methodology that is both applicable to the workplace and good preparation for a doctoral program. Students have the option to select the Graduate Capstone Project or Thesis option, which will provide the opportunity to explore a real-world safety and/or health problem, applying your new knowledge to develop a workable solution. The thesis option provides for a more rigorous analysis of occupational safety and health problems and is best suited for students planning to pursue doctorate degrees and management positions, or who are seeking to enhance their research skills.

The Occupational Safety Management coursework also helps prepare students for certification by the Board of Certified Safety Professionals.

The MSOSM is a Board of Certified Safety Professionals (BCSP) Qualified Academic Program (QAP). A QAP is an academic degree program in safety, health and/or environmental practices meeting BCSP standards for participation and whose curriculum has been reviewed as showing a substantial match to the Associate Safety Professional® (ASP) blueprint.

The MSOSM is designated as a Graduate Safety Practitioner® (GSP) program. The GSP is a designation available to graduates from degree programs that meet BCSP QAP standards. The GSP designation is an alternate path to the Certified Safety Professional®(CSP), waiving the requirement to sit for the ASP exam. The GSP is not a certification, and graduates must apply at the link provided below.

Benefits of the GSP designation are:

- Recognition for being in a path toward the CSP certification
- Recognition for the level of preparation for professional safety practice
- No GSP application fee
- A waiver of the ASP examination requirement for CSP eligibility
- A certificate awarding the GSP designation

BCSP and GSP details provided by http://www.bcsp.org/GSP

Upon completion of the program, your focused skills and specialized degree will distinguish you as an astute and knowledgeable safety management professional. With this distinction, you will be ready to take on occupational safety and health leadership positions – including director of safety, safety manager, safety consultant, compliance officer, and loss-control manager – in virtually every occupational setting.

Program Specific Criteria

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. Graduate level prerequisite courses taken with ERAU must be completed with a grade of B or better.

*Applicants for admission to the **Master of Science in Occupational Safety Management (MSOSM)** program must have prerequisite knowledge in the following areas:*

- *Quantitative Methods*

Students should assume responsibility to see that prerequisites are satisfied. The prerequisite subject knowledge for a specific graduate course must be satisfied before enrollment in that specific course is permitted. Students may enroll in other graduate-level courses as they meet any specific prerequisite knowledge required.

The prerequisite knowledge can be validated through one of the following:

1. *Completed an undergraduate or graduate course in each of the specific subject areas and upon validation of the course from an official transcript; **-OR-***
2. *Completed a course listed in either the National or ACE Guide for which academic credit in one of the specific subject areas is recommended; **-OR-***
3. *Received at least the minimum recommended score on a CLEP, DSST/DANTES, PEP, etc. exam in each of the subject areas as required**.***

DEGREE REQUIREMENTS

Core/Major

Capstone Option

MSOSM Capstone Option		
Students selecting the Capstone Option are required to complete SFTY 691 Graduate Capstone Course, as the final culminating course:		
SFTY 510	Industrial Hygiene & Toxicology	3
SFTY 530	Safety, Health and Environmental Legislation, Litigation & Compliance	3
SFTY 540	Disaster Preparedness and Emergency Response	3
SFTY 570	Fire Safety Management	3
SFTY 580	Environmental Protection for the Safety, Health and Environmental Manager	3

SFTY 590	Hazard Control Methods in Occupational Safety and Health	3
SFTY 600	Occupational Safety and Health Management	3
SFTY 619	Human Factors and Ergonomics	3
SFTY 630	System Safety Programs	3
Research Core:		
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
SFTY 691	Graduate Capstone Course	3
Total Credits		36

Thesis Option

MSOSM Thesis Option		
Students selecting the Thesis Option are required to complete SFTY 700A MSOSM Thesis I and SFTY 700B MSOSM Thesis II as their final culminating courses, and select either SFTY 540 or SFTY 570. Students electing the thesis option must take the GRE. Refer to Master of Science in Occupational Safety and Health Thesis Policy Guide for minimum GRE scores and additional guidance:		
SFTY 510	Industrial Hygiene & Toxicology	3
SFTY 530	Safety, Health and Environmental Legislation, Litigation & Compliance	3
SFTY 540	Disaster Preparedness and Emergency Response	3
or SFTY 570	Fire Safety Management	
SFTY 580	Environmental Protection for the Safety, Health and Environmental Manager	3
SFTY 590	Hazard Control Methods in Occupational Safety and Health	3
SFTY 600	Occupational Safety and Health Management	3
SFTY 619	Human Factors and Ergonomics	3
SFTY 630	System Safety Programs	3
Research Core:		
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
SFTY 700A	MSOSM Thesis I	3
SFTY 700B	MSOSM Thesis II	3
Total Credits		36

Master of Systems Engineering

Complex engineering projects are at the heart of modern business. In order to innovate, adapt, thrive, and survive, organizations must undertake efforts that require the coordination of different teams, the understanding of complex technology and tools, and the integration of interdepartmental work processes. Leaders who can effectively manage these efforts are in high demand across many industries.

The Master of Systems Engineering (MSYSE) degree program prepares and qualifies students to take on such a role. Through this focused curriculum, students will establish a solid foundation of fundamental systems-engineering knowledge, learning how to apply a systems perspective to business and technology.

The program is offered in two tracks, allowing students to tailor their education to their career goals. The Technical track concentrates on system design, analysis, and implementation. The Engineering Management track concentrates on organization, process, and management.

The MSYSE delivers exceptional learning and an esteemed credential for systems engineers entering the field, engineers wishing to broaden their perspective or advance to management positions, and managers seeking the knowledge and skills necessary for engineering products and services from a systems perspective.

Program-Specific Criteria

Admissions Criteria

Applicants and students requesting an internal transfer to MSYSE should meet at least one of the following criteria-

- *Applicant holds an undergraduate degree from an ABET accredited engineering or engineering technology program and has a 3.0 CGPA or higher on a 4.0 scale in that ABET program*

OR

- *Applicant has successfully completed an equivalent to both MATH 242 and STAT 211/222 and have a 3.0 CGPA or higher in their undergraduate program*

Any applicants with graduate coursework must meet the established graduate transfer CGPA as well.

NOTE: Applicants who fail to satisfy the guidelines for full admission may be considered for possible conditional admission under circumstances determined by the Admissions Office or Program Chair. The candidate will be notified of academic conditions of admission, including specific information on required course prerequisites, at the time a decision is rendered. Students granted custom conditional admission must adhere to the individual terms outlined in their letter of admission and will remain on conditional status until they have satisfied the terms of their conditional admission.

In addition, applicants must submit

- *Three (3) letters of recommendation, including one (1) from a recent instructor or trainer*
  *Download the **MSYSE Program Recommendation Form*** (http://worldwide.erau.edu/Assets/worldwide/forms/WW_graduate-reference.pdf)
- *Resume outlining work experience, education, relevant activities and awards*
- *A type-written* Statement of Objectives*, demonstrating a strong capacity for written communication and addressing the following topic areas-*
  - *The applicant's understanding, in their own words, of what Systems Engineering entails*
  - *The applicant's background and exposure to engineering to-date, in both their academic and professional career*
  - *A statement of the particular MSYSE track the applicant intends to pursue (Technical or Management) and a discussion of why this election was made; If the applicant has chosen an elective set, disclosure and justification of elective selections may also be included*
  - *An explanation of the applicant's overall academic and career objectives, including how the applicant believes that the MSYSE program will positively contribute to the achievement of stated goals*

Current students requesting to transfer into the MSYSE program will be required to meet the same program requirements stated above.

Prerequisite Knowledge

Graduate level prerequisite courses taken with ERAU must be completed with a grade of B or better.

The Master of Systems Engineering degree program is designed to instill specific skills and knowledge, with courses reinforcing one another, building toward student mastery. Access a Curriculum Map (http://worldwide.erau.edu/Assets/worldwide/forms/MSE-Core-Curriculum.pdf), outlining the Program Outcomes and suggested sequencing of student coursework.

DEGREE REQUIREMENTS

Core/Major

SYSE 500	Fundamentals of Systems Engineering	3
SYSE 530	System Requirements Analysis and Modeling	3
SYSE 560	Introduction to Systems Engineering Management	3
SYSE 625	System Quality Assurance	3
SYSE 697	Systems Engineering Project	3
Select one track from the following:		3
Technical Track		
SYSE 610	System Architecture Design and Modeling	
Engineering Management Track		
SYSE 660	Organizational Systems Management	
Total Credits		18

Electives

Electives	
Electives will be chosen from existing Embry-Riddle Daytona Beach and Worldwide courses in other disciplines, and must be approved by the Program Chair.	12
Total Credits	12
Total Degree Requirements	30

M.S. in Unmanned and Autonomous Systems Engineering

The 30-credit, online Master of Science in Unmanned and Autonomous Systems Engineering (MSUASE) program enables career establishment and advancement in a rapidly changing field through the development of innovative solutions operating along the spectrum of autonomy, including unmanned aircraft, autonomous cars, robotic surface and underwater vessels, spacecraft, and industrial robots. The degree is built on rigorous multidisciplinary coursework designed to provide a flexible, online, graduate educational option to develop and demonstrate knowledge attainment through project-based experiences. The curriculum features integration and application of concepts, protocols, and techniques in unmanned and autonomous systems: systems engineering, architecture, and design; safety and certification; requirements development analysis; modeling; command, control, and communication (C3); and human factors. Through the review of design, performance, and operational specifications to system testing and evaluation of end-to-end solutions, students gain comprehensive insight and practical experience affecting development, acquisition, fielding, and sustainment of unmanned system designs.

The MSUASE culminates in a two-term capstone project, conducted independently or in a team setting, to develop a technical solution to a critical real world challenge and leading to publication (e.g., conference paper, journal article, or technical report).

Program-Specific Criteria

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. Applicants to the MSUASE program must meet the following requirements:

- Have completed a bachelor's degree in an Accreditation Board for Engineering and Technology (ABET) accredited engineering program, international equivalent, or closely related engineering discipline.
  NOTE: Graduates of Embry-Riddle's Bachelor of Science in Unmanned Aircraft Systems Science (BSUASS), BS in Unmanned Systems Application (BSUSA), BS in Engineering Technology (BSET), and BS in Engineering (BSE) degree programs may be admitted, conditionally, upon completion of undergraduate engineering courses requisite for knowledge and skills, to be specified at the time of admission.
- Have superior academic records with a minimum cumulative grade point average (CGPA) of 3.0;
- Complete the Graduate Record Examination (GRE);
- Submit a complete application package before the deadline specified in the University catalog.
  NOTE: International applicants whose primary language is not English must also achieve the minimum score requirement of Test of English as a Foreign Language (TOEFL) or International English Language Test System (IELTS) as required by the University.

DEGREE REQUIREMENTS

Core/Major

SYSE 500	Fundamentals of Systems Engineering	3
UASE 501	Introduction to Unmanned Aircraft Systems Design	3
SYSE 505	System Safety and Certification	3
SYSE 530	System Requirements Analysis and Modeling	3
ASCI 531	Robotics and Control	3
UNSY 601	Unmanned Systems Command, Control, and Communications	3
SYSE 610	System Architecture Design and Modeling	3
ASCI 638	Human Factors in Unmanned Aerospace Systems	3
UASE 691	Unmanned and Autonomous Systems Capstone Design Project I	3
UASE 692	Unmanned and Autonomous Systems Capstone Design Project II	3
Total Degree Requirements		30

M.S. in Unmanned Systems

Unmanned systems range from small unmanned aircraft systems (UAS) used to explore volcanoes and other dangerous environments to robotic rovers operating on distant planetary bodies, all with the common goal of ensuring safe, efficient, and effective operations. The Master of Science in Unmanned Systems (MSUS) degree provides students with an education focused on the application, development, and management of unmanned systems, policies and regulations, and related technology necessary to support the growing and dynamic needs of the industry.

This program supports the growth, innovative development, and effective use of unmanned system technology across the respective domains (air, space, ground, and maritime) to address major challenges within the industry, including interoperability, autonomy, airspace integration, communications, education and training, propulsion and power, teaming, and regulation.

The MSUS provides an interactive learning environment to acquire and apply knowledge, work in independent and team settings, communicate across a geographically and experientially diverse population, and assume leadership roles, which represent the fundamental skills necessary to establish or advance a successful career in today's competitive and collaborative working environment.

Program-Specific Criteria

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. Graduate level prerequisite courses taken with ERAU must be completed with a grade of B or better.

Applicants for admission to the ***Master of Science in Unmanned Systems (MSUS)*** program must have prerequisite knowledge in the following areas:

- Quantitative Methods

Students should assume responsibility to see that prerequisites are satisfied. The prerequisite subject knowledge for a specific graduate course must be satisfied before enrollment in that specific course is permitted. Students may enroll in other graduate level courses as they meet any specific prerequisite knowledge required.

The prerequisite knowledge can be validated through one of the following:

1. Completed an undergraduate or graduate course in each of the specific subject areas and upon validation of the course from an official transcript;-OR-
2. Completed a course listed in either the National or ACE Guide for which academic credit in one of the specific subject areas is recommended; -OR-
3. Received at least the minimum recommended score on a CLEP, DSST/DANTES, PEP, etc. exam in each of the subject areas as required.

DEGREE REQUIREMENTS

Core/Major

ASCI 531	Robotics and Control	3
UNSY 501	Application of Unmanned Systems	3
UNSY 601	Unmanned Systems Command, Control, and Communications	3
UNSY 605	Unmanned Systems Sensing, Perception, and Processing	3
UNSY 610	Unmanned Systems Autonomy and Automation	3
UNSY 615	Unmanned Systems Power, Propulsion, and Maneuvering	3
RSCH 665	Statistical Analysis	3
RSCH 670	Research Methods	3
UNSY 691	Graduate Capstone Course	3
Total Credits		27

Electives

Electives	9

Select one elective concentration from the following areas (includes three specific courses per):

Total Degree Requirements	36

Concentrations:

Unmanned Aerospace Systems (UAS) Concentration

ASCI 530	Unmanned Aerospace Systems	3
ASCI 637	Unmanned Aerospace Systems Operations and Payloads	3
ASCI 638	Human Factors in Unmanned Aerospace Systems	3

Aeronautics and Design Concentration

ASCI 509	Advanced Aerodynamics	3
ASCI 515	Aviation/Aerospace Simulation Systems	3
ASCI 623	Aircraft Design and Development	3

Human Factors Concentration

ASCI 634	Aviation/Aerospace Psychology	3
ASCI 638	Human Factors in Unmanned Aerospace Systems	3
ASCI 660	Sensation and Perception	3

Space Systems Concentration

ASCI 511	Earth Observation and Remote Sensing	3
ASCI 512	Space Mission and Launch Operations	3
ASCI 601	Applications in Space: Commerce, Defense, and Exploration	3

Safety/Emergency Response Concentration

SFTY 540	Disaster Preparedness and Emergency Response	3
ASCI 621	Aviation/Aerospace Safety Program Management	3
SFTY 630	System Safety Programs	3

Operations Concentration

ASCI 606	Global Air Traffic Control and Management	3
ASCI 637	Unmanned Aerospace Systems Operations and Payloads	3
ASCI 645	Airport Operations and Management	3

Education Concentration

ASCI 550	Aviation Education Foundations	3
ASCI 614	Advanced Aviation/Aerospace Curriculum Development	3
ASCI 654	Adult Teaching and Learning Techniques	3

Aviation/Aerospace Management Concentration

BUSW 500	Business Foundations	3
MGMT 524	Management Science	3
MGMT 651	Production and Procurement in the Aviation and Aerospace Industry	3

Aviation/Aerospace Research Concentration

ASCI 530	Unmanned Aerospace Systems	3
ASCI 638	Human Factors in Unmanned Aerospace Systems	3
ASCI 643	Management of Research and Development for the Aviation/Aerospace Industry	3

Small Unmanned Aircraft System (sUAS) Operation Concentration

Students declaring the sUAS Operation Concentration or registering for courses within it must be U.S. citizens or permanent residents and must be physically located within the U.S. when registering for and while participating in the UNSY 520 course. Students must contact their Academic Advisor regarding additional cost, possible travel, and FAA Testing, prior to enrolling in the first course of this concentration, UNSY 515. Those already in possession of an FAA Part 107 Remote Pilot certificate, prior to starting the concentration, may complete ASCI 530, in lieu of UNSY 515 to ensure sufficient credit, research experience, and topical exposure.

UNSY 515	sUAS Operation Fundamentals	3
UNSY 520	sUAS Practical Application and Assessment	3
UNSY 620	sUAS Operational Planning and Safety Management	3

Minor in Aviation Maintenance Operations

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Not open to BS in Aviation Maintenance students.

ASCI 322	Aircraft Inspection and Scheduled Maintenance Programs	3
ASCI 327	Aviation Work Force Management in a Global Environment	3
ASCI 416	Aviation Maintenance Management: A Global Perspective	3
ASCI 424	Maintenance Repair and Overhaul in Aviation	3
ASCI 429	Advanced Technologies in Design and Production of Aircraft Structures & Systems	3
ASCI 433	Aviation Logistics and Supply Chain Management	3
Total Credits		18

Minor in Aviation Safety

Aviation Safety is an exciting facet of the aviation field that deals with predicting and preventing flight accidents, and aviation safety management. This minor will help students to learn the basics of safety and accident prevention by studying human factors of accidents, mechanical failures, and systems failures. Additionally, the Aviation Safety minor program is designed to provide students with a knowledge of practices and procedures used in establishing and maintaining an effective safety program and promote a safety culture.

This program will serve as a foundation for students with an interest in pursuing graduate work or a career in this area of study.

Not open to BS in Safety Management students

SFTY 320	Human Factors in Aviation Safety	3
SFTY 330	Aircraft Accident Investigation	3
SFTY 335	Mechanical and Structural Factors in Aviation Safety	3
SFTY 345	Aviation Safety Program Management	3
SFTY 409	Aviation Safety	3
SFTY 440	System Safety Management	3
Total Credits		18

Minor in Engineering Sciences

The overall goal of the Engineering Sciences Minor is to provide insight into what engineers do, and an understanding of the tools and techniques they use. Participants in the engineering sciences minor program will not become engineers, but they should dramatically increase their ability to integrate their skills and communicate effectively with engineering professionals. They will acquire a conceptual understanding of what engineering, engineering design process, technology, and technology-related concepts are.

The program is designed to be an effective minor to supplement students' non-engineering degree programs. This program is designed for students who are not engineering majors but are interested in understanding "how things work;" and are looking at management, technical marketing, sales, and related careers in an industry such as aviation and aerospace that continues to involve more technology.

Not open to BS in Technical Management – Engineering Sciences Major, BS in Engineering Technology, or BS in Engineering students

ESCI 105	Fundamentals of Engineering	3
MATH 241	Calculus and Analytical Geometry I	4
PHYS 150	Physics I for Engineers	3
ESCI 201	Statics	3
ETEC 310	Material Science for Engineering Technology	3
SFTY 335	Mechanical and Structural Factors in Aviation Safety	3
ASCI 429	Advanced Technologies in Design and Production of Aircraft Structures & Systems	3
Total Credits		22

* Note: Prerequisite for MATH 241 is MATH 142 or MATH 143. Engineering Sciences Minor students should not take MATH 112, but rather MATH 142. Upon successful completion of MATH 142/241, students will receive credit for MATH 112.

Minor in Helicopter Operations and Safety

Helicopter operations represent a multidisciplinary component of the aviation industry with over 55 designated missions. The helicopter has exceptional versatility, which is instrumental in the continued growth of the industry. Students are exposed to historical, manufacturing, safety and operational aspects of the helicopter industry. To comprehend these aspects, students are exposed to physiological issues, challenges in flight environments, newest technologies, the integration of aviation safety, and combining it all together to learn and apply to an actual helicopter operation. This program was designed with the helicopter industry to provide students with applicable knowledge essential to understanding its multidisciplinary aspects.

ASCI 317	Rotorcraft	3
ASCI 378	Helicopter Flight Environments	3
ASCI 388	Helicopter Flight Planning	3
ASCI 428	Advanced Helicopter Systems and Functions	3
ASCI 438	Advanced Helicopter Operations	3
SFTY 409	Aviation Safety	3
Total Credits		18

Minor in Occupational Safety and Health

The Minor in Occupational Safety and Health brings basic skill and knowledge in the field of Safety and Health in order to be able to take into account hazards and associated risks present in our surrounding environment that could be threatening for any industry. Safety is clearly a challenge for our organizations to prevent losses. Moreover, making a safer workplace is always rewarding for people, goods, environment and profit. Though the focused curriculum, you could gain a first foundation in the critical aspects of occupational safety, including:

- Fundamentals of Occupational Safety and Health;
- Ergonomics;

- Industrial Hygiene and Toxicology;
- System Safety Management;
- Fire Protection;
- Systems Design for Fire and Life Safety;
- Loss Control and Insurance;
- Construction Safety;
- Environmental Compliance and Safety;
- Occupational Safety and Health.

Not open to BS in Technical Management – Occupational Safety & Health Major and BS in Safety Management students.

SFTY 311	Fundamentals of Occupational Safety and Health	3
SFTY 321	Ergonomics	3
SFTY 355	Industrial Hygiene and Toxicology	3
SFTY 341	Occupational Safety and Health Program Management	3
SFTY 410	Design of Engineering Hazard Controls	3
SFTY 470	Advanced Occupational Safety and Health Technology	3
Total Credits		18

Minor in Security and Intelligence

There has never been a time with such a need for security and intelligence professionals in the aviation security, commercial security, and the intelligence communities. The protection of aviation assets and the national security of the United States is paramount with today's security threats.

This exciting degree minor will provide the student with knowledge to work in this demanding career field. It is designed to provide the student with practical applications that will be of value when actually working in the profession.

The security and intelligence minor is also of value to those not working in the security profession but who may be assigned such security responsibility as a collateral duty.

Not open to B.S. in Aviation Security students.

SCTY 310	Introduction to Security	3
SCTY 315	Studies in Intelligence I	3
SCTY 385	Intelligence Collection and Analysis	3
SCTY 400	Airport Security	3
SCTY 485	Corporate Security	3
SCTY 488	National Security Issues and Terrorism	3
Total Credits		18

Minor in Small Unmanned Aircraft System (sUAS) Operation

The Small Unmanned Aircraft System Operation minor will provide students with the knowledge, skills, and abilities (KSAs) specific to the safe, responsible, and effective operation and application of small unmanned aircraft systems (sUAS). The goal is to give students an opportunity to work towards an sUAS operator certification within the framework of the university's academic setting. While core content required for successful completion of FAA theoretical knowledge testing will be provided, the minor also aims to build some operational experience and skills beyond the basic scope of FAA certification, thus, expanding the student's KSAs in planning, execution, and support of sUAS operation.

Eligibility:
Students declaring the sUAS Operation Minor or registering for courses within it must be U.S. citizens or permanent residents and must be physically located within the U.S. when registering for and while participating in the UNSY 435 course.

Important Notes:
1) Students must contact their Academic Advisor regarding additional cost, possible travel, and FAA Testing, prior to enrolling in the first course of this minor.
2) Courses must be taken in the sequence as outlined in the requirements below.

ASCI 121	Private Pilot Operations	5
ASCI 316	Operational and Business Aspects of Unmanned Aerial Systems	3
UNSY 235	sUAS Flight and Mission Planning	3
UNSY 235L	sUAS Flight and Mission Planning Laboratory	1
UNSY 435	sUAS Practical Application and Assessment	3
Select one of the following courses:		3
SFTY 345	Aviation Safety Program Management	
SFTY 409	Aviation Safety	
SFTY 440	System Safety Management	
Total Credits		18

Minor in Transportation

The field of transportation provides rewarding opportunities in multiple careers paths. Transportation is an ever changing ubiquitous and expanding industry that requires professionals with the capability to safely operate, use, and manage the many modes of transportation systems around the globe. The minor in Transportation will provide the skills and knowledge enabling an individual to become successful in an industry that is the foundation of our modern economy. There is a consistent and growing demand for skilled professionals in all modes of transportation providing outstanding opportunities in the business, commercial, government, and military sectors. Through this minor course of study you will acquire the background to the essential principles, including the regulatory and legal concepts, necessary for a successful and rewarding career in an industry that on a daily basis affects all of us worldwide.

Not open to BS in Transportation students.

TRAN 274	Transportation Science	3
TRAN 321	Air Transportation Systems	3
TRAN 331	Road & Highway Transportation	3
TRAN 401	Transportation and the Environment	3
TRAN 411	Strategic Intermodal Alliances	3
TRAN 421	Transportation Safety and Security	3
Total Credits		18

Minor in Unmanned Aerial Systems

Unmanned aerial systems (UAS) represent a significantly growing segment of the aviation/aerospace industry that provides an important capabilities modifier for military, civil, and commercial users. Understanding the historical background, development, integration, and application of this technology, coupled with a detailed comprehension of the regulatory framework, support requirements, advantages and limitations, industry needs, elemental composition, and planning provisions, provides students with the knowledge necessary to succeed in this field. Through this minor course of study you will gain exposure and experience connected to the fundamental concepts, principles, and methods associated with the use, development, configuration, and support of UAS and the associated technology.

Not open to BS in Unmanned Systems Applications students

ASCI 315	Unmanned Aerial Systems and Operations	3

ASCI 316	Operational and Business Aspects of Unmanned Aerial Systems	3
ASCI 318	Unmanned Aerial Systems Robotics	3
ASCI 404	Applications in Aviation/Aerospace Law	3
ASCI 406	Airborne Law Enforcement	3
ASCI 410	Unmanned Systems Sensing Technology	3
Total Credits		18

Aviation Maintenance Technology Part 65

The Aviation Maintenance Technology Certificate provides broad knowledge of general aeronautics, airframe systems, and powerplant systems. The curriculum consist of six courses taken in-residence or online.

Courses taken in this Certificate of Completion can be used to prepare for the A&P testing process. For those individuals who meet the experience requirements established by the FAA, these courses help prepare the applicant for the written, oral, and practical examinations. Experience requirements can be found in Part 65 of the Federal Aviation Regulations.

To be eligible for the award of an undergraduate certificate, a student must achieve a cumulative GPA of 2.0 or higher for the courses included in the degree program. The cumulative GPA for the series of courses in the certificate program must be 2.8 or higher on a 4.0 scale.

Note: Certificate programs are not eligible for Title IV Federal Financial Aid.

Aviation Maintenance Technology Part 65

Certificate of Completion

AMNT 240	General Aeronautics and Applications	3
AMNT 260	Aircraft Electrical Systems Theory	3
AMNT 270	Airframe Structures and Applications	3
AMNT 271	Airframe Systems and Applications	3
AMNT 280	Reciprocating Engine Theory and Applications	3
AMNT 281	Turbine Engine Theory and Applications	3
Total Credits		18

College of Arts and Sciences

The mission of the College of Arts and Sciences is to promote in students the development of competency in inquiry and problem-solving skills, communication skills, and ethical interaction with the contemporary social world.

This mission is accomplished by striving, in every interaction and at every moment during the educational process, to achieve seven encompassing and mutually informative core outcomes: critical thinking, quantitative reasoning, information literacy, communication, scientific literacy, cultural literacy and lifelong personal growth.

For Faculty lists and other information, view the College of Arts and Sciences (http://worldwide.erau.edu/degrees-programs/colleges/arts-sciences) website.

B.S. in Communication

The Bachelor of Science in Communication requires students to integrate knowledge of science and technology with practice in communication. In this program, students learn how scientists think, how they frame research questions, and how they use various methodologies to pursue their goals. Communication students additionally practice gathering, analyzing, and disseminating scientific and technological information to a variety of audiences. A significant element of the program is the capstone course, completing a senior project or an internship****.

As modern society is increasingly influenced by developments in science and technology, the demand for skilled communicators in these fields continues to grow. Aviation, aerospace, and technology industries, for example, require more internal communication specialists, as well as professionals in media and public relations, to relay information clearly and accurately. This program addresses that nationwide necessity.

News organizations rely on science communicators in various fields, including meteorology, environmentalism, medicine, and technology. Communication students work in traditional written media, such as newspapers, newsletters, magazines, and journals, as well as in cutting-edge information retrieval and delivery systems, including Web sites, networked blogs and social media.

This focused, yet flexible, course of study requires students to hone specialized communication skills and to assemble portfolios displaying those skills. These graduates, the next generation of communication specialists, are positioned to enter three specific career paths, including:

1. Communicating science information to specific and general audiences through a variety of mass media,
2. Representing companies and organizations through media relations, using written, oral, and visual media, and
3. Communicating news to general audiences through print and electronic media.

The Bachelor of Science degree in Communication requires successful completion of a minimum of 120 credit hours, of which 40 credit hours must be upper-level courses (300-400 level).

The Communication program requires coursework in General Education, the Communication Core, Communication Specified Electives, a Minor, and Open Electives.

*****Due to state authorization requirements, internships must be conducted in approved states only.*

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, and Humanities and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
ENGL 221	Technical Report Writing	3
or ENGL 222	Business Communication	
SPCH 219	Speech	3
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective (History/Government/Social Science/ Psychology/Economics)		3
Physical and Life Science Lower-Level electives		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
or MATH 140 & MATH 142	College Algebra and Trigonometry	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Communication Core		33
Aviation, Science, & Technology Foundation		9
COMD 225	Science and Technology Communication	3
COMD 260	Introduction to Media	3
COMD 265	Introduction to Newswriting and Reporting	3
COMD 320	Mass Communication Law and Ethics	3
COMD 322	Aviation and Aerospace Communication	3
COMD 335	Technology and Modern Civilization	3
COMD 350	Environmental Communication	3
COMD 360	Media Relations I	3
COMD 362	Communication and Organizational Culture	3
COMD 415	Nonverbal Communication	3
COMD 495	Senior Project	3**
or COIN 496	Co-Operative Education	
**When taken as a part of the BS Communication degree, COIN 496 is a 3 credit hour course, and credit hours are approved by the Program Chair.		
Select three courses from the following options:		
ASCI 202	Introduction to Aeronautical Science	3
ASCI 254	Aviation Legislation	3
ASCI 260	Unmanned Aerial Vehicles and Systems	3
PHYS 142	Introduction to Environmental Science	3
SFTY 201	Introduction to Health, Occupational, and Transportation Safety	3
SFTY 205	Principles of Accident Investigation	3

TRAN 274	Transportation Science	3
WEAX 201	Meteorology I	3
Total Credits		42

Electives

Communication Specified Electives		9
Select three courses from the following options:		
COMD 230	Digital Photography	3
COMD 295	Rhetorical Strategies and Analysis	3
COMD 363	Communication and Society	3
COMD 364	Visual Design	3
COMD 420	Applied Cross Cultural Communication	3
COMD 460	Media Relations II	3

(View Minors) (p. 95)

Minor* **	15-21
Select a minor, in consultation with your advisor.	
***For students in the Bachelor of Science in Communication degree program the RSCH 202 prerequisite for courses in a minor is waived since RSCH 202 is not required for the program.	
Open Electives	12-18
Open elective credits are dependent upon the selected minor.	
Total Degree Requirements	120

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Emergency Services

The Emergency Services degree program provides students with the theoretical foundations for leadership and administration in fire and emergency services response organizations.

The curriculum includes the principles, theory, and practices associated with today's emergency response professionals. The program is regionally academically SACS accredited and FESHE recognized.

The B.S. in Emergency Services degree broadly encompasses all emergency services response disciplines in public and private sectors including: fire, emergency medical, investigation, engineering, aircraft rescue and firefighting, environmental, hazmat, inspection, dispatch, security, OSHA, instruction, public information, wildland firefighting, etc. Concepts covered include human behavior, structures and systems, prevention, protection, investigation and analysis, organization and management, research, administration, hazardous materials, personnel management, political and legal foundations, terrorism, community risk reduction, disaster planning and control, system design for life safety, occupational safety, and human program management.

The curriculum design for this degree is based on in the National Fire Academy's (https://www.usfa.fema.gov/training/prodev/model_courses.html) Fire and Emergency Services Higher Education (FESHE) Model Curriculum for a Bachelor's Degree. When students complete courses through Embry-Riddle Aeronautical University, they receive a National Fire Academy certificate just as if they completed the courses at the National Fire Academy. Beyond the six FESHE core courses, several additional ERAU-developed courses have been approved for students to receive NFA certificates—this is a unique advantage of taking classes at ERAU.

The Bachelor of Science degree in Emergency Services is one of only a handful of programs around the world to have regional accreditation by Southern Association Colleges and Schools (SACS), International Fire Service Accreditation Congress (IFSAC) accreditation and FESHE recognition which all lead to demonstrate our programs excellence and student dedication.

There are two specializations currently offered at the baccalaureate level: Aviation Emergency Management, and Fire and Emergency Services.

- The Aviation Emergency Management Specialization has a focus on aircraft accident crash investigation, airport emergency management, aviation safety, and leadership in emergency response organizations.
- The Fire and Emergency Services Specialization focuses on emergency response administration, management, leadership, community risk reduction, and operational issues in emergency services.

This degree program participates in the Air University-Associate to Baccalaureate Cooperative (AU-ABC Category I). All students who have completed a Community College of the Air Force (CCAF) associates degree in Fire Science and Emergency Management are eligible. CCAF graduates can complete a Bachelor of Science in Emergency Services by taking no more than 60 semester hours beyond their CCAF degree.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, and Humanities and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective (History/Government/Social Science/Psychology/Economics)		3
Physical and Life Science Lower-Level electives		
Physics/Biology/Meteorology/Chemistry		6
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
or MATH 140 & MATH 142	College Algebra and Trigonometry	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Program Support		9
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
WEAX 201	Meteorology I	3
RSCH 202	Introduction to Research Methods	3
Program Specialization		39
Choose one Specialization		

Electives

Open Electives**	27

** Students are allowed to utilize their elective credits to select any Minor (p. 95) offered in the catalog.

Specified Electives	9
Choose 9 credits from ASCI/ SFTY/FIRE/ESVS Courses	
Total Degree Requirements	120

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

Program Specializations:

Aviation Emergency Management Specialization

FIRE 302	Fire Dynamics	3
FIRE 303	Fire Protection Structures and Systems	3
FIRE 305	Fire Prevention Organization and Management	3
FIRE 400	Analytical Approaches to Public Fire Protection	3
FIRE 401	Applications of Fire Research	3
ESVS 301	Community Risk Reduction for the Fire and Emergency Services	3
ESVS 403	Disaster Planning and Control	3
ESVS 404	Managerial Issues in Hazardous Materials	3
ESVS 405	Personnel Management for Fire and Emergency Services	3
ESVS 480	Advanced Principles in Fire and Emergency Services Safety and Survival	3
SFTY 330	Aircraft Accident Investigation	3
SFTY 350	Aircraft Crash and Emergency Management	3
SFTY 409	Aviation Safety	3
Total Credits		39

Fire and Emergency Services Specialization

FIRE 201	Fire-Related Human Behavior	3
FIRE 303	Fire Protection Structures and Systems	3
FIRE 304	Fire Investigation and Analysis	3
FIRE 305	Fire Prevention Organization and Management	3
FIRE 400	Analytical Approaches to Public Fire Protection	3
FIRE 401	Applications of Fire Research	3
FIRE 406	Political and Legal Foundations of Fire Protection	3
ESVS 301	Community Risk Reduction for the Fire and Emergency Services	3
ESVS 402	Fire and Emergency Services Administration	3
ESVS 403	Disaster Planning and Control	3
ESVS 404	Managerial Issues in Hazardous Materials	3
ESVS 405	Personnel Management for Fire and Emergency Services	3
ESVS 480	Advanced Principles in Fire and Emergency Services Safety and Survival	3
Total Credits		39

B.S. in Homeland Security

The Bachelor of Science in Homeland Security (BSHS) degree is based on the needs of the U.S. government and its citizens as well as the needs of the private sector. The BSHS degree combines the University's General Education requirements with a solid core of homeland security courses as well as minors in international relations, cybersecurity or several other minors available to the student. In addition, this degree allows the student to take maximum advantage of transfer credits and electives in order to explore breadth in related areas of study.

The Homeland Security degree is designed for students who have an interest in obtaining a strong foundation in many of the domains of the growing homeland security enterprise, including terrorism studies, law and policy, emergency management, risk analysis, intelligence, physical security, environmental security, asymmetric warfare, and decision making/strategic planning. In addition, students can choose from two ways to specialize their homeland security education; either through (a) taking two minors or (b) one minor and at least a 15 credit "coherent block of courses" (with permission from the BSHS program coordinator). Senior capstone projects require students to work with local organizations to solve real homeland security or emergency management challenges. Internships or cooperative work experiences optimize the student's professional preparation and credentials.

The goal of the degree is to produce highly marketable graduates with entry-level skills such as the ability to perform risk analyses, write emergency management and continuity of operations plans, design and evaluate exercises, design and perform physical security evaluations, design and deliver professional briefings, and understand how to identify and protect critical infrastructure. Graduates of this program will find employment opportunities in federal or state government, universities, and the military or in the private sector. In addition, the BSHS program is ideal preparation for further study in graduate school, including law, public policy, or emergency management, intelligence analysis, business, criminal justice, political science, national security studies, international affairs, and other related fields.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, and Humanities and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective		3
Social Sciences		
ECON 210	Microeconomics	3
or ECON 211	Macroeconomics	
Social Science elective (History/Government/Social Science/ Psychology/Economics)		3
Physical and Life Science Lower-Level electives		
Physics/Biology/Meteorology/Chemistry		6
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
or MATH 140 & MATH 142	College Algebra and Trigonometry	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Homeland Security Core**		
HLSD 110	Introduction to Homeland Security	3
CYBR 155	Foundations of Information Security	3

HLSD 215	Introduction to Industrial Security	3
HLSD 280	Professional Skills in Homeland Security	3
EMGY 310	Fundamentals of Emergency Management	3
HLSD 315	Critical Infrastructure Security, Resilience, and Risk Analysis	3
HLSD 320	Homeland Security Law and Policy	3
SCTY 488	National Security Issues and Terrorism	3
SCTY 315	Studies in Intelligence I	3
or SCTY 385	Intelligence Collection and Analysis	
HLSD 290	Environmental Security	3
HLSD 360	Strategic Planning and Decision Making in Homeland Security	3
HLSD 405	Emergent Topics in Homeland Security	3
HLSD 410	Exercise Design and Evaluation in Homeland Security	3
HLSD 495	Homeland Security Capstone I	3
HLSD 496	Homeland Security Capstone II	3
Total Credits		45

Breadth Area or Choose Minors (p. 95)

Breadth Area/Minors**	
Students complete their breadth requirement by either two non-duplicating minors (minimum 30 credits total), or one minor and a "coherent block of study" (minimum 30 credits total) that is determined with consent of Program Coordinator.	
Total Credits	30

Program Support**		9
SFTY 201	Introduction to Health, Occupational, and Transportation Safety	3
or SFTY 409	Aviation Safety	
Select one of the following safety courses:		3
SFTY 315	Environmental Compliance and Safety	
SFTY 462	Health, Safety and Aviation Law	
STAT 222	Business Statistics	

**For students in the Bachelor of Science in Homeland Security degree program the RSCH 202 prerequisite for Core, Program Support, or Minor courses are waived since RSCH 202 is not required for the program.

Electives

Open Electives	3
Choose Any 300-400 Level Course	

Total Degree Requirements	(Minimum) 123

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Interdisciplinary Studies

Program Plan of Study and Requirements

The Bachelor of Science in Interdisciplinary Studies (BSIS) degree program offers students a unique opportunity to transfer previously earned University and Joint Services Transcripted credit by custom designing a plan of study that serves your needs and aspirations. This flexible degree program, unique to Embry-Riddle, is designed for first-time-in college students and students with previous academic and/or military credit who desire to study more than one academic discipline. BSIS students, minoring in Cybersecurity (p. 71), Homeland Security (p. 72) or Emergency Services (http://catalog.erau.edu/worldwide/arts-sciences/minors/fire-science) are also eligible to participate in multiple BSIS 4+1 degree program options with the M.S. in Cybersecurity Management and Policy (MCMP) (p. 70) or M.S. in Human Security and Resilience (MSHR) (p. 70) degree programs. BSIS 4+1 degree program options create new opportunities for students to participate in an advanced graduate program and the Military Science (p. 72) minor allows students to transfer previously earned, upper-level, American Council on Education recommended military training credit.

The Program requires coursework in general education, a core curriculum, a minor, a specialty area, and open electives. The general education component provides a broad foundation of study, which leads to the core curriculum, focusing on a specialty. Core courses aim to enhance communication and analytical skills, so students gain an understanding of art, literature and history, which shape an appreciation for the humanities. Also, core courses prepare students to discover meaningful links to technology, science and other technical areas -- developing a renaissance education in a global economy.

Interdisciplinary Studies provides freedom for students to choose coursework, which is primarily lodged in the selection of a minor course of study. It allows students to explore the University's offerings in search of a scholarly education that will broaden knowledge and worldwide ambitions. In the capstone experience, each student will complete and document program outcomes. The Capstone Project will illustrate and provide evidence of a well-rounded education to domestic and international employers.

The flexibility of the Interdisciplinary Studies degree program allows students to build on individual strengths and interests. Depending on your choices, graduates can prepare for careers in federal or civilian aviation or aerospace, management, engineering sciences, environmental sciences, communications, mathematics, or other related professions. In addition, Interdisciplinary Studies provides a strong foundation for advanced degrees. The Interdisciplinary Studies degree program seeks students with an entrepreneurial spirit who will cross boundaries, make creative connections, be flexible in a changing career environment, and become leaders in chosen fields.

This degree program participates in the Air University-Associate to Baccalaureate Cooperative (AU-ABC Category I). Students who have completed a Community College of the Air Force (CCAF) associates degree are eligible. CCAF graduates can complete a Bachelor of Science in Interdisciplinary Studies by taking no more than 60 semester hours beyond their CCAF degree.

B.S. in Interdisciplinary Studies students who wish to continue on to a master's degree may enroll in the BSIS 4+1 to M.S. in Cybersecurity Management and Policy (MCMP) (p. 70) **or M.S. in Human Security and Resilience (MHSR)** (p. 70) **degree program option (See below).**

In addition, BSIS students are also eligible to minor in Military Science. (p. 72)

DEGREE REQUIREMENTS

The Bachelor of Science in Interdisciplinary Studies degree requires successful completion of a minimum of 120 credit hours. Included in the 120 credit hours must be 40 credit hours of upper-division courses (300-400 level).

General Education Requirements

For a full description of Embry-Riddle General Education guidelines, please see the General Education (p. 98) section of this catalog. These minimum requirements are applicable to all degree programs.

Communication Theory and Skills	9
Lower-Level Humanities	3
Lower-Level Social Sciences	3
Lower or Upper-Level Humanities or Social Sciences	3

Upper-Level Humanities or Social Sciences	3
Computer Science	3
Mathematics	6
Physical and Life Sciences	6
Total Credits	36

Communication Theory and Skills		
Transfer English Composition or take:		3
ENGL 123	English Composition	
Transfer in up to six (6) credit hours of writing, communication or speech courses or take two Speech/English courses		6
Lower Level Humanities		
Transfer up to three (3) credit hours of 100 or 200 level Humanities courses or take a Humanities course (Lower Level)		3
Lower Level Social Sciences		
Transfer up to three (3) credit hours of Lower Level Social Sciences or take a Social Science elective (Lower Level)		3
Lower or Upper Level Humanities or Social Sciences		
Transfer lower or upper Humanities or Social Sciences credit or select a non-duplicated Humanities or Social Science elective (lower or upper level)		3
Upper Level Humanities or Social Sciences		
Transfer up to three (3) credit hours of upper level Humanities or Social Science or take a Humanities or Social Science elective, (Upper Level) *International Relations minor students may be required to take a humanities course to satisfy this requirement.		3
Computer Sciences		
Transfer three (3) credit hours of 100 level or above computer science course credit or take:		3
CSCI 109	Introduction to Computers and Applications	
Mathematics		
Take six (6) credit hours in a series below or transfer in direct equivalents:		6
MATH 111	Pre-calculus for Aviation	
MATH 112	Applied Calculus for Aviation	
- OR-		
MATH 140	College Algebra	
MATH 142	Trigonometry	
Physical and Life Sciences		
Transfer up to six (6) credit hours of physical/life science courses or take one or two Physical and Life Sciences courses (as appropriate to add up to a total of 6 semester hours).		6

Core Requirements / Categories

Aviation Foundation		
Select one of the following:		3
ASCI 202	Introduction to Aeronautical Science	
HIST 130	History of Aviation in America	
Humanities		
Transfer up to three (3) additional credit hours of humanities upper or lower -or- take a 3 credit hour upper or lower level Humanities course.		3
Management Foundation		
Transfer three (3) 100 level or above Management credit hours or choose one Embry-Riddle Management elective.		3
Interdisciplinary Research and Skills		
Transfer a three (3) credit hour of a 100 level or above Research Methods course or take:		3
RSCH 202	Introduction to Research Methods	
Transfer three (3) credit hours of 100 level or above Statistics course or select one from below:		3
STAT 211	Statistics with Aviation Applications	
STAT 222	Business Statistics	
International Perspectives		
Transfer three (3) upper level credit hour Government course or take a three 3 credit hour upper level Government course.		3
Philosophical Perspectives		
Transfer three (3) credit hours upper level Ethics course or take:		3
HUMN 330	Values and Ethics	
Upper-Level Literature		
Transfer three (3) credit hour upper level Humanities or Literature course or take an upper level Humanities or Literature course		3
Upper-Level Communication		
Transfer three (3) credit hour upper level Communications or English course or select an upper level COMD or ENGL course		3
Senior Capstone		
BSIS 473	Senior Thesis	3
Total Core Requirements		30

View Minors (p. 95)

Available Minors

The Military Science (p. 72) minor is available exclusively to BSIS students. BSIS students must select one minor field of study. Required credits in each minor vary, depending on the minor(s) chosen. Examples of minors and required credits are shown below but can change. Please consult the Worldwide Minor Courses of Study page for up to date list. Courses taken in minors cannot duplicate (double-counted for) requirements in other areas.

Total Credits (for 1 Minor)	15/21
Specialization	15
Specialty Area of related courses can be taken at ERAU or transferred from another college or university.	
Open Electives	0-24
Open Electives (Any shortages in the required upper level hours will be made up in this area).	
Total Degree Credits	120
(at least 40 semester hours need to be upper level coursework)	

BSIS to MCMP or MHSR 4+1 Program: A Unique Opportunity

Students who are accepted into the 4+1 program, spend three academic years in undergraduate-level study, minoring in Cybersecurity, Homeland Security or Emergency Services and then, at the beginning of their senior year (having earned at least 88 credit hours with a 3.00 CGPA), will take up to three graduate-level courses that will meet undergraduate and graduate program requirements (when a B grade or better is achieved).

Upon completion of the BSIS requirements, students will be enrolled in graduate school and can complete their MCMP (p. 70) or MSHR (p. 70) degree in one year. In any graduate course taken by an undergraduate student, a grade of B or better must be earned. If a grade of C or F is earned in any of the MCMP (p. 70) or MSHR (p. 70) graduate courses taken for BSIS credit, the student will be removed from the 4+1 program, have credit awarded to the BSIS degree only, and may continue to complete the BSIS degree.

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

Footnote:
Minnesota student residents refer to State of Minnesota Course Requirement (https://catalog.erau.edu/worldwide/general-ed) statement for Humanities requirements.

M.S. in Cybersecurity Management and Policy

The Master of Science in Cybersecurity Management & Policy (MSCMP) is a 30-credit online degree tailored to IT and non-IT professionals who want to transition into a leadership role. Graduates will emerge from the program with an understanding of cybersecurity and its ramifications across the organization, along with improved critical thinking, leadership and management skills.

Curriculum is constantly updated to reflect a rapidly changing industry. You can expect to study: risk assessment, risk management and risk mediation; threat vectors and mitigation processes; design and management of secure information systems; emerging tools and resources for industry and platform security; and current events in cybersecurity and data breaches. You will also have the opportunity to explore key challenges and workplace-specific issues during a two-part Capstone project. Students may select the General or Aviation specialization.

Our goal is for you to exit from the Cybersecurity Management & Policy degree program with the ability to (1) recognize the relationship between cybersecurity and your organization's strategic goals, (2) realize the long-term impact of a security breach on successful completion of your mission and (3) be ready for a leadership role in the private or public sector.

DEGREE REQUIREMENTS

Core/Major

Common Graduate Core		6
RSCH 670	Research Methods	3
MCMP 501	The Internet, Security, and Governance	3
Cybersecurity Management and Policy Core		6
MCMP 510	The Practice of Cybersecurity	3
MCMP 520	Security Engineering and Management	3
Specialization		6
Choose one specialization:		
General Specialization		
MCMP 615	International Law and U.S. Security Policy	3
MCMP 650	Emerging Topics in Cybersecurity	3
- OR -		
Aviation Specialization		
MCMP 616	Aviation Policy and Law in Cyberspace	3
MCMP 651	Topics in Aviation Cybersecurity	3
Capstone		6
MCMP 690	Cybersecurity Management and Policy Capstone I	3
MCMP 691	Cybersecurity Management and Policy Capstone II	3

Electives

Electives	6
Choose 6 credits from other graduate level courses approved by program chair.	
NOTE: MCMP 615 and MCMP 650 cannot be used as electives for students that select the Aviation Specialization. MCMP 616 and MCMP 651 cannot be used as electives for students who select the General Specialization.	
Total Degree Requirements	30

M.S. in Human Security and Resilience

The Masters of Science in Human Security and Resilience (MHSR) is delivered and developed by faculty in the Security Studies and International Affairs (SSIA), Department in the College of Arts and Sciences at the Daytona Beach Campus, as well as outside experts in specialty areas from the Worldwide Campus. This 30 credit, online program is tailored to working professionals, and includes a capstone course following completion of the specialization courses. Capstone projects are expected to allow students deeply explore challenges from their respective worksites or issues endemic to their careers in a scholarly way. Though not all will culminate in published research, the expectation is that capstone projects will be publishable in either scholarly journals or at conferences. The curriculum is composed of 10 three-credit courses including a 6 credit common core, 15 credits of specialized human security and resilience courses, 3 credits of capstone courses, and 6 credits of electives, as outlined below:

The discipline is rooted in the concept of human security, first defined by the United Nations Development Programme in 1994. The UNDP definition established that human security includes protection from "chronic threats as hunger, disease and repression, and protection from sudden and hurtful disruptions in the patterns of daily lives, whether in homes, jobs or communities". According to the United Nations concept, human security is multidimensional and includes: economic security, food security, health security, environmental security, personal security, community security and political security.

Topics that fall under this multi-dimensional concept of human security include: organized crime and political violence (terrorism), resource competition and environmental change, health and development, armed conflict and intervention, and post-conflict/post-disaster recovery and reconstruction.

It should be noted that there is no single definition of human security or agreement on how to achieve it. These are some of the essential questions the security and policy community is wrestling with – and wonderful areas for continued scholarship, and graduate capstone project development. For example, the capstone and research projects in the Master of Science in Human Security and Resilience program will contribute to the critical debates in this field. Graduates from this program will make a significant contribution to the development and practice of this field. Human security touches every level of government: neighborhood, state, national and international. This degree program will find interest among human security practitioners from the municipal emergency management official to the national level strategic planner; from the public health advisor to international humanitarian aid worker.

DEGREE REQUIREMENTS

Core/Major

Common Graduate Core		6
RSCH 670	Research Methods	3
MHSR 501	The Internet, Security, and Governance	3
Human Security and Resiliency Specialization		15
MHSR 510	Introduction to Human Security	3
MHSR 520	Principles of International Conflict Resolution	3
MHSR 530	Environmental Security	3
MHSR 540	Foundations of Resilience	3
MHSR 615	International Law and U.S. Security Policy	3
Capstone		3
MHSR 690	MHSR Capstone	3
Total Credits		24

Electives

Electives	

Choose 6 credits from other graduate level courses approved by program chair.	
Total Credits	6
Total Degree Requirements	30

Minor in Communication

The Communication Minor provides students with a unique program of study that answers the demand for those who wish to integrate science and technology with solid communication skills. Objectives include providing students with a strong foundation in the basic concepts of communication in today's technology-centric world, analyzing research techniques and the principles of scientific inquiry, gaining hands-on experience with news writing and reporting and business communication essentials, exploring new media communications including social media, blogging, web site content, and more, and evaluating the laws, ethics, cultural, and societal aspects of mass communication.

Not open to BS in Communication students.

ENGL 221	Technical Report Writing	3
or ENGL 222	Business Communication	
COMD 265	Introduction to Newswriting and Reporting	3
Take three courses (9 credit hours) from the following options:		9
COMD 320	Mass Communication Law and Ethics	
COMD 322	Aviation and Aerospace Communication	
COMD 350	Environmental Communication	
COMD 360	Media Relations I	
COMD 415	Nonverbal Communication	
Total Credits		15

Minor in Cybersecurity Application and Management

The Cybersecurity Application and Management Minor program (15 credits, 5 courses) is open to all majors and explores the many approaches and meanings of this field that is fast becoming central to our nation's security. As we see every day in the press, cyber security can be used for offensive or defensive purposes. The approaches to defending critical infrastructures such as the energy grid, financial systems, the healthcare system, or agriculture, etc, can be either proactive (e.g., installing a firewall to detect and prevent attacks) or reactive (e.g., responding to an event). This program will introduce students to cyber security operations (e.g., day-to-day duties, actions, and responsibilities), governance (e.g., law, policy, and analysis), and education and training.

Not open to students pursuing the Cybersecurity Administrator Specialization in the BS in Technical Management degree.

Choose one from the following: (only one course may count towards the Minor)		
CYBR 235	Computer and Network Technologies	3
or CYBR 255	Information Systems Security Principles	
Choose one from the following: (only one course may count towards the Minor)		
CYBR 335	Information Security Tools and Techniques	3
or CYBR 355	Networks and Systems Security Tools	
CYBR 365	Introduction to Digital Forensics	3
CYBR 465	Cybercrime and Cyberlaw	3
CYBR 485	War, Terrorism, and Diplomacy in Cyberspace	3
or CYBR 474	Issues in Aviation Cybersecurity	
Total Credits		15

Minor in Economics

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Choose any 4 of the 5 following courses:		
ECON 225	Engineering Economics	3
ECON 312	Money and Banking	3
ECON 315	Managerial Economics	3
ECON 411	International Economics	3
ECON 420	Economics of Air Transportation	3
Total Hours		18

Minor in Emergency Services

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Not open to BS in Emergency Services students. These courses may not be substituted with other FIRE courses.

Select five from the following list of courses:		15
ESVS 301	Community Risk Reduction for the Fire and Emergency Services	
ESVS 402	Fire and Emergency Services Administration	
ESVS 403	Disaster Planning and Control	
ESVS 404	Managerial Issues in Hazardous Materials	
ESVS 405	Personnel Management for Fire and Emergency Services	
ESVS 410	Terrorism: Roots and Responses	
FIRE 201	Fire-Related Human Behavior	
FIRE 302	Fire Dynamics	
FIRE 303	Fire Protection Structures and Systems	
FIRE 304	Fire Investigation and Analysis	
FIRE 305	Fire Prevention Organization and Management	
FIRE 400	Analytical Approaches to Public Fire Protection	
FIRE 401	Applications of Fire Research	
FIRE 406	Political and Legal Foundations of Fire Protection	

Total Credits	15

Minor in Environmental Science

The Environmental Science minor includes the topics of Earth systems, biological diversity, world resources (water, food, energy), global climate change, urban planning, and sustainable development. This minor meets a growing interest of students and employers in environmental responsibility and sustainability.

Required Courses:		
PHYS 142	Introduction to Environmental Science	3
PHYS 304	Environmental Science	3
CHEM 139/CHEM 141 General Chemistry/General Chemistry Laboratory		4
-OR- BIOL 120 Foundations of Biology I		3
WEAX 201	Meteorology I	3
Electives (select one):		3
COMD 350	Environmental Communication	
SFTY 315	Environmental Compliance and Safety	
PHYS 359	Self-Directed Exploration of Environmental Science	
Total Credits		15/16

Minor in Homeland Security

The Homeland Security minor has a strong focus on protecting the nation's transportation infrastructure and planning for, responding to, and emergency management of events dealing with acts of terrorism and natural and man-made disasters. This minor complements degrees in safety, aeronautical science, airport management, communication, human factors, aeronautics, business, or interdisciplinary studies.

Not open to BS in Homeland Security students.

HLSD 110	Introduction to Homeland Security	3
HLSD 215	Introduction to Industrial Security	3
CYBR 155	Foundations of Information Security	3
Take any two of the following courses:		6
EMGY 310	Fundamentals of Emergency Management	
HLSD 315	Critical Infrastructure Security, Resilience, and Risk Analysis	
HLSD 320	Homeland Security Law and Policy	
HLSD 360	Strategic Planning and Decision Making in Homeland Security	
SCTY 315	Studies in Intelligence I	
SCTY 385	Intelligence Collection and Analysis	
SCTY 488	National Security Issues and Terrorism	
Total Credits		15

Minor in International Relations

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

GOVT 331	Current Issues in America	3
HIST 130	History of Aviation in America	3
Select three of the following:		9
GOVT 325	International Studies	
GOVT 340	U.S. Foreign Policy	
GOVT 363	Inter-American Relations	
GOVT 402	Globalization and World Politics	
HUMN 210	World Culture	
MGMT 335	International Business	
Total Credits		15

Minor in Mathematics

The Mathematics minor includes a multitude of topics involving limits, derivatives, integrals, multivariable calculus, first and second order differential equations, Laplace transforms and matrix methods of solutions. The minor supports a STEM (Science, Technology, Engineering and Mathematics) emphasis highly desired by the aeronautics and technical industries.

MATH 241	Calculus and Analytical Geometry I	4
MATH 242	Calculus and Analytical Geometry II	4
MATH 243	Calculus and Analytical Geometry III	4
MATH 345	Differential Equations and Matrix Methods	4
STAT 412	Probability and Statistics	3
Total Credits		19

Minor in Military Science

Students, having earned Joint Services transcripted American Council of Education (ACE) upper-level recommended credit, pursuing a B.S. in Interdisciplinary Studies degree; are eligible to minor in Military Science.

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Available to BS in Interdisciplinary Studies students only.

Upper Level ACE Recommended Credit	
Joint Services transcripted, upper level ACE recommended academic credit.	15
Upper Level Embry-Riddle Elective Credit	
Select any two non-duplicated 300-400 level ASCI or MGMT courses.	6
Total Credits	21

Aviation Cybersecurity Management and Policy

The Aviation Cybersecurity Management and Policy certificate is designed for students who are pursuing management and policy education

related to cyber issues, including airline operators, airport managers, support staff, industry planners, manufacturers, policy and law advisers, consultants, and others involved in managing day-to-day processes within the industry.

Note: Certificate programs are not eligible for Title IV Federal Financial Aid.

Aviation Cybersecurity Management and Policy

Certificate of Completion

MCMP 510	The Practice of Cybersecurity	3
MCMP 520	Security Engineering and Management	3
MCMP 616	Aviation Policy and Law in Cyberspace	3
MCMP 651	Topics in Aviation Cybersecurity	3
Total Credits		12

College of Business

The College of Business strives to be the premier global educator of leaders and managers in aviation and aerospace. We support this mission by providing undergraduate and graduate programs in leadership and business management that are developed with a focus on the following core objectives:

- To add value to students' lives and careers
- To foster excellence in learning
- To nourish entrepreneurship and discovery in learning
- To remain connected to the aviation and aerospace industry
- To encourage diversity in all that we do

For Faculty lists and other information, view the College of Business (http://worldwide.erau.edu/degrees-programs/colleges/business) website.

Certificate of Completion

Applied Information Technology (AIT) Certificates (p. 92)
Microsoft Software and Systems Academy (MSSA) Certificates (p. 93)

Partnership Certificate

International Society of Transport Aircraft Trading (ISTAT) (p. 94)

A.S. in Aviation Business Administration

In the high-powered aviation industry, the key staff, operational, and executive positions are awarded to professionals who display a thorough knowledge of aviation as well as an exceptional aptitude for business. If you have a passion for this exciting field and want to develop the business skills you need to reach the top, the Associate in Science in Aviation Business Administration from Embry-Riddle Aeronautical University — Worldwide can help you achieve your goals.

As a student of this degree program, you will gain a solid foundation of core business knowledge while developing the sharp business acumen demanded at the highest levels of any organization. The Associate in Science in Aviation Business Administration explores all facets of business administration and management, including:

- Economics
- Management of Aeronautical Science
- Business Statistics & Accounting
- Business Marketing & Management
- Human Resources
- Finance

Through this comprehensive program, you will learn how to think analytically, communicate clearly, and lead a team effectively. These valuable skills will prime you for professional success in any field.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Major		
MGMT 201	Principles of Management	3
MGMT 203	Management for Aeronautical Science	3
MGMT 210	Financial Accounting	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
Total Credits		24
Total Degree Requirements		60

A.S. in Logistics and Supply Chain Management

Globalization is affecting almost every aspect of the world's economy and as a result the demand for qualified logistics and supply chain professionals is higher than ever. The Associate in Science in Logistics and Supply Chain Management is designed to produce graduates who are qualified to enter or continue to work in the logistics and supply chain management career field. This degree program offers students the opportunity to pursue the Bachelor of Science in Logistics and Supply Chain Management and by the same token, it provides a foundation for supervising or managing the procurement, maintenance, and transportation of material, personnel, equipment, and facilities. Graduates are prepared for opportunities in diverse fields such as air cargo, parcel delivery, warehousing, distribution, transportation, manufacturing, and retail business.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English		6

Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology		6
Mathematics		
MATH 111 & MATH 112	Pre-calculus for Aviation and Applied Calculus for Aviation	6
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Undergraduate Business Core		
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
RSCH 202	Introduction to Research Methods	3
Total Credits		12

Logistics and Supply Chain Management Core		
LGMT 236	Principles of Purchasing	3
TRAN 274	Transportation Science	3
Total Credits		6

Electives

Technical Transfer Credit or COB Electives	6
If technical transfer credit is not applicable, the 6 credit hours may ONLY be used toward College of Business (COB) 200 level courses.	
Total Degree Requirements	60

Footnotes*

Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

A.S. in Technical Management

You're a skilled professional in a technical field, but you're ready to advance. You're looking for a move into the management ranks, seeking the personal satisfaction and financial rewards that go along with it. The Associate in Science in Technical Management (ASTM) program from Embry-Riddle Aeronautical University — Worldwide can take you there.

In today's workplace, a college degree has never been more important. Employers see it as a demonstration of knowledge, motivation, and persistence — qualities that will set you above and apart from the pack. The Associate in Science in Technical Management program will appeal to your background, interests, and talents and give you a competitive edge in your career, too.

The Associate in Science in Technical Management curriculum was developed to give students the skills to marshal the resources of any organization toward its goals. Over the course of this program, students learn to organize, plan, staff, and coordinate physical assets as well as personnel.

As part of the ASTM, eligible active duty US Military and Veteran students can also enroll in a Microsoft Software & Systems Academy (https://worldwide.erau.edu/microsoft) (MSSA) Specialization, in which they will take five 3-credit applied software and systems technolgy courses in a cohort-based, intensive, face-to-face program.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, and Humanities and Social Sciences may be chosen from those listed, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

ASTM Core		
MGMT 201	Principles of Management	3
MGMT 203	Management for Aeronautical Science	3
MGMT 210	Financial Accounting	3
MGMT 221	Introduction to Management Information Systems *	3
Total Credits		12

Electives/Minor

Technical Transfer Credit or COB Minor or MGMT Electives	9
If technical transfer credit is not applicable, the 9 hours can ONLY be used toward College of Business (COB) minors. If no minor is chosen, then MGMT electives have to be courses at the 200-300-400 level.	
Open Electives (Lower or Upper Level)	3
May be used for Minors in other Departments	
May be used for College of Business or non College of Business Minors.	

Electives/MSSA or AIT Technical Specializations

Specialization Learning Path Cohort	15

*For MSSA students, each 18-week cohort will only concentrate on one technical specialization, shown in the schedule of MSSA offerings for a particular location hosting this program. The first of these technical specialization courses (the 200-level course) replaces MGMT 221 in the Core courses part of the ASTM degree.

Students must also take MATH 106, or at least one higher-level math course, as part of the MSSA program. See https://worldwide.erau.edu/Microsoft for more information.

Total Degree Requirements	60

Database & Business Intelligence Administrator (Not currently available for enrollment.)		
ISTA 210	Database Fundamentals	3
ISTA 310	SQL Server Administration and T-SQL	3
ISTA 312	Implementing Data Warehouses and Databases	3
ISTA 410	Data Modeling and Reporting	3
ISTA 412	Designing Business Intelligence Solutions	3
Cloud Applications Developer (Only available for MSSA students.)		
ISTA 220	Programming in C#	3
ISTA 322	Developing ASP.NET Web Applications	3
ISTA 420	SQL and Application Development	3
ISTA 421	Developing Cloud Applications	3
ISTA 422	Azure Application Development	3
Server and Cloud Administrator		
ISTA 230	Networking and Server Fundamentals	3
ISTA 330	Windows Server Configuration and Management	3
ISTA 332	Configuring Advanced Windows Server Services	3
ISTA 430	Configuring and Deploying Private Cloud Systems	3
ISTA 432	Building Azure Infrastructures	3
Cybersecurity Administrator		
Choose one from the following: (only one course may count towards the Specialization)		
CYBR 155	Foundations of Information Security (Available to AIT Students Only)	3
or CYBR 255	Information Systems Security Principles	
CYBR 235	Computer and Network Technologies	3
Choose one from the following: (only one course may count towards the Specialization)		
CYBR 335	Information Security Tools and Techniques (Available to AIT Student's Only)	3
or CYBR 355	Networks and Systems Security Tools	
CYBR 365	Introduction to Digital Forensics	3
CYBR 465	Cybercrime and Cyberlaw	3

B.S. in Aviation Business Administration

The Aviation Business Administration program is designed for students seeking to lead and manage in the world of aviation.

Balancing key aviation concepts with advanced business strategy, the curriculum provides students with a solid foundation of industry expertise while developing the sharp business acumen demanded at the highest levels of an organization. The program explores all facets of business administration, including accounting, economics, finance, marketing, management, and global business strategies.

Upon graduation, students will be eligible and qualified candidates for desirable staff, operational, and executive positions within the military sector or civilian business community.

The degree curriculum consists of General Education, Common Undergraduate Business Core, Transfer Credit (when applicable) and the BSABA Core and Electives.

As part of the college of business undergraduate degree, students will take a comprehensive exam in MGMT 436 (Strategic Management).

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English-(ENGL 221 or ENGL 222)		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Common Business Core		
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 312	Managerial Accounting	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
MGMT 371	Leadership	3
MGMT 390	Business Law	3
MGMT 436	Strategic Management	3
RSCH 202	Introduction to Research Methods	3
Total Credits		33

Aviation Management Core		
MGMT 210	Financial Accounting *	3
ECON 315	Managerial Economics	3
or ECON 420	Economics of Air Transportation	

or TRAN 321	Air Transportation Systems	
BSAB 410	Management of Air Cargo	3
or MGMT 419	Aviation Maintenance Management	
BSAB 415	Airline Management	3
or BSAB 418	Airport Administration & Finance	
SFTY 350	Aircraft Crash and Emergency Management	3
BSAB 450	Aviation/Airport Marketing	3
MGMT 494	Aviation Information Systems	3
or SFTY 345	Aviation Safety Program Management	
MGMT 408	Airport Management	3
or BSAB 412	Airport Planning and Design	
or BSAB 425	Trends and Current Problems in Air Transportation	
MGMT 411	Logistics Management for Aviation/Aerospace	3
or MGMT 391	Introduction to Project Management	
BSAB 426	International Aviation Management *	3
*Recommended to be taken prior to MGMT 436 Stategic Management		
Total Credits		30

Electives

Open Electives	12
BSABA Open Electives (Transfer credit or specified electives from approved list below)	
Specified Electives	9
Specified BSABA Electives (see approved list below)	
ASCI 254, BSAB 410**, BSAB 412**, BSAB 415**, BSAB 418**, BSAB 425**, BSAB 416 **, COMD 322, ECON 312, ECON 315**, ECON 411, ECON 420**, MGMT 314**, MGMT 317, MGMT 321, MGMT 322, MGMT 324, MGMT 331, MGMT 391**, MGMT 392, MGMT 394, MGMT 408**, MGMT 411**. MGMT 419**, MGMT 420, MGMT 422, MGMT 424, MGMT 427, MGMT 440, MGMT 461, MGMT 462, MGMT 492, MGMT 494**, SCTY 400, SCTY 420, SCTY 430, SFTY 345**, SFTY 350**, SFTY 320, SFTY 330, SFTY 409, Any course listed in the Aviation Safety Minor, TRAN 321.	
** If course taken as core requirement, the course cannot also be counted as an elective.	
Total Credits	21

Minor option

Students have the option to structure electives such that a Minor in the following areas may be earned.

- Minor in Airport Management (p. 90)
- Minor in Aviation Safety (p. 62)
- Minor in Economics (p. 71)
- Minor in Human Resources (p. 91)
- Minor in Logistics Management (p. 91)
- Minor in Management Information Systems (p. 92)
- Minor in Project Management (p. 92)
- Minor in Technical Management (p. 92)

Total Degree Requirements	120

* Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Leadership

Leadership plays a key role in today's global economy. In fact, leadership has been one of the primary beneficiaries of globalization and over the past several years has become one of hottest topics in business. Learning how to lead in a complex environment is vital to organizational success.

The Bachelor of Science in Leadership (BSL) focuses on developing a holistic leader through a comprehensive and practical leadership education. Students who complete the degree will have knowledge in foundational leadership theories, complexity, ethics, critical thinking, communication, culture and diversity, decision-making, coaching and mentoring, and other areas related to leadership. This degree ensures that students have the appropriate skills to contribute as a leader in all aspects of society.

DEGREE REQUIREMENTS

General Education

General Education

Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry/Environmental Science/ Astronomy		6
Mathematics		
Take six (6) credit hours in a series below or transfer in direct equivalents:		6
MATH 111	Pre-calculus for Aviation	
MATH 112	Applied Calculus for Aviation	
- OR -		
MATH 140	College Algebra	
MATH 142	Trigonometry	
STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Common Business Core		
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 312	Managerial Accounting	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
MGMT 371	Leadership	3
MGMT 390	Business Law	3
MGMT 436	Strategic Management	3
RSCH 202	Introduction to Research Methods	3
Total Credits		33

Leadership Core

BSLD 275	Critical Thinking for Leadership	3
BSLD 285	The Evolution of Leadership	3
BSLD 300	Emotional, Social, and Cognitive Intelligence	3
BSLD 304	Coaching and Mentoring	3
BSLD 310	Mediation, Negotiation, and Conflict Resolution	3
BSLD 315	Contemporary Leadership Theories	3
BSLD 402	Ethics, Values, and Differences	3
BSLD 407	Driving Change in Organizations	3
BSLD 412	Leadership Practicum	3
Total Credits		27

Electives

Transfer Credit -or- COB Minor-or- MGMT Electives	24

If technical transfer credit is not applicable, the 24 credit hours can ONLY be used toward College of Business (COB) minors. Minors require fulfillment of a minimum of 15 credit hours. If no minor is chosen, then MGMT electives 200-300-400 level courses may be used.

Total Degree Requirements	120

** Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Logistics and Supply Chain Management

The Bachelor of Science in Logistics and Supply Chain Management is a 120 credit hour program that is available through the Embry-Riddle Worldwide Campus network. Curriculum is built upon a strong foundation of established coursework that will help you distinguish yourself as a leader in this fast-growing career field.

You will have the choice of multiple learning modes – online, face-to-face, video teleconference – to gain the advanced knowledge and skill sets that set you apart as an informed professional. Topics of study will include: technology, process, and people solutions for warehousing, distribution, and transportation operations; inventory management methods that optimize the supply chain; purchasing and procurement policies and procedures; metrics for tracking and analyzing supply chain performance; best practices, regulations, and professional ethics.

Successful completion of this program will provide you with a strong foundation of knowledge that will serve you on the job and prepare you for future training and education, including a Master's Degree or professional certifications such as the Institute for Supply Management (ISM) Certified Professional in Supply Management (CPSM) and Certified Professional in Supplier Diversity (CPSD), Association for Operations Management (APICS) Certified Supply Chain Professional or the International Society of Logistics (SOLE) Certified Professional Logistician.

Embry-Riddle Logistics and Supply Chain Management graduates are in great demand around the corner and around the world. Any industry that is impacted by manufacturing, warehousing, distribution, transportation, and/or inventory management, is in great need for logisticians and supply chain professionals.

As part of the college of business undergraduate degree, students will take a comprehensive exam in MGMT 436 (Strategic Management).

DEGREE REQUIREMENTS

General Education

General Education		

Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from those listed below, 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology		6
Mathematics		
MATH 111 & MATH 112 or STAT 320	Pre-calculus for Aviation and Applied Calculus for Aviation Decision Mathematics	6
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Business Core		
STAT 211 or STAT 222	Statistics with Aviation Applications Business Statistics	3
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 312	Managerial Accounting	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
MGMT 371	Leadership	3
MGMT 390	Business Law	3
MGMT 436	Strategic Management	3
RSCH 202	Introduction to Research Methods	3
Total Credits		33

Logistics & Supply Chain Management Core		
LGMT 236	Principles of Purchasing	3
TRAN 274	Transportation Science	3
BSAB 410	Management of Air Cargo	3
MGMT 411	Logistics Management for Aviation/Aerospace	3
MGMT 420	Management of Production and Operations	3
MGMT 440	Advanced Professional Logistics	3
MGMT 444	Principles of Supply Chain Management	3
Total Credits		21

Electives

Technical Transfer Credit -or- COB Minor-or-COB Electives	12

If technical transfer credit is not applicable, the 12 hours may ONLY be used toward College of Business (COB) minors or COB electives. Minors require fulfillment of a minimum of 15 credit hours. If no minor is chosen, then 200-300-400 level COB courses may be used.

Open Electives	18

Total Degree Requirements	120

Footnotes*

Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Project Management

From developing transformative technologies to launching bold new products, companies in every industry need projects delivered on time and on budget with minimal friction. Project managers have the opportunity to work on leading-edge ventures in fields of their choice. And the need for the expertise of these project leaders is only growing.

As one of the few undergraduate degree programs in this dynamic field, the Embry-Riddle Bachelor of Science in Project Management (BSPM) will help you master the skills to lead the new projects and strategic initiatives that keep companies ahead of the curve. The project management curriculum was developed entirely by certified PMPs®, industry leaders who possess the recognized global standard for project management knowledge and experience issued by the Project Management Institute® (PMI) – the worldwide leader in the development of standards for the dynamic profession of Project Management.

BSPM graduates will be equipped to manage, drive and execute on vital projects required by companies today and in the future. They will also be prepared to pursue certification or continue on with higher education.

Project Management students who wish to continue on to a master's degree may enroll in courses in the 4+1 option outlined in this program.

DEGREE REQUIREMENTS

General Education

General Education		
Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities*		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Common Business Core		
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 312	Managerial Accounting	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
MGMT 371	Leadership	3
MGMT 390	Business Law	3
MGMT 436	Strategic Management	3
RSCH 202	Introduction to Research Methods	3
Total Credits		33

Project Management Core		
MGMT 391	Introduction to Project Management	3
MGMT 424	Project Management in Aviation Operations	3
MGMT 427	Management of the Multicultural Workforce	3
MGMT 461	Global Project Management	3
MGMT 462	Project Management Advanced Concepts	3
Total Credits		15

Project Management Core 4+1 Option

Project Management Core 4+1 Option		
MGMT 391	Introduction to Project Management	3
MGMT 427	Management of the Multicultural Workforce	3
PMGT 501	Fundamentals of Project Management	3
PMGT 502	Effective Communications for Managing Projects	3
MSLD 632	Decision Making for Leaders	3
Total Credits		15

Electives

COB Minor-or-Electives	15
College of Business (COB) minor or COB elective 200-300-400 level courses.	
Open Electives	21

Total Degree Requirements	120

BSPM-MSPM 4+1 Program

Students who are accepted in the 4 + 1 program, spend three academic years in undergraduate-level study and then, during their senior year, will take up to three graduate-level courses that will meet the undergraduate 400 level elective and graduate program core requirements (when a B grade or better is achieved). Upon completion of the BSPM requirements, students will be enrolled in graduate school and can complete their degree in one year. In any graduate course taken by an undergraduate student, a grade of B or better must be earned. If a grade of C or F is earned in any of the courses taken in lieu of 400 level elective credits, the student will be removed from the program, have credit awarded to the BSPM degree only, and may continue to complete the BSPM degree. Students will use the virtual forms application (https://vforms.erau.edu/forms/private/student-services/recommendation/4plus1) site to work through the application, recommendation, and approval process.

Footnotes:
***** Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

B.S. in Technical Management

The Technical Management degree is designed to prepare students for a variety of managerial/supervisory positions in today's business

environment. The program will teach students how to think critically, and to employ applied research and problem-solving skills to evaluate, manage, and improve business processes.

Many working adults with a background in a technical specialty are looking for opportunities to move into management or supervisory positions as a way of advancing in their careers. For these individuals, Embry-Riddle Aeronautical University's Bachelor of Science in Technical Management programs could be the key to gaining the experience and knowledge to make the transition to management.

The Technical Management degree combines courses in management, business information systems, and project management into one degree.

The management courses help students develop their management, leadership, and organizational behavior skills. Additionally, the business information system courses teach students how to approach, understand, and resolve problems inherent with the implementation and control of a variety of such systems.

This degree opens career opportunities in a number of fields. Regardless of background, Technical Management students gain valuable skills, learning how to organize, plan, staff, and coordinate company resources toward the organization's goals and objectives.

This degree is designed to accommodate a transfer student who has either completed an appropriate associate degree at an accredited college or university (generally 60 credit hours) or has a minimum of 60 hours in coursework from the general education categories of Communication Theory and Skills, Mathematics, Physical Sciences, Computers, Humanities, and Social Sciences.

Prerequisites not previously met may be taken from open elective courses.

The Bachelor of Science in Technical Management curriculum offers general education, common undergraduate business core, plus eight majors and minors that take students deeper into their areas of interest, including: areas of Technical Management, Project Management, Management of Information Systems, Information Security, Occupational Safety and Health, Engineering Sciences, Facilities and Construction Management, and Human Resources Management.

As part of the BSTM, eligible active duty US Military and Veteran students can also enroll in a Microsoft Software & Systems Academy (https://worldwide.erau.edu/microsoft) (MSSA) Specialization, in which they will take five 3-credit applied software and systems technolgy courses in a cohort-based, intensive, face-to-face program.

Graduates may go on to managerial/supervisory careers in Aviation-related and Non-Aviation-related public and private fields.

As part of the college of business undergraduate degree, students will take a comprehensive exam in MGMT 436 (Strategic Management).

Technical Management students who wish to continue on to a master's degree may enroll in the BSTM to MSM, MMIS, MSISA 4+1 program as outlined in this program.

BSTM Program Notes:

1) Students in the Human Resources Management Major should complete MGMT 314 Human Resources Management before taking other courses in the Major.
2) Students that select the Human Resources Management Major must take an additional upper level elective of their choice.

DEGREE REQUIREMENTS

General Education

General Education		

Embry-Riddle courses in the general education categories of Communication Theory and Skills, Humanities, and Social Sciences may be chosen from the list below, assuming prerequisite requirements 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		
ENGL 123	English Composition	3
Speech/English		6
Humanities**		
HUMN 330	Values and Ethics	3
Humanities elective (lower or upper level)		3
Social Sciences		
ECON 210	Microeconomics	3
ECON 211	Macroeconomics	3
Physical and Life Science lower-level elective		
Physics/Biology/Meteorology/Chemistry, etc.		6
Mathematics		
MATH 111	Pre-calculus for Aviation	3
MATH 112	Applied Calculus for Aviation	3
or STAT 320	Decision Mathematics	
Computer Science		
CSCI 109	Introduction to Computers and Applications	3
Total Credits		36

Core/Major

Common Business Core		
STAT 211	Statistics with Aviation Applications	3
or STAT 222	Business Statistics	
MGMT 201	Principles of Management	3
MGMT 221	Introduction to Management Information Systems	3
MGMT 311	Marketing	3
MGMT 312	Managerial Accounting	3
MGMT 314	Human Resource Management	3
MGMT 332	Corporate Finance I	3
MGMT 371	Leadership	3
MGMT 390	Business Law	3
MGMT 436	Strategic Management	3
RSCH 202	Introduction to Research Methods	3
Total Credits		33

Choose Major:	21
Technical Management Major	
Aviation Management Major	
Project Management Major	
Management of Information Systems Major	
Information Security Major	
Occupational Safety and Health Major	
Engineering Sciences Major	
Facilities and Construction Management Major	
Human Resources Management Major	

Electives and MSSA/AIT Specializations

Transfer Credit -or- COB Minor-or- MGMT Electives	12

If technical transfer credit is not applicable, the 12 hours can ONLY be used toward College of Business (COB) minors. If no minor is chosen, then MGMT electives 200-300-400 level courses.

* Not applicable to Engineering Sciences Major

Open Electives (Lower or Upper Level) may be used for Minors in other departments or MSSA Technical Specialization.	18

* (15 credits of Open Electives, all upper level, are required for the Engineering Sciences Major).

****(15 credits: Choose MSSA Technical Specialization)

Specialization Learning Path Cohort: Each 18-week cohort will only concentrate on one technical specialization, which is shown in the schedule of offerings for each specific military base hosting this program. Once students are enrolled with the appropriate base and its scheduled set of courses, students and fellow classmates – the cohort – may take MATH 106 and five ISTA courses that serve the appropriate specialization.

If multiple Specialization learning paths are taken, total credit hours to complete the BSTM degree will exceed 120 credit hours.

****** Microsoft Software and Systems Academy Specializations:**

Database & Business Intelligence Administrator (Not currently available for enrollment.)

ISTA 210, ISTA 310, ISTA 312, ISTA 410, ISTA 412

Cloud Applications Developer (Only available for MSSA students.)

ISTA 220, ISTA 322, ISTA 420, ISTA 421, ISTA 422

Server and Cloud Administrator

ISTA 230, ISTA 330, ISTA 332, ISTA 430, ISTA 432

Cybersecurity Administrator

CYBR 155^ or CYBR 255, CYBR 235, CYBR 335^ or CYBR 355, CYBR 365, CYBR 465

^Available to AIT Students Only.

Available Minors (p. 95)

Students have the option to structure electives such that a Minor may be earned.

Total Degree Requirements	120

** Minnesota student residents refer to State of Minnesota Course Requirement (p. 98) statement for Humanities requirements.

Technical Management Major

Technical Management Major		
MGMT 320	Business Information Systems	3
MGMT 321	Aviation/Aerospace Systems Analysis Methods	3
MGMT 391	Introduction to Project Management	3
MGMT 394	Information Security Management	3
MGMT 420	Management of Production and Operations	3
MGMT 444	Principles of Supply Chain Management	3
MGMT 449	Strategic Marketing Management	3
Total Credits		21

Aviation Management Major

The Aviation Management Major is designed to provide students interested in pursuing a management discipline in the aviation, defense, and aerospace fields with a detailed and relevant flow of courses.

The Aviation Management Major, in conjunction with the BSTM core and elective course requirements, will provide students with an excellent well-rounded educational experience that should lead to exciting growth career opportunities.

Students taking courses in this Major will receive a depth of knowledge in a wide array of aviation, airport, and airline management areas. In addition, this major features a course that will concentrate on today's trends, opportunities and problems in air transportation. The aviation-related management courses should be both rewarding and challenging to the students participating in this Major.

MGMT 408	Airport Management	3
MGMT 419	Aviation Maintenance Management	3
BSAB 412	Airport Planning and Design	3
BSAB 415	Airline Management	3
BSAB 425	Trends and Current Problems in Air Transportation	3
BSAB 426	International Aviation Management	3
BSAB 450	Aviation/Airport Marketing	3
Total Credits		21

Project Management Major

Project managers who can deliver desired results on time and on budget are a valuable business resource. Learners who choose this major are often interested in pursuing project manager, lead, or coordinator positions with aviation-related and non-aviation related organizations. This major combines theory and techniques used by professional project management practitioners in a digital global environment to allow students to develop the skills to effectively lead and manage complex projects. The project management major teaches knowledge and skills to help participate in and lead the management of a variety of project types. The degree includes instruction on a variety of project management-related topics, including the nine project management knowledge areas and the five processes designated by the Project Management Institute® (PMI). The degree is also designed to foster critical thinking, analysis, and communication skills.

Not open to BS in Project Management students

Project Management Major		
MGMT 321	Aviation/Aerospace Systems Analysis Methods	3
MGMT 391	Introduction to Project Management	3
MGMT 394	Information Security Management	3
MGMT 424	Project Management in Aviation Operations	3
MGMT 427	Management of the Multicultural Workforce	3
MGMT 461	Global Project Management	3
MGMT 462	Project Management Advanced Concepts	3
Total Credits		21

Management of Information Systems Major

As information systems become more advanced and increasingly global, the need for Information Systems specialists increases as well. The Management of Information Systems (MIS) major focuses on the business processes of organizations and the information technology utilized in those organizations. The program prepares students to learn to design, implement, and maintain effective information systems in organizations. The MIS major is designed to develop the skills and knowledge necessary for information systems development and support positions.

In conjunction with the Technical Management degree curriculum, this program gives students a foundation for supervising or managing different components of the organization's information systems. Graduates of this program may find new opportunities in aviation and non-aviation related fields. MIS jobs, such as business analyst and chief technology officer, are reported to be among the most recession-proof jobs.

Management of Information Systems Major		
Select seven of the following:		
MGMT 321	Aviation/Aerospace Systems Analysis Methods	3
MGMT 385	Programming Concepts	3
MGMT 392	Database Management	3
MGMT 393	Computer Networks	3
MGMT 394	Information Security Management	3

MGMT 422	Information Technology Management, Strategy, and Governance	3
MGMT 428	Business Analytics and Data Intelligence	3
MGMT 492	Information Systems Project Management	3
MGMT 494	Aviation Information Systems	3
Total Credits		21

Information Security Major

The Information Security major is designed for students interested in pursuing careers in Information Systems. The curriculum focuses on addressing these information security needs in the marketplace. Students completing this program can apply for a broad range of IT-related positions, such as security analyst, security auditor, security consultant, security risk assessor, security manager, information technology manager, information security officer, security trainer, and security systems designer. Similar to other BSTM majors, the requirements for this major will be 21 credit hours. This major will cover the following areas:

Information Security Major		
MGMT 386	Fundamentals of Information Systems Security	3
Select six of the following:		18
MGMT 387	Managing Risk in Information Systems	
MGMT 388	System Forensics, Investigation, and Response	
MGMT 389	Information Assurance and Information Quality	
MGMT 401	Information Security Policies	
MGMT 402	Legal Issues in Information Security	
MGMT 403	IT Audit and Control	
MGMT 404	Business Continuity & Disaster Recovery Planning	
Total Credits		21

Occupational Safety and Health Major

Creating and maintaining a safe work environment and protecting workers from hazards have become a critical issue in nearly every industry. The Occupational Safety and Health major was developed to prepare students for supervisory or management positions relating to occupational safety and health in environmental compliance, ergonomics, industrial hygiene and toxicology, construction, fire protection, and systems design. This program is geared toward students who are seeking new opportunities in the public or private sector, such as service or manufacturing industries, local, state, or federal agencies, and the military.

Occupational Safety and Health Major		
SFTY 311	Fundamentals of Occupational Safety and Health	3
SFTY 315	Environmental Compliance and Safety	3
SFTY 321	Ergonomics	3
SFTY 355	Industrial Hygiene and Toxicology	3
SFTY 360	Construction Safety	3
SFTY 365	Fire Protection	3
SFTY 410	Design of Engineering Hazard Controls	3
or SFTY 420	Systems Design for Fire & Life Safety	
Total Credits		21

Engineering Sciences Major

The Engineering Sciences major is designed to help students develop a conceptual understanding of engineering, the engineering design process, technology, and technology-related concepts. This major is designed to give students a foundation for supervising or managing with an understanding of engineering tools and concepts. The Engineering Sciences major requirements must be satisfied by completing courses from the following list as noted.

*(*See Transfer Credit and Open Electives requirements for Engineering Sciences Major)*

Engineering Sciences Major		
ESCI 105	Fundamentals of Engineering	3
ENGR 115	Introduction to Computing for Engineers	3
ENGR 121	Graphical Communications for Technical Management	3
PHYS 250	Physics III for Engineers ***	3
MATH 243	Calculus and Analytical Geometry III	4
Select two of the following:		6
CESC 220	Digital Circuit Design +	
ESCI 201	Statics	
ESCI 202	Solid Mechanics	
ESCI 204	Dynamics	
ESCI 206	Fluid Mechanics	
***Note: BS in Technical Management Students Majoring in Engineering Sciences are not required to take PHYS 253 in conjunction with PHYS 250.		
+Note: BS in Technical Management Students Majoring in Engineering Sciences are not required to take CESC 222 in conjunction with CESC 220.		
Subtotal Credits		22

Engineering Sciences Support		
PHYS 150	Physics I for Engineers	3
PHYS 160	Physics II for Engineers	3
MATH 241	Calculus and Analytical Geometry I	4
MATH 242	Calculus and Analytical Geometry II	4
Subtotal Credits		14

Total Credits		36

Facilities and Construction Management Major

The Facilities & Construction Management major will prepare students well for careers in the field because of the varied curriculum that addresses all facets of facilities and construction management. Completing this major qualifies graduates for work in a variety of roles at a construction jobsite.

Facilities and Construction Management Major		
MGMT 391	Introduction to Project Management	3
MGMT 452	Construction Estimating & Bidding	3
MGMT 453	Construction Scheduling & Control	3
MGMT 454	Facilities Mechanical and Electrical Systems	3
MGMT 459	Special Topics in Facilities and Construction Management	3
Electives: (Select 2 courses from the following)		6
MGMT 455	Construction Systems	
MGMT 456	Economics for Facilities & Construction Managers	
MGMT 457	Facilities & Construction Safety Systems	
MGMT 458	Building Information Modeling (BIM)	
MGMT 460	Sustainable Facility Design and Construction	
Total Hours		21

Human Resources Management Major

The Human Resources Management major was developed for students interested in pursuing careers in Human Resources Management. In addition to preparing students to work in public, private and non-profit sectors, students will be well prepared to obtain leading industry Human Resources certificates and credentials. Graduates in this major can seek employment in both aviation and non-aviation industries as compensation and benefits specialists, recruitment and retention

specialists, human resources generalists, and other, related occupations. Human Resources Management is an ever growing field and spans all industry and geographic boundaries. As with the other BSTM majors, the requirements for the Human Resources Management major is 21 credit hours and will involve the following courses:

Human Resources Management Major		
MGMT 314	Human Resource Management	3
MGMT 317	Organizational Behavior	3
MGMT 324	Aviation Labor Relations	3
MGMT 427	Management of the Multicultural Workforce	3
MGMT 482	Human Resources Training and Development	3
MGMT 483	Compensation and Benefits	3
MGMT 495	Staffing and Workforce Planning	3
Total Credits		21

See BSTM Program Notes.

BSTM-MSM, MMIS, MSISA 4+1 Program, A Unique Opportunity

The BSTM - MSM, MMIS, MSISA 4+1 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 Technical Management and the Master of Science in Management, Master of Science in Management Information Systems (MMIS), or Master of Science in Information Security and Assurance (MSISA) degree programs in five academic years.

Students who are accepted in the 4 + 1 program, spend three academic years in undergraduate-level study and then, during their senior year, will take up to three graduate-level courses that will meet the undergraduate 400 level elective and graduate program core requirements (when a B grade or better is achieved). Upon completion of the BSTM requirements, students will be enrolled in graduate school and can complete their degree in one year. In any graduate course taken by an undergraduate student, a grade of B or better must be earned. If a grade of C or F is earned in any of the courses taken in lieu of 400 level elective credits, the student will be removed from the program, have credit awarded to the BSTM degree only, and may continue to complete the BSTM degree.

Students will use the virtual forms application (https://vforms.erau.edu/forms/private/student-services/recommendation/4plus1) site to work through the application, recommendation, and approval process.

M.B.A. in Aviation

Program-Specific Criteria

Prerequisite Knowledge

Subject knowledge for specific graduate courses must be satisfied before enrollment in those courses is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. The ERAU graduate level prerequisite course (BUSW 500) taken with ERAU must be completed with a grade of B or better.

Applicants for admission to the **Master of Business Administration in Aviation (MBAA)** *program are required to meet prerequisite knowledge in the following areas:*

- *Management*
- *Accounting Methods*
- *Finance*
- *Quantitative Methods*
- *Marketing*
- *Economics*

Students should assume responsibility to see that prerequisites are satisfied. However, students who still lack prerequisite knowledge in any of the above areas will be required to register for BUSW 500. The prerequisite subjects must be satisfied before enrollment in other MBAA courses is permitted.

The prerequisite knowledge can be validated through one of the following:

1. *Completed an undergraduate or graduate course in each of the specific subject areas and upon validation of the course from an official transcript;* ***-OR-***
2. *Completed a course listed in either the National or ACE Guide for which academic credit in one of the specific subject areas is recommended;* ***-OR-***
3. *Received at least the minimum recommended score on a CLEP, DSST/DANTES, PEP, etc. exam in each of the subject areas as required.*

The Master of Business Administration in Aviation degree program is designed to emphasize the application of modern management concepts, methods, and tools to the challenges of aviation and business. The special intricacies of aviation are woven into a strong, traditional business foundation by combining a specific core of distinct business competencies with a strong aviation foundation.

The demand for skilled professionals continues to grow in response to the increasing need for leaders who can manage the efficient and effective use of scarce resources; operate in an atmosphere of heightened national and international competition; and respond to the call to preserve our world's fragile eco-system – and the MBAA curriculum is oriented toward the needs of leaders and decision-makers who can operate in this environment.

Specific prerequisites for each graduate course in the MBAA are contained in the Graduate Courses section of this catalog. Students must assume responsibility to see that all prerequisites are satisfied. However, students who cannot demonstrate, through academic transcripts, prerequisite knowledge in one of the following areas (management, accounting, finance, quantitative methods, marketing and economics), will be required to register for BUSW 500. The prerequisite subject knowledge for a specific graduate course must be satisfied before enrollment in that specific course is permitted. Students may enroll in other graduate-level courses as they meet the specific prerequisite knowledge required.

Other Program Information:

As part of MBAA degree students will take a **comprehensive exam** in MBAA 635, Business Capstone Course. The exam will test student's knowledge of the core courses in the MBAA program.

Prerequiste Course (if required)		
BUSW 500	Business Foundations	3

DEGREE REQUIREMENTS

Core/Major

Business Core		
MBAA 514	Strategic Marketing Management in Aviation	3
MBAA 517	Managerial Accounting for Decision Making	3
MBAA 518	Managerial Finance	3
MBAA 522	Business Research Methods	3
MBAA 523	Advanced Aviation Economics	3
MBAA 604	International Business Administration	3
MBAA 635	Business Policy and Decision Making	3
Total Credits		21

Electives/Specialization

Electives or Specialization Option	12
Electives Option: Complete a total of 12 credit hours from any College of Business, unduplicated courses. No specialization will be earned for this option.	

Specialization Option: Choose any specialization. Students wishing to complete multiple specializations usually will be required to take an additional 12 semester hours (4 courses) for the second specialization. However, in some instances that may not be the case. For example, the MBAA Finance Specialization requires 4 finance courses and the Marketing Specialization requires 3 marketing courses and 1 unduplicated elective. Students seeking both specializations would only have to take 7 courses (21 semester hours) and not 8 courses (24 semester hours). The reason is that any of the finance specialization courses can also count as the Marketing Specialization unduplicated elective.	
Total Degree Requirements	33

Specialization in Accounting

MBAA 662	Intermediate Accounting I	3
MBAA 663	Intermediate Accounting II	3
MBAA 667	Federal Taxes	3
Elective - Any College of Business unduplicated course		3
Total Credits		12

Specialization in Finance

Select four courses from the following:		
MBAA 653	International Finance	3
MBAA 658	Money and Banking	3
EMGT 618	Introduction to Financial Engineering: Futures and Options	3
FIND 615	Investments	3
FIND 618	Advanced Corporate Finance	3
Total Credits		12

Specialization in Leadership

MSLD 500	Leadership Foundations in Research	3
MSLD 633	Strategic Leadership	3
MSLD 634	Leadership Ethics and Corporate Social Responsibility	3
MSLD 641	Resonant Leadership: Leading Change	3
Total Credits		12

Specialization in Information Technology

MMIS 501	Business Systems: Managing the IS Enterprise	3
MMIS 531	Information Systems Project Management	3
Select any MMIS prefixed unduplicated course		3
Select any MMIS prefixed unduplicated course		3
Total Credits		12

Specialization in Marketing

MBAA 630	Customer Value	3
MBAA 632	Global Marketing	3
MBAA 633	Digital Marketing	3
Elective - Any College of Business unduplicated course		3
Total Credits		12

Specialization in International Business

MBAA 632	Global Marketing	3
MBAA 653	International Finance	3
MGMT 673	Global Economic Analysis	3
LGMT 685	Global Logistics and Supply Chain Management	3
Total Credits		12

Specialization in Public Administration

MBAA 641	Public Leadership	3
MBAA 644	Public Finance	3
MBAA 646	Public Human Resource Management	3
MBAA 648	Public Policy	3
Total Credits		12

MBAA Program Notes:

1. This program is available at selected ERAU Worldwide campuses and/or through partnerships as determined by specific articulation or contract agreement.
2. Students enrolled through the ERAU Asia Campus can take LGMT 685 in lieu of MBAA 604 or both LGMT 685 and MBAA 604 . In addition, students can take an elective course in lieu of MGMT 524 . The MBAA degree requirements at ERAU Asia Campus is 36 semester hours. If the prerequisite knowledge in any area identified above is not evident BUSW 500 will need to be taken.
3. BUSW 500 will not count toward a core or elective course for the MBAA Program. If taken, it will only serve to fulfill prerequisite knowledge requirements for management, economic, and quantitative methods.

MS to MBAA

Students who have already completed the Master of Science in Management (MSM), Master of Science in Project Management (MSPM), or Master of Science in Technical Management (MSTM) may opt to complete the MBAA degree. The 33 hour degree requirement for the MBAA will be partially fulfilled using 15 hours of transfer credit from the MSM, MSPM, or MSTM programs plus an additional 18 hours of required additional core courses and electives. However, in many instances students seeking one or more MBAA specializations will be taking more than 21 additional hours due to the specialization requirements.

For MSM/MSPM/MSTM to MBAA

MSM/MSPM/MSTM students are currently enrolled under significantly different catalogs. As such there are multiple variations that can take place. The guidelines for determining the MSM/MSPM/MSTM transfer hours/additional core hours/specialization hours/elective hours, to the MBAA Program are as follows:

Transfer Students Not Selecting an MBAA Specialization

1. Transfer MBAA core courses or MBAA core equivalents first. The maximum number of hours that can be transferred is 15.
2. After it is determined the number of hours transferred for core courses, then transfer any unduplicated COB courses taken in the MSM Program so that the sum of the total hours transferred for core and non-core courses is 15. For example, if 9 hours of core courses or equivalents are transferred then 6 hours of non-core courses could be transferred.
3. Next, determine the number of hours of MBAA core courses that still needs to be taken to complete the MBAA Program. For example, there are 21 hours core course hours and if 12 core course hours are transferred in there still remains 9 core course hours that need to be taken.
4. Next, determine the number of hours of electives that need to be taken. An elective is any unduplicated COB course. The sum of the hours transferred, plus additional core hours, plus the elective hours must equal 33 hours. For example, if 15 hours in (9 hours of core MBAA courses and 6 hours of non-MBAA core courses), then 12 hours of core MBAA courses and 6 hours of electives will need to be taken.

Transfer Students Selecting an MBAA Specialization(s)

1. Transfer MBAA core courses or MBAA core equivalents first. The maximum number of hours that can be transferred is 15.
2. After it is determined the number of hours transferred for core courses, then transfer any unduplicated COB courses taken in the MSM Program so that the sum of the total hours transferred for core and non-core courses is 15. For example, if 9 hours of core courses or equivalents are transferred then 6 hours of non-core courses could be transferred. However, courses that count toward MBAA Specializations should be transferred before electives.
3. Next, determine the number of hours of MBAA core courses that still needs to be taken to complete the MBAA Program. For example, there are 21 hours core course hours and if 9 core course hours are transferred in there still remains 12 core course hours that need to be taken.
4. Next, determine the number of hours for MBAA Specialization(s) that need to be taken.
5. Next, determine the number of hours of electives that need to be taken. An elective is any unduplicated COB course. A minimum of 33 hours is needed for courses transferred in, additional core courses, specialization courses required, and electives (if needed). However, in most instances the total hours will exceed 33 as a result of the specialization requirements.

M.S. in Engineering Management

The Master of Science in Engineering Management (MSEM) degree is designed for working professionals who desire to add management skill to their prior degrees in engineering, math, physical science, computer science, or another STEM field. The degree is designed to assist those students to move into managerial roles in technical organizations. The degree expands on the student's existing technical abilities, adding management knowledge and skills.

Technical organizations require managers who understand the technical nature of the firm's business. Upon completion of the multi-disciplinary degree, students will have the knowledge to become managers in a technical organization.

The program combines a core curriculum with a selection of concentrations, allowing students to expand their knowledge in an area of interest. Concentrations include financial management; project management; systems engineering; leadership; management; logistics and supply chain management; and aviation/aerospace management.

These concentrations provide the student the opportunity to specialize in an area of their choice and interest, allowing the student to tailor his or her degree in a manner that best fulfills the student's career objectives.

Prerequisite Knowledge: Dependent upon a student's background; students may be required to take BUSW 500 Business Foundations Course to satisfy prerequisite
requirements for several of the courses in the MSEM degree and concentrations.

DEGREE REQUIREMENTS

Core/Major

Master of Science in Engineering Management Core		
MGMT 665	Organizational Theory in a Technical Environment	3
EMGT 514	Professional Service Marketing	3
EMGT 523	Engineering Economic Analysis	3
PMGT 501	Fundamentals of Project Management	3
MGMT 524	Management Science	3
MGMT 533	Social Responsibility, Ethics and Law	3
Total Credits		18

Electives

Technical Electives		
Select 3 courses, one of which must be a quality course (SYSE 625 or MGMT 532)		9
SYSE 625	System Quality Assurance	
MGMT 532	Philosophy, Principles, and Practices in Management of Quality	
LGMT 680	Discrete Event Simulation Modeling	
MBAA 522	Business Research Methods	
LGMT 683	Supply Chain Management	
ASCI 609	Aircraft Maintenance Management [1]	
Total Credits		9

[1] Students selecting the Aviation/Aerospace concentration must take ASCI 609. Students in other concentrations may not take ASCI 609.

Concentration		
Take one of seven concentrations		9
Total Credits		9

Total Degree Requirements	36

Concentrations:

Financial Management

MBAA 517	Managerial Accounting for Decision Making	3
MBAA 518	Managerial Finance	3
EMGT 618	Introduction to Financial Engineering: Futures and Options	3

Project Management

PMGT 502	Effective Communications for Managing Projects	3
PMGT 613	Assessing and Managing Project Risk	3
PMGT 614	Planning, Directing, and Controlling Projects	3

Systems Engineering

SYSE 530	System Requirements Analysis and Modeling	3
SYSE 560	Introduction to Systems Engineering Management	3
SYSE 610	System Architecture Design and Modeling	3

Leadership

MSLD 500	Leadership Foundations in Research	3
MSLD 511	Organizational Leadership	3
MSLD 521	Leadership Communication	3

Management

Select three of the following:		9
MGMT 653	Labor Issues in an Industrial Environment	
MGMT 671	Entrepreneurship and Leadership	
MGMT 672	Planning and Execution of Strategy	
MGMT 673	Global Economic Analysis	

Logistics and Supply Chain Management

Select three of the following:		9

LGMT 536	Purchasing for Logistics and Supply Chain Managers	
LGMT 636	Transportation Management	
LGMT 682	Integrated Logistics Management	
LGMT 685	Global Logistics and Supply Chain Management	

Aviation/Aerospace Management

Select three of the following:		9
ASCI 612	Aviation/Aerospace Industrial Safety Management	
ASCI 641	Production and Procurement Management in the Aviation/Aerospace Industry	
ASCI 642	International Aviation Policy	
ASCI 643	Management of Research and Development for the Aviation/Aerospace Industry	
ASCI 644	Integrated Logistics in Aviation Management	
ASCI 645	Airport Operations and Management	
ASCI 646	Airline Operations and Management	

M.S. in Information Security and Assurance

Complex, emerging threats to information quality and security make it difficult to protect a company's profits, performance and reputation. Add to this a scarcity of high-level leaders who grasp both the technical and business aspects of information assurance, and we face the prospect of a perfect storm of information risks.

That's why Embry-Riddle has created this MSISA degree for professionals who aspire to leadership positions in the information security arena. Curriculum is offered through the College of Business and focuses on the technology and business aspects of how information security drives enterprise-wide strategy and success. Degree specializations are available in Protecting Business Intelligence, Information Systems Security and Information Assurance in a Global Context.

The MSISA is delivered with an interdisciplinary approach that makes the learning applicable to any industry. Choose this degree if you strive to excel as a strong decision maker driving enterprise-wide policies.

MSISA Program Notes:

1) It is strongly suggested that MISA 501 and then MISA 502 be the first two courses a student takes in their degree program. Many other classes build on this knowledge.

DEGREE REQUIREMENTS

Core/Major

Information Security & Assurance Core		
MISA 501	Assured Business Systems: Managing and Protecting the Information Systems Enterprise	3
MISA 502	Risk Management and Business Continuity	3
MISA 503	Informatics: Security Implications of Cross-Disciplinary Computing	3
MISA 504	Enterprise Systems Architectures for Information Assurance	3
MISA 505	Incident Management and Information Forensics	3
MISA 506	Cyber Law, Cyber Compliance, and Information Assurance	3
MISA 507	Quality Management for Information Assurance	3
Total Credits		21

Specializations/Electives

Specialization or Electives Credits	9
Electives: Complete a total of 9 credit hours (3 classes) from any College of Business unduplicated courses. No specialization will be earned for this option.	
Specializations: Choose any specialization and select 9 credit hours (3 classes) within that specialization. Students wishing to complete multiple specializations will usually be required to take an additional 9 semester hours (3 classes) to earn the second specialization.	
Total Degree Requirements	30

Specializations:

Protecting Business Intelligence Specialization		
MMIS 521	Data Warehousing and Information Quality	3
MMIS 522	Business Analytics, Social Network and Web Analytics	3
MISA 523	Information Advantage -- Defensive: Countering Self-Deception and External Deceptions	3
Information Systems Security Specialization		
MISA 531	Secure Information Systems Design	3
MISA 532	Integrated Threat Warning and Attack Assessment for Enterprise Information Systems	3
MISA 533	Product and Systems Safety and Reliability: Issues for Information Assurance	3
MISA 534	Aviation / Aerospace Issues for Information Security	3
Information Assurance in a Global Context Specialization		
MISA 541	International Considerations for Information Assurance and Protection	3
MISA 543	Assured Strategic Messaging: Keeping the Message Intact and Effective	3
MISA 544	The High-Reliability Enterprise Model	3
MMIS 561	Global Information and Technology Management	3

M.S. in Leadership

Many companies look the same from the outside, but on the inside there are dramatic differences in culture and performance. It all starts with leadership.

Good leaders develop high-performing teams that consistently outperform their competition. These teams capitalize on their strengths, draw inspiration from diversity, and hold each other accountable to achieving their mission.

Good leadership is not a fluke. Good leaders are systematically developed. The Master of Science in Leadership degree helps students develop the competencies that are essential for leading an organization effectively.

Through this comprehensive curriculum, you will learn how to:

- Inspire the best from those around you.
- Communicate powerfully and develop additional sources of influence.
- Understand your leadership capacities and minimize your blind spots.
- Coach and mentor others to achieve their potential.
- Analyze and diagnose organizational issues that impact your team's performance.
- Anticipate the need for organizational change and renewal.

- Establish and foster a high-performing culture across your organization.

In addition to grooming you for today's most challenging leadership positions, this degree will arm you with the skill and vision to become one of the architects of tomorrow.

DEGREE REQUIREMENTS

Core/Major

Leadership Core		
MSLD 500	Leadership Foundations in Research	3
MSLD 511	Organizational Leadership	3
MSLD 520	Management Skills for Leaders	3
MSLD 521	Leadership Communication	3
MSLD 632	Decision Making for Leaders	3
MSLD 633	Strategic Leadership	3
MSLD 634	Leadership Ethics and Corporate Social Responsibility	3
MSLD 635	Organizational Change	3
MSLD 641	Resonant Leadership: Leading Change	3
MSLD 690	Graduate Leadership Capstone	3
Total Credits		30

Electives

Electives	6
Select any two graduate level classes of 3 credits from the College of Business	
Total Degree Requirements	36

M.S. in Logistics and Supply Chain Management

Globalization is affecting almost every aspect of the world's economy – and the world's economy is sustained by global logistics and supply chain management. As a result, the demand for qualified logistics and supply chain professionals is higher than ever. Competition is fierce for the most prominent positions.

The right education can distinguish you from other professionals in your field and make you more marketable in both the public and private sectors.

A Master of Science degree in Logistics and Supply Chain Management will benefit you even more by providing you with:

- An excellent foundation for professional certification as a Certified Supply Chain Professional (CSCP) offered by the Association for Operations Management or APICS; Certified Professional Logistics (CPL) certification program offered by the International Society of Logistics (SOLE); and Certified Professional in Supply Management (CPSM) offered by the Institute for Supply Management (ISM). The certification process for the above can be found on each organization's website, and it involves taking exams on different topics and may also require a minimum number of years of professional experience.
- A career that pays very well. According to 2014 salary survey by Institute for Supply Management (ISM), average salary of supply managers with a master's degree was $121,475 compared to $98,079 for those with bachelor's degree. Source: ISM's 2014 Salary Survey (https://www.instituteforsupplymanagement.org/files/Tools/2014ISMSalarySurveyBrief.pdf)

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate level courses only if they meet prerequisite knowledge requirements. Graduate level prerequisite courses taken with ERAU must be completed with a grade of B or better.

Applicants for admission to the **Master of Science in Logistics and Supply Chain Management** program are required to meet prerequisite knowledge in the following areas:

- Management
- Accounting Methods
- Finance
- Quantitative Methods
- Economics
- Marketing

Students should assume responsibility to see that prerequisites are satisfied. However, students who still lack prerequisite knowledge in one of the following areas may be required to register for BUSW 500. The prerequisite subject knowledge for a graduate course must be satisfied before enrollment in that specific course is permitted. Students may enroll in other graduate level courses as they meet any specific prerequisite knowledge required.

The prerequisite knowledge can be validated through one of the following:

1. Completed an undergraduate or graduate course in each of the specific subject areas and upon validation of the course from an official transcript; **-OR-**
2. Completed a course listed in either the National or ACE Guide for which academic credit in one of the specific subject areas is recommended; **-OR-**
3. Received at least the minimum recommended score on a CLEP, DANTES, PEP, etc. exam in each of the subject areas as required; **-OR-**
4. Satisfactorily completed BUSW 500.

Other Program Information:
As part of the **Master of Science in Logistics and Supply Chain Management** program, students will take a **comprehensive exam** in LGMT 691, Logistics and Supply Chain Management Capstone Course. The exam will test students' knowledge of courses from the MS in LSCM program.

DEGREE REQUIREMENTS

Core/Major

LGMT 536	Purchasing for Logistics and Supply Chain Managers	3
LGMT 636	Transportation Management	3
LGMT 682	Integrated Logistics Management	3
LGMT 683	Supply Chain Management	3
LGMT 685	Global Logistics and Supply Chain Management	3
LGMT 691	Logistics and Supply Chain Management Capstone	3
MGMT 524	Management Science	3
MGMT 651	Production and Procurement in the Aviation and Aerospace Industry	3
Total Credits		24

Electives

Electives:	6
Select six credit hours from the following list of courses:	

MBAA 514, MBAA 517, MBAA 518, MBAA 522, MBAA 523, MBAA 604, MBAA 611, MBAA 612, MGMT 532, MGMT 533, MGMT 535, PMGT 652, MGMT 671, MGMT 672, MGMT 673, MGMT 665, MMIS 561, LGMT 680

Total Degree Requirements	30

M.S. in Management

Offered through the Embry-Riddle College of Business, the Master of Science in Management (MSM) degree program provides you with a greater focus on the theory and practice of management than a traditional MBA. Whether you are interested in promoting into management, transitioning from the military or already have a management position, this program will introduce you to cutting-edge concepts at play in today's global marketplace.

Our goal is to help position you for success by equipping you with both the technical skills and managerial skills to manage resources, lead teams, and apply solutions to organizational challenges. In addition to your core curriculum of MSM studies, you will also have the opportunity to specialize in Human Resources Management, Global Management, Leadership, Project Management or Operations Management.

This program is taught by faculty who will challenge you to become a better thinker. You will learn how to analyze problems and research and implement solutions. The MSM then culminates in a Capstone project that will give you the hands-on experience to grow within your current role, as well as reach your future goals. As part of the course requirements for the MSM, candidates choose from general management open electives or one of five areas of specialization, tailored to your background and interests:

- Human Resources Management
- Global Management
- Operations Management
- Project Management
- Leadership

MSM degree candidates know that an advanced education will provide the tools necessary to succeed in today’s fast-paced, technologically driven, and complex organizations.

All MSM students gain practical management skills, such as:

- Quantitative analytical skills – using numbers to make decisions
- Change management skills – the ability to adapt, control, and effect organizational change
- Knowledge of ethical and regulatory requirements
- An understanding of organizational structure and leadership
- Effective communication strategies
- Strategic planning, critical thinking, and decision-making skills
- Research and problem-solving skills

The Master of Science in Management program is accredited by the Accreditation Council for Business Schools & Programs (ACBSP). This achievement means that the program has been peer-reviewed, scrutinized, and meet the stringent requirements set forth by the ACBSP.

The Society for Human Resources Management (SHRM) has acknowledged that the Master of Science in Management program Human Resources Specialization fully aligns with SHRM's *HR Curriculum Guidebook and Templates.*

Prerequisite Knowledge:

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in a specific graduate-level course only if they meet prerequisite knowledge requirements. Graduate-level prerequisite courses taken with ERAU must be completed with a grade of B or better.

Students should assume responsibility to see that prerequisites are satisfied. Students who take elective courses from other College of Business programs may be required to register for certain Business Foundations courses that serve as prerequisites. The prerequisite subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in other graduate-level courses as they meet the required prerequisite knowledge. Specific prerequisite requirements are contained in the Course Description section of this catalog.

MSM Program Notes:

1) BUSW 500 satisfies the prerequisite requirements for many other MGMT and College of Business courses. It is therefore recommended that BUSW 500 be the first class a student takes in the MSM program.

2) Students in the Leadership Specialization must complete BUSW 500 before taking MSLD courses that require MSLD 500. BUSW 500 is equivalent to MSLD 500 for MSM students.

3) Students in the Human Resources Specialization must take MGMT 608 Human Resource Management as one of their three specialization courses.

DEGREE REQUIREMENTS

Core/Major

BUSW 500	Business Foundations	3
MGMT 520	Organizational Behavior and Change	3
MGMT 530	Business Analytics for Managers	3
MGMT 533	Social Responsibility, Ethics and Law	3
MGMT 535	Theory and Application of Managerial Communications	3
MGMT 672	Planning and Execution of Strategy	3
MGMT 691	Management Capstone Course	3
Note: Students should take BUSW 500 early # if not first # in their degree program to satisfy prerequisite requirements of other courses in the MSM core.		
Total Credits		21

Specialization/Electives

Specialization or Elective Credits	9
Electives: Complete a total of 9 credit hours (3 classes) from any College of Business unduplicated courses. No specialization will be earned for this option.	
Specializations: Choose any specialization and select 9 credit hours (3 classes) within that specialization. Students wishing to complete multiple specializations will usually be required to take an additional 9 semester hours for the second specialization.	

Total Degree Requirements	30

Areas of Specialization:

Specialization 1 – Human Resources Management

MGMT 607	Human Resource Development	3
MGMT 608	Human Resources Management	3
MGMT 678	Talent Acquisition and Workforce Planning	3
MGMT 679	Comprehensive Reward Systems	3
See Program Notes.		

Specialization 2 – Leadership

MSLD 511	Organizational Leadership	3
MSLD 520	Management Skills for Leaders	3
MSLD 632	Decision Making for Leaders	3
MSLD 633	Strategic Leadership	3

Note: Students should speak with their academic advisor about software requirements for this specialization. Completing BUSW 500 with a grade of B or better satisfies the MSLD course prerequisite of MSLD 500. See Program Notes.

Specialization 3 – Global Management

MBAA 604	International Business Administration	3
MGMT 673	Global Economic Analysis	3
MMIS 561	Global Information and Technology Management	3
LGMT 685	Global Logistics and Supply Chain Management	3

Specialization 4 – Operations Management

MMIS 561	Global Information and Technology Management	3
MGMT 532	Philosophy, Principles, and Practices in Management of Quality	3
MGMT 651	Production and Procurement in the Aviation and Aerospace Industry	3
PMGT 652	Concepts and Practices of Project Management	3

Specialization 5 - Project Management

PMGT 652	Concepts and Practices of Project Management	3
PMGT 502	Effective Communications for Managing Projects	3
PMGT 613	Assessing and Managing Project Risk	3
PMGT 670	Contemporary Project Management	3

M.S. in Management Information Systems

For the modern business enterprise, the ability to utilize information effectively is key to creating a competitive advantage. The most successful and sought-after leaders are those who understand how data can be used to drive profits, plans and projections

Now you can forge your future as an MIS leader with this exciting new online degree from the Embry-Riddle College of Business. With a focus on the critical intersection of information and business management, the MS in Management Information Systems (MSMIS) program is designed for busy professionals who are interested in how information is applied to achieve bottom-line results.

Individuals with business, managerial and/or technical backgrounds will experience a new dimension of learning and opportunity with a choice of online degree specializations including Business Intelligence and Analytics, Information Security and Assurance, and Information Systems Project Management.

If you are interested in advancing your career into enterprise-wide MIS leadership, consider this program as a springboard to your future.

MSMIS Program Notes:

1) It is strongly suggested that MMIS 501 and then MMIS 531 be the first two courses a student takes in their degree program. Many other classes build on this knowledge.
2) Students in the IS Project Management specialization must take MMIS 531 prior to taking any PMGT courses. MMIS 531 will be considered equivalent to the needed pre-requisite(s) for PMGT courses in the IS Project Management specialization.

DEGREE REQUIREMENTS

Core/Major

Management Information Systems Core		
MMIS 501	Business Systems: Managing the IS Enterprise	3
MMIS 503	Data & Information Modeling & Management	3
MMIS 504	Knowledge Management: Quality Management for the IS Enterprise	3
MMIS 505	Information Analytics and Visualization in Decision Making	3
MMIS 506	Systems Analysis and Design	3
MMIS 507	Information Systems Strategic Planning	3
MMIS 531	Information Systems Project Management	3
Total Credits		21

Specialization/Electives

Specialization or Elective Credits	9
Electives: Complete a total of 9 credit hours (3 classes) from any College of Business unduplicated courses. No specialization will be earned for this option. Additional MMIS electives include MMIS 561, MMIS 552 and MMIS 553.	
Specializations: Choose any specialization and select 9 credit hours (3 classes) within that specialization. Students wishing to complete multiple specializations will usually be required to take an additional 9 semester hours for the second specialization.	
Total Degree Requirements	30

Specializations:

Business Intelligence and Analytics Specialization		
MMIS 521	Data Warehousing and Information Quality	3
MMIS 522	Business Analytics, Social Network and Web Analytics	3
MMIS 523	Data Mining, Machine Learning and Knowledge Discovery	3
MMIS 524	Applied Knowledge Management and Business Intelligence	3
Information Security and Assurance Specialization		
MMIS 541	Information Risk Management	3
MISA 501	Assured Business Systems: Managing and Protecting the Information Systems Enterprise	3
MISA 504	Enterprise Systems Architectures for Information Assurance	3
MISA 531	Secure Information Systems Design	3
Information Systems Project Management Specialization		
PMGT 502	Effective Communications for Managing Projects	3
MSLD 632	Decision Making for Leaders	3
PMGT 613	Assessing and Managing Project Risk	3
PMGT 612	Leading Projects Across Cultural, Corporate, and International Boundaries (Course only available for students enrolled in the MSMIS prior to July 1, 2018)	3

M.S. in Project Management

Program-Specific Criteria

Project management expertise applies to every industry, allowing you the flexibility to choose your destiny.

After earning a Master of Science in Project Management, you'll be able to generate plans, execute projects, and capture your initiatives' successes in order to increase project efficiencies.

Much of the course work is collaborative – just as it is in the workplace. The program curriculum was developed entirely by certified PMPs®, the recognized global standard for project management knowledge and experience issued by the PMI®. PMI® is the worldwide leader in the development of standards for the evolving profession of Project Management.

For your Graduate Capstone Project, you'll build an e-Portfolio, a platform that demonstrates Project Management mastery by showcasing the skills and abilities developed throughout your educational experience. This degree doesn't just give you an *understanding* of projects – it gives you the skills needed to *lead* projects.

The Embry-Riddle Worldwide College of Business Master of Science Degree in Project Management is accredited by the Project Management Institute Global Accreditation Center for Project Management Education Programs (GAC). Degree programs that achieve GAC accreditation must demonstrate and meet the GAC's rigorous global standards of accreditation, which include an assessment of each program's objectives and outcomes, faculty and student evaluations, onsite and online resources, annual self-evaluation, and proof of continuous improvements in the area of project management education. GAC accreditation ensures the quality of academic degree programs and their graduates in order to meet the standards of the rapidly growing field of project management.

Prerequisite Knowledge

Subject knowledge for a specific graduate course must be satisfied before enrollment in that course is permitted. Students may enroll in graduate-level courses only if they meet prerequisite knowledge requirements. Graduate-level prerequisite courses taken with ERAU must be completed with a grade of B or better.

Applicants for admission to the **Master of Science in Project Management (MSPM)** *program are required to meet prerequisite knowledge in the following areas:*

- *Written Communication*
- *Quantitative Methods*
- *Computer Skills**

Access provided by ERAU staff at the location of register or on the College of Business – ERAU Website

** The MSPM program relies heavily on use of current PMIS (Project Management Information Systems) software and other common-use software for word processing, presentation, and computation. While the use of some of these PMIS programs will be the subject of learning exercises within the program, the successful student will be expected to show proficient skill in word processing, spreadsheet usage, and presentation graphics.*

DEGREE REQUIREMENTS

Core/Major

MGMT 672	Planning and Execution of Strategy **	3
MSLD 632	Decision Making for Leaders ***	3
PMGT 524	Management Science for Project Managers	3
PMGT 500	Foundations of Project Management	3
PMGT 501	Fundamentals of Project Management	3
PMGT 502	Effective Communications for Managing Projects	3
PMGT 613	Assessing and Managing Project Risk	3
PMGT 614	Planning, Directing, and Controlling Projects	3
PMGT 670	Contemporary Project Management	3
PMGT 690	Project Management Capstone +	3
+The Project Management Capstone is the last course taken in the MSPM program.		
** BUSW 500 Prerequisite for MGMT 672 is not required for MSPM students.		
*** MSLD 500 Prerequisite for MSLD 632 is not required for MSPM students.		
Total Credits		30

Minor in Air Cargo Management

The goal of the Air Cargo Management Minor is to provide the students with supplemental knowledge and tools required to be successful in the evolving air cargo industry. The target audience for this minor will be the students who are currently working in this field and those students who aspire to be part of the workforce of this ever growing field. The areas of study include Air Transportation Systems, Economics of Air Transportation, International Aviation Management, Aviation Maintenance Management, Airport Management, and Airline Management.

With the upward trend of online shopping and commerce, the demand for air cargo management expertise is expected to increase in the years to come. A minor in air cargo management will expose students to all facets of both domestic and international air cargo logistics operations. The Air Cargo Management Minor will provide students a competitive edge with the differentiated knowledge, skills, and abilities that compliments their major program of study.

Select five courses from the list below:		
BSAB 415	Airline Management	3
ASCI 416	Aviation Maintenance Management: A Global Perspective	3
BSAB 426	International Aviation Management	3
ECON 420	Economics of Air Transportation	3
MGMT 408	Airport Management	3
TRAN 321	Air Transportation Systems	3
Total Credits		15

Minor in Airport Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

ASCI 254	Aviation Legislation	3
MGMT 408	Airport Management	3
BSAB 412	Airport Planning and Design	3
Select two of the following:		6
ASCI 320	Commuter Aviation	
SFTY 345	Aviation Safety Program Management	
SFTY 350	Aircraft Crash and Emergency Management	
SFTY 409	Aviation Safety	
ASCI 401	Airport Development and Operations	
ASCI 404	Applications in Aviation/Aerospace Law	
ASCI 412	Corporate and Business Aviation	
MGMT 324	Aviation Labor Relations	
MGMT 331	Transportation Principles	
MGMT 436	Strategic Management	

BSAB 410	Management of Air Cargo	
BSAB 418	Airport Administration & Finance	
BSAB 425	Trends and Current Problems in Air Transportation	
BSAB 426	International Aviation Management	
MGMT 499	Special Topics in Management	
SCTY 400	Airport Security	
SCTY 488	National Security Issues and Terrorism	
Total Hours		15

Minor in Aviation Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Only available to Worldwide undergraduate students enrolled in degree programs other than BS in Aviation Business Administration and BSTM-Aviation Management Major.

MGMT 408	Airport Management	3
BSAB 415	Airline Management	3
BSAB 418	Airport Administration & Finance	3
BSAB 426	International Aviation Management	3
BSAB 450	Aviation/Airport Marketing	3
Total Credits		15

Minor in Human Resources

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

MGMT 314	Human Resource Management	3
MGMT 482	Human Resources Training and Development	3
MGMT 483	Compensation and Benefits	3
Select two courses from the list below:		
MGMT 317	Organizational Behavior	3
MGMT 324	Aviation Labor Relations	3
MGMT 427	Management of the Multicultural Workforce	3
Total Credits		15

Minor in Humanitarian and Disaster Relief Logistics

The Humanitarian and Disaster Relief Logistics minor provides the students with knowledge and tools required to be successful in the planning, organizing, managing, and controlling the successful deployment of humanitarian and disaster relief efforts from all aspects of providing logistical support where needed. The target audience for this minor are students who are currently working in this field and for those who want to be part of the workforce of this ever growing field of logistics and supply chain management.

ESVS 403	Disaster Planning and Control	3
MGMT 441	Introduction to Management Science	3
LGMT 375	Humanitarian Logistics	3
LGMT 450	Hazard Mitigation in Emergency Management	3
LGMT 484	Material Management in Contingency Operations	3
Total Credits		15

Minor in Logistics Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Select five courses from the list below:		15
MGMT 331	Transportation Principles	
BSAB 410	Management of Air Cargo	
MGMT 411	Logistics Management for Aviation/Aerospace	
MGMT 420	Management of Production and Operations	
MGMT 440	Advanced Professional Logistics	
MGMT 444	Principles of Supply Chain Management	
Total Credits		15

Minor in Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Not open to students pursuing College of Business undergraduate degrees or BS in Aviation Maintenance-Management Specialization.

Students pursuing College of Business undergraduate degrees cannot take minors that are in the same field as their majors.

ECON 210	Microeconomics	3
MGMT 201	Principles of Management	3
MGMT 210	Financial Accounting	3
MGMT 311	Marketing	3
Specified Electives in Management		3
Choose any upper-level MGMT course.		
Total Credits		15

Minor in Management Information Systems

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Not open to BS in Technical Management – Management Information Systems Major students

Select five courses from the list below:		15
MGMT 392	Database Management	
MGMT 394	Information Security Management	
MGMT 422	Information Technology Management, Strategy, and Governance	
MGMT 428	Business Analytics and Data Intelligence	
MGMT 492	Information Systems Project Management	
MGMT 494	Aviation Information Systems	
Total Credits		15

Minor in Marketing

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

MGMT 311	Marketing	3
MGMT 444	Principles of Supply Chain Management	3
MGMT 449	Strategic Marketing Management	3
BSAB 450	Aviation/Airport Marketing	3
Select one course from the following:		3
ECON 315	Managerial Economics	
ECON 420	Economics of Air Transportation	
Total Credits		15

Minor in Project Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Not open to BS in Technical Management – Project Management Major students

MGMT 391	Introduction to Project Management	3
MGMT 424	Project Management in Aviation Operations	3
MGMT 427	Management of the Multicultural Workforce	3
MGMT 461	Global Project Management	3
MGMT 462	Project Management Advanced Concepts	3
Total Credits		15

Minor in Technical Management

Minor courses of study are academic programs designed to satisfy students' personal interest 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 experience, students are encouraged to select minors that complement their degree program and/or other minors that they are pursuing.

The student becomes subject to the requirements of the minor as stated in the catalog that are in effect at the time the minor is declared. The department/program chair responsible for a particular minor determines how students fulfill deficits in credits for a minor and certifies that students are qualified to receive the minor.

Only available to Worldwide undergraduate students enrolled in degree programs other than BS in Technical Management

Select five courses from the list below:		15
MGMT 371	Leadership	
MGMT 391	Introduction to Project Management	
MGMT 394	Information Security Management	
MGMT 420	Management of Production and Operations	
MGMT 444	Principles of Supply Chain Management	
MGMT 449	Strategic Marketing Management	
Total Credits		15

Applied Information Technology (AIT) Certificates of Completion

Embry-Riddle's Applied Information Technology (AIT) Certificates provides you the opportunity to develop the knowledge, skills, attitudes and abilities you'll need to kick-start your career in Applied Information Technologies.

Three different Certificates let you choose between three major areas of IT – Server and Cloud Systems, Cloud Applications Development, and

Cybersecurity – all of which are in high demand by employers in almost every business, industry or government activity.

Currently these courses are offered online, one course per term in sequence.

As an AIT student you'll take five 3-credit undergraduate courses and one math course* to complete the Certificate. Laboratories, exercises, team activities and individual projects give you the opportunity to develop and demonstrate your systems, network and server deployment, sustainment and management skills. Along the way, you're preparing to study for the rigorous Microsoft Certified Professional Exams that are associated with the program.

Check out https://worldwide.erau.edu/ait to learn more about the AIT program and how you can become a part of it.

**Math 106, equivalent, or higher required, unless students demonstrate higher math skills via their math assessment exam.*

Note: Certificate programs are not eligible for Title IV Federal Financial Aid.

Server and Cloud Administrator Certificate of Completion

Server and Cloud Administrator		
ISTA 230	Networking and Server Fundamentals	3
ISTA 330	Windows Server Configuration and Management	3
ISTA 332	Configuring Advanced Windows Server Services	3
ISTA 430	Configuring and Deploying Private Cloud Systems	3
ISTA 432	Building Azure Infrastructures	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

Cloud Applications Developer Certificate of Completion

Cloud Applications Developer		
ISTA 220	Programming in C#	3
ISTA 322	Developing ASP.NET Web Applications	3
ISTA 420	SQL and Application Development	3
ISTA 421	Developing Cloud Applications	3
ISTA 422	Azure Application Development	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

Cybersecurity Administrator Certificate of Completion

Cybersecurity Administrator		
CYBR 155	Foundations of Information Security	3
or CYBR 255	Information Systems Security Principles	
CYBR 235	Computer and Network Technologies	3
CYBR 335	Information Security Tools and Techniques	3
or CYBR 355	Networks and Systems Security Tools	
CYBR 365	Introduction to Digital Forensics	3
CYBR 465	Cybercrime and Cyberlaw	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

Microsoft Software and Systems Academy (MSSA)

Certificates of Completion

Embry-Riddle's Microsoft Software and Systems Academy (MSSA) Certificates provides you the opportunity to develop the knowledge, skills, attitudes and abilities you'll need to kick-start your career in Applied Information Technologies. Three different Certificates let you choose between three major areas of IT – Server and Cloud Systems, Cloud Applications Develoment, and Cybersecurity – all of which are in high demand by employers in almost every business, industry or government activity.

This is an intensive, full-time, daytime program of study spanning two 9-week terms, and is only offered at select US military base locations or in their communities.

As a member of an MSSA Server & Cloud Administrator cohort, you'll take five 3-credit undergraduate courses and one math course* to complete the Certificate. Laboratories, exercises, team activities and individual projects give you the opportunity to develop and demonstrate your systems, network and server deployment, sustainment and management skills. Along the way, you're preparing to study for the rigorous Microsoft Certified Professional Exams that are associated with the program.

MSSA cohort students are also eligible for additional professional development, mentoring and other career-enhancing services, direct from Microsoft – including the possibility of a job interview with Microsoft or one of its Technology Partner companies.

Check out https://worldwide.erau.edu/mssa to see which military locations or off-base campuses are offering which MSSA specializations with the Certificate of Completion as an option.

The MSSA program is open to active duty US military personnel about to be honorably discharged from service, and to honorably discharged military veterans.

**Math 106, equivalent, or higher required, unless students demonstrate higher math skills via their math assessment exam.*

Note: Certificate programs are not eligible for Title IV Federal Financial Aid.

Server and Cloud Administrator Certificate of Completion

Server and Cloud Administrator		
ISTA 230	Networking and Server Fundamentals	3
ISTA 330	Windows Server Configuration and Management	3
ISTA 332	Configuring Advanced Windows Server Services	3
ISTA 430	Configuring and Deploying Private Cloud Systems	3
ISTA 432	Building Azure Infrastructures	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

Cloud Applications Developer Certificate of Completion

Cloud Applications Developer		
ISTA 220	Programming in C#	3
ISTA 322	Developing ASP.NET Web Applications	3
ISTA 420	SQL and Application Development	3
ISTA 421	Developing Cloud Applications	3

ISTA 422	Azure Application Development	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

Cybersecurity Administrator Certificate of Completion

Cybersecurity Administrator		
CYBR 235	Computer and Network Technologies	3
CYBR 255	Information Systems Security Principles	3
CYBR 355	Networks and Systems Security Tools	3
CYBR 365	Introduction to Digital Forensics	3
CYBR 465	Cybercrime and Cyberlaw	3
*MATH 106, or equivalent, if required by student's math skills assessment exam results		3*
Total Credits		15-18

International Society of Transport Aircraft Trading (ISTAT)

The ISTAT certificate is a partnership certificate and will be issued by ISTAT and not Embry-Riddle.

The ISTAT certificate is designed for students who have completed an undergraduate degree in business, accounting, finance or economics, or related transportation fields of study looking for a rewarding and challenging career in the aircraft financing, leasing and other ISTAT member industries.

Students only pursuing the ISTAT certificate should apply as non-degree seeking students. Students who wish to pursue the certificate as part of their degree program should coordinate any potential credit toward a degree with the appropriate college and program chair.

In addition to Embry-Riddle admission requirements, students must be vetted through ISTAT University (http://www.istat.org/page/istat-u) and meet the ISTAT admission requirements.

International students (degree and non-degree seeking) must be admitted in accordance with all applicable international admissions (p. 15) requirements.

Note: Certificate programs are not eligible for Title IV Federal Financial Aid.

International Society of Transport Aircraft Trading (ISTAT)

Certificate

FIND 695A	Topics in Aircraft Finance I	2
FIND 695B	Topics in Aircraft Finance II	2
FIND 695C	Topics in Aircraft Finance III	2
Total Credits		6

Minor Courses of Study

Minor Courses of Study

Students pursuing undergraduate degrees cannot take minors that are in the same field as their majors.

Ph.D. in Aviation

The demand for aviation professionals with the skills to conduct research and solve problems continues to grow in response to the increasing complexity and evolution of the aviation field. The Ph.D. in Aviation program -- the first in the U.S. -- is designed to address that need by allowing students to pursue doctoral studies in aviation in a diverse, intellectually versatile and multi-disciplinary environment.

The program may be pursued in-residence or online. Courses are offered online for greater accessibility to the working professional. Participation in three five-day on-campus residency seminars is required during the program. This program format provides doctoral degree students an innovative way to achieve their personal, educational, and professional goals.

The Ph.D. in Aviation program is designed to enable students to achieve the following learning objectives:

- develop mastery of the central theories and concepts in the field of aviation, including foundations, safety management, economics, and regulatory procedures
- pose and solve theory-based and research-based problems designed to advance applications in the field of aviation;
- extend the aviation body of knowledge by conceiving, planning, producing, and communicating original research;
- develop and demonstrate expertise in instructional processes;
- demonstrate leadership, collaboration, and communication necessary for scholarly work in aviation

Courses are offered during three 12-week terms per year. The program requires completion of four aviation core courses, a four-course sequence in statistics and research methodology, and four specialization courses. A qualifying exam tests students' mastery of core and specialization subject matter and is conducted at the end of the course work. Completion and defense of a dissertation is the final phase of the program. The dissertation is a formal academic paper that constitutes the culmination of the doctoral program. The purpose of the dissertation is to prepare students to be professionals in a discipline, to develop the skills necessary to engage in independent research, and to advance the body of knowledge in aviation. The program requires completion of 60 credit hours beyond the master's degree, including course work, residency seminars, and dissertation courses.

Policies for the Doctor of Philosophy in Aviation program may differ from those in the catalog referencing. Students should consult the appropriate academic department for degree program specific information.

Specific information about the Ph.D. in Aviation program, including admission and course requirements, may be found at the program website: http://aviationphd.erau.edu.

Ph.D. in Aviation Business Administration

The Ph.D. in Aviation Business Administration program allows highly qualified students and professionals from diverse backgrounds and aviation career paths to immerse themselves in the world of aviation business. The Doctor of Philosophy degree will be conferred in recognition of creative accomplishment, the ability to investigate scientific or business research problems independently, and the completion of advanced coursework.
The Ph.D. in Aviation Business Administration is a 60-credit hour program. The curriculum is designed to challenge your knowledge and test your industry experience, as you gain valuable insight into research methods and their applications. The research portion of this program will be conducted under the guidance of faculty who are experienced aviation researchers and/or practitioners.

Course offerings will include online content containing a variety of delivery techniques which will vary by course and instructor. Such techniques may include recorded lectures, interactive discussion boards, course projects, synchronous discussions, and other learning modes.

To provide additional interaction, networking and collaboration among both peers and faculty, all doctoral students are required to complete a one-week residency each year independent of their level or stage in the Ph.D. program. The residencies are scheduled during mid-August and are approximately one week long (Monday-Friday).

For specific information about this program, including admission and course requirements, visit the Ph.D. in Aviation Business Administration (http://daytonabeach.erau.edu/degrees/phd-program/aviation-business-administration) website.

General Education Requirements

Embry-Riddle Aeronautical University recognizes the importance of communications and quantitative skills in all areas of aviation. Successful pilots, airport managers, aviation maintenance technicians, and other aviation professionals must possess these skills to perform their jobs effectively.

Introduction

Recognizing its general and special missions in education, Embry-Riddle Aeronautical University embraces a general education program. This course of study ensures that students possess the attributes expected of all university graduates. Encouraging intellectual self-reliance and ability, the general education program enables students, regardless of their degree program, to understand the significance of acquiring a broad range of knowledge.

Throughout the general education program, students gain and enhance competence in written and oral communication. They practice reasoning and critical thinking skills, collaboration and demonstrate computer proficiency. As students engage in this course of study, they familiarize themselves with and investigate ideas and methodologies from several disciplines. These include the arts and humanities, the social sciences, and the natural sciences and mathematics. The program also helps students recognize interrelationships between the disciplines.

Promoting the appreciation of varied perspectives, the general education program provides intellectual stimulation, ensuring that students are broadly educated. This course of study empowers students to make informed value judgments, to expand their knowledge and understanding of themselves, and to lead meaningful, responsible, and satisfying lives as individuals, professionals, and concerned members of their society and the world. The courses in the General Education Program are designed to build the skills in students that they can apply in their academic degree programs, their jobs and life in general.

Requirements

Embry-Riddle Aeronautical University's general education program encourages effective learning and provides a coherent base for students to pursue their academic specializations. In specific support of the goals of general education, candidates for bachelor's degrees must complete course work in the following areas.

I. Communication Theory and Skills, 9 hours

In order to lead meaningful and responsible lives in complex societies, students produce, evaluate, articulate, and interpret information and meanings in oral and written communications.

II. Mathematics, 6 hours

In order to develop quantitative reasoning skills and to use and understand the language of science and technology, students must demonstrate mathematical proficiency. Three hours may be satisfied by skills assessment or course completion. The other three credit hours must be completed by taking a course that has college algebra as a prerequisite.

III. Computer Science/Information Technology, 3 hours

In order to use computers and to understand and evaluate their significance in the solution of problems, students study the concepts, techniques, and tools of computing.

IV. Physical and Life Sciences, 6 hours

In order to appreciate current understandings of the natural world, students study the concepts and methods of the physical and life sciences, applying the techniques of scientific inquiry to problem solving.

V. Humanities, 3-6 hours at lower level, *3 hours at 300-400 level

In order to participate in the complexity of human experiences that arise in a framework of historical and social contexts, students are exposed to the Humanities. Areas of study may include cultural, aesthetic, philosophical, and spiritual dimensions of the human condition.

VI. Social Sciences and Economics, 3-6 hours at lower level, *3 hours at 300-400 level

In order to understand interrelationships between the individual and society and connections between historical memory and the future, students examine the social sciences, including history, government, economics, psychology, and sociology.

*In order to experience advanced studies in either the Humanities or Social Sciences, students must choose at least one upper-level elective in the Humanities or Social Sciences.

Associate Degree General Education Requirements

Candidates for associate degrees must complete a 36 General Education credit-hour requirement. The university is committed to ensuring that students possess a general education knowledge that will help them be successful in whatever degree program they select.

University General Education Competencies

While taking General Education required courses, students develop a basic set of General Education skills (i.e., competencies, listed below) based on course learning outcomes. This skill set will be instrumental to student success in upper level courses within their degree program; in these courses students will practice application of this skill set, eventually demonstrating mastery before graduation. As a result, students will graduate with a set of General Education competencies that will provide the basis for success in life and on the job. The following skills are the competencies that all University students will develop, practice, and master in preparation for graduate school or the workplace.

Critical Thinking

The student will apply knowledge at the synthesis level to define and solve problems within professional and personal environments.

Quantitative Reasoning

The student will demonstrate the use of digitally enabled technology (including concepts, techniques, and tools of computing), mathematics proficiency and analysis techniques to interpret data for the purpose of drawing valid conclusions and solving associated problems.

Information Literacy

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.

Communication

The student will communicate concepts in written, digital, and oral forms to present technical and non-technical information.

Scientific Literacy

The student will be able to analyze scientific evidence as it relates to the physical world and its interrelationship with human values and interests.

Cultural Literacy

The student will be able to analyze historical events, cultural artifacts, and philosophical concepts.

Collaborative Learning

The student will be able to work effectively with others on diverse teams to produce quality written documents, oral presentations and/or meaningful projects. The student will assist in organizing others to accomplish a

shared task, contribute actively to a group, and work to resolve any conflicts that occur.

State of Minnesota Course Requirement

Residents of the State of Minnesota are required to comply with Minnesota Degree Standards which require students to complete four (4) credits of Humanities. Since Embry-Riddle Aeronautical University – Worldwide baccalaureate degree programs require a minimum of three (3) credits in Humanities, an additional one (1) hour of Humanities credit is required. Students may choose to take an additional Humanities course as one of their elective courses. Students should seek the assistance of their Campus Director at their Worldwide Campus home location (http://worldwide.erau.edu/locations/index.html?address=) if there are questions. For Online students not associated with a Worldwide Campus location, their primary contact is their Online Academic Advisor at the Online Campus (http://worldwide.erau.edu/online-learning/advisors).

State of Nevada Course Requirement

All students who obtain their degree from an Embry-Riddle Worldwide Campus in Nevada must complete a course that covers the United States and State Constitution. Students may satisfy this requirement by completing GOVT 320 American National Government or through transfer credit of an equivalent course from another institution. This requirement does not apply to students taking courses through the Online Campus outside Nevada.

Undergraduate Courses

Courses numbered 1-99 are basic skills courses and do not apply toward degree requirements. Courses numbered 100-200 are lower-division courses and are generally taken in the freshman and sophomore years. Many lower-division courses serve as prerequisites for other coursework, and students are urged to plan ahead to meet necessary prerequisites. Undergraduate prerequisite courses taken with Embry-Riddle must be completed with a grade of C or better.

Courses numbered 300-400 are upper-division courses, reflecting advanced levels of technical skills and disciplinary knowledge. Upper-division work is generally taken in the junior and senior years. Graduate courses are numbered at 500 and above.

Numbers in parentheses, immediately following course titles and numbers, indicate lecture and laboratory hours that a class meets each week. For example, (3,0) signifies that the course consists of three lecture hours and zero laboratory hours weekly.

Aeronautical Engineering (AERO)

Courses

AERO 309 Aerodynamic Performance of Flight Vehicles 3 Credits (3,0)
This course includes a history of atmospheric flight, properties of the atmosphere, concepts of fluid flows, dimensional analysis, airfoil and wing aerodynamics, propulsion including reciprocating and gas turbines, airplane performance, and stability and control.
Prerequisites: ENGR 115 and ESCI 305.

Aeronautical Science (ASCI)

Courses

ASCI 110 Introduction to Space Flight 3 Credits (3,0)
This course provides the student with a background in the major aspects of space flight. Topics covered include the history of space flight; propulsion theory; orbital mechanics fundamentals; space transportation operations; U.S. space policy; and present and future commercial, industrial, and military applications in space.

ASCI 121 Private Pilot Operations 5 Credits (5,0)
This course develops the aeronautical knowledge required for certification as a Private Pilot with an Airplane Single Engine Land rating. Topics include; regulations, safety, pre-solo operations, cross-country planning, airspace, chart use, communications, weather, performance, weight and balance, aerodynamics and decision-making. Corequisite: ASCI 121L (not required for sUAS minor students)

ASCI 121L Airmen Knowledge Test Preparation 1 Credit (0,1)
This course supports the aeronautical knowledge testing preparation required as part of the certification for the appropriate FAA certification or ratings. Students are introduced to airman's knowledge testing (AKT) employed by the FAA and are also exposed to the electronic testing software and testing procedures.
Corequisites: ASCI 121.

ASCI 185 Introduction to Flight 3 Credits (3,0)
This course examines the basics of aerodynamics, aircraft performance, VFR cross-country navigation techniques, weather reports and forecasts, Federal Aviation Regulations, elements of resource management, and safe flying practices.

ASCI 199 Special Topics in Aeronautical Science 1-3 Credit (1-3,0)
Individual independent or directed studies of selected topics in general aviation. Prerequisites: Consent of instructor and approval of department and program chairs. May be repeated with a change of subject. Special topics courses involving flight training are offered in selected areas for the purpose of gaining proficiency in required pilot operations for various certificates and ratings.

ASCI 202 Introduction to Aeronautical Science 3 Credits (3,0)
An introductory course in aeronautical sciences that provides students an orientation in aviation topics appropriate to Aeronautical Science degree programs. Subjects include: the aviation profession, the science of flight, safety, security and human factors; aviation resources; the aviation environment; and meteorology.

ASCI 221 Introduction to Flight Physiology 3 Credits (3,0)
An introduction to the fundamental concepts and topics of flight physiology. The course will explore basic anatomical systems, physiological effects on the human body such as vision and hearing, atmospheric effects, physical stressors, and physiological challenges to flight operations, including disorientation, loss of situational awareness, hypoxia, decompression, impairment and incapacitation.

ASCI 254 Aviation Legislation 3 Credits (3,0)
This course examines the evolution of federal civil aviation regulations in the United States. Students will examine the past and present problems prompting regulation of the industry, the resultant safety, legislation, airport development, funding legislation and international aviation legislation.

ASCI 260 Unmanned Aerial Vehicles and Systems 3 Credits (3,0)
This course is a survey of Unmanned Aerial Vehicles (UAV) and systems, emphasizing the military and commercial history, growth and applications of UAVs. Course will include basic acquisition, use and operation of UAVs with an emphasis on operations.

ASCI 299 Special Topics in Aeronautical Science 1-3 Credit (1-3,0)
Individual independent or directed studies of selected topics in general aviation. Prerequisites: Consent of instructor and approval of department and program chairs. May be repeated with a change of subject. Special topics courses involving flight training are offered in selected areas for the purpose of gaining proficiency in required pilot operations for various certificates and ratings.

ASCI 309 Aerodynamics 3 Credits (3,0)
Students are provided with an opportunity to explore incompressible flow airfoil theory and wing theory. Topics center on calculation of stall speed, drag and basic performance criteria, configuration changes, high and low speed conditions, special flight conditions, and an introduction to compressible flow.
Prerequisites: MATH 112 or MATH 142 or MATH 143 and PHYS 102 or PHYS 150 and RSCH 202.

ASCI 315 Unmanned Aerial Systems and Operations 3 Credits (3,0)
This course chronicles the development of Unmanned Aerial Systems (UAS), Unmanned Aerial Vehicles (UAV), and their role in the aviation industry, as well as an increased awareness of the importance of UAS in modern commercial and military operations. This course chronicles the development of UAS, their operations and applications. An analysis of UAS is covered, including structural and mechanical factors, avionics, navigation, flight controls, remote sensing, guidance control, propulsion systems, and logistical support. Operations of UAS include an examination and analysis of their integration with commercial and military airspace, air traffic control and civilian/federal air and ground operations. The course will also look at past, current and future applications of UAS operations, with an emphasis on commercial applications.
Prerequisites: RSCH 202.

ASCI 316 Operational and Business Aspects of Unmanned Aerial Systems 3 Credits (3,0)
This course will prepare the student to differentiate the applicable needs of civil aviation for UAS. It will examine each of the particular needs and address how to implement the UASs to fill that need within the constraints of the current national airspace and federal aviation regulation restrictions. Particular attention will be given to skill sets and tools used to mitigate restrictions and to create a flight operation that can successfully employ UASs.
Prerequisites: RSCH 202.

ASCI 317 Rotorcraft 3 Credits (3,0)
This course traces the historical development of rotorcraft and introduces the many unique aspects of rotorcraft operations. Rotorcraft operations are examined from the operations, management, and maintenance perspectives. Included are rotorcraft operations and airworthiness regulations, airspace and facilities requirements, and environmental considerations. Uses of rotorcraft to include military and civilian applications are studied. Rotorcraft design, manufacturing, materials, systems, and the variations in rotor configuration are topics of study.
Prerequisites: RSCH 202.

ASCI 318 Unmanned Aerial Systems Robotics 3 Credits (3,0)
This course prepares students to integrate robotic technology into the hardware and software regimes of unmanned aviation. It will include examinations of control and system programming in the context of specific missions through guided discussions, simulation and the operation of actual unmanned aircraft robotic systems.
Prerequisites: RSCH 202.

ASCI 320 Commuter Aviation 3 Credits (3,0)
This course acquaints the student with the development, administrative policies, and operational factors peculiar to commuter aviation, especially since passage of the Airline Deregulation Act of 1978. The impact of mergers and acquisitions, profiles of passenger and cargo carrying commuters, and analysis of commuter successes and failures are discussed. Emphasis is placed on the establishment of a new commuter airline, which includes market and financial analysis, the company plan, aircraft selection and acquisition, route structure and timetable, marketing strategy and pertinent regulatory requirements. The course culminates in a formal proposal soliciting for venture capital to start a commuter airline.
Prerequisites: RSCH 202.

ASCI 322 Aircraft Inspection and Scheduled Maintenance Programs 3 Credits (3,0)
The curriculum within this course provides an in-depth study of aircraft inspection programs and scheduled maintenance processes. National and international regulations governing aircraft inspection and maintenance are evaluated. Inspection program requirements are examined including processes such as pre-flight, post-flight, hourly, calendar, cycles, annual, progressive, and phased inspections. Types and techniques involving non-destructive inspection are explored. Industry practices in managing scheduled maintenance requirements are studied including aircraft reliability, life cycle management, and trend analysis.
Prerequisites: RSCH 202.

ASCI 327 Aviation Work Force Management in a Global Environment 3 Credits (3,0)
The curriculum within this course focuses on management of multicultural workforces in relationship to the aviation industry. Topics include the role of cultural diversity, organizational socialization, and aviation maintenance operations leadership. Also provided is an in-depth study of aviation labor relations, unions, grievance procedures, and conflict resolution. Principles of social responsibility and ethics in the management of a multi-cultural workforce are also presented.
Prerequisites: RSCH 202.

ASCI 357 Flight Physiology 3 Credits (3,0)
This course explores aero-medical information. Topics include causes, symptoms, prevention, and treatment of flight environment disorders. Altitude effects, spatial disorientation, body heat imbalance, visual anomalies, and psychological factors are included as they relate to pilot performance and survival effectiveness.
Prerequisites: RSCH 202.

ASCI 378 Helicopter Flight Environments 3 Credits (3,0)
During this course, the student obtains the foundation for helicopter operations in terrain flight and in varying environmental conditions. The student will be introduced to aspects particular to helicopter flight as it pertains to adverse weather and day and night environments specifically pertaining to take off, cruise and landing. Emphasis will be placed on understanding principles of flight close to the Earth and hazards both natural and man-made. Additional emphasis will be placed on helicopter flight in and around mountains, snow, desert and overwater operations. The student will be exposed to visual references and how to adjust perceptions to maintain safe, low-level flight in and around hazardous conditions present in commercial helicopter operations. By the end of the course, the student will have sufficient knowledge to understand the concepts necessary for employment in the commercial helicopter industry. Prerequisite: FAA/military helicopter pilot certificate or course listed.
Prerequisites: ASCI 317 and RSCH 202.

ASCI 388 Helicopter Flight Planning 3 Credits (3,0)
During this course, the student obtains the foundation for FARs as they relate to flight planning and navigation for various operations. The student will be able to use regulatory and operational considerations used in helicopter flight operations. Remote location operations and low level flight and navigation procedures will be studied closely. Cargo planning for internal and external operations nodes during near-ground operations will be discussed. By the end of the course, the student will have sufficient knowledge to understand the concepts necessary for effective flight planning and operation in the commercial helicopter industry. Prerequisite: FAA/military helicopter pilot certificate or course listed.
Prerequisites: ASCI 317 and RSCH 202.

ASCI 399 Special Topics in Aeronautical Science 1-3 Credit (1-3,0)
Individual independent or directed studies of selected topics in general aviation. Prerequisites: Consent of instructor and approval of department and program chairs. May be repeated with a change of subject. Special topics courses involving flight training are offered in selected areas for the purpose of gaining proficiency in required pilot operations for various certificates and ratings.

ASCI 401 Airport Development and Operations 3 Credits (3,0)
Managerial problems of small- and medium-size airports and fixed base operations are examined, with emphasis on federal, state, and local obligations; leases; internal guidelines; and community relations.
Prerequisites: RSCH 202.

ASCI 404 Applications in Aviation/Aerospace Law 3 Credits (3,0)
Applications in Aviation/Aerospace Law explores the chronological development, federal and state regulatory functions, and rights and liabilities of pilots, maintenance personnel, aircraft manufacturers, and airport and aircraft operators. Students will examine case histories, liens and security interest in aircraft, as well as international conferences, bilateral and multilateral agreements, and criminal statutes. Students will also examine the legal aspects of unmanned aerial systems and operations, as well as space commercialization.
Prerequisites: RSCH 202.

ASCI 406 Airborne Law Enforcement 3 Credits (3,0)
Airborne Law Enforcement covers the historical and modern issues that shape present day airborne law enforcement organizations. Students will study how airborne law enforcement impacts the criminal justice system. Additionally, operational issues, including management of airborne law enforcement units will be studied. Aviation laws and civil/criminal laws that effect airborne law enforcement operations will also be covered. Students will review pilot and crew duties along with aircraft selection and emerging technologies that impact present day airborne law enforcement organizations. The role of airborne law enforcement in preventing and responding to terrorist threats is also reviewed. Safety issues, as they apply to airborne law enforcement, will also be studied.
Prerequisites: RSCH 202.

ASCI 410 Unmanned Systems Sensing Technology 3 Credits (3,0)
This course provides an overview of the technology and concepts used to remotely gather information to satisfy task requirements as well as to gain understanding about an unmanned system's operating environment. Students will examine the fundamental concepts and methods of sensing systems including the type, format, and capabilities of sensors; component and system integration; use cases; challenges and issues; and emerging concepts. Attention will be given to tools and methods used to support development, configuration, and application of sensing systems. Students will develop experience through complex mission planning assignments and guided discussion.
Prerequisites: RSCH 202.

ASCI 412 Corporate and Business Aviation 3 Credits (3,0)
The course is designed to provide the student with an understanding of the operation of a corporate flight department, value of management mobility, aircraft and equipment evaluation, maintenance, flight operations, administration, and fiscal considerations.
Prerequisites: RSCH 202.

ASCI 416 Aviation Maintenance Management: A Global Perspective 3 Credits (3,0)
The curriculum within this course provides a comprehensive examination of maintenance policies, procedures and practices employed in the management of aviation maintenance programs in a global, multiorganizational industry. Emphasis is placed on all aspects of maintenance management, including organizational management, planning, forecasting, cost control, reliability, flight scheduling, and safety.
Prerequisites: RSCH 202.

ASCI 424 Maintenance Repair and Overhaul in Aviation 3 Credits (3,0)
The curriculum within this course provides an in-depth analysis of the requirements, policies, and procedures necessary for the operation of a Maintenance Repair and Overhaul (MRO) organization. Topics include; airline maintenance operations, engineering, and maintenance. Also included is the repair of structures, systems, and aircraft components. Furthermore, the curriculum explores MRO financing, domestic and off-shore operations, regulatory requirements, logistics, supply chain support, human resources and industry oversight.
Prerequisites: RSCH 202.

ASCI 428 Advanced Helicopter Systems and Functions 3 Credits (3,0)
During this course, the student will study the principles and functions of advanced helicopter systems with an emphasis on automatic flight control systems and associated pilot interface mechanisms, power and rotor systems, avionics, environmental systems and structures. Prerequisites: FAA/military helicopter pilot certification or courses listed.
Prerequisites: ASCI 317 and ASCI 388 and RSCH 202.

ASCI 429 Advanced Technologies in Design and Production of Aircraft Structures & Systems 3 Credits (3,0)
The curriculum within this course explores advanced technologies used during the design, production, and certification of aircraft structures and systems. Topics include an analysis of structural materials, including advanced composites and alloys, and an in-depth examination of the design and production of automated systems utilized throughout the aircraft. Examined are national and international aviation regulations and airworthiness standards governing the design, production, and certification of aircraft structures and systems.
Prerequisites: RSCH 202.

ASCI 433 Aviation Logistics and Supply Chain Management 3 Credits (3,0)
The curriculum within this course focuses on concepts and application of logistics and supply chain management utilized within the aviation maintenance industry to increase efficiency in production and maintenance. The curriculum examines the logistics support from Maintenance Repair Operators (MRO) and Original Equipment Manufacturers (OEM) in aviation maintenance operations. Topics include; international collaboration and strategies to improve customer relationships and operational effectiveness within the dynamic aviation maintenance industry.
Prerequisites: RSCH 202.

ASCI 438 Advanced Helicopter Operations 3 Credits (3,0)
During this course, the student will obtain the foundation for advance and specialized commercial helicopter operations. The student will be introduced to broad areas of commercial flight operations. Emphasis will be placed on developing knowledge in organization, budgeting, airframe selection, mission support, insurance, maintenance, ground support operations, safety and training programs, recordkeeping and regulatory compliance. By the end of the course, the student will have sufficient knowledge to understand the concepts necessary to function as a professional in the aviation industry.
Prerequisites: ASCI 317 and ASCI 388 and ASCI 378 and RSCH 202.

ASCI 490 Aeronautical Science Capstone Course 3 Credits (3,0)
The Aeronautical Science Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project associated with a problem in the aerospace industry that provides significant evidence of experience in aviation and aeronautical studies. Students will work with designated faculty members to formulate, develop, and complete the aviation/aerospace aviation project. The completion of the Capstone Course is designed to document evidence that Program Outcomes are understood and provides the student evidence of knowledge to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the degree program.
Prerequisites: RSCH 202.

ASCI 499 Special Topics in Aeronautical Science 1-3 Credit
Individual independent or directed studies of selected topics in general aviation. Prerequisites: Consent of instructor and approval of department and program chairs. May be repeated with a change of subject. Special topics courses involving flight training are offered in selected areas for the purpose of gaining proficiency in required pilot operations for various certificates and ratings.

Air Force Aerospace Studies (USAF)

Courses

USAF 101 The Foundation of the United States Air Force 1 Credit (1,0)
A survey course designed to introduce students to the United States Air Force and provide an overview of the basic characteristics, missions and organization of the Air Force.
Corequisites: USAF 101L.

USAF 101L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 101.

USAF 102 The Foundation of the United States Air Force 1 Credit (1,0)
A survey course designed to introduce students to the United States Air Force and provide an overview of the basic characteristics, missions and organization of the Air Force.
Prerequisites: USAF 101 **Corequisites:** USAF 102L.

USAF 102L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 102.

USAF 201 The Evolution of USAF Air and Space Power 1 Credit (1,0)
Introduces topics on Air Force heritage and leaders, introduction to air and space power through examination of competencies, functions and continued application of communication skills.
Prerequisites: USAF 102 **Corequisites:** USAF 201L.

USAF 201L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.

USAF 202 The Evolution of USAF Air and Space Power 1 Credit (1,0)
Introduces topics on Air Force heritage and leaders, introduction to air and space power through examination of competencies, functions and continued application of communication skills.
Prerequisites: USAF 201 **Corequisites:** USAF 202L.

USAF 202L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 202.

USAF 301 Air Force Leadership Studies 3 Credits (3,0)
Teaches cadets advanced skills and knowledge in management and leadership. Emphasis placed on enhancing leadership skills. Cadets have an opportunity to try out these leadership/management techniques in a supervised environment as juniors and seniors.
Prerequisites: USAF 202 **Corequisites:** USAF 301L.

USAF 301L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 301.

USAF 302 Air Force Leadership Studies 3 Credits (3,0)
Teaches cadets advanced skills and knowledge in management and leadership. Emphasis placed on enhancing leadership skills. Cadets have an opportunity to try out these leadership/management techniques in a supervised environment as juniors and seniors.
Prerequisites: USAF 301 **Corequisites:** USAF 302L.

USAF 302L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 302.

USAF 401 National Security Affairs Preparation for Active Duty 3 Credits (3,0)
A foundation for seniors to understand their role as military officers in American society. An overview of the complex social and political issues facing the military profession.
Prerequisites: USAF 302 **Corequisites:** USAF 401L.

USAF 401L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Prerequisites: USAF 401.

USAF 402 National Security Affairs Preparation for Active Duty 3 Credits (3,0)
A foundation for seniors to understand their role as military officers in American society. An overview of the complex social and political issues facing the military profession.
Prerequisites: USAF 401 **Corequisites:** USAF 402L.

USAF 402L Leadership Laboratory 0 Credits (0,2)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.
Corequisites: USAF 402.

USAF 403L Leadership Laboratory 0 Credits (0,0)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.

USAF 404L Leadership Laboratory 0 Credits (0,0)
Development of personal leadership and managerial abilities. Examination and demonstration of Air Force customs and courtesies, drill and ceremonies and standards of discipline and conduct.

Aviation Maintenance (AMNT)

AMNT courses designated as Part 65 are available at the Worldwide Campus only.

Courses

AMNT 240 General Aeronautics and Applications 3 Credits (3,0)
This course is an introduction to general aeronautics. It includes the study of physical mathematics, weight and balance, government regulations regarding aircraft maintenance, common and special tools and measuring devices, fluid lines, hardware, aircraft servicing, and documentation.

AMNT 260 Aircraft Electrical Systems Theory 3 Credits (3,0)
This course is an introduction to aircraft electrical systems. The study of the principles and concepts of basic DC and AC electrical theory, magnetism, batteries, generators, motors, voltage regulators, circuit protection, and electrical component installations are included in this course.

AMNT 270 Airframe Structures and Applications 3 Credits (3,0)
This course is an introduction to airframe structures, appropriate applications and repairs. The study of aircraft wood, dope, fabric, sheet metal, welding theory and methods of fabrication are included in this course.

AMNT 271 Airframe Systems and Applications 3 Credits (3,0)
This course is an introduction to airframe systems and applications. The study of airframe systems such as aircraft electrical system, fuel systems, cabin atmosphere control systems, instrument systems, communication and navigation systems, ice and rain control systems, fire protection systems, and aircraft inspection are included in this course.

AMNT 280 Reciprocating Engine Theory and Applications 3 Credits (3,0)
This course is an introduction into the characteristics of the reciprocating engine. Topics of study include theory, construction, propeller systems, fuel metering, lubrication, exhaust, engine installation and overhaul, and operational maintenance procedures.

AMNT 281 Turbine Engine Theory and Applications 3 Credits (3,0)
This course is an introduction into aircraft propulsion systems and applications. Theory, principles of operation, and controls and systems for propellers and turbine engines are analyzed in this course.

AMNT 490 Aviation Maintenance Capstone Course 3 Credits (3,0)
The Aviation Maintenance Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project associated with a problem in the aviation maintenance industry that provides significant evidence of experience in aviation maintenance studies. Students will work with designated faculty members to formulate, develop, and complete the aviation maintenance project. The completion of the Capstone Course is designed to document evidence that Program Outcomes are understood, and provides the student evidence of knowledge to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the degree program.
Prerequisites: RSCH 202.

Biology, Life Science (BIOL)

Courses

BIOL 120 Foundations of Biology I 3 Credits (3,0)
A biological science course introducing the fundamentals of biology and essential structures, components, and processes of life. Emphasis placed on biochemistry; cell structure, function, organization, and division; sources and uses of biological energy; as well as genetics and inheritance.

Business Administration (BSAB)

Courses

BSAB 410 Management of Air Cargo 3 Credits (3,0)
This course offers intensive study of the practices and problems of management with respect to air cargo. The importance of air cargo service to the economy, development of the industry, regulation, complexity of the market, carriers, freight forwarders and third party logistics, along with rate and tariff problems, aircraft, terminal facilities, and future prospects are all discussed.
Prerequisites: RSCH 202.

BSAB 412 Airport Planning and Design 3 Credits (3,0)
The principles of airport planning and design are studied. This course covers essential elements of current U.S. and international airport planning and design trends, including airport master planning and layout plans, geometric design and layout of the airfield and terminal facilities, obstruction analysis, signage and lighting, forecasting, airside and landside interface, and capacity and delay effects. The course also focuses on environmental planning, such as hazardous wildlife attractants, airport noise, and compatible land use.
Prerequisites: RSCH 202.

BSAB 415 Airline Management 3 Credits (3,0)
An introduction to the administrative aspects of airline operation and management is provided in this course. Topics include the annual profit plan, uniform system of accounts and reports, demand analysis, scheduling, the theory of pricing, fleet planning, facilities planning, and airline financing.
Prerequisites: MGMT 201 and RSCH 202.

BSAB 416 Space Tourism 3 Credits (3,0)
Space tourism is one of the hottest topics in the aerospace business today and the future of travel. The focus on this course is on understanding the developing space tourism business, the market, cost engineering, marketing, delivery vehicles, and safe operations. Specific topics include suborbital and orbital space flight, delivery vehicle capability, market demand, market supply, regulations, and safety. As part of this class, students will prepare a business plan or objectively assess technologies required for a safe space tourism flight.
Prerequisites: RSCH 202.

BSAB 418 Airport Administration & Finance 3 Credits (3,0)
The student will be presented with an opportunity for advanced study of the organizational, political, and financial administration of public and private civil use airports. Areas of emphasis include public relations management, safety and security issues, employee organizational structures, financial and accounting strategies, revenue and expense sources, economic impacts of airport operations, airport performance measurement standards, aircraft rescue and firefighting, emergency management, airport dispatch and communications, and current trends and issues of direct concern to airport administrators.
Prerequisites: RSCH 202.

BSAB 425 Trends and Current Problems in Air Transportation 3 Credits (3,0)
An analysis of selected contemporary issues, problems, and trends facing management in various segments of the aviation industry, including general aviation and the airlines, will be covered. Students apply previously learned concepts to practical problems to develop increased understanding and demonstrate knowledge of the subject.
Prerequisites: RSCH 202.

BSAB 426 International Aviation Management 3 Credits (3,0)
The student will perform an investigation of international aviation management and its three elements: the nature of international aviation business; working in a foreign environment; and managing in an international environment.
Prerequisites: RSCH 202.

BSAB 450 Aviation/Airport Marketing 3 Credits (3,0)
Students will conduct an investigation of the role of marketing in the aviation/airport industries to include concepts applicable to general aviation enterprises. Issues covered include consumer segmentation, database management, integrated marketing communications, public relations, vendor relations, and retailing.
Prerequisites: RSCH 202.

Chemistry (CHEM)

Courses

CHEM 139 General Chemistry I 3 Credits (3,0)
Fundamentals of general chemistry to include basic nomenclature of inorganic compounds, stoichiometry, atomic structure to include quantum numbers and electron configurations, periodic relationships, chemical bonding and chemical reactions (including oxidation-reduction reactions), molecular geometry, states of matter including properties of gases, principles of solution, and an introduction to chemical thermodynamics and organic chemistry. The laboratory includes both qualitative and quantitative work.
Corequisites: CHEM 141.

CHEM 141 General Chemistry I Laboratory 1 Credit (0,1)
Experiments parallel the materials in the associated chemistry lecture course. Topics include chemical stoichiometry, states of matter, gas laws, solutions, thermodynamics, kinetics, and oxidation-reduction.
Corequisites: CHEM 139.

Communication (COMD)

Communication Courses

COMD 225 Science and Technology Communication 3 Credits (3,0)
This course introduces the practices of communicating news and issues in science and technology to a variety of publics through magazine-style writing and public speaking. Guest speakers will present research questions, methodologies and issues within the sciences. Coursework also includes readings from successful science and technology communicators, illustrating various solutions to writing about complex subjects. Special topics include identifying science and technological stories, evaluating sources and information, and communicating findings clearly, comprehensibly and accurately for publication and speaking engagements.
Prerequisites: ENGL 221 or ENGL 222.

COMD 230 Digital Photography 3 Credits (3,0)
This course introduces fundamental photographic skills through digital technologies. Emphasis is placed on the tools, techniques, and aesthetics of a range of photographic applications pertaining to graphic design and interactive media.

COMD 260 Introduction to Media 3 Credits (3,0)
The structure of professional opportunities in, and social sciences arising from media industries. Required of all Communication students. Must be taken within the first year of entering the program.
Prerequisites: ENGL 123.

COMD 265 Introduction to Newswriting and Reporting 3 Credits (3,0)
Introduction to the fundamentals, theories and practice of news writing and reporting. Identify what constitutes news, as demonstrated by daily news media, conduct interviews, generate story ideas, and write and report news stories using Associated Press style, inverted pyramid organization, and the five Ws of news writing content. Introduction to how editorial departments in contemporary news organizations operate, to the legal, ethical and cultural issues in the news business, the evolution of digital and social media in the news media, and various news-writing strategies beyond the inverted pyramid.
Prerequisites: ENGL 123.

COMD 295 Rhetorical Strategies and Analysis 3 Credits (3,0)
An examination of the theory and practice of effective persuasion for the purposes of shaping public opinion and policy. Students study the principles of Aristotelian rhetoric, and examine how they are applied in public discourse by opinion writers, politicians, political parties, public policy advocates, special interest groups, and documentary film-makers. This writing-intensive course also focuses on effective composition of rhetorical analysis essays.
Prerequisites: ENGL 123.

COMD 320 Mass Communication Law and Ethics 3 Credits (3,0)
A case study-based Communication course introducing students to the legal and ethical environments underpinning First Amendment rights in the United States from the nation's founding to the present. Topics in law include intents of the framers, prior restraint, libel, privacy, obscenity, freedom of information laws, shield laws, copyright and broadcast and cable regulation. Practices of journalists, media relations practitioners and Internet communication will be examined. Topics in ethics concentrate on models for decision making in difficult situations.
Prerequisites: ENGL 221 or ENGL 222.

COMD 322 Aviation and Aerospace Communication 3 Credits (3,0)
This course introduces the practices of communicating news and issues in aviation and aerospace to a variety of publics through magazine-style writing and public speaking. Students will learn how to recognize the news value of contemporary aviation issues, to gain an understanding of those issues through research and interviews with experts, and to write about and discuss the issues. Coursework also includes readings from respected aviation writers that illustrate aviation's economic and social impact on society. Special topics include safety, airport security and congestion, emerging legal issues, and international aviation trends.
Prerequisites: ENGL 221 or ENGL 222 and COMD 265.

COMD 335 Technology and Modern Civilization 3 Credits (3,0)
This course is a humanistic analysis of technology, with attention to its influence upon modern American culture in a global context. Topics include the history and development of technology; the influence of technology upon certain philosophies such as determinism and utilitarianism; the influence of technology on the ecosphere; and the depiction of technology in imaginative literature and the fine arts.

COMD 350 Environmental Communication 3 Credits (3,0)
An examination of a specific national and/or regional environmental issue, including such topics as climate change, pollution, conservation, policy-making and policy change. Course focuses on food as a specific environmental issue. Students' individual interests determine their research focus.
Prerequisites: ENGL 221 or ENGL 222.

COMD 360 Media Relations I 3 Credits (3,0)
This course focuses on different theories of persuasive communication and the construction of persuasive messages. Individual instructors may explore persuasive communication in public service and political campaigns, interpersonal communication, social movements, persuasive writing, or advertising. Students are evaluated on their ability to recognize, apply, and evaluate the communication theories used to design persuasive messages.
Prerequisites: COMD 265.

COMD 362 Communication and Organizational Culture 3 Credits (3,0)
Analysis of organizational culture, a study of theory, as well as application of research methods in communication. Allows students to assess particular organizations and to increase their ability to initiate organizational change. Entails a variety of research methods, including rhetorical, qualitative and quantitative methods.
Prerequisites: SPCH 219.

COMD 363 Communication and Society 3 Credits (3,0)
An examination of human communication with specific focus on gender and sexuality. Analysis of verbal discourses, non-verbal communication, symbolic imagery and media as means of constructing identity and social norms.
Prerequisites: SPCH 219.

COMD 364 Visual Design 3 Credits (3,0)
This course presents principles of visual design applying to print and electronic publications, including unity, emphasis, balance, line, shape, value, color, and texture. Special topics include ethics, typography, semiotics, and layout. Students analyze existing graphical artifacts and create print and electronic projects focused on communicating science and technology, using professional design software.
Prerequisites: ENGL 221 or ENGL 222.

COMD 415 Nonverbal Communication 3 Credits (3,0)
Nonverbal Communication entails the study of communication behaviors and processes, not involving the expression of written or spoken words, which contribute information to a message. Special attention is directed to the study of voice qualities; facial expression and body language; space, personal distance, and touch; the use of time and objects; and personal appearance. Study also involves nonverbal communication in applied settings, as well as research strategies for observing, measuring, and understanding nonverbal phenomena.
Prerequisites: SPCH 219 and ENGL 221 or ENGL 222.

COMD 420 Applied Cross Cultural Communication 3 Credits (3,0)
An examination of the challenges to communicating across the variety of subcultures present in work environments. Ethnicity, nationality, gender, physical impairment and sexuality are among the areas of difference often present in business and professional environments which may influence the establishment of cooperative working relationships. Means for analyzing and developing strategies to transcend and make positive use of sub-cultural differences will be considered.
Prerequisites: SPCH 219.

COMD 460 Media Relations II 3 Credits (3,0)
Mastery of writing and speaking genres in media relations with an emphasis on crisis communication.
Prerequisites: ENGL 221 or ENGL 222 and COMD 360.

COMD 495 Senior Project 3 Credits (3,0)
One option for the capstone experience for the communication program. Provides students with the opportunity to integrate and exhibit knowledge and communication skills acquired during their program of study. Allows students to select from a number of project options, such as researching, writing, and presenting a conference paper; developing a website; creating and delivering a workshop; engaging in a service-learning project; and conducting an empirical study. Requires students to assemble a professional eportfolio that illustrates the depth and breadth of work completed in the program. Prerequisite: Senior status.

Computer Engineering (CESC)

Courses

CESC 220 Digital Circuit Design 3 Credits (3,0)
This course provides a knowledge and facility in logic design, interfacing digital circuits, Boolean algebra, combinatorial logic circuits, circuit minimization techniques, flip-flop storage elements, shift registers, counting devices, sequential logic circuits, state machines and computer structure. Requires concurrent registration in CESC 222 except for Engineering Sciences Major in BS in Technical Management.
Corequisites: CESC 222.

CESC 222 Digital Circuit Design Laboratory 1 Credit (0,1)
This course enables students to perform laboratory experiments in the measurement and verification of digital circuits, discrete and integrated logic circuit design analysis and measurements.
Corequisites: CESC 220.

Computer Science (CSCI)

Courses

CSCI 109 Introduction to Computers and Applications 3 Credits (3,0)
Students are required to already have an understanding of traditional computer-based applications before beginning CSCI 109. These applications include word processing, basic spreadsheet use, basic database use, basic presentation software use, electronic mail, and accessing web resources via the Internet. The purpose of this course is to build on students' existing knowledge of using computer systems and pertinent applications. Students will increase their skills with the most popular computer applications such as word processing, spreadsheet, electronic mail, presentation software, and Internet. Computer literacy is presented through lectures, discussions, and readings on the computer process, the impact of computers on society, emerging technologies, and hardware and software purchasing decisions.

CSCI 123 Introduction to Computing for Data Analysis 3 Credits (3,0)
Students are expected to use a wide and complex set of computer tools and systems. A purpose of this course is to build upon their existing knowledge and help ensure students are proficient in common computer systems and with a skill set to solve a wide variety of data analysis problems. Using Microsoft Excel and R software along with their advanced features students will expand their understanding of computers and software while being equipped to solve large and dynamic data sets.

CSCI 299 Special Topics in Computer Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in computer science. Consent of the instructor and the department chair is required.

CSCI 399 Special Topics in Computer Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in computer science. Consent of the instructor and the department chair is required.

CSCI 499 Special Topics in Computer Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in computer science. Consent of the instructor and the department chair is required.

Co-Operative Education & Internship (COIN)

Courses

COIN 496 Co-Operative Education 1-4 Credit (1-4,0)

The student will gain practical learning experience in full-time or part-time employment that is related to the student's degree program and career goals. Course title and level are based on work assignment.

COIN 497 Co-Operative Education 1-4 Credit (1-4,0)

The student will gain practical learning experience in full-time or part-time employment that is related to the student's degree program and career goals. Course title and level are based on work assignment. Continuation of COIN 496 (https://currentcatalog.erau.edu/worldwide/undergraduate-courses/coin).

COIN 498 Co-Operative Education 1-4 Credit (1-4,0)

The student will gain practical learning experience in full-time or part-time employment that is related to the student's degree program and career goals. Course title and level are based on work assignment. Continuation of COIN 497 (https://currentcatalog.erau.edu/worldwide/undergraduate-courses/coin).

Cybersecurity (CYBR)

Courses

CYBR 155 Foundations of Information Security 3 Credits (3,0)
Survey of the broad field of cyber-security and information assurance. Definition of information security; the need for this field of study; ethical and legal issues; risk management and planning; and information security technology; role of the U.S. Department of Homeland Security (DHS) in securing the cyberspace and the nation's information-related infrastructures.

CYBR 235 Computer and Network Technologies 3 Credits (3,0)
Introduction to the technology that underlies computers and communication networks, Understanding of how computers operate; how users interact with computers; how computers store data; how computers communicate with other computers; the building blocks of communications networks; the Internet, and TCP/IP communications protocols and applications.

CYBR 255 Information Systems Security Principles 3 Credits (3,0)
This course introduces the core concepts of information systems security practices, including key elements of successful information security policies and programs. It sets these in a context of ethical, legal and regulatory considerations, using the National Institute of Standards and Technology (NIST) Cybersecurity Framework. This course relies upon the Cybersecurity Common Book of Knowledge and other materials from (ISC)2, and prepares students for the System Security Certified Practitioner (SSCP) certification exam from (ISC)2. Class activities and online virtual labs provide students with hands-on exploration and application of the concepts and techniques presented throughout the course. Prerequisite: Students in the Microsoft Software and Systems Academy Cybersecurity Administrator program must have either a current, valid Microsoft Technology Associate certification 98-367, Security Fundamentals; or a current, valid CompTIA Security+ certification. All other students: no prerequisite.

CYBR 335 Information Security Tools and Techniques 3 Credits (3,0)
Introduction to the tools and techniques used to secure computers; data networks; and digital information. How attackers view and identify vulnerabilities; weaknesses. Methods to attack and secure operating systems; communications infrastructures; and data networks including TCP/IP and the Internet; including attacker applications. Demonstration and hands-on exercises.
Prerequisites: CYBR 235.

CYBR 355 Networks and Systems Security Tools 3 Credits (3,0)
Networks are an essential element of virtually every information system throughout the world. The ubiquitous nature of networks means that we cannot think about information systems security for very long without dealing with how we secure the networks and the systems that use those networks to collaborate in getting work done safely, securely, and reliably. Using Windows Server technologies as a foundation, this course applies the concepts, techniques and ideas introduced in other CYBR courses to the tasks of identifying vulnerabilities and threats, and then taking steps to prevent damage to our information systems and information infrastructures because of those threats. Virtual labs, exercises and projects provide hands-on experience in applying these concepts and techniques. Prerequisites: CYBR 235 or CYBR 255, or the approval of the Program Chair.

CYBR 365 Introduction to Digital Forensics 3 Credits (3,0)
Introduction to the field of digital forensics; its use in gathering evidence; information interpretation for criminal and civil courts; use for intelligence gathering; in research; and incident response. Legal aspects governing search and seizure; the role of file systems and operating systems and how they interrelate; basic tools for computer, network, and mobile forensics acquisition, analysis, and reporting. Demonstration and hands-on exercises. Prerequisite: CYBR 335 or CYBR 355.

CYBR 465 Cybercrime and Cyberlaw 3 Credits (3,0)
Types of criminal behavior in cyberspace, such as identify theft, white collar crimes, fraud, child sexual exploitation, intellectual property theft, and online scams. Laws governing cyberspace, defining criminal activity and guiding law enforcement investigations; U.S. decisional law guiding search and seizure of digital devices and information; international laws related to computer crime and privacy. Prerequisite: CYBR 335 or CYBR 355 and CYBR 365.

CYBR 474 Issues in Aviation Cybersecurity 3 Credits (3,0)
Employs a multi-pronged approach to the study of problems related to aviation cybersecurity. Will discuss the cyber threat landscape, and apply the lessons of cyber defense to many actors within the aviation and aeronautics industry, including airlines, airplanes, manufacturers, airports, cargo and other vendors, unmanned systems, and more. Topics include cyber threats to all aspects of the industry, including communications, navigation, supply chain, and airports. Examination of frameworks being devised to protect assets from the cyber attack vector, as well as vulnerabilities, protection, and countermeasures. Will explore the current research literature concerning cybersecurity and information assurance as it impacts aviation.
Prerequisites: CYBR 365 and CYBR 465.

CYBR 485 War, Terrorism, and Diplomacy in Cyberspace 3 Credits (3,0)
Cyberdiplomacy; cyberwar; cyberterrorism, definitions and examples and uses in illegal, violent actions against people for purposes of furthering ideological, economic, or political objectives. Impact of cyberspace on modern views of warfare, terrorism, and diplomacy.
Prerequisites: CYBR 465.

Economics (ECON)

Courses

ECON 210 Microeconomics 3 Credits (3,0)
This course is an introduction to the economic principles of free enterprise supply and demand, private and social implications of revenue maximization, cost minimization, profit maximization, market structure, and resource markets. Current microeconomic issues in aviation (such as elasticity, pricing, taxes, subsidies, market implications, liability reform, evolution of airline completion, etc.) are discussed.
Prerequisites: MATH 111 or MATH 140 or MATH 143 or MATH 241 and ENGL 123 or ENGL 143.

ECON 211 Macroeconomics 3 Credits (3,0)
This course is an introductory analysis of employment, inflation, recession, GDP economic growth, national income/output and international trade with an emphasis on practical policy alternatives. Macroeconomic aviation applications such as the counter-cyclical growth of start-up airlines and consideration of ATC privatization are incorporated.
Prerequisites: MATH 111 or MATH 140 or MATH 143 or MATH 241 and ENGL 123 or ENGL 143.

ECON 225 Engineering Economics 3 Credits (3,0)
This course is an introduction to microeconomic principles, problems, and policies as well as basic financial principles such as time value of money, capital budgeting, and cost of capital. The course will provide the engineering graduate with the tools needed for success in the workplace.

ECON 312 Money and Banking 3 Credits
This course is a preliminary investigation of the financial institutions of the US and the relationship of monetary policy to income and price stabilization. Analyses of international capital flows will also be undertaken.
Prerequisites: ECON 210 ECON 211 RSCH 202.

ECON 315 Managerial Economics 3 Credits (3,0)
This course presents an analytical approach to the manager's role in understanding pricing, costing, production and forecasting. This course emphasizes the quantitative and qualitative applications of economic principles to business analysis. Aviation related topics commonly discussed include airport privatization and employee ownership of airlines, forecasting passenger demand, airline production and cost analysis, optimal pricing and production decisions, sensitivity analysis, and capital budgeting. Prerequisite: Junior Standing.
Prerequisites: ECON 210 and STAT 211 or STAT 222.

ECON 399 Special Topics in Economics 1-4 Credit (1-4,0)
These courses are individual independent or directed studies of combinations of selected topics in economics. Prerequisite: Consent of instructor and approval of the department chair.

ECON 411 International Economics 3 Credits
This course introduces the student to the theories of international macroeconomics. Topics include international trade, comparative advantage, tariffs, quotas, export subsidies, and trade agreements. The course studies and analyzes current issues such as the U.S. trade deficit, harmonization of fiscal and monetary policies among countries, and policies toward multination firms.
Prerequisites: ECON 210 ECON 211 RSCH 202.

ECON 420 Economics of Air Transportation 3 Credits (3,0)
In this course, students will explore the economic aspects of airline service with consideration given to the impact of federal aid and regulation, types of aircraft, airport problems, consumer interests and competitive practices.
Prerequisites: ECON 210 and ECON 211.

ECON 499 Special Topics in Economics 1-4 Credit (1-4,0)
These courses are individual independent or directed studies of combinations of selected topics in economics. Prerequisite: Consent of instructor and approval of the department chair.

Electrical Engineering (ELEC)

Courses

ELEC 220 Circuits 3 Credits (3,0)
Introduction of the fundamentals of electrical engineering. Circuit theory and variables. Voltage-current relationship for passive elements. Circuit analysis and network solutions. Phasors and frequency-domain analysis. Transient analysis of first and second order systems. Equivalent circuits and power.
Prerequisites: ENGL 221 and MATH 345 and PHYS 250 and PHYS 253
Corequisites: ELEC 221.

ELEC 221 Circuits Laboratory 1 Credit (0,1)
Lab experiments for ELEC 220 using resistors, inductors, capacitors, operational amplifiers, and DC and AC sources. Hardware and Software circuit simulations will be used.
Corequisites: ELEC 220.

ELEC 230 Electronics 3 Credits (3,0)
Diodes Characteristics, and Applications, Full-Wave rectifiers, Half-Wave rectifiers, Switching; Field Effect Transistors (FET); Bipolar Junction Transistors(BJT); Models, Characteristics, Applications, Biasing, DC Analysis, Small Signal Analysis; Operational Amplifiers and Integrated circuits.
Prerequisites: ELEC 220 and ELEC 221 **Corequisites:** ELEC 231.

ELEC 231 Electronics Laboratory 1 Credit (0,1)
Lab experiments for ELEC 230. Using both hardware and software simulations with Diodes, Field Effect Transistors (FET) and Bipolar Junction Transistors (BJT) to design rectifiers, biasing networks, and small signal amplifiers.
Corequisites: ELEC 230.

Emergency Management (EMGY)

Courses

EMGY 310 Fundamentals of Emergency Management 3 Credits (3,0)
This course studies the various elements involved with all phases of emergency management. It includes thorough coverage of the historical background of emergency management (EM) in the United States viewed through several significant disaster events and the emergence of the most significant laws and policies that have defined and continue to shape the management of emergencies through local, state and federal levels of government including: HSPD 5, HSPD 8, the Stafford Act, the National Flood Insurance Act, along with other pre-FEMA and post-9/11 legislative actions. Topics include a survey and analysis of natural and technological hazards; detailed coverage of FEMA's all hazards approach; all phases of EM cycle - mitigation, preparation, response and recovery; integrated emergency management systems; the incident command and the National Incident Management Systems, and Emergency Support Functions; risk assessment factors; and traditional and social media communications. The course culminates in a group project with each student writing and formally presenting an integrated emergency management plan (EMP).
Prerequisites: RSCH 202.

EMGY 400 Introduction to Incident Command System 3 Credits (3,0)
The primary focus of this course is to introduce the history, features and principles, and organizational structure of Emergency Management and the Incident Command System (ICS) as a systematic tool used in the command, control, and coordination of emergency response. The course defines and explains the relationship between ICS and the National Incident Management System (NIMS), a standardized approach to incident management developed by the Department of Homeland Security; and the National Response Framework (NRF), a part of the National Strategy for Homeland Security that provides a unified national response to disasters and emergencies.
Prerequisites: RSCH 202 and EMGY 310.

EMGY 405 Disaster Policy and Management 3 Credits (3,0)
Disaster Policy & Management introduces principles of disaster management, the understanding of disaster policy, and the global organization of disaster and crisis public management. This course focuses on disaster management in the United States and its relationship between disaster management and public management; through case studies and other activities students will gain a thorough understanding of national disaster policy and crisis management at all levels of government.
Prerequisites: RSCH 202.

EMGY 430 Emergency Management and Contingency Planning 3 Credits (3,0)
This course provides students with a comprehensive overview of emergency management practices in both government and private organizations in the U.S. The students will become familiar with the basic concepts, principles, and terms used in the emergency management discipline that includes preparedness, mitigation, response and recovery operations. Students will focus on the planning and leadership roles during natural and man-made disasters and interaction between government and private organizations during such incidents. During the course, the students will discuss the individual roles of the federal, state, and local governments and the private sector in such emergencies. The students will become familiar with the National Response Framework and the National Incident Management System and their application during national disasters. Students will also examine the essentials of business contingency planning in the private sector for disasters. Finally, students will plan and participate in a mock disaster drill to demonstrate their full understanding of the course material.

Emergency Services (ESVS)

Courses

ESVS 301 Community Risk Reduction for the Fire and Emergency Services 3 Credits (3,0)
This course provides a theoretical framework for the understanding of the ethical, sociological, organizational, political, and legal components of community risk reduction, and a methodology for the development of a comprehensive community risk reduction plan.

ESVS 402 Fire and Emergency Services Administration 3 Credits (3,0)
This course is designed to be a progressive primer for students who want more knowledge about fire and emergency services administration. The course demonstrates the importance of the following skills, necessary to manage and lead a fire and emergency services department through the challenges and changes of the 21st century: Persuasion and influence, accountable budgeting, anticipation of challenges and the need for change, and using specific management tools for analyzing and solving problems. A central part of the course focuses on how the leadership of a fire and emergency services department develops internal and external cooperation to create a coordinated approach to achieving the department's mission.
Prerequisites: RSCH 202.

ESVS 403 Disaster Planning and Control 3 Credits (3,0)
This course examines concepts and principles of community risk assessment, planning, and response to fires and natural and human-caused disasters, including National Incident Management System--Incident Command Systems (NIMS ICS), mutual aid and automatic response, training and preparedness, communications, civil disturbances, terrorist threats/incidents, hazardous materials planning, mass casualty incidents, earthquake preparedness, and disaster mitigation and recovery.
Prerequisites: RSCH 202.

ESVS 404 Managerial Issues in Hazardous Materials 3 Credits (3,0)
This course presents current issues in management of a department-wide hazardous materials program. It includes issues that are pertinent to officers and managers in public safety departments, including regulations and requirements for hazardous materials (HAZMAT) preparedness, response, storage, transportation, handling and use, and the emergency response to terrorism threat/incident. Subjects covered include State, local and federal emergency response planning, personnel and training, and operational considerations such as determining strategic goals and tactical objectives.
Prerequisites: RSCH 202.

ESVS 405 Personnel Management for Fire and Emergency Services 3 Credits (3,0)
This course examines relationships and issues in personnel administration and human resource development within the context of fire-related organizations, including personnel management, organizational development, productivity, recruitment and selection, performance management systems, discipline, and collective bargaining.
Prerequisites: RSCH 202.

ESVS 410 Terrorism: Roots and Responses 3 Credits (3,0)
This course examines the development and evolution of terrorism, including historical and contemporary contexts within domestic and international settings. The course provides a framework for understanding terrorist organizations, their motivations, intended impacts, financing, and the role of media in proliferation of terrorist activity. Counterterrorism measures, response, and emergency management roles and responsibilities are examined within the pre and post-9/11 construct. Chemical, biological, nuclear, cyber terrorism, low-intensity warfare, super terrorism, explosives, suicide killers are explored, with the future of terrorism and society's ability to prevent, respond, and recover studied.
Prerequisites: RSCH 202.

ESVS 480 Advanced Principles in Fire and Emergency Services Safety and Survival 3 Credits (3,0)
This course examines the 16 Firefighter Life Safety Initiatives (FLSI)--what they mean and how they can be adapted by every fire and emergency service organization. The 16 FLSI were developed by the National Fallen Firefighters Foundation (NFFF) with the support and consultation of virtually every major United States fire service organization. The goal of this course, set at the supervisory and managerial level, is to formulate and put into practice health and safety procedures that address firefighter injuries and fatalities. The course will also focus on the need for a culture change, especially regarding how decisions made at the managerial and operational levels can exert influence to ensure that "everyone goes home.
Prerequisites: RSCH 202.

Engineering (ENGR)

Engineering Courses

ENGR 101 Introduction to Engineering 3 Credits (3,0)
This course is an introduction to the interdisciplinary aspects of the engineering of aerospace systems. It is a project-based course, demonstrating how the engineering profession is a multi-disciplinary field. Students are involved in an array of conceptual exercises, simple design activities, and projects dealing with engineering in aerospace-related areas.
Prerequisites: MATH 142 or MATH 143 or qualifying score on the mathematics skills assessment.

ENGR 115 Introduction to Computing for Engineers 3 Credits (3,0)
This is an introductory course in computer programming for scientists and engineers. This course introduces students to aspects of algorithm design and software development including specification of the problem, design of a solution, implementation of code, and testing. This course applies a problem-solving approach to developing algorithms. Algorithms are implemented and utilize the following topics: data types and related operations; looping; decision; input/output; functions; arrays; and files.
Prerequisites: ENGR 101 or ESCI 105.

ENGR 120 Graphical Communications 3 Credits (3,0)
Students will use free-hand pencil sketching and CAD as tools for graphical communication of engineering designs. Topics include the standard form for design graphics and view layout, orthographic projection, section and auxiliary views, dimensioning, and tolerancing.
Prerequisites: ENGR 101.

ENGR 121 Graphical Communications for Technical Management 3 Credits (3,0)
In this course, students will employ free hand pencil sketching and Computer Aided Design (CAD) as tools for graphical communication of engineering designs. They will also be introduced to various topics related to graphical communication and engineering design processes such as the design process and engineering drawings; the importance of teamwork and collaboration in the engineering design process; the development of hand sketches, orthographic projections, and pictorial views; an overview of dimensioning, tolerances, and types of fit in design drawings; the use of CAD for design, drafting, and analysis; the incorporation of section views, advanced sections, threads, and fasteners into design drawings; the creation of assembly drawings from part files; and effective communication and interpretation of blueprint drawings for desired results in manufacturing to avoid failures in the design of a final product. Prerequisite: Enrollment in an Engineering Sciences major.

ENGR 330 Signals & Systems 3 Credits (3,0)
Signal representations; response due to various inputs: using convolution, Fourier series, Fourier transforms, Laplace transforms, Z-transform; filter design.
Prerequisites: ELEC 220 **Corequisites:** ENGR 331.

ENGR 331 Signals & Systems Laboratory 1 Credit (0,1)
Lab for ENGR 330. The student will gain hands-on experience with programming in MATLAB. MATLAB will enable the students to link the theory they will gain in ENGR 330 to real software implementations. The lab will cover convolution, Fourier series, Fourier transforms, Laplace transforms, Z-transform, and filter design.
Corequisites: ENGR 330.

ENGR 350 Project Management for Engineered Systems 3 Credits (3,0)
Students will study systems thinking and lifecycle considerations in the completion of project initiation, planning, monitoring, control, and closeout activities for engineering systems. Additional topics include various roles in engineering project teams, effective communication and systematic planning and evaluation of project activities, costs, quality, risks and performance.
Prerequisites: ENGR 120 and ECON 225.

ENGR 400 Fundamentals of Energy Systems 3 Credits (3,0)
Single phase power, three phase power, magnetics circuits, transformers, DC machines, induction motors and synchronous machines, introduction to alternative energy, computer based projects will be assigned.
Prerequisites: PHYS 160 and ENGR 330.

ENGR 430 Control System Analysis and Design 3 Credits (3,0)
Modeling, analysis, and control of dynamical systems with aerospace applications. Transfer functions, block diagram algebra. Routh Hurwitz stability criteria. Introduction to system design using root locus, Bode and Nyquist diagrams.
Prerequisites: ENGR 330.

ENGR 490 Capstone Design Project I 3 Credits (3,0)
The first of two courses intended to provide senior level engineering students with experience in the multiple phases of a design project. This course will focus on the system requirements definition, exploration of the design space, and development of a conceptual design of a team project. Students will develop a preliminary design of the selected system design concept using computer based design and analysis tools. Prerequisite: Senior level standing and course listed.
Prerequisites: ENGR 350.

ENGR 491 Capstone Design Project II 3 Credits (3,0)
The final course in the capstone design sequence. Students will conduct a detailed design of the final project as well as conduct verification and validation exercises to demonstrate how the system performed when compared to system specifications and user requirements.
Prerequisites: ENGR 490.

Engineering Science (ESCI)

Courses

ESCI 105 Fundamentals of Engineering 3 Credits (3,0)
This course explores the topic of engineering and is appropriate for both those intending to major or specialize in engineering (or engineering sciences) and those with an interest in learning about the design process and other aspects of the engineering profession. Students will learn how to formulate, articulate, and solve problems, how to work on a conceptual design team, and how to present the results of engineering work in oral and written form. Students will also learn about the different disciplines of engineering and the multidisciplinary nature of modern engineering design.
Prerequisites: MATH 142 or MATH 143 or qualifying score on the mathematics skills assessment.

ESCI 201 Statics 3 Credits (3,0)
The purpose of this course is to provide the engineering student with the ability to analyze static equilibrium problems in a logical manner. It is designed to provide assistance to the student for preparation in all solid mechanics courses. Emphasis is placed on an understanding of principles employed in the solution of problems rather than reliance on a rote process of substitution in numerous formulas.
Prerequisites: PHYS 150 and ENGR 101 or ESCI 105.

ESCI 202 Solid Mechanics 3 Credits (3,0)
The concepts of stress and strain and their tensor properties. Elastic stress strain relations. Analysis of stress and deformation in members subject to axial, torsional, bending and combined loading. Column stability.
Prerequisites: ESCI 201.

ESCI 204 Dynamics 3 Credits (3,0)
A vector treatment of the kinematics and kinetics of particles and rigid bodies. Acceleration, work, energy, power, impulse, and momentum. Prerequisite: ESCI 201.

ESCI 206 Fluid Mechanics 3 Credits (3,0)
Physical characteristics of the fluid state. Fluid statics. Kinematics of fluid motion. Flow of an incompressible ideal fluid. The impulse-momentum principles. Similitude and dimensional analysis; fluid measurements.
Prerequisites: ESCI 201 and PHYS 160.

ESCI 305 Thermodynamics 3 Credits (3,0)
This course is a study of the concepts of heat and work and their transformation as governed by the first and second laws of thermodynamics. Topics discussed include properties of pure substances, ideal gas behavior and relationships, reversible processes and temperature- entropy diagrams, conventional power cycles, properties of ideal gas mixtures and combustion.
Prerequisites: ESCI 206 and MATH 345.

ESCI 320 Engineering Materials Science 2 Credits (2,0)
Materials used in aeronautical engineering applications. Electrical and mechanical properties of materials and their measurements. Metals and their structures. Characteristics of metallic phases. Equilibrium diagrams. Processing of metals and alloys. Plastics, their structures, and characteristics. Ceramics and their characteristics. Composite materials. Corrosion.
Prerequisites: ENGL 221 and ESCI 202 **Corequisites:** ESCI 321.

ESCI 321 Engineering Materials Science Laboratory 1 Credit (0,1)
Students will complete laboratory experiments and study techniques in materials science, composites and solids mechanics.
Corequisites: ESCI 320.

Engineering Technology (ETEC)

Courses

ETEC 310 Material Science for Engineering Technology 3 Credits (3,0)
This course includes an introduction to materials science and engineering. Emphasis is given on the "processing, structure, properties, performance" relationships that lead to the development of materials for society's needs. Examples are drawn from the major materials classes. Prerequisite: Courses listed or greater or equivalent from mathematics skills assessment.
Prerequisites: MATH 142 or MATH 143.

ETEC 315 Circuit Analysis 3 Credits (3,0)
This course provides a comprehensive review of the Kirchhoff's laws, resistive circuits and equivalent circuit study of electric circuits and networks. The course also includes first-order transients, sinusoidal steady-state analysis, and frequency response. Emphasis is given on basic principles and their application to circuit analysis using linear algebra and calculus.
Prerequisites: PHYS 160 and CESC 220.

ETEC 409 Applied Aeronautics 3 Credits (3,0)
In this course, students will apply the principles of aerodynamics, performance, and stability. Topics covered include airfoil and wing theory in the generation of lift and drag, high-lift systems, propeller and rotor performance, Reynolds number and Mach number effects, aircraft performance during the different stages of flight, and the effect of weight and balance on the stability of an aircraft.
Prerequisites: ASCI 309 and ENGR 115 and MATH 241.

ETEC 410 Thermodynamics for Engineering Technology 3 Credits (3,0)
This course is designed to provide a comprehensive review of the heat, work, and kinetic theory of gases, equation of state, thermodynamics system, control volume, first and second laws of thermodynamics, reversible and irreversible processes, and introduction to basic thermodynamic cycles.
Prerequisites: PHYS 160.

ETEC 415 Control Systems 3 Credits (3,0)
This course is designed to provide a comprehensive review of the analyses of closed loop systems using frequency response, root locus, and state variable techniques. System design is performed based on analytic and computer methods. This is an introductory control systems course. It presents a broad overview of control techniques for continuous and discrete linear systems, and focuses on fundamentals such as modeling and identification of systems in frequency and state-space domains, stability analysis, graphical and analytical controller design methods.
Prerequisites: ESCI 204 and ETEC 315.

ETEC 420 Applications of Engineering Technology 3 Credits (3,0)
This course is designed to provide a comprehensive review of various engineering disciplines. The engineering disciplines include mechanical, electrical, aerospace, civil, systems and computer Engineering.
Prerequisites: CHEM 139 and ESCI 202 and ESCI 204 and ESCI 206 and ETEC 310 and ETEC 315 and ETEC 410 and ECON 210 or ECON 211 or ECON 225.

ETEC 485 Professional Seminar 1 Credit (1,0)
As part of this course, professional seminars by internal and external speakers will be offered throughout the semester. These seminars will cover topics of current interest or provide in-depth coverage of selected topics from the core courses.
Prerequisites: ETEC 310 and ETEC 315.

ETEC 490 Engineering Technology Capstone 3 Credits (3,0)
This course is designed for students to conduct a senior design project. The project includes project statement, in-depth survey, conceptual and structural design, analysis, statistical and cost analyses, ethical, societal and environmental impact, evaluation and revision of design for the global arena with multi-cultural and multi-national perspective, prototype construction, and final presentation.
Prerequisites: CHEM 139 and ESCI 202 and ESCI 206 and ETEC 310 and ETEC 410 and ETEC 415 and ECON 210 or ECON 211 or ECON 225.

English (ENGL)

(Communication Theory & Skills)

Review the ERAU Worldwide English placement policy under the Skills Assessments (p. 31) *section of the Worldwide Catalog.*

Courses

ENGL 106 Introduction to Composition 3 Credits (3,0)
This course focuses on the basic principles of unity, support, and coherence as applied to the writing of a variety of paragraphs and essays. Grammar, mechanics, punctuation, sentence skills and basic writing skills are emphasized. Prerequisite: Qualifying score on the ERAU English Skills Assessment or course listed.
Prerequisites: GNED 104.

ENGL 123 English Composition 3 Credits (3,0)
This course focuses on the principles of using writing for thinking, as well as a tool for expressing ideas. It addresses the composing process, research and documentation, and rhetorical strategies for various audiences and purposes. Students develop their communicative, evaluative, critical thinking, and research writing abilities. Prerequisite: Qualifying score on the ERAU English Skills Assessment or course listed.
Prerequisites: ENGL 106.

ENGL 143 Studies in Rhetorical Theory 3 Credits (3,0)
This course is a broad survey of speculation concerning the nature and techniques of persuasion, this course is a continuation of ENGL 123. This writing-intensive course will focus on enduring issues in the study of rhetoric: the value of such a study, the nature of audiences, the most effective techniques, and the continual re-framing of these issues to meet changing circumstances.
Prerequisites: ENGL 123.

ENGL 221 Technical Report Writing 3 Credits (3,0)
This course introduces students to the preparation of formal and informal technical reports, abstracts, proposals, instructions, professional correspondence and other forms of technical communication. Major emphasis is placed on the long technical report and the acquisition of advanced writing skills.
Prerequisites: ENGL 123.

ENGL 222 Business Communication 3 Credits (3,0)
This course is an introduction to effective business communication. Topics in oral, written, non-verbal and intercultural communications are covered. Research methods, effective speaking and the preparation of letters, memoranda and reports are emphasized.
Prerequisites: ENGL 123.

ENGL 355 Creative Writing 3 Credits (3,0)
This course culminates the interpretive and expressive elements of communications classes. The study, practice and utilization of a personal style of creative composition, examples of contemporary literature and submittal of publications are included in this course.
Prerequisites: ENGL 123.

Fire Science (FIRE)

Courses

FIRE 201 Fire-Related Human Behavior 3 Credits (3,0)
This course presents a study of human behavior in fire and other emergency situations. Students will examine current and past research on human behavior, systems models, life safety education and building design to determine interactions of these areas in emergency situations. Students will develop an understanding of a best practice building life safety system as one that combines knowledge in the areas of psychology and sociology joined with engineering and education to produce the best possible outcomes in terms of human survivability in an emergency.

FIRE 299 Current Topics in Fire Science 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in Fire science. Prerequisites: Consent of Instructor, Approval of Department and Program Chairs, and 12 Hours of FIRE Courses.

FIRE 302 Fire Dynamics 3 Credits (3,0)
This course examines fire dynamics within the context of firefighting and its applications to fire situations, including combustion, flame spread, flashover, and smoke movement, as well as applications to building codes, large-loss fires, and fire modeling.

FIRE 303 Fire Protection Structures and Systems 3 Credits (3,0)
This course examines design principles involved in structural fire protection and automatic suppression systems, including fire resistance and endurance, flame spread evaluation, smoke control, alarm systems, sprinkler innovations, evaluation of sprinkler system designs, and specialized suppression systems.

FIRE 304 Fire Investigation and Analysis 3 Credits (3,0)
This course examines technical, investigative, legal, and managerial approaches to the arson problem, including principles of incendiary fire analysis and detection, environmental and psychological factors of arson, gang-related arson, legal considerations and trial preparations, managing the fire investigation unit, intervention and mitigation strategies, and shaping the future.

FIRE 305 Fire Prevention Organization and Management 3 Credits (3,0)
This course examines the factors that shape fire risk and the tools for fire prevention, including risk reduction education, codes and standards, inspection and plans review, fire investigation, research, master planning, various types of influences, and strategies.

FIRE 399 Current Topics in Fire Science 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in Fire science. Prerequisites: Consent of Instructor, Approval of Department and Program Chairs, and 12 Hours of FIRE Courses.

FIRE 400 Analytical Approaches to Public Fire Protection 3 Credits (3,0)
This course examines the tools and techniques of rational decision making in fire and emergency services agencies, including data collection, statistics, probability, decision analysis, utility modeling, resource allocation, and cost-benefit analysis.
Prerequisites: RSCH 202.

FIRE 401 Applications of Fire Research 3 Credits (3,0)
This course examines the basic principles of research and methodology for analyzing current fire-related research. The course also provides a framework for conducting and evaluating independent research in the following areas: fire dynamics, fire test standards and codes, fire safety, fire modeling, structural fire safety, life safety, firefighter health and safety, automatic detection and suppression, transportation fire hazards, risk analysis and loss control, fire service applied research and new trends in fire-related research.
Prerequisites: RSCH 202.

FIRE 406 Political and Legal Foundations of Fire Protection 3 Credits (3,0)
This course examines the legal aspects of the fire service and the political and social impacts of legal issues. This course includes a review of the American legal system and in-depth coverage of legal and political issues involving employment and personnel matters, administrative and operational matters, planning and code enforcement, and legislative and political processes with regard to the fire service.
Prerequisites: RSCH 202.

FIRE 499 Current Topics in Fire Science 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in Fire science. Prerequisites: Consent of Instructor, Approval of Department and Program Chairs, and 12 Hours of FIRE Courses.
Prerequisites: RSCH 202.

General Education (GNED)

Courses

GNED 103 Basic Mathematics 1 Credit (1,0)
The purpose of this course is to enable the student who did not take algebra in high school or who took it several years ago to succeed in an intermediate algebra course or in courses that require a very basic knowledge of the fundamentals of algebra. Topics included in the course are properties of the rational numbers to include review of operations with fractions, simple linear equations and inequalities in one variable, ratio, proportion, percent, basic operations with simple polynomials and applications to problem solving integrated throughout the course. This course cannot be used to satisfy credit for General Education requirements.

GNED 104 Basic English 1 Credit (1,0)
Emphasis in the course is placed on improving conceptual and organizational skills, grammar, spelling, capitalization, punctuation, and word choice. Students will also practice arranging ideas and supporting details in logical order, identifying topic and thesis statements, recognizing errors in pronoun usage, using verb tenses correctly, recognizing parallel structures and misplaced modifiers, and using coordination and subordination effectively. Students will also complete a variety of writing assignments. They will practice editing and revising paragraphs before submitting them for a grade, making corrections in sentence structure, content and rhetoric. The culmination of the course is applying learned skills to a final essay. This course cannot be used to satisfy credit for General Education requirements.

Government (GOVT)

(Social Sciences)

Courses

GOVT 320 American National Government 3 Credits (3,0)
This course covers basic issues of American democracy, constitutional principles, and the executive, legislative, and judicial branches of government.

GOVT 325 International Studies 3 Credits (3,0)
An overview of the land, the people, the culture, and the history of one region of the world, this course emphasizes current events and policies on the global scene. Specific content varies from year to year.

GOVT 331 Current Issues in America 3 Credits (3,0)
This is a course in selected political-economic issues of national and international importance. It includes extensive use of journals, magazines and newspapers to supplement lectures and discussions.
Prerequisites: RSCH 202.

GOVT 340 U.S. Foreign Policy 3 Credits (3,0)
A survey of the evolution of present American foreign policy, stressing the factors that affect and shape this policy. Attention is given to present governmental offices, agencies, and departments and the role each plays in policy formulation and implementation. Emphasis is on the period since World War II.
Prerequisites: RSCH 202.

GOVT 363 Inter-American Relations 3 Credits (3,0)
This course explores the development of U.S. political and economic relations with Latin America from their beginnings in the 19th century to present.
Prerequisites: RSCH 202.

GOVT 401 American Constitutional Law 3 Credits (3,0)
This course is a study of the basics of the United States Constitution and the rights of the individual. Included is the study of the First Amendment freedoms of speech, press, assembly, association, and religion; the right to privacy; and Fourteenth Amendment equal protection. Constitutional law pertaining to the rights of the criminally accused and the duties and responsibilities of the officer to protect and respect such rights is also studied.

GOVT 402 Globalization and World Politics 3 Credits (3,0)
This course is a study of the contemporary debate on globalization and new world order. Key topics include but are not limited to problems of definition in globalization; transborder issues and the role of the state; multinational corporations; labor and the terms of international trade; issues of environmental degradation; international organizations and nongovernment organizations in global affairs; terrorism, global crime, and international security human rights, democracy and cultural nationalism; technology and global communication.
Prerequisites: RSCH 202.

History (HIST)

(Social Sciences)

Courses

HIST 130 History of Aviation in America 3 Credits (3,0)
A survey of the history of America in the 20th century, the course emphasizes the explosive growth of aviation as a major influence upon the economic, military, and societal development of the United States.

HIST 302 Evolution of Scientific Thought 3 Credits (3,0)
This course traces the development of science from the earliest times through the modern period, with particular emphasis given to our changing concepts of nature and of science itself.

Homeland Security (HLSD)

Courses

HLSD 110 Introduction to Homeland Security 3 Credits (3,0)
The primary focus of this course is on issues dealing with the security of the citizens and industries of the United States, with emphasis on the transportation system and critical infrastructure protection roles of states, cities, and municipalities. Specific subjects introduced include the mission; the functions and responsibilities; and the legislative and regulatory framework governing the various agencies of the Department of Homeland Security; criminal acts against transportation; emergency management within the United States; the intelligence community and its role in homeland security; and issues pertaining to air; airtime; surface; and cargo security.

HLSD 215 Introduction to Industrial Security 3 Credits (3,0)
This course will review the fundamentals of security and emergency planning and management. The nature, scope, history, and essential elements of security in the workplace are discussed with emphasis on personal protection and to a limited extent property protection. The workplace will include selected aviation and industrial settings. Operational aspects of security that include strategies for identifying and controlling security exposures and applicable legal issues are also discussed. Students develop and/or evaluate security programs for selected industries.
Prerequisites: HLSD 110.

HLSD 280 Professional Skills in Homeland Security 3 Credits (3,0)
Prepare students to seek and win internships. Personality evaluations, cover letter and resume preparation, interviewing skills. Ethics and professionalism in homeland security.

HLSD 290 Environmental Security 3 Credits (3,0)
Students will learn how environmental issues may give rise to sociopolitical instability around the world. This course will explore how the development and execution of U.S. domestic and foreign policy, and ultimately U.S. national security, can be impacted by emerging threats to nations from environmental health issues, infrastructure vulnerabilities, and natural resource shortages caused by rapid industrialization, population growth, and urbanization in less developed countries. It will also examine transnational threats from ozone depletion, deforestation, and climate change. In a seminar format, students and faculty will cover a variety of readings and discuss their conclusions. Students will have the opportunity to lead class discussions on assigned readings.
Prerequisites: HLSD 110.

HLSD 315 Critical Infrastructure Security, Resilience, and Risk Analysis 3 Credits (3,0)
Critical infrastructure security, resilience, and risk analysis. History and evolution of critical infrastructure on both public and private levels. Federal definitions, sector identification, composition and characteristics of critical infrastructure, as expressed in formal documents (Stafford Act, PDD-63; HSPD-7, PPD-21) and within the private sector. The public-private partnership approach between infrastructure sectors, and sector-specific plans, critical infrastructure in a global context. Definition and role of resilience in critical infrastructure planning and disaster mitigation, response, and recovery. Complete a project involving an in-depth review and presentation of a critical infrastructure sector. Additionally, the concept of risk analysis as a means by which resources and assets are allocated to critical infrastructure(s). Complete a group project utilizing a qualitative risk assessment methodology. Risk fundamentals, network theory, continuity of business planning, and cost-benefit analysis. A formal risk analysis report will be completed at the conclusion of the project and an oral presentation will be delivered. Role of risk in the overall mission of the Department of Homeland Security, to include the National Infrastructure Protection Plan (NIPP). Successful completion of a FEMA on-line certification on the NIPP.
Prerequisites: HLSD 110 and HLSD 215.

HLSD 320 Homeland Security Law and Policy 3 Credits (3,0)
This course is an overview of key legal, policy, and ethical issues in the context of Homeland Security policy and practice. Students examine legal concepts regarding constitutional rights of individuals, legal process, access to courts, the law of war, and national security principles as they relate to homeland security legislation and policy initiatives. Legal principles of due process, habeas corpus, search and seizure, compulsory process, and international agreements are explored in greater depth. The law of war will be examined in the context of preemptive war and the 2006 National Security Strategy, as well as issues involving the status of combatants and detention. Elements of national security law, including intelligence collection and sharing, the Patriot Act, and military-civilian relations will also be discussed. Recent Supreme Court decisions relating to some of the above concepts and legal principles will be examined and discussed.
Prerequisites: HLSD 110 and HLSD 215.

HLSD 360 Strategic Planning and Decision Making in Homeland Security 3 Credits (3,0)
Strategic planning is the process of defining an organization's strategy (a long term plan of action designed to achieve a particular goal or objective) or direction and making decisions on allocating its resources to pursue this strategy, including its capital, its technology and its human resources. This course will investigate the nature of strategic planning as it relates to homeland security and national security in the U.S. In addition, students will explore how strategic planning relates to decision making in more stable environments as well as decision making under uncertainty. Relevant legislation and past decisions (such as the Bay of Pigs and the Cuban Missile Crisis) will be explored. In addition, the basic concepts of and techniques for strategic communication will be explored and developed and related to decision making.
Prerequisites: HLSD 110 and HLSD 215 and HLSD 290.

HLSD 405 Emergent Topics in Homeland Security 3 Credits (3,0)
This course will present multiple learning opportunities for students in either the terrorism or the emergency management area of concentration. In a seminar format, this course will be facilitated by the instructor as an advanced reading class wherein current or emerging topics specific to a given area of concentration will be explored. The instructor will present a series of articles, case studies, and talking points that each student will read and be prepared to discuss in class. In addition, the concept of business continuity planning will be described and illustrated. In the second half of the semester, each student will lead at least one class in the scholarly discussion of a topic assigned to him/her. Domestic and foreign policy implications will be considered.

HLSD 410 Exercise Design and Evaluation in Homeland Security 3 Credits (3,0)
This course studies the nature and structure of exercise design as it is applied in the homeland security professions in general, and in the field of emergency management in particular. Students will be introduced to the nature and characteristics of both discussion-based and operations-based exercises as well as the Homeland Security Exercise Evaluation Program (HSEEP) inside the Department of Homeland Security. A brief history of the origins of emergency management and its legislative background (e.g., HSPD 5 and HSPD 8) will be presented. A final student project and presentation that demonstrates the student's understanding of how exercises are designed, scripted, implemented, and evaluated is required.
Prerequisites: HLSD 315.

HLSD 495 Homeland Security Capstone I 3 Credits (3,0)
This course is designed to allow the student to explore more deeply issues specific to aspects of homeland security as they affect businesses. Students are expected to work collaboratively in groups to identify a real client, on or off campus, for whom the student group will attempt to solve a homeland security or emergency management related challenge. Each student group will research the origins of their client's challenge, and attempt to identify best practices in the field in order to adapt and apply them to their client's challenge. All projects will contain an introduction, literature review, problem statement, risk/hazard analysis, risk mitigation plan, and policy recommendations that are sensitive to economic realities facing their client. Students will culminate their final projects with presentations to their classmates and to their clients at the end of the term. The expectation of this class is to develop a professional example of the student's thinking and writing.

HLSD 496 Homeland Security Capstone II 3 Credits (3,0)
This course is designed to allow the student to explore more deeply issues specific to aspects of homeland security as they affect businesses. Students are expected to work collaboratively in groups to identify a real client, on or off campus, for whom the student group will attempt to solve a homeland security or emergency management related challenge. Each student group will research the origins of their client's challenge, and attempt to identify best practices in the field in order to adapt and apply them to their client's challenge. All projects will contain an introduction, literature review, problem statement, risk/hazard analysis, risk mitigation plan, and policy recommendations that are sensitive to economic realities facing their client. Students will culminate their final projects with presentations to their classmates and to their clients at the end of the term. The expectation of this class is to develop a professional example of the student's thinking and writing.

Humanities (HUMN)

Courses

HUMN 142 Studies in Literature 3 Credits (3,0)
This course emphasizes writing, reading and appreciation skills. Reading materials include selected novels, poems and plays.
Prerequisites: ENGL 123.

HUMN 210 World Culture 3 Credits (3,0)
This course focuses on the cultural development of world societies including but not limited to religious, social, political, and philosophical arenas as all apply to contemporary circumstances. Skills emphasized are: comprehensive comparative reading, analysis and critiques, and writing.
Prerequisites: ENGL 123.

HUMN 213 Introduction to Islamic Studies 3 Credits (3,0)
This interdisciplinary course will provide students with a broad overview of Islamic history and contemporary culture. It will explore the social and cultural conditions of pre-Islamic Arabia, the foundational teachings of Islam, the history and aesthetic form of the Quran, the biography and sayings of Muhammad and the relationship between Muhammad's biography and contemporary Islamic practices, including the daily rituals, modes of dress and gender norms variously observed in societies where Islam is predominant. The course will culminate with an exploration of specific cultural and social issues facing contemporary Muslims, including the role of women in public space, the separation between religion and politics, and religious violence. Skills emphasized will be: comprehensive comparative reading, analysis, and writing.
Prerequisites: ENGL 123.

HUMN 299 Special Topics in Humanities 1-6 Credit (1-6,0)
Individual independent or directed studies of selected topics in the humanities.

HUMN 300 World Literature 3 Credits (3,0)
This course provides a study of the major works and literary trends in world literature. Course content varies by instructor and is listed in the Schedule of Courses.
Prerequisites: ENGL 123 and HUMN 142.

HUMN 310 American Literature 3 Credits (3,0)
This course is a survey of intellectual backgrounds, major works and literary trends in American literature. Course content varies by instructor and is listed in the Schedule of Courses.
Prerequisites: ENGL 123 and HUMN 142.

HUMN 330 Values and Ethics 3 Credits (3,0)
This course focuses on the process of practical ethics as a way of resolving moral conflict and of understanding professional responsibility in a multi-culturally diverse society without devaluating specific viewpoints of ethical or metaphysical theory, ideology, or religion. Students will use proposals, value judgments, observation statements, assumptions, and alternate-world assumptions in arguing contemporary issues of moral importance. With this basic moral logic, students will resolve issues in terms of rights, responsibilities, and the community of rational beings; in terms of consequences and contingencies; and in terms of habituated virtues and character. Free and unrestricted discourse will be encouraged so as to let students find common ground in diversity.
Prerequisites: ENGL 123.

HUMN 399 Special Topics in Humanities 1-6 Credit (1-6,0)
These courses are individual independent or directed studies of selected topics in the humanities. Prerequisite: Consent of instructor and approval of the department chair.

HUMN 400 Science and Aviation/Aerospace Technology in Society 3 Credits (3,0)
Throughout history, science and technology have consistently transformed society. From medicine to communications to the arts and all points between, our culture is very much a society of science and technology. A systemic awareness of how science and technology both impact and are influenced by society is critical to function as a responsible professional in an increasingly complex world. This course will examine the interrelated roles that science and technology play in society, with a particular emphasis on aviation and aerospace.
Prerequisites: ENGL 123 and RSCH 202.

HUMN 499 Special Topics in Humanities 1-6 Credit (1-6,0)
These courses are individual independent or directed studies of selected topics in the humanities. Prerequisite: Consent of instructor and approval of the department chair.

Information Systems &Technologies Applications (ISTA)

Courses

ISTA 210 Database Fundamentals 3 Credits
This course introduces database concepts and programming using SQL. Students are introduced to SQL server and data warehouse fundamental principles. Key topics include an introduction to relational databases, SQL syntax, and DML. This course is part of a set of five related ISTA courses that make up the Data Base and Business Intelligence Administrator specialization's technical content.

ISTA 220 Programming in C# 3 Credits
An introduction to applications programming in C# including a coverage of the Visual Studio development environment. Key topics including C# syntax, variables, types, expressions, classes, and interfaces are introduced leading to a final application project. This course is part of a set of five related ISTA courses that make up the Cloud Applications Developer specialization's technical content. Prerequisites: Students in the Microsoft Software and Systems Academy Cloud Applications Developer Specialization: ISTA 420. All other students: no prerequisite, although ISTA 420 highly encouraged.

ISTA 230 Networking and Server Fundamentals 3 Credits
This course introduces the fundamentals of network server architectures using the installation and configuration processes of Windows Server as a framework. It provides an in-depth examination of server architectures, performance tuning, and resource access and allocation controls. Using online labs, projects and other activities derived from Microsoft Official Course, the student conducts a variety of server installation and configuration activities, while building the conceptual and practical knowledge and skills necessary for server and cloud administration. Required course materials include time-sensitive license vouchers that students must have to participate in the course. The course prepares students to take the associated Microsoft Certification exam, which is incorporated as the course Final Exam. Students must take this exam at a Microsoft-approved test proctor facility; see the Master Textbook List for further information. Prerequisite: Students in the Microsoft Software and Systems Academy Server & Cloud Administrator specialization must have one of the following current, valid credentials:*Microsoft Technology Associate certification 98-367, Security Fundamentals*Microsoft Technology Associate certification 98-366, Networking Fundamentals*CompTIA Security+ certification*CompTIA Network+. All other students: no prerequisite.

ISTA 310 SQL Server Administration and T-SQL 3 Credits
This course is building upon fundamental database concepts and focuses on methods for inputting, retrieving and updating database information using T-SQL and DML. This course is part of a set of five related ISTA courses that make up the Data Base and Business Intelligence Administrator specialization's technical content.

ISTA 312 Implementing Data Warehouses and Databases 3 Credits
This course provides an introduction to practical techniques for building and using a data warehouse using SQL server. Topics include dimensioning a warehouse, extracting, transforming and controlling the flow of data as well as the use of SSIS. This course is part of a set of five related ISTA courses that make up the Data Base and Business Intelligence Administrator specialization's technical content.

ISTA 322 Developing ASP.NET Web Applications 3 Credits
This course prepares students to develop dynamic Web applications using the .NET framework. Students are introduced to Web architecture and the MVC (Model-View-Controller) model and employ the Microsoft Web Technologies stack within the course project in order to develop a dynamic Web application. This course is part of a set of five related ISTA courses that make up the Cloud Applications Developer specialization's technical content. Prerequisite: ISTA 220.

ISTA 330 Windows Server Configuration and Management 3 Credits
This course is part two of a three part series that provides the skills and knowledge necessary to implement a core Windows Server infrastructure in an existing enterprise IT environment. Building on the concepts and technologies covered in ISTA 230, this course provides a deeper, more detailed focus on the provisioning and systems administration tasks necessary to maintain a Windows Server infrastructure such as configuring and troubleshooting name resolution, user and group management, and implementing remote access solutions in the context of establishing and maintaining network access protection and data security. Deployment and maintenance of server images, as well as update management and monitoring of Windows Server environments, complete the course. This course incorporates materials from Microsoft Official Courses; required course materials include time-sensitive license vouchers that students must have to participate in the course. The course prepares students to take the associated Microsoft Certification exam, which is incorporated as the course Final Exam. Students must take this exam at a Microsoft-approved test proctor facility; see the Master Textbook List for further information. Prerequisites: ISTA 230, or the approval of the Program Chair.

ISTA 332 Configuring Advanced Windows Server Services 3 Credits
This course examines how to achieve a variety of IT systems performance, continuity of operations and disaster recovery capabilities in the context of Windows Server infrastructures. As the third of a three-course sequence, it combines fundamental concepts and skills used to deploy, provision and manage server systems and infrastructures with a hands-on approach to information risk management. This course focuses extensively on advanced networking services, Active Directory Domain Services (AD DS), Active Directory Rights Management Services (AD RMS), Active Directory Federation Services (AD FS), as part of implementing strategies to achieve network load balancing, failover clustering, business continuity, and disaster-recovery services. This course also covers access and information provisioning, and protection technologies such as Dynamic Access Control (DAC), and Web Application Proxy integration with ADFS and Workplace Join. This course incorporates materials from Microsoft Official Courses; required course materials include time-sensitive license vouchers that students must have to participate in the course. The course prepares students to take the associated Microsoft Certification exam, which is incorporated as the course Final Exam. Students must take this exam at a Microsoft-approved test proctor facility; see the Master Textbook List for further information. Prerequisites: ISTA 330 Advanced Windows Server Administration and Services, or the approval of the Program Chair.

ISTA 410 Data Modeling and Reporting 3 Credits
An introduction to multidimensional and tabular data models including customization, maintenance, reporting, and data delivery. This course is part of a set of five related ISTA courses that make up the Data Base and Business Intelligence Administrator specialization's technical content.

ISTA 412 Designing Business Intelligence Solutions 3 Credits
This course introduces the design process for developing a BI solution from planning and designing the infrastructure to creating an ETL (Extract, Transform, and Load) solution complete with reporting services. This course is part of a set of five related ISTA courses that make up the Data Base and Business Intelligence Administrator specialization's technical content.

ISTA 420 SQL and Application Development 3 Credits
This course introduces the key components of SQL including tables, indexes, data integrity, managed code, XML, and functions. The SQL components are applied using APIs in order to support the development of applications that interact with SQL servers. This course is part of a set of five related ISTA courses that make up the Cloud Applications Developer specialization's technical content. Prerequisite: Students in the Microsoft Software and Systems Academy Server & Cloud Administrator specialization must have one of the following current, valid credentials: *Microsoft Technology Associate certification 98-367, Security Fundamentals *Microsoft Technology Associate certification 98-366, Networking Fundamentals *CompTIA Security+ certification *CompTIA Network+. All other students: no prerequisite.

ISTA 421 Developing Cloud Applications 3 Credits
Developing applications programs that run in the Cloud requires developers to design code with many different and sometimes conflicting requirements in mind. Cloud-based apps often require greater end-user device mobility (or platform independence), while at the same time being able to selectively engage with end user device hardware and firmware features. User access authorization, data protection (at move and at rest), and provisioning, licensing and monetizing of apps are design issues that all must take cloud hosting considerations into account. Using the Microsoft Azure public cloud stack as a foundation, this course combines approaches from the Universal Windows Platform and ASP.NET MVC to guide the student through these and other development, deployment and sustainment issues of apps in and for the Cloud. Prerequisites: Students in the Microsoft Software and Systems Academy (MSSA), Cloud Applications Developer Specialization: ISTA 322, plus recommendation by the MSSA Program Chair for continued study in this Specialization. All other students: ISTA 322.

ISTA 422 Azure Application Development 3 Credits
A practical introduction to the Microsoft's cloud computing technologies. The course includes practical techniques for coding, testing and deploying Visual Studio and Microsoft Azure to Azure itself and the SQL Azure storage services. This course is part of a set of five related ISTA courses that make up the Cloud Applications Developer specialization's technical content. Prerequisite: ISTA 421.

ISTA 430 Configuring and Deploying Private Cloud Systems 3 Credits
This course focuses on the deployment, configuration and operation of private cloud systems using Windows Systems Center technologies. Students will learn how to plan and implement private clouds; to monitor, manage and administer cloud environments; while also monitoring and managing key infrastructure elements and applications that run within cloud environments. Students will also learn how to operate and extend Service Management in cloud environments, achieve high availability, protection and recovery services, and use service level agreements (SLAs) to manage and optimize private cloud systems. Students produce high-level cloud systems designs, configure and deploy cloud systems to meet requirements, and use a variety of virtualization technologies and tools to deliver applications services, configure and publish service catalogs, and use Data Protection Manager to provide information security. This course encompasses the learning objectives, labs, projects and other materials derived from two Microsoft courses; as such, required course materials include time-sensitive license vouchers that students must have to participate in the course. The course prepares students to take the associated Microsoft Certification exams, which are incorporated into ISTA 430. Students must take these exams at a Microsoft-approved test proctor facility; see the Master Textbook List for further information. Prerequisites: Students in the Microsoft Software and Systems Academy (MSSA), Server & Cloud Administrator Specialization: ISTA 332, plus recommendation by the MSSA Program Chair for continued study in this Specialization. All other students: ISTA 332.

ISTA 432 Building Azure Infrastructures 3 Credits
This course completes our study of the deployment, configuration and operation of private cloud systems and infrastructures using Windows Systems Center and Azure technologies. Building on previous ISTA courses, students will learn how to use and manage virtual networking, virtual machines and related technologies to plan, configure, control, optimize and support private cloud infrastructures, systems and applications. Hands-on exercises will also investigate how to plan for, deploy and support SQL database applications and services, web site deployment and configuration, as well as a variety of monitoring, incident analysis and problem-solving techniques. This course encompasses the learning objectives, labs, projects and other materials derived from Microsoft Official Courses; as such, required course materials include time-sensitive license vouchers that students must have to participate in the course. The course prepares students to take the associated Microsoft Certification exam, which is incorporated as the course Final Exam. Students must take this exam at a Microsoft-approved test proctor facility; see the Master Textbook List for further information. Prerequisites: ISTA 430 or the approval of the Program Chair.

Leadership (BSLD)

Courses

BSLD 275 Critical Thinking for Leadership 3 Credits (3,0)
Emphasizes several models and strategies for critical thinking within a leadership context. Additional topics include: digital literacy tools; library research; and written communication.

BSLD 285 The Evolution of Leadership 3 Credits (3,0)
In this course, students will explore the historical roots of modern leadership theory. The course will take an in-depth look at the societal, cultural, economic, and political environment that led to the forming of specific leadership theories. Special emphasis is placed on understanding the context of leadership theories, and then applying that context to one's own environment.
Prerequisites: BSLD 275.

BSLD 300 Emotional, Social, and Cognitive Intelligence 3 Credits (3,0)
Examines behavioral competencies needed for success in the enterprise. Topics include relationship building, networking, boundary spanning and mindfulness. Being aware of being emotionally, socially, and cognitively intelligent will establish the practical underpinnings of primal leadership.
Prerequisites: BSLD 275.

BSLD 304 Coaching and Mentoring 3 Credits (3,0)
Introduces coaching and mentoring as performance management techniques. Topics include theoretical underpinnings, models, development, and evaluation of coaching and mentoring programs.
Prerequisites: BSLD 275.

BSLD 310 Mediation, Negotiation, and Conflict Resolution 3 Credits (3,0)
Develops skills and methods for successful conflict management. Topics include mediation, negotiation, resolution and avoidance. Special emphasis will be placed on the relationships of the leader and how to help address conflict in a positive manner that results in personal and systematic change.
Prerequisites: BSLD 275.

BSLD 315 Contemporary Leadership Theories 3 Credits (3,0)
Explores contemporary organizational leadership theories. Topics include full-range leadership, values-based leadership, authentic leadership, complex adaptive leadership, and self-leadership.
Prerequisites: BSLD 275.

BSLD 402 Ethics, Values, and Differences 3 Credits (3,0)
The study of the ethical issues related to leadership and the ethics of leadership. Topics include: diversity, civility, social contract, power, influence, vision, authenticity, fairness, rights and responsibilities, and self interest.
Prerequisites: BSLD 275.

BSLD 407 Driving Change in Organizations 3 Credits (3,0)
Explores the forces that drive change and examines planned change within organizations. Topics include assessing the need for change, involving stakeholders in the change process, communicating the need for change, developing strategies for managing change, and evaluating change projects.
Prerequisites: BSLD 275.

BSLD 412 Leadership Practicum 3 Credits (3,0)
The leadership practicum provides students an opportunity to apply previous knowledge in an organization of their choice. Students can put into practice what is learned. Students will serve in a consultative role to work on a problem or outcome and report their findings in a variety of formats.
Prerequisites: BSLD 275.

Interdisciplinary Studies (BSIS)

Courses

BSIS 473 Senior Thesis 3 Credits (3,0)
The Interdisciplinary Studies Senior Thesis course will be taken toward the end of the student's degree program. The course is a significant part of the student's entire learning experience. Students will complete a project that provides significant evidence of experience in Interdisciplinary Studies. Students will work with designated faculty members to formulate, develop, and complete the Senior Thesis project. Course completion, designed to document significant evidence students met Program Outcomes, also provides students evidence of experience to show to current and prospective employers. Prerequisites: RSCH 202 or equivalent and completion of at least 88 hours in the degree program.

Logistics and Supply Chain Management (LGMT)

Courses

LGMT 236 Principles of Purchasing 3 Credits (3,0)
This course is an introductory course on the procurement function. The course will address the impact of purchasing and supply chain management on the competitive success and profitability of modern organizations. The students will understand the strategic nature of purchasing, not just buying goods and services. The students will also learn about the ethical, contractual, risk management, sustainability, and legal issues that purchasing and supply chain professionals come across. The course will also address the relationship between purchasing and inventory management, materials management, just-in-time manufacturing, and manufacturing resource planning. Global sourcing and the role of supply chain partnerships are also addressed, along with how to evaluate, bargain, and negotiate with suppliers.

LGMT 375 Humanitarian Logistics 3 Credits (3,0)
Humanitarian logistics and disaster response is becoming an important global issue. The fundamental goal of logistics is to deliver the right product to the right place at the right time. When faced with a natural disaster, much of the critical infrastructure is decimated and alternate transportation and communication channels need to be quickly recovered or developed. The victims of the disaster need critical supplies immediately and the private sector in the impacted area needs to rapidly recover and resume normal business practices. This course takes a case-study approach and introduces the student to all phases of a humanitarian logistics from disaster preparation to complete recovery. Topics to be covered include: disaster analysis, disaster management cycle, risk assessment, critical need supply chain techniques, disaster transportation, warehousing and material management, distribution mechanisms, best practices and resources.

LGMT 450 Hazard Mitigation in Emergency Management 3 Credits (3,0)
Whether a disaster is natural or man-made, both government and private sectors must recognize and manage the risks associated with each disaster type and implement effective hazard mitigation programs. This course takes a case-study approach and introduces the student to all phases of a disaster including pre-event mitigation and preparedness and after-event response and recovery. Topics to be covered include: mitigation framework, rules and regulations, roles of government and private sectors, risk assessment, hazard identification, vulnerability assessment and impact analysis, mitigation strategies, tools, best practices and resources.

LGMT 484 Material Management in Contingency Operations 3 Credits (3,0)
Contingency operations in support of domestic or international crisis require rapid response from logisticians and logistic support elements in facilitating the necessary equipment and supplies needed for relief efforts. This course takes an exploratory approach to introduce the student to the logistician's role in supporting contingency operations with a focus on agile, responsive material management initiatives. Topics to be covered are: contingency planning, forecast, preparation, and deployment strategies, operation phases, roles of governments and private sectors, supply chain strategic partnerships, global capabilities, leveraging purchasing flexibilities, and legal and ethical implications.

Management (MGMT)

Courses

MGMT 201 Principles of Management 3 Credits (3,0)
A comprehensive overview of relevant management principles and practices as applied in contemporary organizations, this course focuses on management theories, philosophies, and functions.

MGMT 203 Management for Aeronautical Science 3 Credits (3,0)
An introductory course in aeronautics to provide students an orientation in aviation and other aerospace related topics appropriate to management degree programs. Subjects include: aviation careers; the science of flight; aviation safety managerial responsibilities; passenger and cargo security issues; safety and human factors issues; aircraft airworthiness certifications; aviation resources; the aviation environment; and meteorology.

MGMT 210 Financial Accounting 3 Credits (3,0)
This course introduces the student to accounting information systems and financial reports. Included are accounting concepts and analysis and interpretation of financial reports, with an emphasis on the operating activities of aviation-related businesses.

MGMT 221 Introduction to Management Information Systems 3 Credits (3,0)
The course integrates many theories, concepts, and methodologies related to the implementation and use of Information Systems within an enterprise. Special attention is given to the following topics: Digital technology; Winning, engaging, and retaining consumers; Optimizing performance with enterprise systems and analytics; Managing business relationships, projects and codes of ethics.

MGMT 299 Special Topics in Management 1-4 Credit (1-4,0)
These are individual independent or directed studies of selected topics in management. Prerequisite: Consent of instructor and approval of the department chair.

MGMT 308 Public Administration 3 Credits (3,0)
The characteristics of organization and management in government will be discussed in this course. The course will center on the impact of political processes and public pressures on administration action, the role of regulatory agencies, governmental personnel, and budgetary procedures, and the unique qualifications of the public administrator.

MGMT 311 Marketing 3 Credits (3,0)
This course centers on marketing theory, marketing management, sales management, and market research. In addition, public and customer relations, advertising, and distribution will be explored.

MGMT 312 Managerial Accounting 3 Credits (3,0)
The course emphasizes management's use of cost information in internal decision making. Decision-making processes include cost analysis, control, allocation, and planning. A variety of accounting techniques applicable to aviation/aerospace companies are presented.

MGMT 314 Human Resource Management 3 Credits (3,0)
The focus of this course is on the functions to be accomplished in effectively managing human resources. An in-depth study of the interrelationship of managers, organizational staff, and/or specialists, will assist the student in understanding and applying management theories to real-world human resource planning. Areas of concentration include human resource planning; recruitment and selection; training and development; compensation and benefits; safety and health; and employee and labor relations.

MGMT 317 Organizational Behavior 3 Credits (3,0)
This course provides an overview and analysis of various behavioral concepts affecting human behavior in business organizations, with emphasis on research, theory, and practice.

MGMT 320 Business Information Systems 3 Credits (3,0)
A management approach to understanding business information systems is introduced in this course. The general characteristics, potential, and limitations of business systems are covered. Major emphasis is on understanding the inputs, processing, and outputs of a variety of business systems; the ways in which business systems are interrelated; and the inherent management problems involved in the implementation and control of such systems.

MGMT 321 Aviation/Aerospace Systems Analysis Methods 3 Credits (3,0)
An overview of the system development life cycle is provided in this course. Emphasis is on current system documentation through the use of both classical and structured tools/techniques for describing process flows, data flows, data structures, file designs, input and output designs, and program specifications.
Prerequisites: MGMT 221.

MGMT 322 Aviation Insurance 3 Credits (3,0)
An introduction to the basic principles of insurance and risk with special application to the aviation industry will be presented. The course offers an in-depth review of the aviation insurance industry in the United States, including the market and types of aviation insurers.

MGMT 324 Aviation Labor Relations 3 Credits (3,0)
This course focuses on an investigation of labor-management relations in the aviation industry. Examined are the history of unionism, structure of unions, legal environment, and the Railway Labor Act, collective bargaining, public sector relationships, grievance procedures, and conflict resolution.

MGMT 325 Social Responsibility and Ethics in Management 3 Credits (3,0)
The course provides a comprehensive inquiry into the major components of social responsibility and a study of moral and ethical issues that relate to problems in business. Focus will be on the economic, legal, political, ethical, and societal issues involving the interaction of business, government, and society.

MGMT 331 Transportation Principles 3 Credits (3,0)
The basic principles of the several modes of transportation (air, sea, rail, highway, and pipeline) are analyzed. Topics include problems of competition, the importance of each in the economy, and future developmental prospects.

MGMT 332 Corporate Finance I 3 Credits (3,0)
Students will learn about the finance function as used by management, including financial analysis and control; financial planning; short, intermediate, and long-term financing; and the theory of cost of capital and leverage in planning financial strategies. Aviation-related businesses are emphasized.

MGMT 333 Personal Financial Planning 3 Credits (3,0)
The nature of the personal financial planning process is examined. Areas of concentration include taxes, investments, purchase of housing/auto, insurance needs and analysis, use of credit, and retirement and estate planning. Students will develop a personal financial plan and will invest in a $500,000 portfolio of securities.

MGMT 335 International Business 3 Credits (3,0)
This course presents an analysis of economic development and international trade in modern times, with an examination of current U.S. relations with other nations. Attention will be focused on the impact of foreign trade on the aviation industry and the industry's contribution to economic development.
Prerequisites: MGMT 201.

MGMT 371 Leadership 3 Credits (3,0)
The focus of this course is about leadership in organizations. In the increasingly competitive global economy, leaders must develop the necessary skills to lead organizational development, change, and create a motivating workplace. This course focuses on analyzing the leadership skills that enhance organizational success. Topics discussed are the approaches and models of leadership, organization change, and organization development.
Prerequisites: MGMT 201.

MGMT 385 Programming Concepts 3 Credits (3,0)
This course presents a language-independent introduction to programming concepts in design and implementation. Topics covered include data types, control structures, arrays, files, functions, top-down modules design, and data validation. The course discusses the design issues of the various languages construct, examining the design choices for these constructs in some of the most common programming languages, and critically comparing design alternatives.
Prerequisites: MGMT 221.

MGMT 386 Fundamentals of Information Systems Security 3 Credits (3,0)
This course focuses on new risks, threats, and vulnerabilities in a digital world. The integration of the Internet and broadband communications into our everyday lives has created a need for information system security. Furthermore, compliance laws require organizations to protect and secure privacy data and reduce liability.
Prerequisites: MGMT 221.

MGMT 387 Managing Risk in Information Systems 3 Credits (3,0)
Managing Risk in Information Systems provides a unique, in-depth look at how to manage and reduce IT associated risks. This course provides a comprehensive explanation of the Risk, Response, and Recovery Domain in addition to providing a thorough overview of risk management and its implications on IT infrastructures and compliance.
Prerequisites: MGMT 386.

MGMT 388 System Forensics, Investigation, and Response 3 Credits (3,0)
Computer crimes call for forensics specialists, people who know how to find and follow the evidence. System Forensics, Investigation, and Response begin by examining the fundamentals of system forensics; such as what forensics is, the role of computer forensics specialists, computer forensic evidence, and application of forensic analysis skills. It also gives an overview of computer crimes, forensic methods, and laboratories. It then addresses the tools, techniques, and methods used to perform computer forensics and investigation. Finally, it explores emerging technologies as well as future directions of this interesting and cutting-edge field.
Prerequisites: MGMT 386.

MGMT 389 Information Assurance and Information Quality 3 Credits (3,0)
This course provides an overarching model for information assurance for businesses, government agencies, and other enterprises needing to establish a comprehensive plan. All the components of security and how they relate are featured. Topics include asset identification, human factors, compliance with regulations, personnel security, risk assessment and ethical considerations, as well as computer and network security tools and methods.
Prerequisites: MGMT 386.

MGMT 390 Business Law 3 Credits (3,0)
A survey of the legal aspects of business transactions is provided. Areas covered include contracts, agency, bailment, negotiable instruments, partnerships, corporations, consumer credit, and the government's influence on business law.

MGMT 391 Introduction to Project Management 3 Credits (3,0)
This course introduces basic concepts and tools of project management, such as the work breakdown structure, scheduling, earned value analysis, and risk management. At the end of this course, students will be able to develop, execute, and control a project for supporting business objectives linked to measures of success.

MGMT 392 Database Management 3 Credits (3,0)
Database systems are powerful, complex facilities for managing data. The advent of database management systems for personal computers in the 1980s moved database management into the hands of everyday users from all segments of the population. This course presents the fundamental concepts of database management. It covers key topics related to any database management system, including database models, database design and implementation, database management systems functions, and database management approaches.
Prerequisites: MGMT 221.

MGMT 393 Computer Networks 3 Credits (3,0)
Computer networks is a rapidly evolving field. This course presents an introduction to fundamental concepts in the design and implementation of computer communication networks, their protocols, and applications. Topics to be covered include: network architecture, fundamentals of data transmission, LAN technology and data link protocols, and network security.
Prerequisites: MGMT 221.

MGMT 394 Information Security Management 3 Credits (3,0)
This course presents the concepts of information security in an enterprise approach to provide managers with tools and understanding needed to allocate scarce security resources. Introduction to security attributes and policies, developing effective and appropriate enterprise security plans, threats, vulnerabilities, and risk management concepts. Study of the architecture of an enterprise security system is developed to include a need analysis, levels of protection, detection strategies and correction/recovery with crisis management, risk analysis, and business continuity plans.
Prerequisites: MGMT 221.

MGMT 399 Special Topics in Management 1-4 Credit (1-4,0)
These are individual independent or directed studies of selected topics in management. Prerequisite: Consent of instructor and approval of the department chair.

MGMT 401 Information Security Policies 3 Credits (3,0)
This course provides students with an introduction to information security policies. The course is designed to provide students with the foundation for developing and implementing policies. It also assists students with the effective evaluation of policies. Several examples from different information security domains are incorporated to assist the students learn in context of real life situations.
Prerequisites: RSCH 202 and MGMT 386.

MGMT 402 Legal Issues in Information Security 3 Credits (3,0)
This course addresses the area where law and information security concerns intersect. Information systems security and legal compliance are now required to protect critical governmental and corporate infrastructure, intellectual property created by individuals and organizations alike, and information that individuals believe should be protected from unreasonable intrusion. Organizations must build numerous information security and privacy responses into their daily operations to protect the business itself, fully meet legal requirements, and to meet the expectations of employees and customers.
Prerequisites: RSCH 202 and MGMT 386.

MGMT 403 IT Audit and Control 3 Credits (3,0)
The course is designed to provide a foundation for the study of information technology (IT) auditing and the IT audit process. The course introduces the fundamentals of IT auditing, main reasons why IT auditing is a specialized area of auditing, and the principle objectives of IT auditing. The course emphasizes business management issues regarding the security and control of IT and the achievement of value through managed IT processes. Students will also be introduced to control evaluation techniques and a number of the primary references used by IT professionals and IT auditors regarding IT management and control.
Prerequisites: RSCH 202 and MGMT 386.

MGMT 404 Business Continuity & Disaster Recovery Planning 3 Credits (3,0)
Every year, nearly one in five businesses, non-profit and government activities suffer major disruptions to their ongoing operations because of catastrophic failures in their critical information systems. And although information systems and their technologies can provide some measure of "fail-safe" capabilities, without management attention to business continuity planning, the organization is putting its institutional life at risk! This course addresses the strategic, tactical and day-to-day operational planning and implementation of an integrated set of plans that assure the long-term survivability of the organization's ability to keep doing business in the face of major malware threats, natural disasters, or man-made hazards that could cripple or destroy the information flow that business decision making depends upon. In doing so, the course places contingency planning and response into a solid information risk management and information security framework. By focusing on critical information flow - and how people use information systems and technologies to make and carry out decisions before, during and after disaster strikes - the course sheds light on critical decisions that organizations must make, both technology issues and technology-independent considerations.
Prerequisites: RSCH 202 and MGMT 386.

MGMT 408 Airport Management 3 Credits (3,0)
The focus of this course will be an examination of the management of airports. Emphasis is on the facilities that comprise an airport system, including airspace, airfield, terminal, and ground access operations.
Prerequisites: RSCH 202.

MGMT 411 Logistics Management for Aviation/Aerospace 3 Credits (3,0)
Students are provided with an opportunity to examine ways to optimize the physical flow of goods and materials within a firm from acquisition through production, and movement through channels of distribution. The course focuses on applying logistics theory to aviation management problems in materials handling, managing inventory, planning capacities, and locating distribution centers. Case studies with aviation/aerospace applications using computer models are included.
Prerequisites: RSCH 202.

MGMT 419 Aviation Maintenance Management 3 Credits (3,0)
Students will perform a comprehensive examination of organizational maintenance policies, programs, and procedures. Emphasis is on maintenance planning, forecasting and cost control, reliability, safety, and flight schedule performance.
Prerequisites: RSCH 202.

MGMT 420 Management of Production and Operations 3 Credits (3,0)
An intensive study of management of production and operations in all organizations, both service-oriented and product-oriented, will be conducted. Scheduling, inventory control procurement, quality control, and safety are investigated. Particular attention is given to applications of aviation-oriented activities.
Prerequisites: RSCH 202.

MGMT 422 Information Technology Management, Strategy, and Governance 3 Credits (3,0)
The course examines how firms use IT to architect a foundation for executing their business strategies and competing on information products and services. Information Technology departments are required to increase system performance and improve availability while simultaneously reduce costs and improve quality. The use of best practices methods and metrics must be used.
Prerequisites: MGMT 221 and RSCH 202.

MGMT 424 Project Management in Aviation Operations 3 Credits (3,0)
This course introduces the student to the concept of project management in aviation operations. It addresses the three-dimensional goals of every project: the accomplishment of work in accordance with budget, schedule, and performance requirements. The procedures for planning, managing, and developing projects in an aeronautical environment are covered, as well as the aspects of controlling project configuration from inception to completion. Automated tools used to determine cost, schedule, staffing, and resource allocation are covered, as well as the process of determining the effectiveness and technical validity of aviation-related projects.
Prerequisites: RSCH 202.

MGMT 427 Management of the Multicultural Workforce 3 Credits (3,0)
Students are provided with an opportunity to explore management of the multicultural workforce. The elements of cultural anthropology and international business, communicating across cultures, contrasting cultural values, and managing and maintaining organizational culture are addressed in the context of international aviation management.
Prerequisites: RSCH 202.

MGMT 428 Business Analytics and Data Intelligence 3 Credits (3,0)
The massive growth of the Internet and the rapid expansion of communication and information technology have resulted in a great flow of data -- both structured and unstructured, and while accessing and gathering data is important, analyzing and making sense of that data is even more important. This course introduces students to how businesses can use applications and technologies to effectively manage, analyze, and distribute enterprise data to arrive to more accurate analysis that can lead to more confident decision making and greater operational efficiencies, cost reduction, greater revenue, and reduced risks.
Prerequisites: MGMT 221 and RSCH 202.

MGMT 436 Strategic Management 3 Credits (3,0)
Strategic management principles involving strategy, formulation, implementation, evaluation, and organization analysis are studied in this management capstone course. Case analysis and the use of strategic management principles are used to examine and solve organizational problems.
Prerequisites: HUMN 330 ECON 210 ECON 211 STAT 211 or STAT 222 MGMT 201 MGMT 221 MGMT 311 MGMT 312 MGMT 314 MGMT 332 MGMT 371 MGMT 390 and RSCH 202.

MGMT 440 Advanced Professional Logistics 3 Credits (3,0)
In the advanced professional logistics course, a heavy emphasis is placed on the analysis of the Systems Engineering, Integrated Logistics Support and other previously learned business logistics theories and concepts so as to determine their appropriate application. A secondary emphasis is placed on the horizontal integration of these theories and concepts in a practical framework, which will serve as professional guidance for the business logistics manager. Prerequisites: listed courses or the equivalent of each of these courses.
Prerequisites: MGMT 411 and RSCH 202.

MGMT 441 Introduction to Management Science 3 Credits (3,0)
The study of management science encompasses the logical approach to solving optimal decision-making managerial problems by developing mathematical models. The course explores concise examples of how to solve these models as they apply in the industry. Topics to be covered include linear programming, sensitivity analysis, transportation and assignment models, inventory models, critical path method, program review and evaluation technique analysis, decision and queuing theory.
Prerequisites: RSCH 202.

MGMT 444 Principles of Supply Chain Management 3 Credits (3,0)
Supply Chain Management is one of the hottest topics in business today. The focus of this course is on understanding the history, principles, and major elements of supply chain management. Specific topics include sourcing and purchasing management; managing supplier relationships; demand forecasting; inventory management; quality management; domestic and international transportation; customer relationship management; enterprise resource planning systems; facility location decision-making; performance management; and future challenges facing supply chain managers.
Prerequisites: RSCH 202.

MGMT 449 Strategic Marketing Management 3 Credits (3,0)
This is a capstone marketing course that focuses on strategic analysis and planning by aviation marketing managers. Emphasis will be given to corporate and marketing strategy, market analysis, and targeting, strategic marketing programming, and market control.
Prerequisites: RSCH 202.

MGMT 452 Construction Estimating & Bidding 3 Credits (3,0)
This course will develop the student's ability to perform material, labor, subcontract and equipment take-off quantities from construction drawings and specifications. Students are required to perform quantity takeoffs of materials, labor, equipment and subcontracts using a standard set of plans and specifications. Both manual and electronic take-off procedures are covered, beginning with a residential structure.
Prerequisites: RSCH 202.

MGMT 453 Construction Scheduling & Control 3 Credits (3,0)
This course provides students with a thorough understanding of project planning and scheduling principles utilized in facilities and construction management. It introduces various planning and control techniques in an integrated planning and control system. It helps students develop an understanding of time, cost, and resource management principles as well as ethics issues involved. The course also provides an overview of advanced project planning concepts.
Prerequisites: RSCH 202.

MGMT 454 Facilities Mechanical and Electrical Systems 3 Credits (3,0)
This course is an introduction to the basics of Mechanical, Electrical, Plumbing and Fire Protection systems (MEP). This includes the installation of these systems in buildings, resources for estimating and basic plan reading of the components of MEP systems in construction documents.
Prerequisites: RSCH 202.

MGMT 455 Construction Systems 3 Credits (3,0)
This course provides an introductory overview of the various materials used in construction. After receiving an introduction into fundamental principles of structural, physical and long-term performance, students learn about material and product manufacturing techniques and how they relate to mechanical and non-mechanical properties of the various materials. Common construction methods are introduced and building details are explored.
Prerequisites: RSCH 202.

MGMT 456 Economics for Facilities & Construction Managers 3 Credits (3,0)
This course is a study of economics as applied to construction and facilities management decision making emphasizing evaluation of the costs and benefits associated with technical projects. The time value of money and methods of discounted cash flow are studied to facilitate financial decisions regarding cash as capital.
Prerequisites: RSCH 202.

MGMT 457 Facilities & Construction Safety Systems 3 Credits (3,0)
This course is an introduction to the Occupational Safety and Health Administration (OSHA) regulations pertinent to general industry and construction.
Prerequisites: RSCH 202.

MGMT 458 Building Information Modeling (BIM) 3 Credits (3,0)
This course is a study of REVIT Architecture and is designed to quickly engage the student with hands-on exercises. This instructional material assumes some architectural and building understanding; a working knowledge of Microsoft Windows 7, Microsoft Windows Vista, Microsoft Windows XP, or Microsoft Windows 2000; and a basic knowledge and ability to load REVIT Architecture on a computer with at least 3 gig of RAM.
Prerequisites: RSCH 202.

MGMT 459 Special Topics in Facilities and Construction Management 3 Credits (3,0)
The objective of this course is for students to demonstrate the knowledge learned throughout the concentration of Facilities and Construction Management coursework. The theories learned will be applied to real work and project issues. Students will develop cost, time, safety and quality plans for a project. This course will also cover the topics and requirements to prepare and present a Project Manual for use in preplanning and control of projects.
Prerequisites: MGMT 391 and MGMT 452 and MGMT 453 and MGMT 454.

MGMT 460 Sustainable Facility Design and Construction 3 Credits (3,0)
Introduction to sustainable construction and design. Green building economics, rating systems; design process; site, landscape and low-energy strategies; built environment hydrologic cycle and carbon footprint; material loops; indoor air quality; construction operations and commissioning.
Prerequisites: RSCH 202.

MGMT 461 Global Project Management 3 Credits (3,0)
This course is designed to assist learners gain an understanding of the increasingly challenging task of working within global corporations and with distant and diverse work teams. The course describes how project managers can help organization and your projects adapt to thrive in this Global Project Management environment. The learner is introduced to collaborative tools, best practices on cross-cultural team management and global communication, and recommended organizational changes and project structures for the global environment.
Prerequisites: MGMT 391 and RSCH 202.

MGMT 462 Project Management Advanced Concepts 3 Credits (3,0)
This course is designed to assist learners gain an understanding of a wide range of topics that relate to project management. Knowledge of these topics is essential to successful project management. Some of these topics include human factors, technical factors, and organizational factors.
Prerequisites: MGMT 391 and RSCH 202.

MGMT 482 Human Resources Training and Development 3 Credits (3,0)
This course introduces the student to the roles of training and development in the growth and success of organizations. Students will learn about current developments in training, research, and in practice, including the strategic role of training and the use of new technologies in training. The use of the ADDIE model, a systematic instructional design model, will provide a framework for effective training including (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. Course material will delve into such specifics as needs assessment, learning and transfer design, employee development and career management.
Prerequisites: RSCH 202.

MGMT 483 Compensation and Benefits 3 Credits (3,0)
This course introduces the student to the theoretical and practical bases of compensation and benefits. Importance will be placed on strategic role; in other words, how pay decisions help the organization achieve a competitive advantage and its goals. This course includes a systematic review and analysis of organizational reward systems. Total compensation systems include the environment as well as the impact of intrinsic rewards on employee motivation. Job analysis and performance appraisal will also be given emphasis.
Prerequisites: RSCH 202.

MGMT 492 Information Systems Project Management 3 Credits (3,0)
Although project management has been an established field for many years, managing information technology requires ideas and information that go beyond standard project management. By weaving together theory and practice, this course presents an understandable, integrated view of the many concepts skills, tools, and techniques involved in project management. Because the project management field and the technology industry change rapidly, this text provides up-to-date information on how good project management and effective use of software can help you manage projects, especially information technology projects. In this course, students apply all nine project management knowledge areas: project integration, scope, time, cost, quality, human resource, communications, risk, and procurement management; all five process groups: initiating, planning, executing, monitoring and controlling; and closing to information technology projects.
Prerequisites: MGMT 391 and RSCH 202.

MGMT 494 Aviation Information Systems 3 Credits (3,0)
This course will focus on a variety of information technology systems that are in use and their impact on successful operations within the aviation industry. An overview of current and emerging technologies in reservation systems, aircraft productivity modeling, air traffic control systems and various database, data communication and e-commerce systems will be explored.
Prerequisites: MGMT 221 and RSCH 202.

MGMT 495 Staffing and Workforce Planning 3 Credits (3,0)
This course is designed to provide an overview of the strategic planning processes by which organizations staff positions with both internal and external applicants. The course's concentration will focus on the identifying and utilizing of forecasting tools involving personnel needs, recruitment strategies, and various applicant screening and interviewing techniques. Discussion topics will also include key legal compliance issues, HRM planning, job/competency analysis, engaging in an active diverse staffing pool, and the retention of personnel.

MGMT 499 Special Topics in Management 1-4 Credit (1-4,0)
These are individual independent or directed studies of selected topics in management. Prerequisite: Consent of instructor and approval of the department chair.
Prerequisites: RSCH 202.

Mathematics (MATH)

Review the ERAU Worldwide Mathematics placement policy under the Skills Assessments (p. 31) *section of the Worldwide Catalog.*

Courses

MATH 106 Basic Algebra & Trigonometry 3 Credits (3,0)
The course includes a study of the basic laws of numbers, fractions, exponents, complex numbers, and radicals, as well as an understanding of a variety of expressions and equations including; equalities, inequalities, polynomials, and quadratics. The elements of trigonometry will also be reviewed. Prerequisite: Qualifying score on the ERAU Mathematics Skills Assessment or course listed.
Prerequisites: GNED 103.

MATH 111 Pre-calculus for Aviation 3 Credits (3,0)
This is a pre-calculus course designed for the student aviation. Topics include a review of the fundamentals of algebra; linear equations and inequalities, quadratic equations; variation; polynomial, rational, exponential, logarithmic and trigonometric functions; radian measures; right triangle solutions, vectors and the laws of sines and cosines. Prerequisite: Qualifying score on the ERAU Mathematics Skills Assessment or course listed.
Prerequisites: MATH 106.

MATH 112 Applied Calculus for Aviation 3 Credits (3,0)
This course presents basic calculus, designed for the student of aviation. Topics include differentiation and integration of algebraic functions; applications to velocity, acceleration, area, curve sketching, and computation of extreme values.
Prerequisites: MATH 111 or MATH 140 or qualifying score on the mathematics skills assessment.

MATH 140 College Algebra 3 Credits (3,0)
This course focuses on fundamentals of exponents, radicals, linear and quadratic equations, inequalities, functions, graphing techniques, and complex numbers. It includes an introduction to function, curve sketching, elementary theory of equations, sequences and series, matrix algebra and systems of equations, linear, polynomial, logarithmic, exponential, inverse and composite functions, variation, and systems of equations. Prerequisite: Qualifying score on the ERAU Mathematics Skills Assessment or course listed.
Prerequisites: MATH 106.

MATH 142 Trigonometry 3 Credits (3,0)
Students will be introduced to trigonometric functions and their graphs; identities; radian measure with applications; compound, half and double angle identities; solving elementary trigonometric equations, right and oblique triangles, law of sines and cosines; inverse trigonometric functions; vectors and trigonometric form of a complex number.
Prerequisites: MATH 111 or MATH 140 or qualifying score on the mathematics skills assessment.

MATH 143 Precalculus Essentials 3 Credits (3,0)
This is a precalculus course with an emphasis on functions and their graphs, including polynomial, rational, exponential, logarithmic, and trigonometric; radian measure; trigonometric identities and equations; vectors, parametric and polar curves; sequences and series; binomial theorem. NOTE: This course is open only to Engineering degree students.
Prerequisites: MATH 106 or MATH 111 or MATH 140 or qualifying score on the mathematics skills assessment.

MATH 241 Calculus and Analytical Geometry I 4 Credits (4,0)
This course is a study of graphs and functions; limits and continuity; differentiation and integration of algebraic and elementary trigonometric functions; applications of first and second derivatives.
Prerequisites: MATH 142 or MATH 143 or qualifying score on the mathematics skills assesment.

MATH 242 Calculus and Analytical Geometry II 4 Credits (4,0)
This course is a study of differentiation and integration of transcendental functions; special integration techniques; polar coordinates; applications of the definite integral; numerical methods.
Prerequisites: MATH 241.

MATH 243 Calculus and Analytical Geometry III 4 Credits (4,0)
This course is a study of solid analytic geometry; vector functions in three dimensions; elements of infinite series; partial differentiation; directional derivative and gradient; multiple integrals.
Prerequisites: MATH 242.

MATH 345 Differential Equations and Matrix Methods 4 Credits (4,0)
This course is a study of the treatment of ordinary differential equations to include principle types of first and second order equations; methods of substitution on simple higher order equations; linear equations and systems of linear equations with constant coefficients; methods of undetermined coefficients and variation of parameters; Laplace transforms; series solutions; linear algebra and matrix methods of solutions; applications to physics and engineering.
Prerequisites: MATH 243.

Mechanical Engineering (MECH)

Courses

MECH 302 Introduction to Robotics 3 Credits (3,0)
This course is an introduction to robotics with emphasis on the mathematical tools for kinematics and dynamics of robot arms. Topics include the geometry and mathematical representation of rigid body motion; forward and inverse kinematics of articulated mechanical arms; trajectory generation, splines, interpolation; manipulator dynamics; position sensing and actuation; and an introduction to topics in manipulator control and computer vision.
Prerequisites: ENGL 221 and ESCI 204 and ELEC 230 and ELEC 231 and CESC 220 and CESC 222 **Corequisites:** MECH 303.

MECH 303 Robotics Laboratory 1 Credit (0,1)
This course is lab part of the introduction to robotics with emphasis on hands-on experience of embedded microcontroller unit and emulation of serial robotic systems. Topics include the programming skills of microcontroller unit used for robotic systems; coding MCU for sensors and actuators; forward and inverse kinematics of articulated mechanical arms; and trajectory generation and interpolation.

MECH 313 Instrumentation and Data Acquisition 2 Credits (2,0)
This course will be a combination of theoretical and applied topics related to instrumentation, data acquisition, and hardware interfacing with mechatronic systems. This course covers aspects related to interfacing sensors and actuators with computers including sampling rates; sources of error and time delay; analog and digital signal conditioning circuits; and the influence of EMI, grounding, and noise in the power supply. Students will be exposed to data acquisition and control software (e.g., LabVIEW).
Prerequisites: ELEC 230 and ELEC 231 and CESC 220 and CESC 222 **Corequisites:** MECH 314.

MECH 314 Instrumentation and Data Acquisition Laboratory 1 Credit (0,1)
This course is the lab companion for MECH 313, and aims to provide hands-on experience emphasizing measurement and instrumentation concepts, sensor operations, and computer-based data acquisition and analysis. Specifically, students will build data acquisition system based on LabVIEW and myDAQ to collect and analyze data from commonly used sensors for measuring temperature, pressure, and displacement, etc.
Prerequisites: ELEC 230 and ELEC 231 and CESC 220 and CESC 222 **Corequisites:** MECH 313.

MECH 404 Mechatronics 3 Credits (3,0)
This course includes the application of microprocessors to robotic systems with control. This course emphasizes the integration of aerospace, mechanical, electrical, and computer systems in robotics. Design and integration of microcontrollers, actuators, motors, power systems, and sensors are studied with significant group-oriented design experiments. High-level graphical programming is introduced. Simple autonomous algorithms such as line tracking, edge detection, and path planning are examined with and without feedback control.
Prerequisites: ESCI 204 and ELEC 230 and ELEC 231 and CESC 220 and CESC 222 **Corequisites:** MECH 404L.

MECH 404L Mechatronics Laboratory 1 Credit (0,1)
This laboratory course implements real-time systems to control aerospace and robotic systems, with an emphasis on microcontrollers and embedded hardware with a Real Time Operating System (RTOS). Topics follow ME 404 lectures on actuators, motor controllers, sensors, filters and their implementation.
Corequisites: MECH 404.

Meteorology (WEAX)

Courses

WEAX 201 Meteorology I 3 Credits (3,0)
This is a survey course in meteorology that includes applications to flight. Included is a systematic development of the following topics: the composition and general structure of the atmosphere, energy and energy transfer, seasonal and daily controls on temperature, pressure, wind, local and regional circulations, atmospheric stability, vertical motion, turbulence, moisture, fog, clouds, precipitation, icing, the general circulation pattern, climate, jet streams, air masses, fronts, mid-latitude cyclones, tropical cyclones, thunderstorms, and weather observations and charts.

Physical Science (PHYS)

Courses

PHYS 102 Explorations in Physics 3 Credits (3,0)
Survey course in elementary physics. Stress will be placed on basic concepts, principles and history of the development of physics. Presentation will include selected topics in mechanics, heat, light, sound, electricity and magnetism, and modern physics.
Prerequisites: MATH 106 or MATH 111 or MATH 140 or MATH 142 or MATH 143 or MATH 241.

PHYS 123 Science of Flight 3 Credits (3,0)
This introductory course explores the science of flight from an interdisciplinary perspective, covering basic aerodynamics and aircraft performance, weather and aviation, fuels and propulsion, metals and composites, hydraulics, altitude physiology and environmental impacts of aviation.

PHYS 142 Introduction to Environmental Science 3 Credits (3,0)
This introductory course stresses the interrelations of all aspects of the living and the nonliving world. It introduces the student to key concepts and principles that govern how nature works and the application of these concepts and principles to possible solutions to environmental and resource problems.

PHYS 150 Physics I for Engineers 3 Credits (3,0)
This course explores vectors and scalar quantities, kinematics, Newton's Law of Motion, work, work-energy, conversion of energy, conversion of momentum, center of mass and its motion, torque, equilibrium and orbital motion.
Prerequisites: MATH 241.

PHYS 160 Physics II for Engineers 3 Credits (3,0)
This is a calculus-based study of the fundamental principles of classical mechanics and topics include, rotational motion, simple harmonic motion, waves, fluid, heat, kinetic energy, and thermodynamics.
Prerequisites: PHYS 150 **Corequisites:** MATH 242.

PHYS 199 Special Topics in Physical Sci 1-4 Credit (1-4,0)
These are individual independent or directed studies of topics in the fields of the physical sciences impinging on aerospace development or practices, and which are of current or anticipated interest. Prerequisite: Consent of instructor and approval of the department chair.

PHYS 250 Physics III for Engineers 3 Credits (3,0)
This course is a calculus-based study of the fundamental principles of classical mechanics. It is the third course of a three-semester sequence, intended for students of science and engineering and is designed to provide the student with an appropriate background for more advanced physics and engineering course work. Topics of discussion include; electric forces, electric field, Gauss's law, Ohm's law Ampere's law, Faraday's law, Lenz's law, Kirchhoff's law and Maxwell's equations; electric potential and electrostatic potential energy; capacitance; simple DC circuit theory; magnetic force, magnetic field; inductance; electromagnetic oscillations and wave propagation; Linear accelerators, cyclotrons.
Prerequisites: PHYS 160 and MATH 242 **Corequisites:** PHYS 253.

PHYS 253 Physics Laboratory for Engineers 1 Credit (0,1)
One three hour laboratory session per week, with experiments complementing the material of PHYS 250. Primarily lab report writing workshop, error analysis, damped harmonic oscillations, spectrometers, optics, atomic physics, thermodynamics and circuit theory.
Corequisites: PHYS 250.

PHYS 299 Special Topics in Physics 1-4 Credit (1-4,0)
These are individual independent or directed studies of topics in the fields of the physical sciences impinging on aerospace development or practices, and which are of current or anticipated interest. Prerequisite: Consent of instructor and approval of the department chair.

PHYS 301 Astronomy 3 Credits (3,0)
This descriptive course deals with the structure and evolution of the physical universe. Topics include the solar system (Earth, moon, sun, and planets), stars, black holes, galaxies, quasars, cosmology, and exobiology. Planetarium trips and night observing sessions are optional.
Prerequisites: RSCH 202.

PHYS 304 Environmental Science 3 Credits (3,0)
This course explores interrelationships between humans and the environment and impacts of human activities on the environment. Scientific, economic, societal, and technological principles will be applied to the management of pollution of Earth's resources, including land and soil resources, water resources, and energy resources.
Prerequisites: RSCH 202.

PHYS 359 Self-Directed Exploration of Environmental Science 3 Credits (3,0)
This is an individual independent study of topics in the fields of the physical sciences impinging on environmental science, and which are of current or anticipated interest. Prerequisites include the consent of the instructor and the approval of the department chair.

PHYS 399 Special Topic Physical Sciences 3 Credits (3,0)
These are individual independent studies of topics in the fields of the physical sciences impinging on environmental science, and which are of current or anticipated interest. Prerequisites include the consent of the instructor and the approval of the department chair.

PHYS 499 Special Topic Physical Science 1-4 Credit (1-4,0)
These are individual independent or directed studies of topics in the fields of the physical sciences impinging on aerospace development or practices, and which are of current or anticipated interest. Prerequisite: Consent of instructor and approval of the department chair.

Research (RSCH)

Courses

RSCH 10 Research Preparation 0 Credits (0,0)
This performance-oriented course is designed to increase student success in college by introducing and actively engaging students in the research process. Topics include: understanding research, sourcing, using a library, choosing a research topic, gathering and organizing information, analyzing a thesis and outline, and determining how to cite and reference sources. This course is for zero credit hours, cannot be used to satisfy credit requirements for ERAU degrees, and may be repeated.

RSCH 202 Introduction to Research Methods 3 Credits (3,0)
This course is a general introduction to research intended to equip first and second year undergraduate students with the skills needed in their studies. Topics covered include the purposes of research, defining research and research problems, defining a hypothesis, problem solving and knowledge discovery, methods of quantitative and qualitative research, conducting literature reviews, designing appropriate methodologies, evaluating outcomes, analysis and communicating the results.
Prerequisites: ENGL 123 or ENGL 221 and STAT 211 or STAT 222.

Safety Management (BSSM)

Courses

BSSM 410 Safety and Health Regulations for Construction 3 Credits (3,0)
The primary focus of this course is to introduce the general aspects of construction standards, and to provide an understanding of safety legal requirements, specifically: Occupational Safety and Health (OSH) controls, safety and health provisions, noise, personal protective and lifesaving equipment, fire protection and prevention, electrical, and other related topics. This course is focused on the Occupational Safety and Health Administration's (OSHA) construction standards and OSHA requirements at construction sites, as well as developing jobsite safety and health programs. Additionally, the course emphasizes safety training and reporting.
Prerequisites: RSCH 202.

BSSM 490 Safety Management Capstone Course 3 Credits (3,0)
The Safety Management Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project associated with a problem in the Safety Management area that provides evidence of experience in Safety Management studies. Students will work with designated faculty members to formulate, develop, and complete the safety management project. The completion of the Capstone Course is designed to document evidence that Program Outcomes are understood and provides the student evidence of knowledge to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the degree program.
Prerequisites: RSCH 202.

Safety (SFTY)

Courses

SFTY 201 Introduction to Health, Occupational, and Transportation Safety 3 Credits (3,0)
This course introduces the student to the basic health and safety concepts associated with industry and transportation. Included are a comprehensive health and safety overview, a historical study of the legislative development and enactment of appropriate statutes, regulations and laws, the definition of safety terms, and a discussion of the ethics and professionalism required by the health and safety profession. This course also provides an introduction to the hazard recognition and reporting, evaluation, and control concepts used in risk management, accident investigation, ergonomics, and accident prevention.

SFTY 205 Principles of Accident Investigation 3 Credits (3,0)
This course is an introduction to the process required for the investigation of accidents. Topics will include different methods of accident investigation, such as root cause analysis and Management Oversight Risk Tree (MORT), among others. Further topics will include filing appropriate accident reports and applications of corrective actions.

SFTY 210 Introduction to Aerospace Safety 3 Credits (3,0)
This course provides an introduction and overview of the theories, concepts, applications and practices of the field of aerospace safety. This course is designed for the beginning aviation safety student and covers topics such as human factors, mechanical factors, accident investigation, safety programs and safety statistics.

SFTY 299 Special Topics in Safety 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in safety. Prerequisites: Consent of instructor, approval of department and program chairs, and 12 hours of SFTY courses.

SFTY 311 Fundamentals of Occupational Safety and Health 3 Credits (3,0)
The student will be provided an introduction and overview of the Occupational Safety and Health (OSH) Act and how provisions of the Act are implemented in the workplace. The course is designed for the beginning safety student and is a prerequisite for most of the higher-level safety courses. Material presented covers the rights and responsibilities under the OSH Act, the appeals process, recordkeeping, and voluntary protection programs. The course also includes an introduction to OSHA's general industry standards and an overview of the requirements of the more frequently referenced standards.
Prerequisites: RSCH 202.

SFTY 315 Environmental Compliance and Safety 3 Credits (3,0)
This course examines matters associated with health and safety relating to the environment including air, water quality and sanitation. Areas of concentration include hazardous materials, their storage, handling, and transportation. Additional study includes waste management and cleanup as well as a detailed study of environmental laws, regulations, and protection of workers involved in activities associated with hazardous material activities.
Prerequisites: RSCH 202.

SFTY 320 Human Factors in Aviation Safety 3 Credits (3,0)
This course focuses on the major causative agent in aircraft accidents: the human being. Emphasis is placed on psychological and physiological factors that enhance the accident probability. Included is a detailed analysis of ergonomics (human engineering) and its influence in aviation design.
Prerequisites: RSCH 202.

SFTY 321 Ergonomics 3 Credits (3,0)
The concepts and physiological aspects of ergonomics will be examined in this course. Material presented covers anthropometric principles in workspace and equipment design, workspace design, human-machine systems, analysis and design of displays and controls, and environmental factors affecting work environment.
Prerequisites: RSCH 202.

SFTY 326 System Safety 3 Credits (3,0)
This course will emphasize the specialized integration of safety skills and resources into all phases of a systems life cycle. Topics will include qualitative and quantitative tools and techniques for system analysis and design applied to accident analysis, prevention, and mitigation.
Prerequisites: RSCH 202.

SFTY 330 Aircraft Accident Investigation 3 Credits (3,0)
This course is a detailed evaluation of methods and procedures involved in aircraft accident investigation. The organization, duties and procedures of an aircraft board are analyzed. The student explores procedures for determining accident causes through analysis of such elements as the function and techniques employed by the trained accident investigator and the role of the specialized laboratory. Analysis is also made of reporting procedures and the all-important follow-up work designed to avoid similar or related aircraft accidents.
Prerequisites: RSCH 202.

SFTY 335 Mechanical and Structural Factors in Aviation Safety 3 Credits (3,0)
This course examines the influence that design, manufacturing, metallurgy, and maintenance have on aircraft accidents. A detailed analysis of the failure process will be conducted. Additional topics of discussion include: stress and design loading, fatigue, corrosion, and the envelope of operation.
Prerequisites: RSCH 202.

SFTY 341 Occupational Safety and Health Program Management 3 Credits (3,0)
Students will learn about the principles of the development and management of materials, techniques, and procedures used in the implementation of occupational safety and health programs and their application in a variety of occupational settings. Examined will be the management techniques, governmental regulations, and safety and health programs developed for industry. The course will focus on the history of the safety and health movement; government regulations; safety and health program organization; hazard information and analysis process; and implementation of an occupational safety and health program.
Prerequisites: RSCH 202.

SFTY 345 Aviation Safety Program Management 3 Credits (3,0)
This course is a study of the principles of the development and management of an effective safety program. The philosophy and historical development of major concepts are examined with particular emphasis on areas of special concern in organizational accident prevention. Students analyze the influence of morale, education and training, the role of the supervisor, and other substantial program elements of value to the safety manager.
Prerequisites: RSCH 202.

SFTY 350 Aircraft Crash and Emergency Management 3 Credits (3,0)
Theory, practices and techniques utilized in the response phase of aircraft crashes and emergencies are examined. This course is designed as a "real world" introduction to the field of emergency response at the CFR agency level, the airport response and administration levels and the related and associated entities involved in aircraft mishaps.
Prerequisites: RSCH 202.

SFTY 355 Industrial Hygiene and Toxicology 3 Credits (3,0)
This course focuses on the evaluation of principles associated with industrial hygiene. Topics include recognition, evaluation and control of hazards related to noise, vibration, ionizing and non-ionizing radiation, thermal conditions, pressure, chemicals, airborne contaminants, and biological substances. These subjects will be discussed in relation to all regulatory requirements, using both engineering and non-engineering controls for reducing or eliminating health hazards in the workplace.
Prerequisites: PHYS 102 or PHYS 160 and SFTY 311 and RSCH 202.

SFTY 360 Construction Safety 3 Credits (3,0)
The student is provided with an opportunity for an in-depth study of construction safety and the importance of safety and health in the construction industry. The Code of Federal Regulations (29 CFR 1926) governing the construction industry will be examined. The focus is the management and application of the regulations in the workplace, typically through safety inspections, job safety planning, organizing and conducting health and safety training, investigating and maintaining records of construction accidents, incidents, and injuries and illnesses.
Prerequisites: RSCH 202.

SFTY 365 Fire Protection 3 Credits (3,0)
This course introduces the basics of fire and fire protection. Students will study the physics, chemistry, characteristics and behavior of fire, fire hazards of material, fire suppression systems, extinguishing agents, and detection and alarm systems. Primary emphasis will be on transportation related fire hazards and the regulatory requirements associated with air, rail, marine, and highway modes of transportation.
Prerequisites: PHYS 102 and SFTY 311 and RSCH 202.

SFTY 375 Propulsion Plant Investigation 3 Credits (3,0)
A technical course in aircraft reciprocating and turbine engine fundamentals and relevant accident investigative procedures. Areas of study include basic construction and design with emphasis on major sections, components, and their mechanical relationships. Power plant systems and system mishap investigation is also covered and includes fuel, lubrication, ignition, and start systems. A study of propeller basics and investigative techniques is also included. On site field investigation as well as engine teardown/disassembly procedures are presented.
Prerequisites: RSCH 202.

SFTY 399 Special Topics in Safety 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in safety. Prerequisites: Consent of instructor, approval of department and program chairs, and 12 hours of SFTY courses.

SFTY 409 Aviation Safety 3 Credits (3,0)
This course covers all facets for an aviation safety program including both flying safety and safety of ground operations. Major problem areas in aviation safety, safety program evaluation, and impact of accidents on industry are covered. Focus is on human factors, basic accident prevention programs, and the roles of various government and industry organizations have in preventing accidents.
Prerequisites: RSCH 202.

SFTY 410 Design of Engineering Hazard Controls 3 Credits (3,0)
This course addresses the application of scientific and engineering principles and methods to achieve optimum safety and health through the analysis and design of processes, equipment, products, facilities, operations and environments. Subjects will include; product design, plant layout, construction maintenance, pressure vessels and transportation vehicles and systems. These subjects will be discussed in relation to all regulatory requirements.
Prerequisites: PHYS 102 and SFTY 311 and RSCH 202.

SFTY 415 Human Reliability and Safety Analysis 3 Credits (3,0)
This course will emphasize an understanding of probability and human reliability as an important technique in safety analysis. Topics will include qualitative and quantitative tools and techniques for human reliability analysis applied to accident analysis, prevention, and mitigation.
Prerequisites: RSCH 202.

SFTY 420 Systems Design for Fire & Life Safety 3 Credits (3,0)
This course centers on design principles involved in building construction standards and building codes to ensure maximum life and property safety from fires, explosions, and natural disaster. Egress design specifications, occupancy and construction classifications, and fire protection requirements for buildings will be covered.
Prerequisites: PHYS 102 and SFTY 311 and RSCH 202.

SFTY 421 Ergonomics II 3 Credits (3,0)
This course is an extension of SFTY 321 - Ergonomics. SFTY 421 will explore in greater depth human factors and its relationship to ergonomics in organizational and social environments, as well as the relationship between ergonomics and general workplace safety. In addition, the course will explore how human factors can improve occupational safety, and how one may predict and analyze hazards in order to design and engineer safer industrial workplaces.
Prerequisites: SFTY 321 and RSCH 202.

SFTY 435 Aircraft Crash Survival Analysis and Design 3 Credits (3,0)
This course provides an in-depth analysis of the accident environment, with particular emphasis on the protection of the occupants. The injury mechanisms and causes will be analyzed, as will the physics and kinematics of the impact sequence. The intent of the course is to familiarize the student with what can be done to minimize the effects of an accident.
Prerequisites: RSCH 202.

SFTY 440 System Safety Management 3 Credits (3,0)
This course reviews the development and implementation of the system safety discipline in technical industries, including aviation. "System Safety" entails specialized integration of skills and resources in all phases of the life cycle of a given system in furtherance of accident prevention. Its heritage is systems engineering and management theory but amplified to include modern safety practices derived from numerous disciplines. Students will acquire an understanding of how safety is designed into equipment, processes, and facilities under development, evaluated and enhanced during testing, and assured or otherwise controlled during operational use.
Prerequisites: RSCH 202.

SFTY 450 Loss Control & Insurance 3 Credits (3,0)
The principles of loss control, insurance, and financial risk management, as they apply to the SHE (Safety, Health, and Environmental) professional, are studied in this course. The basic concepts of financial risk management, legal principles, property and liability insurance, life and health insurance, employee benefits, social insurance, and functional and financial operations of insurers will be examined. Primary emphasis is placed on consumer considerations, coverage of personal risk management, and financial planning.
Prerequisites: RSCH 202.

SFTY 462 Health, Safety and Aviation Law 3 Credits (3,0)
This course introduces the student to the legal issues and concerns confronting the health and safety industry. Included is an overview of the historical legal precedence established for the aviation industry as well as a comprehensive examination of the laws, regulations and legislation that governs the actions and authority of the health and safety professional. This course also provides an introduction to the governing bodies and associations tasked with setting the legal standards by which the industry must operate, including the scope and level of their authority.
Prerequisites: RSCH 202.

SFTY 470 Advanced Occupational Safety and Health Technology 3 Credits (3,0)
This course is the culminating experience that derives from previous work in the occupational safety and health technology field. In this course, a heavy emphasis is placed on the analysis of previously learned occupational safety and health theories and concepts so as to determine their appropriate application. A secondary emphasis is placed on the horizontal integration of these theories and concepts in a practical framework, which will serve as professional guidance for the practicing Occupational Safety and Health Technologist. Students will draw on previous occupational safety and health studies, and develop and defend an in-depth analysis of an occupational safety and health issue in a program or business of their choice.
Prerequisites: SFTY 311 and SFTY 341 and SFTY 355 and RSCH 202.

SFTY 499 Special Topics in Safety 1-3 Credit (1-3,0)
These courses consist of individual independent or directed studies of selected topics in safety. Prerequisites: Consent of instructor, approval of department and program chairs, and 12 hours of SFTY courses.

Security Science (SCTY)

Security Science Courses

SCTY 310 Introduction to Security 3 Credits (3,0)
This course provides an overview of the historical development of the security profession and the role of security today as part of the criminal justice system, business and society. The current security disciplines such as contract security, private investigations, industrial security, aviation security, cultural property security, physical security and information security will be explored. Legal and ethical aspects of the security profession are explored along with a review of the development of an effective professional proprietary security.
Prerequisites: RSCH 202.

SCTY 312 Global Crime and Criminal Justice Systems 3 Credits (3,0)
In this course, students will be presented the current status and predicted trends in global crime and criminal justice systems. They will be given descriptions of the three types of terrorism: domestic (U.S.), international (group-directed), and state-sponsored. Concepts and theories will be applied in discussions on how to best combat the threat.
Prerequisites: RSCH 202.

SCTY 315 Studies in Intelligence I 3 Credits (3,0)
In this course, the student will be provided descriptions of the varied ways strategic intelligence is used by world leaders to shape policy and its effect on world events. Intelligence collection, analysis, and dissemination and counterintelligence will be among the issues examined and discussed. Prerequisites: one psychology course and one government/history course, or permission of the instructor.
Prerequisites: RSCH 202.

SCTY 385 Intelligence Collection and Analysis 3 Credits (3,0)
In this course, the student will be given the opportunity to gain practical experience in the intelligence functions of analysis, writing, and briefing. The student will be expected to demonstrate an "intelligence-oriented mind" and ability to work under time pressure. The student will become familiar with analytical methodologies and writing styles that make complex world events explicable to military decision makers and senior policy makers.
Prerequisites: RSCH 202.

SCTY 400 Airport Security 3 Credits (3,0)
This course will cover specific facets of aviation- related security to include physical and procedural controls, regulations of the Department of Homeland Security, the Transportation Security Administration, the Federal Aviation Administration and ICAO, as well as international treaties. The course will also discuss the current threat, counter terrorism measures, new technologies in the field and the importance of the aviation industry, both passenger and cargo to the global economy.
Prerequisites: RSCH 202.

SCTY 410 Physical Security 3 Credits (3,0)
This course is designed to provide a comprehensive review the methods utilized to conduct an effective physical security risk analyst. Building on the results of the risk analyst the five line of defense, property line, areas security, outer shell of structures, and interior of structures, are examined in detail. The deployment of intrusion detection systems, fire protections systems, access control, barriers, security lighting and use of security cameras are discussed.
Prerequisites: RSCH 202.

SCTY 415 Studies in Intelligence II 3 Credits (3,0)
The course is a simulation of intelligence officers' activities. The student will function as an intelligence desk officer for either a government, global corporation, terrorist group, global criminal organization, or multilateral political organization. Using the simulation, the student will study and practice many components of tactical and strategic intelligence. Some components included will be intelligence collection, evaluation, analysis, production, and dissemination; intelligence oversight; covert and clandestine operations; intelligence bureaucracies; espionage; ethical and moral issues in intelligence; and counterintelligence. The course emphasizes functional interactions.
Prerequisites: RSCH 202.

SCTY 420 General Aviation Security 3 Credits (3,0)
The focus of this course is to identify what general aviation is and to explore the security and terrorism threats to the general aviation community. Methods of protection of general aviation airports, aircraft, fixed-base operations, hangers and flight schools will be addressed. The establishment of the Aircraft Owners and Pilots Association Airport Watch is examined. The use of physical security measures and the establishment of a security force operations will be addressed.
Prerequisites: RSCH 202.

SCTY 430 Counterterrorism for Aviation 3 Credits (3,0)
This course will focus on the specific threats to the aviation community from terrorism. An historical overview of aviation terrorism is explored along with terrorist groups and tactics used against the aviation profession, Specific methods of protection to the aviation profession is investigated to include the use of the Transportation security Administration, Airport Security Coordinators, airport law enforcement, personnel screening, access control and physical at airports and on commercial aircraft.
Prerequisites: RSCH 202.

SCTY 485 Corporate Security 3 Credits (3,0)
The student will be exposed to issues in the field of private/corporate security. Private security firms work with public law enforcement strengthening the overall security posture of firms, schools, etc. Beginning with a discussion of the differences between public and private police, students will analyze security needs of business and private establishments, in detail, and the threats that might emanate from tapped phones, bugged offices, stolen papers, covert recording, undercover employees, phony repair people, fax intercepts, etc. The substance of the course will include practical and theoretical elements affecting the field.
Prerequisites: RSCH 202.

SCTY 488 National Security Issues and Terrorism 3 Credits (3,0)
Although terrorism has been a known phenomenon for centuries, it has become the most frequent form of conflict in the late 20th century. Success in preventing nuclear warfare and in curbing the outbreak of most conventional war has resulted in more forms of low intensity violence, a significant feature of which is overt terrorism. Ideological hardening, ethnic militancy, and religious revivalism have fueled terrorist ambitions. Broadly speaking, there are three types of terrorism, classified on the basis of actors. The course will address all three types: domestic US, international or group directed, and state sponsored.
Prerequisites: RSCH 202.

SCTY 490 Aviation Security Capstone Course 3 Credits (3,0)
The Aviation Security Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project associated with a problem in the aerospace industry that provides significant evidence of experience in aviation and aeronautical studies. Students will work with designated faculty members to formulate, develop, and complete the aviation security project. The completion of the Capstone Course is designed to document evidence that Program Outcomes are understood and provides the student evidence of knowledge to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the degree program.
Prerequisites: RSCH 202.

Social Sciences (PSYC)

Courses

PSYC 220 Introduction to Psychology 3 Credits (3,0)
This course will introduce the student to the field of psychology, and is a survey of the bio-psychosocial continuum and the intra-psychic, interpersonal, and organizational factors affecting human behavior. A primary feature of the course is its focus on the scientific method as the route to psychological knowledge. Students examine the rationalist, empiricist and experimental foundations of the scientific method and how these foundations can be critiqued. Topics include sensation, perception, learning, motivation, emotion, memory, personality, psychopathology, physiological psychology and social processes. Emphasis is placed on the application of the basic principles of psychology to engineering, aviation, public policy and business.

PSYC 320 Aviation Psychology 3 Credits (3,0)
A study of the complexities of human factors research in aviation. Drawing extensively on such diverse areas as human physiology, basic learning theory, aviation safety, and pilot training. The course surveys the study of human behavior as it relates to the aviator's adaptation to the flight environment.
Prerequisites: RSCH 202.

PSYC 350 Social Psychology 3 Credits (3,0)
This course is intended to provide students with an introduction to the interactional forces between groups and the individual in society. Topics include the following: introduction to social psychology, group influence, the self in a social world, prejudice-disliking others, social beliefs and judgments, attraction and intimacy, genes, culture and gender, altruism-helping others, conformity, and persuasion.

PSYC 400 Introduction to Cognitive Science 3 Credits (3,0)
This course is an introduction to the science of the mind from the perspective of cognitive psychology, this course is a study of linguistics, neuroscience, philosophy, and artificial intelligence. The focus is on the similarities and differences in the approaches taken by researchers in their study of cognitive mechanisms in these different fields. Issues to be addressed include: What does it mean to be able to think? What kind of computational architecture(s) is most appropriate to describe cognitive mechanisms? Is the mind an emergent property of the brain? What kind of hardware is required for thinking to occur? Can a computer have a mind?

Sociology (SOCI)

(Social Sciences)

Courses

SOCI 210 Introduction to Sociology 3 Credits (3,0)
Students are provided an integrated survey of the fundamental concepts of culture, forms of collective behavior, community and social organization, social interaction, and social change. The social effects of aviation and the impact of science on the social order living in an air age will also be investigated.

SOCI 299 Special Topics/Social Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in the areas of history, sociology, psychology, and human culture in general. Prerequisite: Consent of instructor and approval of the department chair.

SOCI 300 Marriage & Family 3 Credits (3,0)
This course analyzes the sociological, physical, psychological, legal and economic aspects of the American family. Demographic trends and interpersonal behavior in family and marriage are discussed, including childbearing and divorce, theories of mate selection, preparation for marriage, marital interaction, sexuality, parenthood and marital adjustment. Contemporary controversial issues, such as the relationship of unmarried couples, alternative marriage forms, abortion, and violence are also addressed as they relate to the family.

SOCI 310 Personality Development 3 Credits (3,0)
This course is a survey of selected theories of human nature and functioning from the beginnings of modern Psychology to present developments, including psychodynamic, cognitive, behavioral, biological, humanistic and other types. Various concepts of personality and the associated methodologies for gathering validating knowledge are explored. Theories are applied to normal issues in personal, professional and relational life, and theory-related skills are taught for self-awareness, problem-solving, habit change, and emotional and interpersonal competence.

SOCI 399 Special Topics/Social Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in the areas of history, sociology, psychology, and human culture in general. Prerequisite: Consent of instructor and approval of the department chair.

SOCI 499 Special Topics/Social Science 1-6 Credit (1-6,0)
These are individual independent or directed studies of selected topics in the areas of history, sociology, psychology, and human culture in general. Prerequisite: Consent of instructor and approval of the department chair.

Speech (SPCH)

Courses

SPCH 219 Speech 3 Credits (3,0)
This course is a continuation of the study of communication and communication theory, with an emphasis on overcoming communication apprehension, developing listening skills, mastering oral performance and writing about communication. Individual sections may focus on public speaking, group discussion, oral interpretation or interpersonal communication.

SPCH 319 Advanced Speech 3 Credits (3,0)
This course continues the study of oral communication with emphasis on effective public speaking. It includes the analysis and practice of modern and traditional methods of persuasion within and beyond the classroom.
Prerequisites: SPCH 219.

Statistics (STAT)

Courses

STAT 211 Statistics with Aviation Applications 3 Credits (3,0)
This course is a study of basic descriptive and inferential statistics. Topics include types of data, sampling techniques, measures of central tendency and dispersion, elementary probability, discrete and continuous probability distributions, sampling distributions, hypothesis testing, confidence intervals, and simple linear regression.
Prerequisites: MATH 111 or MATH 140 or MATH 143 or MATH 241.

STAT 222 Business Statistics 3 Credits (3,0)
This course is a study of basic descriptive and inferential statistics. Topics include types of data, sampling techniques, measures of central tendency and dispersion, elementary probability, discrete and continuous probability distributions, sampling distributions, hypothesis testing, confidence intervals, and simple linear regression.
Prerequisites: MATH 111 or MATH 140 or MATH 143 or MATH 241.

STAT 320 Decision Mathematics 3 Credits (3,0)
This course is a study of mathematical concepts and applications in mathematical model building and problem solving. Included are mathematical areas which are basic to decision theory.
Prerequisites: STAT 211 or STAT 222.

STAT 412 Probability and Statistics 3 Credits (3,0)
Finite sample spaces; conditional probability and Bayes' Theorem; discrete and continuous random variables and their functions; expected value, variance and standard deviation; systematic study of the major discrete and continuous distributions; moment generating functions; hypothesis testing and estimation.
Prerequisites: MATH 243.

Transportation (TRAN)

Courses

TRAN 274 Transportation Science 3 Credits (3,0)
The principles and analytical research tools applicable to the various modes of transportation, including highway, railroad, marine, urban transportation, pipeline, and aviation, are studied. The focus is on public policy, the economy, operations, and management of modal and intermodal transportation. Major subjects of analysis include carrier strategies, intermodal transportation, the shipping process, and globalization issues related to transportation.

TRAN 301 Transportation Legislation 3 Credits (3,0)
A study of the evolution and development of federal transportation legislation including highway, railroad, maritime, urban transportation, pipeline, and aviation; students will examine both past and present problems resulting in the regulation of transportation as well as the funding process. A review of applicable international treaties and conventions is included.
Prerequisites: RSCH 202.

TRAN 321 Air Transportation Systems 3 Credits (3,0)
This course examines operations and management of air transportation as part of a global transportation system. The course reviews the evolution of the technological, social, environmental, and political aspects of this system since its inception. The effects of U.S. economic deregulation, energy shortages, federal regulations, national and international issues, including security concerns, are discussed. Passenger, cargo and general aviation transportation modes are studied in relation to ever-changing transportation requirements.
Prerequisites: RSCH 202.

TRAN 331 Road & Highway Transportation 3 Credits (3,0)
This course applies transport characteristics and regulations to the study of the movement of people and goods on the road and highway system. The focus is on economics, policy, regulations, vehicle characteristics, and the value of time to the cost of transporting goods and people. The multiple factors influencing rate development and rate structure are part of the course.
Prerequisites: RSCH 202.

TRAN 341 Railroad Operations 3 Credits (3,0)
This course examines the characteristics of rail transport for the movement of passengers and materials. The topics of rail operations and management, including economic issues, regulatory issues, and labor issues are studied. Factors influencing the transport costs of passengers and materials that move on the railroad system, as well as the development of rail rate structures, are examined.
Prerequisites: RSCH 202.

TRAN 351 Urban Transportation and City Planning 3 Credits (3,0)
The various modes of urban transportation, as well as their advantages and disadvantages, are discussed. The importance of incorporating both practicality and efficiency into transportation systems, including non-motorized systems such as bicycles and bikeways, is explored. Methods of implementing an urban transportation system, meeting the expectations of users, effectively utilizing land and energy resources, and satisfying environmental and zoning regulations to design safe and effective urban transportation systems are discussed.
Prerequisites: RSCH 202.

TRAN 361 Marine Transportation 3 Credits (3,0)
The focus of this course is on the physical, economic, and domestic and international regulatory characteristics of marine transportation, which includes the movement of passengers and goods on the oceans as well as on inland waterways. A review of economics, regulation, policy, and labor as it pertains to the domestic and international maritime industries is included.
Prerequisites: RSCH 202.

TRAN 371 Pipelines, Land Use, and the Environment 3 Credits (3,0)
This course examines the economics, regulatory environment, policy issues, management, and operations of domestic and international pipeline systems for the movement of gases, liquids, and slurries. Special emphasis is placed on environmental and land use issues as they relate to the construction and operation of pipelines.
Prerequisites: RSCH 202.

TRAN 401 Transportation and the Environment 3 Credits (3,0)
This course examines environmental considerations relevant to the principal transportation systems. Transportation systems provide incalculable economic, political, and social benefits, but these benefits come at a price. The challenge is to provide an effective and efficient transportation system while mitigating environmental impacts. Included is an examination of the economic, regulatory, legal, and political issues as they relate to the environment in which transportation systems operate.
Prerequisites: RSCH 202.

TRAN 411 Strategic Intermodal Alliances 3 Credits (3,0)
In this course the student is introduced to complex issues of the physical, economic, and regulatory aspects of intermodal transportation alliances. Partnerships in highway, railroad, marine, urban transportation, pipeline, and aviation transportation systems are explored, including the Intelligent Transportation Systems and Information and Communication Systems that integrate the intermodal transportation of goods and products. Containerized shipping is also examined, including container design, load factors, product design and the standard transportation packaging regulations used in domestic and international shipping. Simulation models will be used to develop an intermodal transportation flow chart for international and domestic shipping of standard and non-standard containerized products.
Prerequisites: RSCH 202.

TRAN 421 Transportation Safety and Security 3 Credits (3,0)
This course provides an analysis of the procedures and management decisions required to maintain safety in transportation networks, vehicles, and facilities. Security and protection of vehicles, cargo, facilities, and personnel is examined. Construction and design of operational and managerial criteria for defense of property are discussed.
Prerequisites: RSCH 202.

TRAN 490 Transportation Science Capstone Course 3 Credits (3,0)
The Transportation Science Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project that provides significant evidence of experience in transportation studies. Students will work with designated faculty members to formulate, develop, and complete the transportation project. The completion of the Capstone Course is designed to document significant evidence that Program Outcomes have been met, and provides the student evidence of experience to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the program.
Prerequisites: RSCH 202.

Unmanned Systems (UNSY)

Courses

UNSY 205 Applied Physics for Unmanned Systems 3 Credits (3,0)
This course provides students with a foundation in physics as required to understand unmanned systems applications such as sensor technology; communication and control interfaces; and electro-technical and electronic application design, construction, & implementation. Emphasis is put on elementary particle theory, field properties, wave propagation, and optical relationships as required for an understanding of applications within the electromagnetic spectrum to include modulation concepts, analog and digital electronic circuitry to include signal logic, and electromechanical and electromotive devices to include servo applications.
Prerequisites: PHYS 102 and MATH 140 and MATH 142 or MATH 143 or MATH 111.

UNSY 235 sUAS Flight and Mission Planning 3 Credits (3,0)
This course will introduce undergraduate students to specific aspects of small unmanned aircraft systems (sUAS) flight and mission planning in support of task-oriented flying operations. Attention will be given to tools, methods, and skills used to support selection, configuration, and application processes during planning, pre-flight, inflight (monitoring and data-gathering), post-flight, and post-processing procedures. A comprehensive understanding of current sUAS systems and operating requirements will be reviewed and navigation concepts and components introduced. Unmanned aircraft contain a variety of system packages that are unique to the environment in which they operate. The student will identify the system packages available, and determine their proper operation during unmanned aircraft flight applications.
Prerequisites: ASCI 316 or ASCI 260 **Corequisites:** UNSY 235L.

UNSY 235L sUAS Flight and Mission Planning Laboratory 1 Credit (0,1)
This laboratory is dedicated to Unmanned Aircraft System (UAS) flight planning techniques, procedures, and methods. Students will apply vehicle specific knowledge to create detailed flight plans and adhere to procedures. This lab is designed to complement UNSY 235.
Prerequisites: ASCI 316 or ASCI 260 **Corequisites:** UNSY 235.

UNSY 307 Unmanned Systems Networking 3 Credits (3,0)
This course is a study of the information technology, communications, and frequency spectrum used in conjunction with unmanned systems around the world. Students explore signal processing, communications, interfaces, data links/exchange, FCC regulations, interoperability, and communication standards and protocols associated with robotic systems. Attention will be given to tools and methods used to support development, configuration, and application of unmanned systems individual and networked operations through communication and information processing of signals and data.
Prerequisites: UNSY 205 and RSCH 202.

UNSY 311 Unmanned Ground Systems and Applications 3 Credits (3,0)
This course provides students with an introduction to the fundamental concepts and commonly applied technology used for unmanned ground systems (UGS). Students are exposed to an historical perspective, control fundamentals, control systems, mobility methods, sensor systems, and applications such as agriculture, search and rescue, firefighting, construction, mining, and others. Attention will be given to tools and methods used to support development, configuration, and application of UGS to conduct operations of appropriate vehicles, sensors, and payloads in terrestrial environments.
Prerequisites: RSCH 202.

UNSY 313 Unmanned Maritime Systems and Applications 3 Credits (3,0)
This course provides students with an introduction to the fundamental concepts and commonly applied technology used for unmanned maritime systems (UMS). Students are exposed to an historical perspective, control fundamentals, control systems, surface and underwater methods, sensor systems, and applications such as search and locate, inspection, construction, and others. Attention will be given to tools and methods used to support development, configuration, and application of UMS to conduct operations of appropriate vehicles, sensors, and payloads in marine environments.
Prerequisites: RSCH 202.

UNSY 319 Unmanned Systems Operational Interaction and Control 3 Credits (3,0)
This course serves as an overview of the concepts and principles affecting operational interaction and control of unmanned systems. Students will explore the principles of command, control, and communications (C3) as the foundation to design, planning, and interactions of standalone and interoperable (human-system and system-system) processes in centralized and distributed models. Attention will be given to considerations relating to the development, configuration, and application of individual and multi-unmanned system solutions and behavior used in teleoperated (manual), autonomous, and cooperative/collaborative operations.
Prerequisites: UNSY 205 and RSCH 202.

UNSY 321 Unmanned Systems Localization and Path Planning 3 Credits (3,0)
This course introduces students to concepts of localization, orientation, and navigation as applicable to the application of unmanned systems in various operational domains (e.g., air, space, ground, and maritime). Different navigational methods will be examined, utilizing on/off-board technologies for determining and manipulating vehicle positioning and orientation, to include visual sensors; distance and density sensing; inertial navigation; positional referencing and determination mechanisms; computational methods; and possible combinations supporting sensor fusion and dead reckoning. A required knowledge base in cartographical methods and principles will be provided to lead into presentation and discussion of pre/in-flight planning considerations and applicable error corrections. Emphasis will be placed on application of planning and optimization practices and the required navigational calculation framework.
Prerequisites: UNSY 205 and RSCH 202.

UNSY 325 Unmanned Systems Testing and Inspection 3 Credits (3,0)
This course provides students with an opportunity to explore and apply the fundamental concepts, methods, and tools associated with the testing and inspection of unmanned systems components, elements, subsystems, and unified designs. Types and methods of testing and inspection will be examined, including acceptance, compliance, quality assurance and control, reliability, and system/subsystem operational readiness. Students will gain a comprehension of the rationale and variation among test and inspection types to produce strategies and plans, map requirements, justify recommendations, and document results. Attention will be placed on the development, manufacturing, and operational (configuration and application) environments.
Prerequisites: RSCH 202.

UNSY 329 Unmanned Systems Computation and Programming 3 Credits (3,0)
This course provides students with an introduction to commonly applied unmanned systems computational technology and an opportunity to apply basic programming concepts, with a focus on methodologies for task-oriented unmanned systems applications. It includes a) the examination of system processing requirements, appropriate hardware and software design; b) the development of programming solutions to specific unmanned systems tasks; and c) testing and debugging to optimize unmanned systems solutions. Attention will be given to the tools and methods used to support the development, configuration, and application of computational architectures with respect to representative unmanned systems operations.
Prerequisites: UNSY 205 and CESC 220 and ENGR 115 and RSCH 202.

UNSY 331 Unmanned Systems Legal and Regulatory Compliance 3 Credits (3,0)
This course introduces students to the wide ranging legal requirements, regulations, and policies affecting the development and application of unmanned systems across various operational domains (air, space, maritime, and ground). It features examination of current legal frameworks and domain specific rules; compliance enforcement; challenges and issues; case examples; processes for change; intellectual property and design; and emerging concepts. Unique factors and challenges that impact domain specific types of unmanned systems such as unmanned aerial systems (UAS) and autonomous automobiles will be addressed. Attention will be given to those laws, regulations, and policies relating to the development, configuration, and application of command, control, and communication (C3), autonomous operation, and the capture and review of sensor data.
Prerequisites: RSCH 202.

UNSY 361 Unmanned Systems Sensing Technology 3 Credits (3,0)
This course provides an overview of the technology and concepts used to remotely gather information about an unmanned system operating environment. Students will examine the fundamental concepts and methods of sensing systems including the type, format, and capabilities of sensors; signal and data processing; interfaces and communication protocols; component and system integration; use cases; challenges and issues; and emerging concepts. Attention will be given to tools and methods used to support development, configuration, and application of sensing systems used as primary payload or input for command, control, and communication (C3) or autonomous operation.
Prerequisites: UNSY 205 and RSCH 202.

UNSY 405 Unmanned Systems Operational Environments and Conditions 3 Credits (3,0)
This course provides an overview of complex environmental issues and conditions with respect to factors affecting performance and appropriateness of platform and associated components. Students are introduced to concepts of matching the mission purpose and the environment/conditions with the design and capabilities of an unmanned system. Elements of extreme temperature, terrain, weather, pressure, range, and required endurance are explored. Attention will be given to considerations relating to the development, configuration, and application of correctly identified robotic solutions based on problem sets, environments, conditions, and operational types.
Prerequisites: RSCH 202.

UNSY 415 Unmanned Space Systems and Application 3 Credits (3,0)
This course will introduce students to the fundamentals and commonly applied technology for unmanned space systems. Historical perspectives, current developments, and possible future concepts will be discussed. Students will be exposed to unmanned space system specific considerations of craft design requirements, maneuvering fundamentals and control systems, and payload selection. A fundamental knowledge base in space navigation and orbital maneuvering will be provided. This course builds on other unmanned systems courses (as defined in prerequisites). Previously introduced unmanned systems operational domains (air, space, ground, and maritime) will be applied towards exploration of extraterrestrial celestial bodies, such as planets, moons, comets, and asteroids. Attention will be given to the conceptual understanding of current and future challenges in unmanned space system development and employment.
Prerequisites: ASCI 315 PHYS 102 RSCH 202 UNSY 311 UNSY 313 and UNSY 405.

UNSY 421 Unmanned Systems Mission Planning 3 Credits (3,0)
This course will build on prior unmanned systems localization and path planning coursework and will introduce students to concepts of task and object oriented unmanned systems employment. Previous navigational knowledge will be applied towards specific mission objectives, incorporating considerations of point/area of interest approach planning; payload selection and employment optimization; inter/intra-system coordination and de-confliction; contingency planning; and mission assessment/evaluation. Attention will be given to application of task and objective definitions; system, sensor, and payload selection/matching; and performance based scenario planning.
Prerequisites: ASCI 410 or UNSY 361 and UNSY 321 UNSY 405 and RSCH 202.

UNSY 431 Unmanned Systems Human Factors Considerations 3 Credits (3,0)
This course serves as an overview of human factors concepts and implications affecting the development, configuration, and application of unmanned systems. Students will be exposed to types and functions of human-machine-interfaces (HMI)s; human behavior, capabilities, and limitations; psychological and perceptual information processing; sensation, cognition, and ergonomics; and effects of autonomy. Attention will be given to considerations relating to the development, configuration, and application of HMIs used for command, control, and communication (C3), autonomous operation, and the review and manipulation of sensor data.
Prerequisites: RSCH 202.

UNSY 435 sUAS Practical Application and Assessment 3 Credits (3,0)
This course will introduce undergraduate students to safely and effectively perform small unmanned aircraft systems (sUAS) operations in support of program and educational goals, through the practical application and practice of fundamental knowledge, skills, and abilities (KSA)s. Students will participate in the review and practice of basic to advanced aircraft controls (manual and automatic), checklist and emergency procedures, flight planning, review of platform specific traits, aerial photography and post-flight processing techniques, pilot application, crew resource management, and instructor-student practical assessment. The use of both interactive scenario-based modeling and simulation and actual (live) sUAS tools helps students to establish and improve unmanned airmanship skills in settings supporting incremental exposure, progression, and assessment combined with instructor-guided feedback and practice. With the successful completion of this course a student can expect to demonstrate appropriate application of unmanned airmanship, while attaining further comprehension of key factors supporting productive, purposeful, responsible, and legal operation of sUAS. Students must acquire items detailed in the ERAU-Worldwide sUAS Toolkit at their own expense. Eligibility: Students must be U.S. citizens or permanent residents and must be physically located within the U.S., and hold an FAA Part 107 Remote Pilot Certificate while participating in the UNSY 435 course.
Prerequisites: UNSY 235 and RSCH 202.

UNSY 490 Unmanned Systems Application Capstone Course 3 Credits (3,0)
The Unmanned Systems Application Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project associated with a problem in the unmanned systems industry that provides significant evidence of experience in the industry. Students will work with designated faculty members to formulate, develop, and complete the unmanned systems application project. The completion of the Capstone Course is designed to document evidence that Program Outcomes are understood and provides the student evidence of knowledge to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program as the final course of the degree program.
Prerequisites: RSCH 202.

US Military Service (USMS)

Courses

USMS 101 Basic Military Science I 1 Credit (1,0)
A study of the defense establishment and the organization and development of the U.S. Army. A study of the roles that active Army forces, Army Reserve forces, and the Army National Guard play in our nation's defense. A study of military courtesy, customs, and traditions of the service. A historical perspective of the role of the different branches of the U.S. Army and the role they have played in the freedom of our nation. An introduction to physical readiness training. Course includes lectures and laboratory. Field training exercises normally include M16-A1 rifle firing, rappelling training, and airmobile helicopter operations.
Corequisites: USMS 101L.

USMS 101L Basic Military Science Laboratory 0 Credits (0,3)
Training on basic soldier tasks and skills, such as land navigation, basic rifle marksmanship and movement as a member of a fire team and rifle squad. Practical application of field craft and soldier skills in a tactical environment.

USMS 102 Basic Military Science II 1 Credit (1,0)
Continued emphasis on physical readiness training. Course includes lecture and laboratory. Field training exercises normally include M16-A1 rifle firing, rappelling training, and airmobile helicopter operations.
Corequisites: USMS 102L.

USMS 102L Basic Military Science II Laboratory 0 Credits (0,3)
Consists of Air Force customs, courtesies, health, physical fitness, field training orientation, drill and ceremonies. These courses are graded Pass/Fail.

USMS 201 Basic Military Leadership I 2 Credits (2,0)
A review of the customs and traditions of the service. The fundamentals of leadership development and the importance of understanding the principles that are important to effective leadership. This includes focus on goal setting, communication, problem solving, decision making, and group process. The course requires mandatory physical training and includes lecture and laboratory.
Corequisites: USMS 201L.

USMS 201L Basic Military Leadership I Laboratory 0 Credits (0,3)
Builds on the topics covered in 101L and 102L. Further in-depth training on basic soldier tasks and skills, such as land navigation, basic rifle marksmanship and movement as a member of a fire team and rifle squad. Practical application of field craft and soldier skills in a tactical environment.

USMS 202 Basic Military Leadership II 2 Credits (2,0)
The fundamentals of military geography and their application in the use of navigational aids for the military forces. A study of preventive medicine countermeasures and first-aid techniques that every leader must know. The course requires mandatory physical training and includes both lecture and leadership laboratory. Two weekend training exercises normally include M16-A1 rifle firing, rappelling training, and airmobile helicopter operations.
Corequisites: USMS 202L.

USMS 202L Basic Military Leadership II Laboratory 0 Credits (0,3)
This is a continuation course building on the experience and tactics of USMS 201L.

USMS 301 Adaptive Tactical Leadership 3 Credits (3,0)
Cadets are challenged to study, practice, and evaluate adaptive leadership skills as they are presented with challenging scenarios related to squad tactical operations. Cadets receive systematic and specific feedback on their leadership attributes and actions. Prerequisite: Complete basic military science (or given constructive credit) and be a contracted Army ROTC cadet.
Corequisites: USMS 301L.

USMS 301L Adaptive Tactical Leadership Laboratory 0 Credits (0,3)
Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program. Students develop and refine leadership skills in position of responsibility.

USMS 302 Adaptive Tactical Leadership II 3 Credits (3,0)
Cadets receive increasingly intense situational leadership challenges to build awareness and skills in leading tactical operations. Cadets review aspects of combat, stability, and support operations in preparation for the Leadership Development and Assessment Course.
Prerequisites: USMS 301 **Corequisites:** USMS 302L.

USMS 302L Adaptive Tactical Leadership II Laboratory 0 Credits (0,3)
Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program.

USMS 401 Developing Adaptive Leaders 3 Credits (3,0)
A course to develop proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff, and providing performance feedback to subordinates. Cadets assess risk, make ethical decisions, and lead fellow cadets.
Prerequisites: USMS 301and USMS 301L and USMS 302 and USMS 302L **Corequisites:** USMS 401L.

USMS 401L Developing Adaptive Leaders Laboratory 0 Credits (0,3)
Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program.

USMS 402 Leadership in a Complex World 3 Credits (3,0)
A course in exploring the dynamics of leading in the complex situations of current military operations, examining customs and courtesies, military law, principles of war, and rules of engagement in the face of international terrorism.
Prerequisites: USMS 401 and USMS 401L **Corequisites:** USMS 402L.

USMS 402L Leadership in a Complex World Laboratory 0 Credits (0,3)
Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution and evaluation of training and activities with basic course students and ROTC program.

Graduate Courses

Graduate courses are numbered at 500 and above. Numbers immediately following course titles indicate lecture hours that a class meets weekly.

Graduate prerequisite courses taken with Embry-Riddle must be completed with a grade of B or better.

Embry-Riddle Aeronautical University – Worldwide courses are not necessarily offered every term, nor are they necessarily offered at all locations.

Numbers in parentheses, immediately following course titles and numbers, indicate lecture and laboratory hours that a class meets each week. For example, (3,0) signifies that the course consists of three lecture hours and zero laboratory hours weekly.

Aerospace Engineering (AENG)

Courses

AENG 502 Strength and Fatigue of Materials 3 Credits (3,0)
Analysis of stress and deformation in rods, beams, plates, shells and solids using the elementary theories of elasticity and plasticity. Theories of strength, impact, fatigue and creep. Computer methods and applications.

AENG 510 Aircraft Structural Dynamics 3 Credits (3,0)
Vibrations of deformable elastic structures using the assumed modes method. Analysis of a continuous system for specialized cases. Undamped and damped free and forced vibration of single-degree-of-freedom and multiple-degree-of-freedom system. Computer programming skills are necessary.

AENG 511 Engineering Materials Selection 3 Credits (3,0)
Introduction to mechanical behavior of common aerospace materials as it relates to structural performance. Methods for strengthening and toughening of metals ceramics and composites. Materials selection basics using functions, constraints, objectives. Ashby materials property charts. Materials selection with multiple constraints and conflicting objectives and shape factors. Designing hybrid materials and composites. Case studies from general and aerospace engineering. Course project.

AENG 514 Introduction to the Finite Element Method 3 Credits (3,0)
Basic equations of the theory of elasticity. Energy principles. Formulation and assembly of stiffness matrices and load vectors for elastic solids. Modeling considerations. Solution methods Computer implementation of finite element and stress analysis procedures. Interpretation of computer solutions. Design applications.

AENG 522 Analysis of Aircraft Composite Materials 3 Credits (3,0)
Fiber materials, tapes cloths, resin systems. Theory of elastic anisotropic materials. Elastic constants for multi-ply composites. Matrix formulation. Computer analysis. Strength and theory of failure. Sources and use of experimental data. Design considerations.

AENG 525 Structural Design Optimization 3 Credits (3,0)
Review of numerical optimization techniques. Structural applications of linear and discrete methods, approximation techniques and sensitivity analysis, shape and topology optimization. Optimality criteria methods. Applications to trusses, frames and composite laminates. Optimization simulations using computer graphics software. Emphasis on modern optimization techniques linked to numerical methods of structural analysis (finite element method) through a structural design course project.

AENG 534 Smart Materials in Engineering 3 Credits (3,0)
This course covers the general area of smart materials used for aerospace structures. Current research in material development, diverse applications, design, modeling, and control are introduced to learn their potentials and challenges as smart actuators and sensors. Various types of smart materials are discussed including piezoelectric, active fiber composites, electrostrictive, magnetostrictive, electroactive polymers, shape memory alloys, electro and magnetorheological fluids, and optical fibers. Prerequisites: Graduate standing.

AENG 540 Structural Health Monitoring 3 Credits (3,0)
General introduction of structural health monitoring and nondestructive evaluation techniques of mechanical and aerospace structural components. Passive and active damage analysis through intelligent actuation and sensing systems. Damage detection, diagnosis, and prognosis are discussed utilizing signal processing techniques and physics based approaches.

AENG 595Z Applied Engineering Analysis for Aerospace Applications 3 Credits (3,0)
Equilibrium problems include equations of bodies at rest or steady-state equations resulted from dynamic problems by setting time derivatives equal to zero Basic equations of theory of elasticity. Work and Energy principles. Eigenvalue problems involve the determination of the critical values of certain physical quantities such as obtaining natural frequencies of vibrating structural components and their corresponding mode shapes (eigenvalues). Eigenvalue determination for Buckling type Problems in Structures. Propagation problems are basically initial-value problems which include transient and unsteady-state problems in vibration, in fluid flow, in heat transfer, in acoustics and in solids. Solution methods.

AENG 612 Analysis of Aircraft Plate and Shell Structures 3 Credits (3,0)
Bending and buckling of plates. Cylindrical bending. Boundary value problems. Axisymmetric problems. Deformation of shells. Energy principles. Stress and stability analysis. Approximate methods. Finite element methods. Computer applications.

AENG 618 Aeroelasticity 3 Credits (3,0)
This course focuses on fundamentals of aeroelasticity; the interaction between the elastic, inertial, and aerodynamic forces with emphasis on aeronautical applications. It presents the theoretical and computational foundations of structural dynamics, aerodynamics, static and dynamic aeroelasticity, and studies the related performance issues such as flutter, control effectiveness, and divergence.
Prerequisites: AENG 510.

Aeronautical Science (ASCI)

Courses

ASCI 509 Advanced Aerodynamics 3 Credits (3,0)
In this course, students will examine current flight applications and problems. Specifically, this includes transonic, supersonic, and hypersonic aerodynamics, principles of aircraft stability and control, and operational strength considerations. Emphasis is placed on the applications of the rapidly changing technological innovations in aerodynamics and the solutions to the problems created by these advances.

ASCI 511 Earth Observation and Remote Sensing 3 Credits (3,0)
U.S. and International solar system exploration programs are reviewed and related to the current and proposed Earth-research projects. Examination of these research programs will be structured towards defining problems related to environmental changes and resource exploration. Formatted research data from Earth-resource satellites and EOS sources will be used for demonstrating specific research techniques, exploration methods, and economic and social elements of exploration.

ASCI 512 Space Mission and Launch Operations 3 Credits (3,0)
This course introduces the student to launch, mission operations, and facilities for manned and unmanned missions at U.S. and foreign sites. Satellite and spacecraft launch facility system discussion covers safety, meteorology, communications, and tracking, as well as navigation and control systems. Examples of mission control, operations, and systems include spacecraft project descriptions and control site operations. U.S. mission operations will include NASA, DoD, and commercial space operations and launch sites. Legacy spacecraft operations including the Space Shuttle (STS) and Russian Soyuz are examined along with future commercial space transportation programs.

ASCI 513 Space Habitation and Life Support Systems 3 Credits (3,0)
This course addresses the problems related to space-flight induced changes in the major body systems that need to be solved in this decade, to develop countermeasures for maintaining the health of crewmembers on long duration space operations. Physiological elements of zero gravity environment, radiation hazards, and protection measures are explored, along with physical and chemical closed-loop life support systems for long duration space missions. More elaborate life support systems for larger manned missions and colonies are outlined for further student development.

ASCI 514 Computer-Based Instruction 3 Credits (3,0)
This course addresses the design, development, and evaluation of instructional software as it applies to the aviation/aerospace industry. Students are offered practice in the systematic design of computer-based instruction, with emphasis in tutorials, drill and practice, and simulation. CBI lessons are developed using available authoring systems.

ASCI 515 Aviation/Aerospace Simulation Systems 3 Credits (3,0)
The course focus is on a comprehensive examination of simulation in modern aviation/aerospace that includes history, state-of-the-art, and current research and development. Discussions focus on the extent and impact of simulator application throughout the industry and the effects on training costs and safety. Topics range from basic design principles to flight crew training for initial qualification, continuation and currency purposes. The course emphasizes implementation of training that is transferable from simulated to real world environments. Systems simulators to the simulation models used in management, flight operations, scheduling, or air traffic control, are examined in detail.

ASCI 516 Applications in Crew Resource Management 3 Credits (3,0)
In this course, students examine the common concepts of crew resource management (CRM) as developed by major air carriers and explore the theoretical basis of such training. Topics such as supervision of crewmembers, counseling, manner and style, accountability, role management, and use of simulators and computer-based instruction will be studied. Each student has the opportunity to become knowledgeable in a specific area of CRM by assisting in the development of a CRM research document as part of the course.

ASCI 517 Advanced Meteorology 3 Credits (3,0)
A graduate-level treatment of major topics in meteorology with an emphasis on aviation weather hazards. Topics include, but are not limited to: atmospheric structure and circulation, atmospheric kinematics and thermodynamics, mid-latitude and tropical cyclones, convective and non-convective weather features, local wind phenomena, and fundamental concepts in weather analysis and forecasting. Students will also be introduced to the use of numerical weather prediction products in weather forecasting. Assignments and projects will focus on conducting basic atmospheric analysis and forecasting using internet-based weather data and forecasting products, and provide the student with practical experience in making informed weather-sensitive decisions.

ASCI 530 Unmanned Aerospace Systems 3 Credits (3,0)
This course offers a conceptual approach to overall system design of unmanned aircraft and spacecraft systems, including remotely operated and autonomous unmanned aerial systems (UAS) and unmanned space systems. Course will include the concepts of communication systems, payload systems, control stations and related systems, vehicle specific systems, and support systems. The requirements for system architecture development and conceptual level assessment of major system elements will be examined as they relate to use in industry. The major system elements will be evaluated from a systems engineering perspective to include consideration for cost and weight estimation, basic aircraft performance, safety and reliability, lifecycle topics, vehicle subsystems, and system integration.

ASCI 531 Robotics and Control 3 Credits (3,0)
The purpose of this course is to analyze the concepts of modeling, design, planning, and control of robotic systems. The student will evaluate robotics and control design decisions specific to unmanned systems, including remotely operated and autonomous unmanned aerial systems (UAS) and unmanned space systems. Course topics include robotics foundations in kinematics, dynamics, control, motion planning, trajectory generation, programming, telemetry, sensor integration, remote operation, and design. Course applications include task and motion planning for utilization within unmanned system technology.

ASCI 550 Aviation Education Foundations 3 Credits (3,0)
This course assists in developing contexts and concepts in which educational problems and issues may be understood, particularly the role of aviation in education. Emphasis is placed on aviation education and its historical and philosophical foundations.

ASCI 560 Advanced Rotorcraft Operations 3 Credits (3,0)
The course introduces the complexities of rotary wing flight systems and the advancements made to overcome them. The unique problems facing an organization involved in rotorcraft operations are studied, from the initial inception of a program to the government rules and regulations, environmental and noise considerations, special landing and take-off facilities, flight and maintenance ratings, and techniques of control. Special consideration is given to the unique problems and issues facing such rotorcraft operations as police, medical evacuation, forestry service, and corporate aviation.

ASCI 601 Applications in Space: Commerce, Defense, and Exploration 3 Credits (3,0)
The scientific, military, and commercial interests in international and domestic space programs are examined throughout the history of space flight. The needs of commercial space endeavors and methods of expanding space technology into manufacturing are contrasted to the importance of scientific exploration, and the requirements of military space operations. The justification, development, and costs of scientific exploration programs, defense-related projects, and commercial endeavors are used to study the evolution of space missions and the development of future programs.

ASCI 602 The Air Transportation System 3 Credits (3,0)
Air Transportation is a complex and rapidly evolving industry that plays a substantial role in global and national economies and in efforts to improve environmental quality and promote sustainable development. Major components include the human, technological, environmental and operational aspects of airports, airspace, air traffic management, aircraft and aircraft component manufacturing and design, airlines, and other airspace users. This course is foundational for the Master of Science in Aeronautics degree and focuses on the complex global air transportation system infrastructure, it?s strengths and vulnerabilities, and the influences by and impacts to global and national economies, environmental sustainability, and technological advancement.

ASCI 604 Human Factors in the Aviation/Aerospace Industry 3 Credits (3,0)
This course presents an overview of the importance of the human role in all aspects of the aviation and aerospace industries. Emphasis is on issues, problems, and solutions of unsafe acts, attitudes, errors, and deliberate actions attributed to human behavior and the roles supervisors and management personnel play in these actions. Students examine the human limitations in the light of human engineering, human reliability, stress, medical standards, drug abuse, and human physiology. Discussions include human behavior as it relates to the aviator's adaptation to the flight environment, as well as the entire aviation/aerospace industry's role in meeting the aviator's unique needs.

ASCI 606 Global Air Traffic Control and Management 3 Credits (3,0)
This course is designed to examine the management concepts related to technology, collaboration, and innovation in Air Traffic Control (ATC) and Air Traffic Management (ATM). Topics covered include Global Air Navigation Plan (GANP), governance restrictions, regulatory capabilities, ATM systems, sustainable infrastructure, and environmental impacts. The implications on managers of ongoing air navigation improvement programs of International Civil Aviation Organization (ICAO) Member States (SESAR in Europe; NextGen in the United States; CARATS in Japan; SIRIUS in Brazil, and others in Canada, China, India, Asia, Pacific, Africa and The Russian Federation) are analyzed.

ASCI 609 Aircraft Maintenance Management 3 Credits (3,0)
This course features a detailed analysis of commercial air carrier and general aviation aircraft maintenance that includes regulation, organization and structure, capabilities and limitations, maintenance levels, inspection and reporting requirements, and prevention and correction inspections. Case studies of typical and unique maintenance scenarios are utilized. A major course objective is to heighten awareness of the critical interface of maintenance with flight, supply, and training activities.

ASCI 611 Aviation/Aerospace System Safety 3 Credits (3,0)
This course emphasizes the specialized integration of safety skills and resources into all phases of a systems life cycle. Accident prevention, beginning with systems engineering together with sound management, are combined in this course to enable students to fully comprehend their vital roles in preventing accidents. The total program, from basic design concepts through testing, maintenance/systems management, and operational employment, is fully examined and evaluated.

ASCI 612 Aviation/Aerospace Industrial Safety Management 3 Credits (3,0)
The course focus is on the modern work setting from an aviation and aerospace safety and health point of view. An analysis of the history of industrial safety leads the student to an understanding of why and how aviation/aerospace industrial safety management evolved into an advanced discipline. The roles of and interactions between government, corporation, safety management and the worker, in the dynamic, economy-driven environments of aviation and aerospace, are central themes.

ASCI 614 Advanced Aviation/Aerospace Curriculum Development 3 Credits (3,0)
This course will investigate the traditional manner of curriculum development and then proceeds to prepare an instructional framework for a variety of aviation and aerospace instructional programs. The course focuses on instructional strategies and delivery modalities, as well as the impact of social forces, in aviation/aerospace educational environments. Systematic approaches to planning, designing, implementing and evaluating curriculum development will also be explored.

ASCI 615 Aviation/Aerospace Accident Investigation and Analysis 3 Credits (3,0)
This course covers all aspects of the aircraft accident investigation process starting with preparation for investigation through report writing. Particular emphasis is placed on the study of human factors connected with flight and support crews activities in aviation operations. The course provides students with knowledge of the process of investigating accidents and incidents in an aviation organization. A critical analysis of selected aircraft accidents and an evaluation of causal factors are covered.

ASCI 616 Transportation Security 3 Credits (3,0)
This course will focus on Transportation Security Administration regulations covering aviation, railroad, highway, marine, and pipeline transportation. Requirements for all modes of transportation will be covered, with emphasis on aviation security. Personnel and the technology needed to provide a safe and secure environment for airports and airlines will be discussed. Advanced security technology and its use to significantly increase the level of security in transportation will be covered.

ASCI 619 Airport Certification and Operations Safety 3 Credits (3,0)
This course is an analysis and application of Federal regulations, ICAO Indexes, and advisory guidance applicable to the certification and safe conduct of day-to-day airport operations. Airport emergency management protocols and application of Safety Management Systems are foundational.

ASCI 620 Air Carrier Operations 3 Credits (3,0)
This course is an overview of air carrier operations from the viewpoints of the cockpit flight crew, cabin crew, operational specialists, managers, and dispatchers. Topics include airline history, organization, crewmember requirements, training programs, duty time, aircraft airworthiness, dispatch, flight operations, and maintenance. Air carrier operational problems, both domestic and internationally since deregulation and 9/11, will be explored.

ASCI 621 Aviation/Aerospace Safety Program Management 3 Credits (3,0)
This course covers the essential skills and methodology needed to plan and manage an effective aviation safety program. Emphasis is placed on understanding the principles of risk management, and the principles, tools, and techniques used in a Safety Management System. Methods to achieve enhanced safety, moving beyond mere compliance with regulatory requirements are studied.

ASCI 623 Aircraft Design and Development 3 Credits (3,0)
This course is an overview of aircraft design and development. Included are vehicle mission, the requirements directed by economics, commercial operator requirements and requests, military and defense considerations, and research and developmental processes needed to meet vehicle requirements. Aviation and aerospace manufacturing organizations and techniques are addressed to include planning, scheduling, production, procurement, supply, and distribution systems. Aviation and aerospace maintenance systems from the built-in test equipment to the latest product support activities are explored.

ASCI 624 Global Aviation Leadership: Critical Decision Making in Air Traffic Systems 3 Credits (3,0)
This course is designed to give students in Air Traffic Management (ATM) a practical and comprehensive understanding of leadership theories and practice applicable to ATM as well as critical decision-making processes. These processes are in government and industry organizations supporting Air Traffic Management, Airport Management, Human Factors, and Safety Systems globally. Knowledge of the operational aspects of NextGen, SESAR and other international air navigation system components such as WAAS, ADS-B and PBN-OPD as they apply to ethical and moral responsibilities will be analyzed.

ASCI 625 The Role of Airports in Global Air Traffic Management 3 Credits (3,0)
This course examines the aspects of Global Air Traffic Management systems that are directly linked to airports. Airports are tangibly the beginning and end of aircraft movements within air traffic management systems. Knowledge of the operational aspects of NextGen, SESAR and other international air navigation system components such as WAAS, ADS-B and PBN-OPD that are owned, operated or occur on airport properties are critical concepts of air traffic management. The course also evaluates the influences of NextGen and other international modernized air navigation systems on airport operations management with regards to facilities, local ATC, airport tenants, airline operations, environmental impacts and community relations programs.

ASCI 626 Air Traffic Control Human Factors 3 Credits (3,0)
This course is designed to examine the psychological, physiological, and ergonomic capabilities of humans as related to Air Traffic Control (ATC). The performance limitations of air traffic controllers will also be examined to assess how these limitations are impacted by different variables in the ATC environment. This course will also investigate how human factors can result in human error, but at the same time be used to bring about strategies that can enhance efficiency, effectiveness, and safety to mitigate human error in ATC.

ASCI 634 Aviation/Aerospace Psychology 3 Credits (3,0)
This is a survey course that covers the primary areas of interest in aviation psychology. Topic areas may include the effects of alcohol on performance, aviation safety and accident investigation, cockpit and air traffic control automation, display and control issues and design, personnel selection, task analysis, workload assessment, training research and development, scale development methodologies, crew resource management, and other areas of current interest. The topic areas change periodically depending on the focus of the current research environment.Prerequisites: MSHF Capstone Option: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670/ MSHF Thesis Option: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670.

ASCI 637 Unmanned Aerospace Systems Operations and Payloads 3 Credits (3,0)
This course focuses on the operational and payload capabilities of unmanned systems, including remotely operated and autonomous unmanned aerial systems (UAS) and unmanned space systems, under a variety of mission standards. Operational course content includes typical software and hardware installations, launch and recovery procedures, normal and emergency procedures, and the appropriate selection of payload based upon mission requirements. Students will research current and future payloads and sensor systems utilized in unmanned aircraft and space systems. An exploration of multi-mission payload applications and requirements, including state-of-the art, secure uplink and downlink telecommunications, signals intelligence, precision geo-location, airborne cellular network, and software-defined communications relay will be conducted.

ASCI 638 Human Factors in Unmanned Aerospace Systems 3 Credits (3,0)
This course is designed to present an overview of the importance of major human factors issues associated with unmanned systems, including remotely operated and autonomous unmanned aerial systems (UAS) and unmanned space systems operations across a variety of platforms employed in both commercial and military operations. Emphasis will be placed on the differences and commonalities between occupied and unoccupied systems, with a focus on the human factor issues encountered by individual unmanned operators (pilots and sensor operators) as well as UAS teams. Students will become familiar with human factor issues surrounding unmanned launch, recovery, long duration operations, fatigue, human performance, Ground Control Station (GCS) design, use of automation, Situation Awareness (SA), Crew Resource Management (CRM), integration into the National Air Space (NAS), attitudes and perspectives of both government agencies and public entities, use of technology to compensate for no-pilot-onboard, and regulatory issues and solutions. Discussions of human capabilities and limitations as it relates to safe and effective operation of unmanned aircraft and space systems in a variety of commercial and military operations will be included.

ASCI 641 Production and Procurement Management in the Aviation/ Aerospace Industry 3 Credits (3,0)
The evolution of an air carrier aircraft from design concept to delivery is examined from the perspectives of the purchase, manufacturer, component manufacturers, operators, and certificator/regulator. The study of the process begins with demand analysis and continues through purchase contracting, manufacturing, marketing, certification, pre-delivery activities, and introduction into service.

ASCI 642 International Aviation Policy 3 Credits (3,0)
This course addresses international management and aviation policy through the examination of major trends and issues challenging the aviation manager. Cross-cultural situations are evaluated from the perspective of interpersonal relationships in a diverse domestic and foreign environment, and in the context of evolving global trends. Strategic planning and negotiation are examined by defining the major tasks involved in organizing for international aviation, such as designing the organization and staffing. Managing workforce diversity is examined from culture-based and comparative perspectives, along with the function of control through the examination of effective control systems for overseas operations that ensure environmental interdependence through social responsibility and ethical behavior.

ASCI 643 Management of Research and Development for the Aviation/Aerospace Industry 3 Credits (3,0)
The types and sources of aviation/aerospace research and development are analyzed, with a focus on the structure and interrelationship of the industry, educational institutions, and other organizations. Sources and methods of funding, specification determination, the relationship of research and development to procurement and production, and the regulatory factors affecting progress from the initial development to production of the aircraft and components are examined. Concepts of motivation and management as applied to research scientists and engineers will be studied as well as procedures for promoting optimum creativity concurrently with efficient operations.

ASCI 644 Integrated Logistics in Aviation Management 3 Credits (3,0)
This course centers on elements of a modern integrated logistics system. The organizational structure, inventory management, principles of warehousing, traffic management, international logistics, and quality management principles as they apply to logistics are key elements. The impact of just-in-time systems and quality management principles on physical distribution and their relationship with integrated package and cargo carriers, advancements in intermodal transportation, and the deregulation of the transportation industry are probed. The characteristics of system design to meet requirements of reliability, maintainability, and supportability are examined, as is the economic feasibility of a logistics system, including Life-Cycle Cost Analysis methods. The explosion of computer technology and its effect on electronic data interchange capability as they influence logistics policies and practices are explored. The use of computer software to solve logistics problems is introduced.

ASCI 645 Airport Operations and Management 3 Credits (3,0)
This course focuses on management and operation of public use airports. Topics covered include traffic forecasting, sources of revenues and expenses, management of passenger and cargo terminal buildings, ground handling of passengers and baggage, ground access systems, and the U.S. Federal Aviation Administration Regulations dealing with airport operations. Current problems with environmental impact, land-use planning and control, airport capacity and delay, public relations, airport finance, airport privatization, liability, and economic impact are discussed.

ASCI 646 Airline Operations and Management 3 Credits (3,0)
This course is an integrated study of airline operations and functions. Domestic and international regulation of air carriers and the industry's changing structure due to alliances and globalization are addressed. Airline economics, airline marketing and pricing, computer reservation and revenue management systems, fleet planning and scheduling, aircraft maintenance, aircraft finance, labor relations, organizational structure, and strategic planning are studied.

ASCI 654 Adult Teaching and Learning Techniques 3 Credits (3,0)
The major instructional strategies used in education with particular emphasis on higher education and adult learning are the core of this course. Multiple approaches as they relate to academic disciplines and grade levels are studied. The unique "cockpit classroom" environment will be discussed and evaluated.

ASCI 660 Sensation and Perception 3 Credits (3,0)
This course examines how the human senses transform stimulus patterns of physical energy into the neural codes that become our perceptions of the world. This class will address advanced issues in human information processing with specific regard to the physical and psychological variables associated with sensory and perceptual phenomena. Topics include vision, audition, smell, taste, touch, balance, and phenomena common to all sensory modalities, such as feature enhancement, inhibition, adaptation, and stages of neural coding. While all the senses will be covered, special attention will be paid to the visual and tactile senses.

ASCI 662 Statistical Analysis for Aviation/Aerospace 3 Credits (3,0)
This course includes the review, design, planning, analysis, and statistical interpretation of data from the aviation/aerospace industry. Students will build on statistical theory and learn advanced techniques that can be applied to problem solving, research analysis and numerical interpretation of data from the aviation/aerospace industry. Students will learn to identify parametric and non-parametric statistics, develop correlation methods for linear data, and statistical significance testing between samples and within samples. Students will undertake projects using computer programs for data that is derived or given. Statistical results will be presented in tabular, graphical, and numerical formats in accordance with the American Psychological Association style of writing.

ASCI 670 Research Methods for Aviation/Aerospace 3 Credits
This course is designed to equip students with the theoretical techniques and skills needed to identify, apply, and solve qualitative and quantitative aviation/aerospace research problems. The course introduces the need for non-numerical data analysis and how part of a methodology can allow for in depth analysis of complex issues and relationships. Sampling and data gathering in a systematic manner is incorporated into research methodologies. The use of numerical analysis on qualitative data is covered to result in significance solutions and recommendations.

ASCI 674 Project Management in Aviation/Aerospace 3 Credits (3,0)
This course examines the concepts and principles of project management in the aviation/aerospace industry. It addresses the ten knowledge areas of project management: integration, scope, time, cost, quality, human resources, communications, risk, procurement, and stakeholders. Process areas of initiation, planning, execution, control, and closure of projects are studied. Emphasis is placed on strategies for developing projects in an aviation/aerospace environment. Project management software is utilized as appropriate.
Prerequisites: ASCI 662.

ASCI 691 Graduate Capstone Course 3 Credits (3,0)
The Master of Science in Aeronautics (MSA) Graduate Capstone Project (GCP) course is the culminating effort of the student's entire learning experience in the MSA degree. It is a written document on an aviation/aerospace topic that exposes the student to the aspects of research and technical writing. This course is included in the MSA curriculum to provide the student with the opportunity to research a project of special interest, but not to the level of a thesis. This is a required course for those students who choose not to write a thesis. Students will work with designated faculty to formulate, develop, and complete the aviation/aerospace project. The completion of the GCP course is designed to document significant evidence that all Program Outcomes have been met, and provides the student evidence of experience to show to current and prospective employers. The GCP course will be taken at the end of the student's degree program.
Prerequisites: RSCH 665 and RSCH 670.

ASCI 699 Special Topics in Aeronautical Science 1-3 Credit (1-3,0)
Students may elect to perform a special, directed analysis and/or independent study in an area of particular interest. A detailed proposal of the desired project must be developed and presented to the Program Chair and Department Chair of the degree program being sought for faculty review and recommendation at least three weeks prior to the end of registration for a term.

ASCI 700A Thesis I 3 Credits (3,0)
This course is the first of a two course sequence (ASCI 700A and ASCI 700B) to complete the degree program through the accomplishment of a thesis. The student will propose and begin to develop a written document on an aviation/aerospace topic, supervised throughout its preparation by the student's Thesis Committee. The document is intended to demonstrate the student's mastery of the topic and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will continue on to ASCI 700B for the completion and submittal of the thesis.

ASCI 700B Thesis II 3 Credits (3,0)
This course is the second of a two course sequence (ASCI 700A and ASCI 700B) to complete the degree program through the accomplishment of a thesis. The student will complete their thesis under the supervision of the student's Thesis Committee. The document is intended to demonstrate the student's mastery of the topic and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will be permitted to graduate from the program.
Prerequisites: ASCI 700A.

Aviation & Aerospace Sustainability (AASI)

Courses

AASI 600 Sustainable Aviation and Aerospace Perspectives 3 Credits (3,0)
An examination of aviation/aerospace's interaction with the world from the viewpoint of positive and negative effects. Short term and long term effects will be investigated to highlight the major challenges associated with forming a sustainable future from a local to global level by examining case studies and best management practices.

AASI 605 Aviation and Aerospace Sustainable Organizations 3 Credits (3,0)
In this course the business and hardware life cycles of flight vehicles are investigated. The course provides an analysis of evolution of aviation/aerospace businesses through the typical stages of existence and examines sustainable business and environmentally sound methods to prolong or maintain the market share.

AASI 610 Aviation and Aerospace Workforce Development and Diversity 3 Credits (3,0)
Aviation and aerospace industries today reach across cultural and international boundaries. This course addresses the global aspects of building and sustaining the aviation and aerospace workforce by examining staffing techniques, cross-cultural communications, diversity, workforce development and social equity.

AASI 615 Sustainable Technical Systems Communications 3 Credits (3,0)
Successful sustainability solutions stretch across many disciplines in any industry. This course examines the need to apply an interdisciplinarymethodology to solving sustainability concerns for aviation/aerospace industries. Appropriate technical solutions are best derived throughcollaboration and appreciate of diverse contributions; a systematic process. Communication across teams, organizations, regulatory authorities and the general public is stressed in the course.

AASI 620 Aviation and Aerospace Sustainable Techniques 3 Credits (3,0)
Systems in aviation and aerospace are complex and diverse across many global platforms. This course investigates the design, development and maintenance of not only aerospace vehicles, but the systems needed to maintain them, through application of forward thinking engineering, environmental and management practices to determine sustainable solutions.

AASI 625 Sustainability Associated Legal Topics in Aviation and Aerospace 3 Credits (3,0)
For any type of aviation or aerospace activity the quest towards a more sustainable future must integrate legal requirements. Legal considerations include international treaties along with federal, state and local laws and regulations governing environmental, intellectual property, aftermarket product ownership rights and others. These legal obligations form a crucial component of sustainability for any type of organization.

AASI 630 Sustainable Aviation and Aerospace Organizational Communications 3 Credits (3,0)
In this course, students will investigate the current communications methods utilized in corporate communications within the aviation and aerospace industry. Many aviation and aerospace organizations now encompass increasingly global boundaries. As such, the necessity to communicate clearly and effectively across multiple types of groups inside as well as outside an organization is a sustainable responsibility. Students will examine best practice communication methods utilized by industries of all types to identify best practices or updated methods of communication to promote sustainability in the aviation and aerospace industry.

AASI 691 Aviation and Aerospace Sustainability Graduate Capstone 3 Credits (3,0)
The MSAAS Capstone Course is the culminating effort of the student? s entire learning experience. The student will complete an individual project that provides significant evidence of experience in aviation and or aerospace studies. Students will work with designated faculty to formulate, develop, and complete the aviation and or aerospace sustainability project. The completion of the Capstone Course is designed to document significant evidence that all Program Outcomes have been met. The Capstone Course will be taken at the end of the student?s degree program.

Aviation Finance (FIND)

Courses

FIND 516 Financial Accounting 3 Credits (3,0)
This course is a study of financial accounting concepts, standards, and financial reports used for external reporting by an enterprise. The course will examine accounting concepts, the accounting model, measurement and disclosure of economic transactions, preparation of financial statements, financial statement analysis, the accounting cycle, property, plant, and equipment, depreciation methods, inventory, short- and long-term liabilities, stockholders' equity transactions, inter-corporate investments, and off-balancing financing with an emphasis on aviation and aerospace related businesses. Prerequisite: A Financial Accounting course completed, or prerequisite knowledge met with approval of Program Coordinator and Instructor.

FIND 615 Investments 3 Credits (3,0)
This course provides a survey of investments including security markets, investment vehicles, investment analysis, and portfolio management. Specific topics include the concept of risk and return, types of financial instruments, security valuation, mechanics of trading, the survey of investment companies, asset allocation for individual and an institutional investors, the concept of efficient markets, equity and bond portfolio management, and portfolio performance evaluation. The course is taught from the viewpoint of both an individual and institutional investor. The course uses case studies from the airline and aerospace industries, Web-based investment simulation, and current economic and capital market information to provide practical application of the course materials.
Prerequisites: MBAA 518.

FIND 618 Advanced Corporate Finance 3 Credits (3,0)
Airlines, airports, and manufacturers are complex, capital-intensive enterprises operating in volatile, international markets. Consequently, participants in the industry rely on a variety of financial instruments to raise necessary capital and to manage financial risk arising from uncertain demand and supply markets. While building on the finance concepts developed in Managerial Finance, this course examines the complicated financial structures and advanced financial tools employed in the aviation industry. Concepts covered include project finance,financial derivatives (real options, interest rate swaps and hedges, forward contracts and futures), financial modeling using simulation and optimization techniques, and international financial management (foreign exchange exposure management, foreign investment and capital allocation, multinational cash and tax management). The course relies on current articles and cases to explore the application of advanced financial concepts to the aviation industry.
Prerequisites: MBAA 518.

FIND 619 Economic Modeling 3 Credits (3,0)
This course introduces students to several important advanced mathematical and statistical techniques that are used to build and test econometric models, and provide solutions addressed by the institution. Emphasis will be placed on developing an understanding of the essentials underlying various methods and the ability to relate the methods to important issues faced by analyst carrying out econometric analysis on airline economic and/or financial data. Students will use statistical software such as SPSS/ EVIEWS/ LIMDEP/ R to do computational studies with economic data. In this course students are expected to utilize a systematic and careful reasoning to solve managerial problems.

FIND 620 Air Transport Economic Modeling 3 Credits (3,0)
This course introduces students to several important advanced mathematical and statistical techniques that are used to build and test econometric models, and provide solutions addressed by the institution. Emphasis will be placed on developing an understanding of the essentials underlying various methods and the ability to relate the methods to important issues faced by an analyst carrying out econometric analysis on airline economic and/or financial data. That is, how to choose the right method and how to make the right decision. Students will learn how to conduct time series analysis using EVIEWS, cross-sectional analysis using SPSS, and panel data analysis using LIMDEP. In this course students are expected to utilize a systematic and careful reasoning to solve managerial problems.
Prerequisites: MBAA 523 and FIND 619.

FIND 695A Topics in Aircraft Finance I 2 Credits (2,0)
This course is the first of the three required courses for the ISTAT University diploma in aircraft financing. This course introduces students to aircraft selection strategy basics from an airline and leasing company? s perspective, including important considerations of mission capability, availability, economics, and availability of financing. In addition, the course provides a detailed review ofaviation legal and regulatory framework and discusses applicable governing laws, conventions and treaties, lessor and operator liability, and aviation insurance. Students will also learn principles of aircraft leasing versus ownership, including pros and cons of aircraft ownership, types of leases,lessor and lessee relationship and obligation, and lease accounting. Prerequisites: MBAA 518 or equivalent or permission of instructor.

FIND 695B Topics in Aircraft Finance II 2 Credits (2,0)
This course is the second of the three required courses for the ISTAT University diploma in aircraft financing. This course introduces students to airline credit analysis and provides them with tools and techniques to conduct quantitative and qualitative credit analysis of domestic and international airlines. Student will also learn sources of capital and financial instruments that airlines and leasing companies use in aircraft funding. In addition, the course provides a detailed review of the fleet portfolio management and risk management that leasing companies employ to reduce their exposure to aircraft residual values, foreign exchange, interest rate, and other risks. Prerequisite: FIND 695A or permission of the instructor.

FIND 695C Topics in Aircraft Finance III 2 Credits (2,0)
This course is the last of the three required courses for the ISTAT University diploma in aircraft financing. This course provides an in depth review of the principals of maintenance reserve, maintenance reserve economics and rate setting and maintenance reserve management, transactionmodeling for aircraft returns (includes advanced excel simulations) and lease negotiations between the lessor and the lessee Students will also learn advanced excel skills (calculation of IRRs, Multiples, NPV analysis, return of capital, pay back periods, lease earnings) test the model functionality and interpret data from them. Prerequisite: FIND 695B or permission of the instructor.

Aviation Maintenance (MAVM)

Courses

MAVM 601 Leadership in Global Aviation Maintenance Organizations 3 Credits (3,0)
The course focus is on the leadership role in Global Maintenance Organizations principles and application to evaluate and implement a maintenance philosophy that supports a global aviation maintenance organization. The course addresses the leadership of subordinate managers and supervisors through the communication of organizational philosophies and directives, including prioritizing assigning and tracking goals, objectives, and standards.

MAVM 605 Global Maintenance Resource Management 3 Credits (3,0)
In this course, students will examine the leadership role in Maintenance Resource Management (MRM) principles and applications, to include compliance with Federal Aviation Administration and European Aviation Safety Agency guidelines. Specific emphasis is placed on management's role in the five pillars of MRM: communication, decision-making, situational awareness, workload management, and teamwork skills, as they pertain to awareness and mitigation of latent and active failures. The overall objective is to manage maintenance technical skills, interpersonal skills, and human performance and cognition in a way that increases communication effectiveness and enhances safety. Included are the foundations in Crew Resource Management, the dirty dozen, and case studies in aircraft accidents attributed to maintenance failures.

MAVM 615 Strategic Management of Global Maintenance, Repair and Overhaul (MRO) Operations 3 Credits (3,0)
This course covers the concepts and management fundamentals of Maintenance, Repair and Overhaul (MRO) operations in a dynamic and complex global industry. The course addresses strategic management and control of scheduled and unscheduled inspections, maintenance and repair, including cost projection, analysis, maintenance trends and maintenance recorded keeping for efficiencies in operations. Compliance with national and international laws and regulations applicable to global MRO operations are explored.

MAVM 620 Project Management for Aviation Maintenance 3 Credits (3,0)
This course provides the student with project management fundamental techniques and principles utilized within the aviation maintenance industry to increase efficiency in managing resources in a global business environment. The content of this course addresses the development of strategies to effectively manage a global aviation maintenance organization and the requirements to balance project constraints of scope, quality, schedule, budget, resources, and risks. The five Process Groups of Initiating, Planning, Executing, Monitoring and Controlling, and Closing are covered, as well as the aspects of controlling and managing aviation maintenance tasks from inception to completion. Software will be used to analyze the cost, schedule, staffing, and resource allocations, as well as to demonstrate the value of automated calculations, record keeping, and reporting related to managing aviation maintenance.

MAVM 691 Aviation Maintenance Graduate Capstone 3 Credits (3,0)
The Master of Aviation Maintenance Capstone Course is the culminating effort of the student's entire learning experience. The student will complete an individual project that provides significant evidence of experience in aviation maintenance studies. Students will work with designated faculty to formulate, develop, and complete the aviation maintenance project. The completion of the Capstone Course is designed to document significant evidence that all Program Outcomes have been met. The Capstone Course will be taken at the end of the student's degree program.

Business Administration (MBAA)

Courses

MBAA 514 Strategic Marketing Management in Aviation 3 Credits (3,0)
The traditional role of marketing management is enlarged to include the development, implementation, and control of marketing strategies in the dynamic aviation/aerospace organization. Emphasis is on the application of the strategic marketing process in the turbulent global aviation business environment. Strategic marketing decisions, analysis, and issues are integrated with the goal of achieving customer satisfaction to gain a sustainable competitive advantage within the aviation industry. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 517 Managerial Accounting for Decision Making 3 Credits (3,0)
Financial control procedures for a systems approach to program management are presented. Cost elements in manufacturing, research and development, logistic and support services are explored. Included will be the introduction of fixed and variable costs; computing and using overhead; process and job order costing methods; preparation of income statements in the contribution format; ratio analysis; profit planning and its relationship to cost; budget and overhead analysis; pricing, capital budgeting and investment decisions. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 518 Managerial Finance 3 Credits (3,0)
This course focuses on the theoretical and practical approaches to effective financial management. Planning, analyzing and controlling investment and short and long term financing are examined for decision making purposes. Emphasis is placed on the application of these methods in businesssettings. Topics include investment (capital budgeting, risk and diversification), financing (debt and equity), payouts (dividends and other payouts) and financial derivatives (options and futures). Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 520 Organizational Behavior, Theory, and Applications in Aviation 3 Credits (3,0)
This course focuses on current theoretical and practical organizational issues which have a direct impact on management in the aviation industry. The emphasis is on human development and the development of effective work elements, as well as the personnel concerns which must be resolved for successful leadership. Topics provide insights to behavior, structure, authority, motivation, leadership, organizational development, and social responsibility. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 522 Business Research Methods 3 Credits (3,0)
Students are introduced to the art and science of solving business research problems and becoming better users of research. Topics include research design, the scientific method and other research methodologies, problem formulation, operational definition, measurement and its impact on error and design, classification and modeling. An introduction of a style manual for the preparation of a research proposal is covered. Students will analyze data and interpret results using a variety of statistical tools. Prerequisite: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 523 Advanced Aviation Economics 3 Credits (3,0)
This course pursues an economic analysis of the global airline industry. Topics include the history and economic rationale of government regulation and the effects of worldwide liberalization, demand for air transportation and modeling, pricing and revenue management, supply and route architecture, cost structure and methods of control, and fleet selection and financing. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 604 International Business Administration 3 Credits (3,0)
This course addresses international business through the examination of major issues challenging those managers operating in the international business environment. Ways to enter foreign markets and the forces work for and against that entry are examined. Financial issues, to include foreign currency exchange, hedging techniques, and the International Monetary Fund are examined. Structuring organizations within the economy are analyzed. Human resources issues are also examined, to include culture, the labor force, communications, effective teamwork, and ethics. Strategic planning is reviewed in terms of the various components that contribute to the successful conduct international business. Trade theory, tariffs, the theory of absolute and comparative advantage, and trade barriers, are also discussed and examined in terms of global operations. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 611 Airport Management 3 Credits (3,0)
In this course students have the opportunity to gain significant knowledge of the broad aspects of managing airports. Topics include air-carrier relationships, governing body relationships, regulatory compliance, physical plant management, vendor relationships, zoning and land use issues and more.

MBAA 612 Air Carrier, Passenger, and Cargo Management 3 Credits (3,0)
The course provides students with a broad perspective of passenger and cargo air carrier management. Topics include the role of air transportation in global economic development, alternative strategic approaches to route structure and product design, fleet selection, finance, and revenue management. Distribution systems including the role of travel agencies, freight forwarders, global distribution systems, and Internet portals are explored. The regulatory foundation of international aviation, the effects of liberalization and privatization, and emerging global alliances receive attention. The course concludes with a review of the evolving role of governments, airports, and air carriers in protecting the security of passengers and cargo.

MBAA 616 Managing Human Factors in the Aviation/Aerospace Industry 3 Credits (3,0)
This course provides an overview of managing the human role in all aspects of the aviation and aerospace industries. Emphasis is on issues, problems, and solutions of unsafe acts, attitudes, errors, and deliberate actions attributed to human behavior and the roles supervisors and management personnel play in these actions. Students examine a variety of human factors and evaluate how management intervenes to foster, correct, or alter these factors. Some of the key factors examined include the human limitations in the light of human engineering, human reliability, stress, medical standards, drug abuse, and human physiology. Discussions include human behavior as it relates to the aviator's adaptation to the flight environment, as well as the entire aviation/aerospace industry's role in meeting the aviator's unique needs. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 630 Customer Value 3 Credits (3,0)
This course examines ways that high performing companies consistently meet and exceed customer desires. Emphasis is on understanding and identifying customers wants and needs, customer orientation, product or service differentiation and value-creating processes to attract, maintain, and retain customers through relationship management. Topics covered will provide managers with a blueprint for responding effectively to customer demands while creating value attributes to sustain an organization in service and product excellence. Customer value themes will address how companies respond to change, customer loyalty, and more. The course explores the use of best practices in various manufacturing and service related industries that model effective customer value behavior, customer satisfaction, e-services, integrated marketing communications, and information-based organizations.
Prerequisites: MBAA 514.

MBAA 632 Global Marketing 3 Credits (3,0)
This course builds upon the concepts in marketing from a more global perspective with a hands-on understanding of current issues and events found in the international market. Students will apply the 4Ps to global marketing with an emphasis on understanding the legal, regulatory, political, language, and other cultural factors that influence products and services in other markets.
Prerequisites: MBAA 514.

MBAA 633 Digital Marketing 3 Credits (3,0)
This course explores the digital marketing technology that has changed the way customers, retailers, manufacturers, and marketers utilize information in the marketing domain. Topics discussed are the use of technology that influences the way customers shop, how products and services are marketed, and how customer information can improve the marketing mix. Students will learn the various aspects of technology marketing with an emphasis on analytical data collection with social media, impact with mobility devices, beacon technology used for mapping store layout or used for security, and other adoption of new technology that impact business.
Prerequisites: MBAA 514.

MBAA 635 Business Policy and Decision Making 3 Credits (3,0)
This is a capstone course in the MBAA program that expands on the skills, knowledge, and abilities the students have achieved in their core courses. Students examine applications of long-term planning and management tools in aviation related industries, and formulate the strategic vision and policies to achieve such a perspective. Emphasis is on research and analysis in the field of Strategic Management. Applications of the concepts are applied to the domestic and international activities of airlines, airports, manufacturing, service, merchandising and government organizations to sustain a competitive advantage. Prerequisite: Completion of all MBAA core courses: MBAA 514, MBAA 517, MBAA 518, MBAA 522, MBAA 523, and MBAA 604.

MBAA 641 Public Leadership 3 Credits (3,0)
This course examines the elements found in public leadership. Reviews the different leadership theories associated with the public leader including early theories, change in theories, and ideal theories. Evaluates leadership in the public and non-profit sectors. Assesses the culture, society, and diversity as they relate to making leadership decisions. Compares the qualities of successful and poor performing leaders. Examines the ethical framework for public leadership. Explores new leadership modules and theories for the future. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 644 Public Finance 3 Credits (3,0)
This course examines the U.S. Federal Government fiscal finance structure and explores taxation, public debt, government public policy, and finance at the state and local levels of government. Reviews the basis for taxation, economics as it relates to government activities, public policies such as Social Security, government subsidies, and health care. Provides insight on how the federal, state, and local governments allocate and compete for resources. Interprets various economic principles as they relate to government spending. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the Graduate Program Chair.

MBAA 646 Public Human Resource Management 3 Credits (3,0)
This course focuses of the functions to be accomplished in effectively managing human resources in the public and nonprofit sectors. Reviews labor law and regulatory constraints. Areas of concentration include planning, recruitment and selection, training and development, compensation, safety and health, outsourcing, privatization, collective bargaining, and the Civil Service Commission. Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 648 Public Policy 3 Credits (3,0)
This course evaluates the elements associated with the public policy process. Describes the historical challenges in public policy. Focuses on current methods to address public issues. Outlines the role of each level government in the policy making process. Interprets the changing relationship between government and business. Reviews economic issues such as taxing, spending, and budgeting. Justifies public policy in the areas of energy and the environment, crime and criminal justice, poverty and social welfare, health care, education, legal and social equity, immigration, and foreign policy and defense. Compares private ethics and morals to society and the Constitution.Prerequisites: Satisfactory completion of Business and Research Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MBAA 653 International Finance 3 Credits (3,0)
This course introduces the student to the role of international financial considerations in the development of corporate financial policy. The course will examine the international financial management environment with an emphasis on exchange rate behavior, risk management, and asset management from a global perspective.
Prerequisites: MBAA 518.

MBAA 658 Money and Banking 3 Credits (3,0)
This course introduces the student to the role of money and banking as they relate to business. The course studies and analyzes the financial system, money and payments, the fundamentals of banking, macroeconomics, and monetary policy. Specific topics, such as, the federal reserve system, monetary policy, fiscal policy, the government's role in banking, interest rates, economic growth and business cycles, stocks, demand and supply, and economic interdependence will be addressed.
Prerequisites: MBAA 518.

MBAA 662 Intermediate Accounting I 3 Credits (3,0)
This course provides an in depth examination of accounting theory as it applies in a business setting. To help insure business success a firm needs to properly account for its financial resources. This course addresses many financial areas where the proper application of financial accounting and accounting standards would benefit the business firm. These areas include financial reporting, cash and receivables, intangible assets, acquiring and disposing of property, plant, and equipment, financial statements, depreciation, depletion, and the time value of money.
Prerequisites: MBAA 517.

MBAA 663 Intermediate Accounting II 3 Credits (3,0)
This course is a continuation of MBAA 662. The business accounting topics addressed in this course include; revenue recognition, stockholders equity, pensions, leases, the statement of cash flows, full disclosure and financial reporting, investments, current and long-term liabilities, dilutive securities and earnings per share, and error analysis.
Prerequisites: MBAA 662.

MBAA 667 Federal Taxes 3 Credits (3,0)
This course examines the application of federal taxes as they apply to individuals, partnerships, and corporation. The understanding of federal tax laws allows the firm (sole proprietorship, partnership, or corporation) to make spending and investment decisions that ultimately will help realize the financial and other goals of the firm. This course will address such topics as; tax authorities, tax planning and strategies, individual incomes taxes, corporation income taxes, and partnership income taxes.
Prerequisites: MBAA 517.

MBAA 691 Graduate Aviation Research Proposal 3 Credits (3,0)
This course serves as a foundation for the preparation of the mandatory Graduate Aviation Research Study (GARS). The course provides an opportunity to apply the various research tools and techniques learned in MBAA 522 for the completion of the GARS. The course enables students to identify an aviation/aerospace business problem and to apply the most appropriate analytical tools and statistical methods. The purpose of the course is to have students complete a Graduate Aviation Research Proposal. This proposal will be assessed and approved by the Graduate Aviation Research instructor.

MBAA 692 Graduate Aviation Research Study 3 Credits (3,0)
In this course students must complete their Graduate Aviation Research Study (GARS). The purpose of the GARS is to present answers to questions that are pertinent and useful to some area within the aviation/aerospace industry management topic. This course builds upon MBAA 691, by completing the GARS and providing a solution to the problem identified in MBAA 691.
Prerequisites: MBAA 691.

MBAA 699 Special Topics in Business Administration 1-3 Credit (1-3,0)
In this course, students elect to perform a special, directed analysis and/or independent study in an area of particular interest. Candidates selecting this elective must prepare a detailed proposal for the desired project and present the proposal to the graduate program chair or department chair for faculty review. Proposals must be submitted at least four weeks prior to the start of the term in which the elective is being taken. Prerequisite: Permission of the appropriate Department Chair.

MBAA 700A Thesis I 3 Credits
A written document on an aviation/aerospace management topic supervised throughout its preparation by the student's Thesis Committee, which demonstrates the student's mastery of the topic and is of satisfactory quality for publication.
Prerequisites: MBAA 522.

MBAA 700B Thesis II 3 Credits (3,0)
This is a continuation of MBAA 700A. A written document on a business topic supervised throughout its preparation by the student's Thesis Committee, which demonstrates the student's mastery of the topic and is of satisfactory quality for publication.
Prerequisites: MBAA 700A.

Business (BUSW)

Courses

BUSW 500 Business Foundations 3 Credits (3,0)
Students are introduced to several topics that are foundational to graduate programs in the College of Business. Topics include basic: accounting, finance, economics, marketing management science. Additionally, students will learn qualitative and quantitative research fundamentals and review basic statistics. Students will also be introduced to APA writing style and the library resources available for ERAU students. MSM Students are also introduced to the requirements for the Graduate Capstone Project.

Co-Operative Education & Internship (COIN)

Courses

COIN 696 Graduate Internship 1-3 Credit (1-3,0)
Temporary professional or industrial work appointment made available to students enrolled in graduate programs at the University. An internship provides graduate students with an opportunity to extend their academic endeavors through the application of the theories and philosophies studied in the classroom to specific professional activities coordinated by the University between offering organizations and the graduate student. Prior approval of the graduate program chair is required.

Cybersecurity Management and Policy (MCMP)

Courses

MCMP 501 The Internet, Security, and Governance 3 Credits (3,0)
This course examines how the Internet and associated communication technologies have created new means for people to organize, both within their local communities and across great distances, changing the nature of the relationship between society and the institutions of government. The Internet has allowed people to communicate often without detection, resulting in both positive and negative effects; e.g., Internet- based communications have been a significant factor in the growth of transnational terrorism and popular uprisings, such as the Arab Spring. In response, governments have often attempted to control the Internet, in some cases to aid legitimate law enforcement, in others to repress restless populations seeking change. State institutions can also use these technologies to create more effective governance and better responses to humanitarian crises.

MCMP 510 The Practice of Cybersecurity 3 Credits (3,0)
The course introduces principles of cybersecurity, providing a framework covering technical, legal, and managerial issues. Students will examine computer and network security from the perspectives of the industry-standard ten core bodies of knowledge: access control; telecommunications and network security; information security governance and risk management; software development security; cryptography; security architecture and design; operations security; business continuity and disaster recovery planning; legal, regulations, investigations and compliance; and physical (environmental) security.

MCMP 520 Security Engineering and Management 3 Credits (3,0)
This course is designed to teach how cybersecurity should be integrated early on in any project or other use of information in a computer or network setting. Emphasis is placed on the relationship between information and the operation and mission of an agency, business, organization, or other entity. This course specifically ties together information and communications technology (ICT), cybersecurity, business, policies, and ethics. Topics include security engineering concepts (although this is not an engineering course), distributed systems, network attacks and defense, security management, encryption, the role of training and education, and more.

MCMP 615 International Law and U.S. Security Policy 3 Credits (3,0)
The course examines the role of international law, U.S. foreign policy, and international institutions in responding to terrorism, crime, complex emergencies, disasters and crises. It analyzes the challenges and difficulties in achieving unified response and the administrative and legal barriers that must be overcome. The course discusses how U.S. laws and policies intersect with international norms and regimes in a US security context, including existing multinational treaties such as UNCLOS and the Antarctic Treaty System, International Cybercrime Treaty, the Biological Weapons Convention or the Chemical Weapons Convention, and international humanitarian law. Particular attention is paid to privacy laws. The conflicts that are caused by disparate laws and policies will also be explored, as well as challenges to solutions.

MCMP 616 Aviation Policy and Law in Cyberspace 3 Credits (3,0)
This course addresses emerging policies and laws that affect cyberspace, particularly related to information security and cybercrime in the aviation and aerospace industry. The clash between real space and cyberspace is examined, as well as international laws and policies related to aviation, aerospace, and aeronautics.

MCMP 650 Emerging Topics in Cybersecurity 3 Credits (3,0)
This course examines the current research literature concerning issues related to cybersecurity. Topics will include, but not be limited to, current research topics in information assurance, cybersecurity policy, information warfare and the Advanced Persistent Threat, policy and law in cyberspace, evolving information security technologies and methods, new approaches to incident response and digital forensics, emerging threats and adversaries, and the impact of cybersecurity on society and organizations. Students will focus on research techniques, as well as the presentation of results, legal issues, and relevant technologies. Prerequisite: Completion of at least two MCMP 500-level courses.

MCMP 651 Topics in Aviation Cybersecurity 3 Credits (3,0)
This course employs a multi-pronged approach to the study of problems related to cybersecurity related to the aviation, aeronautics, and aerospace industry. The course will describe the cyber threat landscape, and apply the lessons of cyber defense to many actors within the aviation and aeronautics industry, including airlines, airplanes, manufacturers, airports, cargo and other vendors, unmanned systems, and more. Topics include cyber threats to all aspects of the industry, including communications, navigation, supply chain, and airports. Frameworks andbest practices being devised to protect assets from the cyber attack vector, as well as vulnerabilities, protection, and countermeasures, will also be examined. The course will also explore the current research literature concerning cybersecurity and information assurance as it impacts the greater aviation industry.

MCMP 690 Cybersecurity Management and Policy Capstone I 3 Credits (3,0)
This course will provide students with the opportunity to integrate all disciplines and competencies that have been learned in this program, plus their past experiences and professional goals, into a single work-based project, internship experience, or other appropriate activity. The project will be the culmination of a student's studies integrated in their area of specialization or expertise. In cooperation with an advisor or program chair, the student will design, research, and implement a project that is comprehensive in nature and which addresses, to the extent feasible, all core areas of knowledge around which the program has been built. The capstone is intended to be a six-credit experience. Depending upon the project, and with instructor and advisor guidance, Capstone I (MCMP 690) and Capstone II (MCMP 691) can be taken in sequential terms or both in a single term. Prerequisite: Completion of at least 21 credits in the MS in Cybersecurity & Management Policy program.

MCMP 691 Cybersecurity Management and Policy Capstone II 3 Credits (3,0)
This course will provide students with the opportunity to integrate all disciplines and competencies that have been learned in this program, plus their past experiences and professional goals, into a single work-based project, internship experience, or other appropriate activity. The project will be the culmination of a student's studies integrated in their area of specialization or expertise. In cooperation with an advisor or program chair, the student will design, research, and implement a project that is comprehensive in nature and which addresses, to the extent feasible, all core areas of knowledge around which the program has been built. The capstone is intended to be a six-credit experience. Depending upon the project, and with instructor and advisor guidance, Capstone I (MCMP 690) and Capstone II (MCMP 691) can be taken in sequential terms or both in a single term. Prerequisite: MCMP 690 or concurrently taking MCMP 690.

Engineering Management (EMGT)

Courses

EMGT 514 Professional Service Marketing 3 Credits (3,0)
This course will introduce students to marketing in a service and customer driven context. The course will examine the differences between marketing tangible goods and services. Marketing issues related to these differences will be identified and solutions/alterations necessary to market services will be explored. The Gap model of service quality will provide the framework for exploring the topics of the class.

EMGT 523 Engineering Economic Analysis 3 Credits (3,0)
Optimizing financial performance is a key responsibility of the engineering manager. This course will present students the major concepts and techniques of engineering economic analysis needed in the decision making process. Concepts covered will include time value of money, discounted cash flows, break-even analysis, tax implications and analysis of single and multiple investments. Prerequisites: BUSW 500 or permission of Graduate Program Chair.

EMGT 618 Introduction to Financial Engineering: Futures and Options 3 Credits (3,0)
This course examines the use of forwards, futures, SWAPS and other financial derivatives for hedging, arbitrage and speculative purposes in the global environment. The course focuses on how firms use these instruments to manage risks such as exchange rate risk, interest rate risk and commodity price risk. The emphasis is on understanding the mechanics, valuation and management techniques behind financial engineering using these derivatives.
Prerequisites: MBAA 518 or EMGT 523.

Entrepreneurship Technology (MOET)

Courses

MOET 601 Entrepreneurship: Exploration, Opportunity and Effectuation 3 Credits (3,0)
This course provides the student with a broad introduction to the fundamental principles, processes, and practices associated with entrepreneurship in the aviation/aerospace global environment. The course will focus on entrepreneurial exploration from the perspective of creative thinking and problem solving to identifying opportunities and business development within the aviation/aerospace industry. Students will research and understand effectuation logic and how it applies to opportunity identification, innovation, and new venture creation.

MOET 606 Entrepreneurship Ethics, Sedulity and Solutions 3 Credits (3,0)
This course examines the characteristics of entrepreneurs and identifies the survival skills needed to be successful. The course will research and analyze the successes and failures of entrepreneurs, their ventures, and any associated business models. The course will focus on the ethical elements that shape or impact market activity by an individual entrepreneur or within an organization. Sources that support decision making, communications, planning and networking, negotiating, and discipline to create solutions in aviation/aerospace technology-based ventures will be identified and examined.

MOET 611 Technology Commercialization and Entrepreneurship in the Global Environment 3 Credits (3,0)
This course prepares students in understanding the application of technology commercialization and the factors associated with entrepreneurship in a global environment, including intellectual property, market, and team factors. The factors to be considered will include the goals and objectives of the global markets, steps for commercialization, global opportunities for entrepreneurs, barriers of importing and exporting products, management and development of new products, and finally the strategy to firm up the process. Students will evaluate current market opportunities and research options for improvement or analyze future technologies which will result in successful results. Additionally, the course will introduce students to the legal concepts that are an integral part of entrepreneurship; conception of a technology-based ideas to exit strategies. The student will gain an understanding of legal protection and liability, ownership, market IP, agreements, and contracts as well as examine the challenges of the regulatory process and look at interventions to achieve success.

MOET 691 Entrepreneurship Technology Capstone 3 Credits (3,0)
The Master of Entrepreneurship in Technology Capstone Course is the culminating effort of a student's entire learning experience. The student will complete an individual project or group project that provides significant evidence of experience in entrepreneurship and technology studies. Students will work with designated faculty to formulate, develop, and complete the project. The completion of the Capstone Course is designed to document significant evidence that all Program Outcomes have been met, and provides the student evidence of experience to show current and prospective employers. The Capstone Course must be taken at the end of the student's degree program. Prerequisite: All Master of Entrepreneurship in Technology degree program curriculum.

Human Factors (MSHF)

Human Factors Courses

MSHF 606 Human Cognition 3 Credits (3,0)
This course examines human cognitive processes, both simple and complex, and normal human cognitive functioning. It provides an overview of what human cognition is and what it involves. It examines the processes by which humans gather data and information, including how humans sense and perceive the surrounding environment to how humans recall and process data and information from all forms of memory. The course also examines the impacts of constructs such as attention, sensation, and perception on those processes. Next it examines how humans organize knowledge in the mind, as well as the impact language has on doing so. It also examines the impact of reasoning and creativity on the processes of risk assessment, problem solving, and decision making. Finally the course provides an overview of human decision making strategies, including the differing requirements, strengths, and weaknesses of each strategy, as well as of strategies for decision making in dynamic environments.

MSHF 612 Human Performance, Limitation, and Error 3 Credits (3,0)
This course examines the psychological and physiological performance capabilities of humans as related to human cognition. It also examines the limitations of that performance, both common and individual, and how these limitations are impacted by systemic variables such as the environments in which humans work and individual behavioral attributes. It then examines how human performance capabilities and limitations can collectively result in human error as well as examining the types and nature of those errors.
Prerequisites: MSHF 606.

MSHF 618 Virtual Environments, Simulation and Robotics 3 Credits (3,0)
The course examines the application of virtual, robotic, and simulated environments as a means to further the fields of aerospace, medicine, and engineering, through the enhancement of communications, operations, and training interfaces between humans and computers or other complex systems. The course researches applications in advanced robotics, simulation, and virtual environments and then analyzes and evaluates their benefits and challenges to the human interface and effective environments. Systemic resolutions to challenges are also investigated.
Prerequisites: MSHF 606 and MSHF 612.

MSHF 624 Ergonomics and Biomechanics 3 Credits (3,0)
This course examines in depth the principles and applications of ergonomics and biomechanics in engineering, aerospace, industrial hygiene, occupational safety and health, and other technical industries. The course focuses on the biomechanical foundations of design of the workplace, tasks and tools, and analyzes human anatomy, anthropometry, kinematics, and musculoskeletal disorders. The course also explores the regulatory environment, identifying and evaluating risk factors, and implementing ergonomic hazard controls.
Prerequisites: MSHF 606 and MSHF 612.

MSHF 640 Human Physiology and Adaptation in Aerospace Environments 3 Credits (3,0)
This course examines in depth the principles and critical elements of aerospace physiology, to include human performance, adaptation and significant challenges to the human body and mind in low and high-altitude/space flight and low-pressure and low-gravity environments. Specific topics include the physics of atmosphere, radiation environments, acceleration physiology, systemic physiological responses, sensorimotor interactions, environmental pathologies (e.g. circadian dysrhythmia, spatial disorientation, hypoxia, visual anomalies), and the effects of stimulants, disease and injury. Life support equipment and high performance aircraft are also explored.Prerequisites: Capstone Option: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670/ Thesis Option: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670.

MSHF 646 Industrial Applications in Aerospace 3 Credits (3,0)
This course examines human factors principles and elements in developing and designing effective processes and applications for the aerospace industry. The course provides a working knowledge in areas of cognitive neuroscience and cognitive engineering, performance analysis, modeling, intelligent systems, and control design. Topics of emphasis examine neuroengineering, simulation and virtual environments, distributed cognition, adaptive technology, investigative approaches, engineered standards, human-robot collaboration, and other aerospace applications incorporating human factors considerations. The course builds a foundation for researching and designing operational applications in several venues for the aerospace industry. An orientation focusing on current and emerging technologies assesses approaches to integrate human factors elements and to collaborate effectively within the industry environment. Methods in the course employ scenario-based platforms and synthesizing learning from multiple disciplines.Prerequisites: Capstone Option: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670/ Thesis Option: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670.

MSHF 652 Crew Platform Automation, Design, and Integration 3 Credits (3,0)
Human performance and other human factors considerations involved in the automation, design, and systems integration of crew platforms are examined. The focus of this examination is on the elements enabling improvements in the efficiency, effectiveness, and safety of operations as related to crew platform function. The impact of normal human cognition and physiology as well as variables in human cognitive and physiological performance and limitations on crew platform design, human interface, automation, integration, human error, and operations in both piloted aircraft and unmanned aerial systems (UAS) are also examined.Prerequisites: Capstone Option: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670/ Thesis Option: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670.

MSHF 691 MSHF Graduate Capstone Course 3 Credits (3,0)
The Master of Science in Human Factors Capstone Course is the culminating effort of the student's entire learning experience. The student will complete an individual project that provides significant evidence of experience in Human Factors. Students will work with designated faculty to formulate, develop, and complete the Human Factors individual project. The completion of the Capstone Course is designed to document significant evidence that all Program Outcomes have been met, and provides the student evidence of experience to show to current and prospective employers. The Capstone Course will be taken at the end of the student's degree program. NOTE: MSHF 691 must be taken as the final course in the MSHF program. With approval from the Program Chair, a student may undertake MSHF 691 in parallel with ONE final course only. Prerequisites: Aerospace Track: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670, ASCI 634, MSHF 640, MSHF 646, MSHF 652, SYSE 653/ Systems Engineering Track: MSHF 606, MSHF 612, MSHF 618, MSHF 624, RSCH 665, RSCH 670, SYSE 500, SYSE 641, SYSE 647, SYSE 653, MSHF 646.

MSHF 700A MSHF Thesis I 3 Credits (3,0)
This course is the first of a two course sequence (MSHF 700A and 700B) to complete the degree program through the accomplishment of a thesis. The student will propose and begin to develop a written document on a Human Factors topic, supervised throughout its preparation by the student's Thesis Committee. The document is intended to demonstrate the student's mastery in a topic of Human Factors and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will continue on to MSHF 700B for the completion and submittal of the thesis. Prerequisites: For the Aerospace Track: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670, ASCI 634, MSHF 646, and MSHF 652./For the Systems Engineering Track: MSHF 606, MSHF 612, MSHF 624, RSCH 665, RSCH 670, SYSE 500, SYSE 647, and SYSE 653.

MSHF 700B MSHF Thesis II 3 Credits (3,0)
This course is the second of a two course sequence (MSHF 700A and MSHF 700B) to complete the degree program through the accomplishment of a thesis. The student will complete their thesis under the supervision of the student's Thesis Committee. The document is intended to demonstrate the student's mastery of the topic and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will be permitted to graduate from the program. Prerequisite: MSHF 700A.
Prerequisites: MSHF 700A.

Human Security and Resilience (MHSR)

Courses

MHSR 501 The Internet, Security, and Governance 3 Credits (3,0)
This course examines how the Internet and associated communication technologies have created new means for people to organize, both within their local communities and across great distances, changing the nature of the relationship between society and the institutions of government. The Internet has allowed people to communicate often without detection, resulting in both positive and negative effects; e.g., Internet- based communications have been a significant factor in the growth of transnational terrorism and popular uprisings, such as the Arab Spring. In response, governments have often attempted to control the Internet, in some cases to aid legitimate law enforcement, in others to repress restless populations seeking change. State institutions can also use these technologies to create more effective governance and better responses to humanitarian crises.

MHSR 510 Introduction to Human Security 3 Credits (3,0)
In contrast to traditional state-centered models of security, human security focuses on the individual and his/her multifaceted security needs. This course provides an overview of the emerging Human Security paradigm, including the development of the concept and the difficulties of both defining and measuring human security. Each of the component parts of human security, such as economic vulnerability and food vulnerability, and the challenges to alleviate them, are explored more deeply through case studies. Low levels of human security are often associated with high levels of instability and conflict. This course will address the debate within the international community on the actions that more powerful states should take to address human security deficits in places with little government capacity.

MHSR 520 Principles of International Conflict Resolution 3 Credits (3,0)
The course exposes students to the different kinds of organized, violent conflicts that exist in today's world and surveys different theories seeking to explain why and how these conflicts have occurred. The course examines how states and other international actors such as the United Nations have sought to resolve these conflicts and establish stable societies in their wake. The course discusses diplomatic, economic, legal, military, and nation-building approaches to conflict resolution, and uses case studies to demonstrate their application to recent conflicts.

MHSR 530 Environmental Security 3 Credits (3,0)
Students will learn how environmental issues may give rise to socio-political instability around the world. This course explores how development and execution of U.S. domestic and foreign policy, and ultimately, U.S. national security, can be impacted by emerging threats to states from environmental health issues, infrastructure vulnerabilities, and natural resource shortages caused by rapid industrialization, population growth, and urbanization in less developed countries. It will also examine transnational threats from deforestation and global warming. Students will have the opportunity to link their experiences in localities across the globe to course themes through projects and problem-based learning activities.

MHSR 540 Foundations of Resilience 3 Credits (3,0)
Resilience embraces the concepts of awareness, detection, communication, reaction (and if possible avoidance) and recovery. The term also suggests an ability and willingness of societies and other groups to adapt over time to a changing and potentially threatening environment. The course includes risk management principles, communication of risk, crisis management, information management and assurance, and approaches for developing resilient critical infrastructures, strategies, and organizations.

MHSR 615 International Law and U.S. Security Policy 3 Credits (3,0)
The course examines the role of international law, U.S. foreign policy, and international institutions in responding to terrorism, crime, complex emergencies, disasters and crises. It analyzes the challenges and difficulties in achieving unified response and the administrative and legal barriers that must be overcome. The course discusses how U.S. laws and policies intersect with international norms and regimes in a US security context, including existing multinational treaties such as UNCLOS and the Antarctic Treaty System, International Cybercrime Treaty, the Biological Weapons Convention or the Chemical Weapons Convention, and international humanitarian law. Particular attention is paid to privacy laws. The conflicts that are caused by disparate laws and policies will also be explored, as well as challenges to solutions.

MHSR 680 Topics in Human Security and Resilience 3 Credits (3,0)
This course will provide students with the opportunity to explore current and emerging topics in human security, resilience, critical infrastructure security, and several other topics as they develop. As the discipline of human security and resilience is dynamic and complex, not all relevant topics can be integrated into the MHSR core curriculum. The main function of this course is to provide a platform to explore pertinent and topical expressions, policies, challenges or dangers to security/resilience as they occur across the globe. As such, each semester will thoroughly explore a given topic and learn how the topic presents national security or homeland security challenges to the US. Students will be expected to synthesize relevant literature and analyze trends and data in order to make the connections to US security.

MHSR 690 MHSR Capstone 3 Credits (3,0)
This course provides students with the opportunity to integrate all disciplines and competencies that they have learned in the program, plus incorporate their past experiences and professional goals into a single work-based project, internship experience, or other appropriate activity. In cooperation with an advisor, the student will design, research, and implement a project that is comprehensive in nature and which addresses, to the extent feasible, all core areas of knowledge around which the program has been built.

Information Security and Assurance (MISA)

Courses

MISA 501 Assured Business Systems: Managing and Protecting the Information Systems Enterprise 3 Credits (3,0)
This course provides the two major foundation elements for the MSISA program. It first reviews the many ways in which computation, communications and information systems are used to identify and solve problems, recognize opportunities and generate competitive advantage. It then focuses attention on the importance of assuring that those systems achieve the reliable decision support that organizations require. It does this by looking first at the risks to those systems - risks incurred by their builders and designers through poor design or undisciplined use that can present hackers, criminals and one's own employees the opportunity to cause harm. It then uses the concepts of the "enterprise perspective" to demonstrate the various information systems used to lead, manage and operate a variety of organizations, while exploring the need for organizations large or small, public or private, to sustain their own existence through continuity planning and risk management.

MISA 502 Risk Management and Business Continuity 3 Credits (3,0)
Business continuity is the study and practice of making smart risk management decisions that protect and enhance the organization's ability to survive and flourish despite the hazards of the real world. This view of resilience focuses on getting the organization's mission accomplished in part because the organization is flexible enough, responsive enough to meet changing circumstances. Risk management, therefore, is about identifying potential events that could impede the accomplishment of those objectives, and then making cost-effective choices as to whether to absorb, ignore, transfer or mitigate that potential impact. This planning and decision making is an ongoing task that management must perform - well in advance of the occurrence of a hazard, during the event itself, and after the repairs and remediation are complete. While there are many schools of thought about risk, and therefore many categorization schemes about risk, this course takes the perspective that risk is about decision making, and therefore information risk is the fundamental risk that must be managed. The course assesses the different perspectives on information risk -- asset-based, threat-based, process-based, or outcomes-based -- and then looks to the different strategies that can be used to deal with such risks and their potential costs and impacts. Students will then examine the central role that information risk management plays in organizational continuity, and how this dictates the need for effective continuity planning.

MISA 503 Informatics: Security Implications of Cross-Disciplinary Computing 3 Credits (3,0)
Informatics is the study of natural and engineered information systems and how people and organizations use them to leverage what they know to solve problems and create opportunities. Countering the threats and hazards that face a modern information-based organization requires the same kind of interdisciplinary approach. Many "threat actors" are using an informatics frame of mind to consider, plan and conduct their attacks; this course challenges the information systems security and decision support assurance professionals to respond by applying that same informatics paradigm across the range of organizational processes and behaviors, from risk mitigation and management to strategic, tactical and operational planning.

MISA 504 Enterprise Systems Architectures for Information Assurance 3 Credits (3,0)
Protection of information in systems architectures is a complex, multidisciplinary challenge. Maintaining the confidentiality, integrity, and availability of critical information in interconnected, dynamic architectures presents multiple dimensions of risk to the systems architect. It also challenges the architecture team that typically consists of product managers, designers, developers, project, program management as well as sales and marketing to clearly understand the technology, processes and tools needed for the architecture when delivering the architecture design to customers and suppliers. This course examines information assurance challenges in the context of complex systems with interconnected processes, complex product and technology design and enterprise domains. Topics to be covered include systems architectures, information assurance objectives, and systemic risk.

MISA 505 Incident Management and Information Forensics 3 Credits (3,0)
The compromise, theft, or sabotage of information systems vital to the organization's activities and objectives can have a profound effect on an enterprise. Investigating such incidents requires a special form of problem-solving that combines technical, legal and organizational skills and insights to solve the right problem without creating more in its wake. This calls for information systems forensics specialists, people who know how to find and follow the evidence, and managers who know why, when and how to put the forensics process to work in defense of the organization.This course explores system forensics processes and tools, and the implications this has both for the information security professional as well as the organization. The first part of the course includes a study of foundational concepts of the nature of security incidents, forensics techniques, and the evidentiary process. It considers the various roles that forensic specialists play in preparing the organization to deal with incidents including controlling, conducting and reporting on the investigation and resolution of information systems incidents. The second part of the course provides an opportunity for students to apply foundation concepts against sample and potential incidents, drawing from case studies and media reports. Students will consider various types of information systems forensic evidence and apply various tools and forensic analysis skills for incident investigation. Additional topics include communicating investigations and findings to organizational leadership as well as emerging technical frontiers of computer forensics.

MISA 506 Cyber Law, Cyber Compliance, and Information Assurance 3 Credits (3,0)
Virtually every aspect of the way in which organizations collect, generate, use, modify and dispose of information as a part of their daily operations is quite likely the subject of laws, regulations, government policies, or other aspects of modern society. As governments continuously reset the balance between protecting the rights and needs of the individual citizen, vs. the need for business and government to get things done in cost-effective ways, these laws and regulations place dynamic, evolving functional requirements demands on the information systems that organizations must use. This course examines the many different regulatory regimes levied upon organizations by the marketplaces they operate in -- and guides the student in identifying key management considerations that should drive information systems design and operational use. One key fundamental concept emerges: information assurance, in assuring management that all of these compliance issues are effectively dealt with, is in and of itself a risk management decision.

MISA 507 Quality Management for Information Assurance 3 Credits (3,0)
Quality management provides a systems engineering approach that focuses on process design to achieve objectives, without having to rely upon exhaustive testing or inspection of outputs to achieve desired outcomes. This course applies this concept across the life cycle of information in organizations, and the information systems that generate and make that information useful -- including the information systems used to keep the "front-line" systems alive and secure.

MISA 523 Information Advantage -- Defensive: Countering Self-Deception and External Deceptions 3 Credits (3,0)
Defending the image and reputation of an organization, and assuring the value of the business intelligence it gathers and creates, is critical to protecting and enhancing that organization?s competitive advantage within the marketplace. As such, leaders must effectively manage information and mitigate the risk of deception within internal and external environments. Managing the perception of an organization?s image and reputation requires a proactive approach given advances in technology and globalization. This course borrows heavily from the traditions of information warfare practiced over centuries and translates them into a business and organizational context. Perception management topics will include a comprehensive review of threats, risk analysis, control techniques, and managerial/crisis issues. This course also offers defensive skills, tools and processes necessary to eliminate or counter the negative ramifications of erroneous information, corrupt practices and espionage. From a management perspective learners will explore strategic methods designed to protect intelligence and maintain an information advantage.

MISA 531 Secure Information Systems Design 3 Credits (3,0)
Designing information systems with security and assurance goals in mind provides an important foundation to deploy secure solutions and support ongoing assurance in systems operations. Approaches that, in contrast, minimize the gathering of security requirements during design stages can be expected to result in substantial effort to engineer security into an existing system as the system is deployed. Adoption of secure design practices enables a much more efficient path to the deployment of secure systems. Secure design is an important concern for business analysts as they identify functional requirements, as well as to developers as they transform requirements and design elements into a working system. IT management strives to implement and deploy the system using secure systems design principles. But most importantly, it is as the business owners and operational managers assume functional ownership of deployed systems, and use it as they strive to build a resilient enterprise, that secure information systems design principles realize their greatest payback.

MISA 532 Integrated Threat Warning and Attack Assessment for Enterprise Information Systems 3 Credits (3,0)
Virtually every organization large or small faces a non-stop demand to be connected -- with competitors and customers, with regulators and suppliers, and especially with its own shareholders, stakeholders and employees. The sheer volumes of data exchanged and their complexity and sophistication are growing faster than ever before, which makes it even more difficult for organizations to detect, isolate and characterize potential hazards, and separate the accidents or non-deliberate from potentially hostile actions. Faced with this ever-increasing volume of more complex information interchange, organizations must use more powerful and sophisticated techniques to help sift suspicious network activity from routine traffic. Some of the most promising of these increasingly sophisticated monitoring techniques employ aspects of machine learning. This course provides the foundational knowledge for appropriately deploying those techniques. Topics include security risks and vulnerabilities, mobile systems, social networks, and ways to enhance system security.

MISA 533 Product and Systems Safety and Reliability: Issues for Information Assurance 3 Credits (3,0)
Technical risk is created whenever computing systems are integrated with products and services, as a computing failure cascades into the failure of the product or service that relies upon the technology. The management of cascading technical risks becomes more urgent, and therefore challenging, in the realm of safety-critical systems, where failure could potentially result in significant damage, physical losses, or loss of life. Ever-increasing reliance on computerization for the control of physical assets such as vehicles and production facilities creates an increased need to address product and systems safety and reliability. Information assurance principles can and should be applied throughout such environments to ensure continuous, reliable system function.

MISA 534 Aviation / Aerospace Issues for Information Security 3 Credits (3,0)
During the past decade, airlines have made substantial investments in information technology solutions. These solutions extend throughout the airline's environment and contribute to improved operational efficiency, safety, and customer satisfaction. Securing these investments and protecting the information that these systems manage requires knowledge, leadership, and an effective information security system. The introduction of advanced e-enabled airplanes and systems will provide an increased level of operational efficiency for the airlines. However, this means increased interaction with many information systems that are outside the traditionally defines airline security perimeter. This course provides an overview of information security for the air transport industry and for airline operators. It outlines the requirements for an information security framework, discusses how digital airplanes influence airline, airport and air transport system information security and describes a general information security strategy for aviation and airlines.

MISA 541 International Considerations for Information Assurance and Protection 3 Credits (3,0)
Globalization of information resources within enterprises and across the world via the Internet increases systems complexity, including the distribution of system users, data, and architecture across national boundaries. Increasing global distribution of information presents substantial assurance challenges. The resulting information systems environment is multi-national, and therefore under the scope of multiple political and legal jurisdictions, may support users from numerous national and organizational cultures, and may be subject to a wide variety of threats to local users and system components. Management is faced with significant obstacles to ensuring physical and cyber security of systems resources and the protection of information assets in an environment of sometimes limited transparency. Recognition of emerging risks and appropriate enterprise response across a global environment has become a functional requirement for organizations of all sizes that seek to build the most efficient and effective information systems regardless of the physical location of people, processes, and computing resources.

MISA 543 Assured Strategic Messaging: Keeping the Message Intact and Effective 3 Credits (3,0)
This course studies the role and impact of communication in achieving organizational goals through effective messaging. The communication strategy will focus on proven, effective strategies for understanding stakeholder information needs and translating them into clear and differentiated messaging. Specific attention will be placed on the following topics: identifying key internal and external audiences, developing communication goals and objectives, devising appropriate messaging, and creating a plan to reach designated stakeholders that uses the most efficient communication strategies and tactics. In addition, the course will explore industry trends, including the technological convergence of communication modes (voice, video and data), enterprise wide connectivity, distributed network environments, and the Internet.

MISA 544 The High-Reliability Enterprise Model 3 Credits (3,0)
Reliable and resilient enterprises are those that are built to withstand negative forces and events, which can also make them more agile, better suited to take advantage of unforeseen opportunities. This course demonstrates that the development of secure and reliable products and services, and the continuous operation of critical internal systems, is best achieved in an organizational environment that prioritizes information assurance. Organizational approaches to the implementation of standards, best practices, and quality principles are essential considerations and provide the foundation that enables and promotes the building of reliable, trustworthy systems. Dimensions of information quality, overall quality management, process maturity, and others combine to set an organizational tone that supports assurance objectives and drive enterprises to the effective management of enterprise risks.

Leadership (MSLD)

Courses

MSLD 500 Leadership Foundations in Research 3 Credits (3,0)
Students are introduced to several topics that are foundational to the Master of Science in Leadership Program. Topics include: critical thinking, fallacies, digital literacy tools, library research, and writing using the APA style manual. Additionally, students learn qualitative and quantitative research fundamentals and complete an action research project. Students are also introduced to the requirements for the Graduate Capstone ePortfolio.

MSLD 511 Organizational Leadership 3 Credits (3,0)
This course is designed for students to explore leadership in organizations. The course provides students with knowledge and a review of organizational leadership theory and research. It also examines the effects of internal and external organizational factors on leadership outcomes. Topics covered are the approaches and models of leadership, to include the nature of leadership, effective leadership behavior, strategic leadership by executives, leadership and organization change, group and team leadership strategies, and the associated ethical, gender based, cross-cultural and diversity oriented aspects of leadership.
Prerequisites: MSLD 500.

MSLD 520 Management Skills for Leaders 3 Credits (3,0)
This course emphasizes the integration of the individual into the organization by studying the current and fundamental issues in organization theory and organizational behavior as they relate to the individual. The effectiveness of the individual in the organization is examined in terms of personal traits such as communicative abilities, leadership style and potential, and beliefs about organizational ethics and social responsibility.
Prerequisites: MSLD 500.

MSLD 521 Leadership Communication 3 Credits (3,0)
This course explores the impact of communication in leading contemporary technical organizations and provides a broad survey of the technical aspects of communications. Emphasis is placed on the application of theory to practice to develop students' managerial and strategic communication skills so that they may grasp not only how, but also what, why, when, and by what means leaders effectively communicate. Students will have the opportunity to gain an understanding of why good communication skills are important in business, how communications today is affected by technology, why effective communication can be difficult, how communication is used in teams, and what issues exist in overcoming intercultural communication barriers. Students will practice communicating conclusions to problems in concise and persuasive writing and speaking. Written assignments involve preparing technical reports and use of APA style manual.
Prerequisites: MSLD 500.

MSLD 632 Decision Making for Leaders 3 Credits (3,0)
The leaders in an organization often set the tone and establish benchmarks for success. In this course the focus is on developing a successful leadership style so as to facilitate team-building, collaboration and a corporate culture that promotes success. Decision-making techniques will be explored in the context of successful leadership styles. Students learn frameworks for approaching decisions and for representing real-world problems using models that can be analyzed to gain insight and understanding.
Prerequisites: MSLD 500.

MSLD 633 Strategic Leadership 3 Credits (3,0)
In constantly changing environments, leaders routinely create and revise strategies. This course explores the role of leaders in developing unity, focus, credibility, and direction within organizations. Students will be exposed to several strategic frameworks and develop an understanding of which models might be useful in certain situations. Students also learn how to scan the environment; develop and deploy coalitions; identify critical success factors and barriers to implementation, and create viable actions plans.
Prerequisites: MSLD 500.

MSLD 634 Leadership Ethics and Corporate Social Responsibility 3 Credits (3,0)
Students are introduced to several topics that form the foundation for Leadership Ethics and Corporate Responsibility. Topics include: personal dilemmas, morals, virtues, organizational dilemmas, and societal issues. The course focuses on the role of ethics in decision-making on three levels: the individual, the organization, and society.
Prerequisites: MSLD 500.

MSLD 635 Organizational Change 3 Credits (3,0)
In a constantly changing environment, leaders will need to become changearchitects for their organizations. This course focuses on leadership elementsnecessary to introduce planned change through an understanding of theories and concepts related to organizational intervention. The student will develop the skills necessary to anticipate the need for change; champion change agendas; diagnose organizational issues; develop change action plans, strategies, and techniques; and assess, monitor, and stabilize changed organizations. Throughout the course, the student will develop methods and models for assessing current organizational climate, resolving interpersonal issues, and developing strategies for planned organizational change through the use of high performance systems.
Prerequisites: MSLD 500.

MSLD 640 Cases in Leadership 3 Credits (3,0)
This course will examine different case studies and leadership theories to help enhance the students understanding of leadership. The student will gain an understanding of how particular leadership theories impact organizations and their stakeholders. Students will grapple with real-world decisions and their organizational impact. Students will learn how to diagnose leader and organizational attributes and the importance of those attributes.
Prerequisites: MSLD 500.

MSLD 641 Resonant Leadership: Leading Change 3 Credits (3,0)
The objectives of this course are to broaden and deepen the student's selfawareness and prepare them to be a life-long learner. Success in today's organizations depends on your ability to learn and adapt quickly to new and changing situations. The course is based on a model of self-directed learning and development. Gaining self-awareness and being mindful of oneself is extremely valuable in understanding and formulating your own career and life vision, in assessing your skills and abilities and in designing plans to reach your objectives. From mastery of this basic process comes the ability to manage change and lead others effectively.
Prerequisites: MSLD 500.

MSLD 642 Leading Innovation 3 Credits (3,0)
Creating a competitive advantage in today's business environment increasingly demands that organizations understand how to innovate. Creativity, continuous improvement, and the ability to turn concepts and ideas into action are critical to differentiating an organization in a competitive environment. As leaders, how do we create a culture of innovation? What skills are needed by a leader and what skills do your teams need? This course will provide the expertise to adapt an organization into a thriving environment where ideas are encouraged and visions manifest. This course will identify real world examples and research from experts in the field. Students will learn how to incorporate innovation into their daily work and develop the creative confidence to innovate successfully.
Prerequisites: MSLD 500.

MSLD 690 Graduate Leadership Capstone 3 Credits (3,0)
In the Graduate Leadership Capstone course, the student reviews and assimilates the materials and lessons from the Master of Science in Leadership Program. The capstone course has the following outcomes:* A reflective paper that develops significant themes, frameworks, and program outcomes within the context of the student's leadership learning.* A leadership action plan to propel and guide the student into future phases of personal mastery and growth as a leader.* A leadership portfolio of significant program artifacts. The portfolio will demonstrate the student's mastery of program outcomes and provide significant documentation to provide current or prospective employers. Prerequisite: Completion of all Leadership Program Courses.

Logistics and Supply Chain Management (LGMT)

Courses

LGMT 536 Purchasing for Logistics and Supply Chain Managers 3 Credits (3,0)
This course addresses the critical role of purchasing in supply chain management. The course begins with a review of the basic components of purchasing followed by a discussion of the role of purchasing in the supply chain and how it contributes to the strategy and profitability of the enterprise. The course also addresses the legal aspects of purchasing and the relationship between purchasing and inventory management, materials management, just-in-time manufacturing, and manufacturing resource planning. Global sourcing and the role of supply chain partnerships are also addressed, along with how to evaluate, bargain, and negotiate with suppliers. Other topics include the relationship between purchasing and quality assurance; different pricing methods; the use of different pricing strategies for different transportation modes; and the role of purchasing in evaluating capital investments as well as professional services.

LGMT 636 Transportation Management 3 Credits (3,0)
Transportation plays a key role in today's global economy. The focus of this course is on understanding the technical, operational, and economic characteristics of the different freight and package transportation modes and their application in integrated physical distribution systems. This course addresses regional, national, and international passenger transportation and explores the impact of the different transportation modes, transportation intermediaries, and intermodality on small package, freight, and passenger systems. The course also addresses national and international regulatory constraints and their impact on passenger transportation and global supply chain management. Additional topics include carrier and shipper strategies; alliance management and the use of third parties; transportation metrics; transportation security; and the role of information technology in modern transportation management.

LGMT 680 Discrete Event Simulation Modeling 3 Credits (3,0)
Simulation refers to a collection of methods to mimic the behavior of real systems. The focus of this course will be simulation modeling of discrete event systems using simulation software ARENA. Introduction to the theory and application of systems simulation will be provided. The topics include, modeling systems dynamics using discrete events, modeling manufacturing-oriented and service-oriented systems, random variable generation, model verification and validation, and statistical analysis of output. Prerequisites: Satisfactory completion of an introductory statistics course, and/or permission of the Graduate Program Chair.

LGMT 682 Integrated Logistics Management 3 Credits (3,0)
The focus of this course is on integrated logistics management. Although different organizations define the concept differently, at its core, integrated logistics is all about the systematic management of activities associated with the delivery of goods and services to meet customer needs. As a result, this courses addresses the cross-functional management of a number of activities including sourcing, procurement, packaging, in-bound transportation, warehousing, inventory management, distribution, customer service, and reverse logistics where appropriate. Additional topics include the concept of life cycle cost, outsourcing, performance management, international logistics, and the role of web and EDI in managing the logistics information needs of the enterprise. Case studies and problems are used throughout the course to highlight important principles and best practices in integrated logistics management.

LGMT 683 Supply Chain Management 3 Credits (3,0)
The focus of this course is on supply chain management. Topics include the evolution and objective of supply chain management; the major stages and processes involved in planning and managing supply chains; and why the concept of strategic fit is so important to supply chain managers. Successful students will also understand the major drivers of supply chain performance; key metrics for managing performance; and how to plan and forecast demand under conditions of uncertainty to meet desired customer service levels. This course also addresses the purpose and content of the Supply Chain Operations Reference (SCOR) Model. Case studies and problems are used throughout the course to highlight important principles and best practices in supply chain management.
Prerequisites: MGMT 524.

LGMT 685 Global Logistics and Supply Chain Management 3 Credits (3,0)
Today, globalization is affecting almost every aspect of the world's economy - and the world's economy is sustained by global logistics. The focus of this course is on understanding the role of logistics and supply chain management in meeting the needs of the transnational enterprise, from the sourcing of raw materials through delivery of the finished product to the final customer. The course addresses the role and scope of logistics in the global economy; key strategies for supporting different market entry alternatives; the impact of different transportation modes on international supply chain management; the use of international commerce terms and contracts; the impact of exchange rates on supply chain profitability; supply chain security; and the role of global supply chain management as a key source of competitive advantage. A number of case studies are also analyzed throughout the course to highlight important principles and best practices in global logistics and supply chain management.

LGMT 691 Logistics and Supply Chain Management Capstone 3 Credits (3,0)
This course is designed to provide students with the opportunity to apply and demonstrate knowledge gained throughout the program. This will be accomplished utilizing a logistics and supply chain management portfolio. Demonstration of understanding of the full spectrum of logistics and supply chain management will include the following topics: sourcing, procurement, contracting, warehousing, inventory management, transportation, integrated logistics and supply chain management, logistics and supply chain security, global logistics and supply chain management, and ethics. Prerequisites: This course is a part of an integrated program. Each course builds on knowledge and skills developed in previous courses. These courses are not stand-alone courses and the degree is not just an assemblage of independent courses. This is a culminating course taken at the end of the student's program in which the student applies concepts learned throughout the MSLSCM program. Permission of the instructor for waiver of prerequisites is NOT applicable for this class.

Management (MGMT)

Courses

MGMT 520 Organizational Behavior and Change 3 Credits (3,0)
This course presents existing theories and methods for understanding, analyzing, and predicting individual, group, and organizational behavior and how behavior and processes shape the internal dynamics of organizations . The course focuses on current theoretical and practical organizational issues which have a direct impact on management. Topics provide insights to behavior, structure, authority, motivation, stress, leadership, organizational development, and change. Elements needed for successful organizational change will be reviewed in the context of the modern, learning organization. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 524 Management Science 3 Credits (3,0)
Students have the opportunity to gain knowledge and experience in the application of management science processes and models used in decision making in management. Techniques include decision theory, queuing theory, forecasting models, inventory theory, linear and integer programming, transportation and assignment models, and network models including project management calculations (time and cost) using PERT and CPM. Computer techniques are used to solve problems and to communicate the results in a clear and understandable fashion. Emphasis is placed on using quantitatively based analytical methodologies, interpreting quantitative results, and communicating conclusions. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 530 Business Analytics for Managers 3 Credits (3,0)
Business analytics refers to ways a manager can use data to gain insights and make better decisions. This course will help the student think critically about data and data analysis in an effort to solve managerial problems using different organizational data streams. In addition, the use of key performance indicators along with data presentation tools such as scorecards and dashboards will help managers engage in evidence-based decision making.Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 532 Philosophy, Principles, and Practices in Management of Quality 3 Credits (3,0)
The content of this course incorporates multiple aspects of the management of quality and the integration of quality considerations into all other management decision processes. The primary thrust of the course is an in-depth analysis of quality management concepts, methods, and techniques from a systems perspective. Areas of emphasis are leadership, strategy development and deployment, quality management tools, customer focus, supplier performance, management communications, projects, and training and development. The course encompasses the body of knowledge required in the Certified Quality Manager certification. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 533 Social Responsibility, Ethics and Law 3 Credits (3,0)
This course emphasizes understanding the complex regulatory and legal setting surrounding management. The federal acquisition regulations and how they affect all projects, such as legal responsibility and accountability, ethical considerations within and external to the organization, the internal environment and how it may affect projects are discussed. Regulatory controls and constraints on managerial decision making in areas such as occupational and environmental safety and discrimination in the workplace are included, as are other safety and security issues of which the manager should have knowledge. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 535 Theory and Application of Managerial Communications 3 Credits (3,0)
This course explores the impact of communication in managing contemporary technical organizations and provides a broad survey of the technical aspects of communications. Emphasis is placed on the application of theory to practice to develop students managerial and strategic communication skills so that they may grasp not only how, but also what, why, when, and by what means managers effectively communicate. Students will have the opportunity to gain an understanding of why good communication skills are important in business, how communication today is affected by technology, why effective communication can be difficult, how communication is used in teams, and what issues exist in overcoming intercultural communication barriers. Students will practice communicating conclusions to problems in concise and persuasive writing and speaking. Written assignments involve preparing technical reports and use of APA Style manual.

MGMT 607 Human Resource Development 3 Credits (3,0)
This course emphasizes the integration of the individual into the organization by studying the current and fundamental issues in organization theory and organizational behavior as they relate to the individual. The effectiveness of the individual in the organization is examined in terms of personal traits such as communicative abilities, leadership style and potential, and beliefs about organizational ethics and social responsibility. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 608 Human Resources Management 3 Credits (3,0)
The focus of this course is on the functions to be accomplished in effectively managing human resources. An in-depth study of the interrelationship of managers, organizational staff, and/or specialists, will assist the student in understanding and applying management theories to real-world human resource management. Areas of concentration include human resource planning; recruitment and selection; training and development; compensation and benefits; safety and health; and employee relations. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 651 Production and Procurement in the Aviation and Aerospace Industry 3 Credits (3,0)
This course examines Production Operations from a systems perspective, and demonstrates how dynamic interchanges between the constituent parts of the system affect the operations and maximize efficiency and effectiveness. This course relates to the management of product and process design, operations, and supply chains. Areas of emphasis are quality management, scheduling, inventory management, purchasing, material management, JIT and manufacturing strategy. This course includes substantial measurement and analysis of internal processes. This course demonstrates that the products or services in an organization, as well as their management, drive how Operations Management is carried out in an organization. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 653 Labor Issues in an Industrial Environment 3 Credits (3,0)
In this course, the student conducts a comprehensive study of labor issues that are germane to both the industrial and the aviation environment. The course concentration includes the current issues affecting contemporary labor relations, the evolution of private and public sector bargaining practices, and the contract negotiation process. Specific areas analyzed include the historical evolution of the American union movement, union structure and government, congressional legislation and executive orders, the representative election process, contract administration, grievance procedures, mediation and arbitration, and conflict resolution. The strategic impact the labor movement has had on American industry is analyzed from both the employer and the employee perspective.

MGMT 661 Project Development Techniques 3 Credits (3,0)
A study of current scientific research methods that includes techniques of problem identification, hypothesis formulation, literature search strategies of libraries and on-line databases, design and use of data-gathering instruments, formulation of a research model and plan, and appropriate statistical data analysis. The COB Capstone Guidelines format and American Psychological Association (APA) style will be reviewed and followed. A formal Graduate Capstone Project proposal will be developed and presented by each student as a basic course requirement.
Prerequisites: BUSW 500 and MGMT 524.

MGMT 665 Organizational Theory in a Technical Environment 3 Credits (3,0)
In this course the students review organizational theory and learn how the organizational design impacts organizational effectiveness and productivity. The student has the opportunity to gain and expand knowledge concerning how organizations carry out work. Included in the course are elements of organizational theory, organizational structure, organizational planning, leadership versus management, conflict between functional management, matrix versus hierarchical organizations, organizational alternatives, and human response in the organization. Topics address advantages and disadvantages of structural types, locus of power and locus of authority issues, and formal and informal networks. Also included are issues such as conflict resolution, change management, formal and informal work relationships, influence and authority in the technical setting, participation, sensitivity to cultural and minority differences, managing technical change and innovation in a large organization, communication in a technical organization, organization culture and tradition, government perspective, and industry perspective are reviewed. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 671 Entrepreneurship and Leadership 3 Credits (3,0)
In this course, students explore the roles and interrelationships of leadership and entrepreneurship in successful enterprises in a global environment. The primary focus is on analyzing the leadership skills and entrepreneurship that enhance organizational success. Topics to be explored are the approaches and models of leadership, entrepreneurship, organization change, implementing an entrepreneurial strategy inside existing organizations, product innovation and technology, and developing new ventures. In addition, students gain insight to the important elements required for a supportive environment needed to sustain the corporate entrepreneurship process. Lastly, the entrepreneurship orientation of organizations for the future is discussed. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair. Prerequisite BUSW 500 not required for students in the MoET Program.

MGMT 672 Planning and Execution of Strategy 3 Credits (3,0)
In this course, the student addresses the integration of all management aspects of business with the cultural, ethical, and regulatory environments to form comprehensive, workable strategies for success. Multinational and international factors and differences related to enterprise success are emphasized. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 673 Global Economic Analysis 3 Credits (3,0)
Managers in any industry, and particularly those employed by aerospace firms conducting business worldwide, can benefit from a foundation in applied international economics. This course builds three economic models for markets in real goods and services, credit, and foreign exchange. These qualitative models are then integrated into a single analytical framework that students use to understand the effects of government economic policy initiatives and external shocks on an economy. This analysis provides the basis for recommending actions a firm can use to benefit from or mitigate the adverse effect of evolving global economic forces. No previous economic background is required, but students should welcome an analytic approach to problem solving. Prerequisites: Satisfactory completion of Business and Foundation Course BUSW 500 or permission of the appropriate Department Chair.

MGMT 678 Talent Acquisition and Workforce Planning 3 Credits (3,0)
This course prepares managers to take a strategic approach to identifying, attracting, selecting, and retaining talent. The course addresses how to strategically develop a staffing strategy that reinforces business strategy, so students can learn best practices for forecasting, recruiting, staffing, and development of employees. Topics include strategic staffing, legal aspects of staffing, job analysis and forecasting, strategic sourcing, selection, workforce planning and workforce flow.

MGMT 679 Comprehensive Reward Systems 3 Credits (3,0)
This course examines current approaches to Total Compensation, including both the theory and practice of compensation, benefits, and rewards. The course analyzes how reward systems motivate employees and explores approaches to compensation policy and design. A strategic approach to reward strategies, linked to business and people strategies, will be taken. Topics include strategic compensation, rewards and motivating work environment, government and union influences, job evaluation and developing pay structures, market analysis, incentives and variable pay, compensation administration and executive compensation.

MGMT 691 Management Capstone Course 3 Credits
In this course students are required to author and defend a scholarly paper that requires substantial research to generate solutions to a real-world managerial problem. The student will be exposed to the technical aspects of writing to include problem definition, analysis, and presentation of solutions utilizing structured methods of evaluation. This course shall be taken at the end of the student's program and will give the student the opportunity to apply management concepts learned throughout the MSM program.

MGMT 699 Special Topics in Business Administration 1-3 Credit (1-3,0)
In this course, students elect to perform a special, directed analysis and/or independent study in an area of particular interest. Candidates selecting this elective must prepare a detailed proposal for the desired project and present the proposal to the department chair for faculty review. Proposals must be submitted at least four weeks prior to the start of the term in which the elective is being taken.

MGMT 700 Thesis Research 1-6 Credit (1-6,0)
A written document on an aviation/aerospace topic is supervised throughout its preparation by the student's Thesis Committee. If the document demonstrates the student's mastery of the topic and is of satisfactory quality for publication, it will be submitted.

Mathematics (MATH)

Courses

MATH 502 Boundary Value Problems 3 Credits (3,0)
Basic technique of solving boundary-value problems of partial differential equations by employing the methods of Fourier series, orthogonal functions, operational calculus including Laplace transforms, other integral transforms and Cauchy's residue calculus. Applications to heat transfer, fluid mechanics, elasticity and mechanical vibrations. Computer applications.

Management Information Systems (MMIS)

Courses

MMIS 501 Business Systems: Managing the IS Enterprise 3 Credits (3,0)
This course provides the foundation for the MSMIS program by reviewing the many ways in which computation, communications and information systems are used to identify and solve problems, recognize opportunities and generate competitive advantage. It uses the concepts of the "enterprise perspective" to demonstrate the various information systems used to lead, manage and operate a variety of organizations. It then uses the "enterprise as system" model to show how all organizations large or small link into the information and knowledge systems of the organizations they interact with -- suppliers, customers, regulators, and their competitors. It also lays the foundations for further examination of key issues, such as information quality and information assurance, throughout the MSMIS program. Throughout, the concept of business processes -- and the engineering and re-engineering of these processes -- provides the unifying focus.

MMIS 503 Data & Information Modeling & Management 3 Credits (3,0)
The Era of instantaneous Data is here. Data is a strategic organizational asset and a central resource used in business intelligence (BI) and analytics to generate actionable information to decision- makers. Many companies rely on Excel Spreadsheets for data management and analytics. Excel Spreadsheets conceal a churning sea of data, flowing through the enterprise databases, that need to be combined and synchronized to generate a single, accurate vision of the data. Current data infrastructure designs are crucial but inefficient for a company to become data-driven. Often, organizations have several databases that are built in a silo type of environment where data is not easily linked so that the full picture of the organization?s status is available. The focus of this course is centered on the core skills of identifying organizational information requirements, information modeling and all principles related to managing and storing organization data and information. Students will gain insight into understanding how data fundamentally affects a business. These core data management and design skills cross all disciplines, from financial data to customer related data. In addition, recent developments related to big data (and tools for their analysis) will be introduced.

MMIS 504 Knowledge Management: Quality Management for the IS Enterprise 3 Credits (3,0)
Knowledge Management (KM) provides a disciplined approach to recognizing and exploiting the value-added transformation of raw data -- numbers, names, or quantities -- into progressively more useful and more powerful forms of understanding. KM has its roots in a variety of different disciplines. Using the overall framework of Quality Management, and its emphasis on learning organizations, this course provides a comprehensive overview of the field of knowledge management integrating theory, practice, history, issues, terms and a future outlook examining organizational change and organizational learning.

MMIS 505 Information Analytics and Visualization in Decision Making 3 Credits (3,0)
One of the most potent models of the decision process is the OODA Loop -- that we Observe, Orient, Decide, and then Act. Key to this or any other control and decision (or cybernetic) process is that vast quantities of raw sensory data about the outside world must be processed, abstracted, and then presented in contrast and conjunction with the knowledge previously generated and retained. This two-step process -- the reduction, analysis, filtering and abstracting of data into knowledge, and its presentation in formats and fashions that support the decisions that must be made -- is the subject of this course. The relationships between such analysis and visualization will be examined in the context of business and organizational decision-making and decision support systems concepts.

MMIS 506 Systems Analysis and Design 3 Credits (3,0)
Systems analysis and design is the science and art of examining a problem and creating the most effective solution. It is a science in that quantitative analysis, strongly supported by theory and practice, can dictate correct and complete solutions that can be cost-effective. It is also an art, in that organizational culture, prerogatives, and perceptions about value and risk quite often play a major role in how systems design and implementation decisions are made. This course considers systems development methods and analysis and design techniques using a practical rather than technical approach. Learners engage in hands-on learning and work in teams to complete a real-world project using contemporary analysis and design methodologies and tools.

MMIS 507 Information Systems Strategic Planning 3 Credits (3,0)
Strategic planning is the art and science of setting the enterprise's vision and allocating resources to achieve the vision. When formulating information systems strategies, organizations seeks to identify emerging opportunities to leverage new technologies that may add substantial value but also dramatically change the organization. Strategic planning includes choosing which goals and objectives to accomplish, sets criteria for how well they must be accomplished to satisfy other needs, and sets forth the activities to make these "game-changing" events happen effectively and affordably. Many strategic opportunities may present themselves to an organization, or may be discovered by a variety of introspective or business intelligence activities. Making the decision to take advantage of such opportunities is deciding to make strategic change happen. Strategic opportunities may exist because of fundamental changes in technologies, market preferences, government and regulatory actions, and other factors. The strategic planner knows that nothing remains the same, and that while no plan survives contact with reality, the planning process itself provides insight and the opportunity to choose wisely. Strategic planning for information and information systems entails applying the concepts of strategic business planning to the subset of organizational activity that generates, analyzes, maintains, and produces information and knowledge to support strategic decision making. Information systems strategic planning can address, but is not limited to, choices about fundamental information technologies, systems architectures, and information risk mitigation approaches.

MMIS 521 Data Warehousing and Information Quality 3 Credits (3,0)
The term "data warehouse" conveys many different meanings, which this course will examine in some depth. Whether the warehouse provides a historical look back through the organization's transaction histories, or acts as an amalgam of many different data sets, from many different organizations, the key question the organization has to ask is why. Why build a data warehouse? Many different business processes are involved with and affected by the accumulation, extraction (mining), and interpolation of data that might exist between the real data points (data farming). Information quality, as a design discipline and as a management attitude, provides essential emphasis on assuring the right data comes in, to properly-designed and verified correct business decision processes, so that the right decisions can come out of the data warehouse and its operational use. Of all the many attributes and facets of data warehousing, data quality is undoubtedly the utmost significant one. Basically, this is because if the data is wrong, we place our organization at greater risk if we rely on the data warehouse for decision support. Over the past decade, a large number of vendors have saturated the market with several data warehousing products, and it is difficult to evaluate their offerings and help one's organization choose wisely. Students will explore these issues by looking at selected steps in typical data warehousing projects, focusing on organizational objectives and needs, while examining the details of how data warehouses are designed, built, used and maintained. Administration, security, information quality and other key issues will also be placed in this project framework.

MMIS 522 Business Analytics, Social Network and Web Analytics 3 Credits (3,0)
Analytics is the application of techniques to identify important observations and patterns in data. Analytical techniques can be used to overcome the practical challenges presented by data, such as the challenges presented by data volume, variety, velocity, and other properties. This includes application of techniques of data reduction, filtering and analysis in order to identify, measure and assess key business indicators. This course focuses on the business rationale for and application of analytics including exploration of how decision-making processes can and should be driven by the results of well-crafted analytics processes. In particular, the course focuses on both the need for organizations to more fully understand, appreciate and exploit so-called "soft" or "unstructured" data -- the things human beings say to each other, in uncontrolled and unformatted ways, on various social media. Search histories and other "temporary" data, not normally revealed by traditional search engines, will also be examined.

MMIS 523 Data Mining, Machine Learning and Knowledge Discovery 3 Credits (3,0)
Many organizations are familiar with "drilling down" in their data systems to see the details behind a higher-level, more abstract piece of business knowledge -- such as going from "customer complaints have risen 20% this year" to the statistical process control systems' measurements that should have warned us of that before disaster struck! Data mining is both finding the right data in one's file systems or data warehouses, by applying smarter search and filtering criteria, as much as it is the reduction, analysis and presentation of that data in meaningful ways. While many of these techniques are statistical in nature, many rely on applied artificial intelligence algorithms -- so-called "machine learning" -- to help the organization's managers, accountants and lawyers in "discovering" new knowledge in the sea of data that they already have, but cannot digest without significant software help. But data mining and knowledge discovery is not just the domain of "Big Data", as books such as Big Data for the Little Guy, and small business analytics web pages at major big data providers demonstrate. This course surveys these methodologies, and guides the student in identifying the criteria to use to define, manage and operate a successful data mining and machine learning system that meets organizational needs.

MMIS 524 Applied Knowledge Management and Business Intelligence 3 Credits (3,0)
Business intelligence (or BI) is both a process and a product. The product is the timely, precise, high-value and actionable business insights that management needs to make decisions. The process is the gathering, collating, analyzing, and assessing of many different kinds of information that lead to those insights. Business intelligence processes and products can have a profound impact on corporate strategy, performance and competitiveness; and much like intelligence processes and products in the military and national security arenas, BI can have positive or negative impacts upon the organization depending upon how it is done and how it is used (or misused). In that regard, BI is shown to be a focused application of the principles of knowledge management. This course presents students with both the theoretical concepts and practical applications of BI, and examines some aspects of BI successes and failures.

MMIS 531 Information Systems Project Management 3 Credits (3,0)
Managing information technology requires ideas and information that go beyond standard project management. Because the project management field and the technology industry change rapidly, this course provides up-to-date information on how good project management and effective use of software can help you manage projects, especially information technology projects. This course provides an information system orientation for project management. It stresses information systems as a whole, not just software development. The course explains some of the key concerns of project manager as the project develop through the project life cycle.

MMIS 541 Information Risk Management 3 Credits (3,0)
Management information system leaders' responsibility includes structuring the IT and information security functions to defend the organization's information assets, i.e., information and data, hardware, software, processes, networks and people. As the organization grows and develops for IT-based systems to remain viable, information security and the discipline of risk management must become an integral part of the economic basis for making business decisions. These decisions are based on trade-offs between the costs of applying information systems controls and the benefits realized from the operation of secured, available systems. Whether your company is small (<250), medium(>250) or large (>500), organizations must design and create safe environments in which business processes and procedures can function. This course addresses these unique environments and how they must maintain their confidentiality, privacy and assure the integrity of organizational data that are met via the application of the principles of risk management.

MMIS 552 Information Systems and Information Technology Governance 3 Credits (3,0)
Governance is the broad category of policies, plans and procedures that help translate an organization's strategic objectives and plans into the management and control of the people, systems and resources allocated to those plans. Governance is thus strongly linked to organizational compliance with many kinds of government regulations and statutory requirements which aim to control or mitigate risk -- risk to investors, customers, employees and society at large. Two strongly competing governance models bring very different perspectives to this course. The first is data or information governance, which focuses on how the organization does an information or knowledge quality management process. The second is often called information technology governance, even though it focuses on the delivery of information services -- or knowledge work -- to the organization via systems and technologies.

MMIS 553 Change Management and Configuration Control 3 Credits (3,0)
Organizational change is constant for organizations that wish to remain viable and competitive in changing markets. Unfortunately, the literature suggests that change efforts often fail even when the ideas were positive. Unlike other industries, the IT industry generally has a shorter life cycle and organizations generally see IT-related changes more frequently than other types. Therefore, changes must be led, managed, and controlled throughout the organization to achieve success. This course presents techniques for reducing social and systemic resistance to change, and provides effective tools for accomplishing change management and configuration control. These tools can be applied to small and large systems at any level of an organization, including the organization itself. The course will focus on the use of knowledge management systems and other information technology protocols to enable change.

MMIS 561 Global Information and Technology Management 3 Credits (3,0)
Organizations are using information technology (IT) to transform themselves into global enterprises via key ventures in global e-business, e-commerce and other IT initiatives. IT is a critical component of enterprise success and plays a key role in enterprise globalization, as organizations deploy global IT architectures. The continuous integration of new technologies requires effective management practices to support emerging architectures and organizational objectives.

Project Management (PMGT)

Courses

PMGT 500 Foundations of Project Management 3 Credits (3,0)
In this course, students will be introduced to the project management profession and international methodologies. The role of the project manager will be examined through performance and personal competencies. Additionally, the organization?s governance is considered as a foundation for project success.
Prerequisites: PMGT 524 and MGMT 672 and MSLD 632.

PMGT 501 Fundamentals of Project Management 3 Credits (3,0)
In this course, students study project management with focus on the development and management of the project schedule, following global project management standards. The course includes an emphasis the technical planning of integration, scope, schedule as they are applied to initiating, planning, execution, monitoring and controlling, and closing of projects. The integration of technical skills, general management skills, and project management skills for successful project completion is emphasized. Prerequisite(s): For MS in Project Management (MSPM) the prerequisite is PMGT 500; For MS in Engineering Management (MSEM) the prerequisite is MGMT 524.
Prerequisites: PMGT 500 or MGMT 524.

PMGT 502 Effective Communications for Managing Projects 3 Credits (3,0)
This course is designed to help the student explore the role of communication in managing projects and to provide a broad understanding of the theoretical, organizational, behavioral, and technical aspects of communications with an emphasis on developing technical soft skills. The focus is placed on the application of theory to practice, which is intended to develop students' managerial and strategic communication skills so that they may grasp not only how, but also what, why, when, and by what means managers effectively communicate, both in the US and abroad. Special attention is devoted to development and use of project management plans including stakeholder, communication, resource, risk, quality, and procurement.
Prerequisites: PMGT 501.

PMGT 524 Management Science for Project Managers 3 Credits (3,0)
Students in this course are introduced to management science processes, tools and techniques used in decision making and analysis with emphasis on the project management context. Techniques include probability, decision theory, decision making in the context of uncertainty, queuing theory, forecasting models, inventory theory, and linear programming. Computer techniques are used to solve problems and to communicate the results in a clear and understandable fashion. Emphasis is placed on using quantitatively based analytical methodologies, interpreting quantitative results, and communicating conclusions.Prerequisites: Admission to the MS in Project Management (PM) Program or PM Specialization.

PMGT 613 Assessing and Managing Project Risk 3 Credits (3,0)
More difficult economic conditions, increasing competition, and exponentially expanding technology create greater uncertainty and risk in projects. With these complex challenges come complex threats and opportunities. Uncertainty and associated risks have become more complex as projects spans organizational, national, and cultural bounds. In this course, the student will investigate the iterative nature of planning, identification, qualitative and quantitative analysis, response, and control of risk events for both threats and opportunities. Additional course skills will include contingency and reserve development and the use of Project Management Information Systems (PMIS).
Prerequisites: PMGT 502.

PMGT 614 Planning, Directing, and Controlling Projects 3 Credits (3,0)
In this course, students will gain increased knowledge and experience in the art and science of project management. Emphasis will be placed on planning, directing, and controlling projects. Practical exercises using project management software will be used to challenge the student to develop higher levels of project management ability. Exercises will require critical thinking and problem-solving techniques required in complex projects.
Prerequisites: PMGT 613.

PMGT 652 Concepts and Practices of Project Management 3 Credits (3,0)
This course provides graduate students, who are not enrolled in a project management degree program, an appreciation for the depth and breadth of the project management profession. The course will address the complete project model including initiating, planning, executing, monitoring and controlling and closing. Emphasis will be placed on gaining a knowledge of common terminology, principles, techniques and tools that are found global standards for project management.
Prerequisites: PMGT 524.

PMGT 670 Contemporary Project Management 3 Credits (3,0)
This course is designed to assist students in synthesizing what has already been learned about projects and project management and apply that knowledge to contemporary and evolving project concepts. Topics will change from term to term to continue to make the course relevant, but may include alternative lifecycles, project management competency, innovation management, and global project management topics to name a few. Assignments will be conducted within the context of critical review of the relevant research and theory, as well as current practice and standards.
Prerequisites: PMGT 614 or PMGT 652.

PMGT 690 Project Management Capstone 3 Credits (3,0)
This course is designed to provide the student the opportunity to apply knowledge gained throughout the degree program. Demonstration of the study of project management, paying particular attention to technical project management, project leadership, and business strategy.
Prerequisites: PMGT 501 PMGT 502 MSLD 632 PMGT 613 and PMGT 614.

Research (RSCH)

Courses

RSCH 665 Statistical Analysis 3 Credits (3,0)
The review, design, planning, analysis and statistical interpretation of data to support research studies and industrial applications. Students will build on statistical theory and learn advanced techniques that can be applied to problem solving, research analysis and numerical interpretation of data. Students will learn to identify parametric and non parametric statistics, develop correlation methods for linear and non linear data, and statistical significance testing between samples and within samples. Students will undertake projects using computer programs for data that is derived or given. Statistical results will be presented in tabular, graphical and numerical ways in accordance with the American Psychological Association format.

RSCH 670 Research Methods 3 Credits (3,0)
This course is designed to equip students with the theoretical techniques and skills to identify and apply for solving qualitative and quantitative research problems. The course introduces the need for non numerical data analysis and how part of a methodology can allow for in depth analysis of complex issues and relationships. Sampling and data gathering in systematic manners are incorporated into research methodologies. The use of numerical analysis on qualitative data is covered to result in significance solutions and recommendations.

Safety (SFTY)

Courses

SFTY 510 Industrial Hygiene & Toxicology 3 Credits (3,0)
This course addresses the technical concepts and application of industrial hygiene and toxicology as it pertains to preventing occupational illnesses. Topics include the recognition of occupational health hazards, hazard evaluation through screening and sampling, and the prevention and control of occupational health hazards in order to mitigate occupational illnesses. The course also prepares the student to select, interpret and apply federal and state occupational health and safety laws and regulations.

SFTY 530 Safety, Health and Environmental Legislation, Litigation & Compliance 3 Credits (3,0)
This course is a survey of the complex regulatory and legal settings surrounding occupational safety, health and environmental management. Occupational safety, health and environmental regulations, and how they affect industry, legal responsibility, and accountability; ethical considerations in and external to the organization; and the international environment and how it may affect projects are all examined.

SFTY 540 Disaster Preparedness and Emergency Response 3 Credits (3,0)
This course is designed to increase the student's knowledge of disaster preparedness and emergency response procedures, safety and health hazards and controls, and enforcement issues. Topics include elements of an emergency response plan, training requirements, the incident command system, medical surveillance, and post-emergency recovery. Major elements involved in disasters and emergencies, systems use, and attention to essential human services are covered.

SFTY 570 Fire Safety Management 3 Credits (3,0)
This course is designed to teach the essentials of fire protection and prevention in the context of safety, health and environmental management. The course will provide an introduction to fire behavior and combustion to include fire chemistry, fire dynamics and concepts related to the development and spread of fire. The course will also address fire prevention methods, fire detection systems and fire protection including control systems, fire suppression and extinguishment. Lastly, the development of fire safety programs will be addressed, along with emergency action plans and response.

SFTY 580 Environmental Protection for the Safety, Health and Environmental Manager 3 Credits (3,0)
This course is designed to equip students with the knowledge, skills and techniques used by the safety, health and environmental manager to protect workers, the community and the environment from environmental hazards; to facilitate a strategic approach to environmental conservation and sustainable business practices; and, to comply with EPA, OSHA and state and local regulations. Prevention and mitigation of environmental problems will be paramount in the course, but management techniques and programs focused on containment and clean-up of spills and releases will also be addressed.

SFTY 590 Hazard Control Methods in Occupational Safety and Health 3 Credits (3,0)
This course focuses on the application of scientific, engineering and technical principles and methods used to identify, evaluate and control workplace safety and health hazards. Hazard elimination and engineering controls are emphasized in the course. General industry topics, such as the following, are addressed: job safety analysis; inspections and audits; facility design, layout and maintenance; machine safeguarding; walking and working surfaces; materials handling; production operations; and, occupational health hazards and controls.

SFTY 600 Occupational Safety and Health Management 3 Credits (3,0)
This course provides a broad overview of occupational safety. It begins with an exploration of the history of the subject, moves through the OSH Act, workers' compensation, safety program development and management, and finally addresses hazards and controls. The application of safety and health management principles to the management of complex technical industries is covered.

SFTY 619 Human Factors and Ergonomics 3 Credits (3,0)
This course emphasizes the role of human factors in workplace and work task design with emphasis on complex technical industries. Topics include traditional material such as anthropometry, control/display design, visual and auditory acuity and their importance in work design, circadian rhythms and their implications for work design and shift work, psychomotor skills, and learning and memory. Also included are concepts of physiological aspects in ergonomics and the anthropometric principles in workspace and equipment design.

SFTY 630 System Safety Programs 3 Credits (3,0)
This course emphasizes the specialized integration of systems engineering and sound management practices into all phases of a system's life cycle, to achieve acceptable risk, given the confines of operational effectiveness and fiscal responsibility. Hazard recognition, assessment and risk mitigation strategies and resources are applied to systems from conception and design phases to operational and disposal phases, as a means to minimize legal risk and maximize safety and health.

SFTY 691 Graduate Capstone Course 3 Credits (3,0)
The Master of Science in Occupational Safety Management Graduate Capstone Course is the culminating effort of the student's entire learning experience. The student will identify an occupational safety and health research problem; complete a thorough review of the scholarly literature; formulate and test hypotheses or research questions; collect and appropriately analyze qualitative or quantitative data; and, interpret and report research findings using scientific judgement to improve the field of occupational safety and health or to provide solutions to an occupational safety and health problem. The Capstone Course will be taken at the end of the student's degree program.
Prerequisites: SFTY 510 SFTY 530 SFTY 540 SFTY 570 SFTY 580 SFTY 590 SFTY 600 SFTY 619 SFTY 630 RSCH 665 RSCH 670.

SFTY 700A MSOSM Thesis I 3 Credits (3,0)
This course is the first of a two-course sequence (SFTY 700A and 700b) to complete the degree program through the accomplishment of a thesis. The student will propose and begin to develop a written document on an Occupational Safety and Health Management topic, supervised throughout its preparation by the student's Thesis Committee. The document is intended to demonstrate the student's mastery in a topic of Occupational Safety and Health Management and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will continue on to SFTY 700B for the completion and submittal of the thesis.

SFTY 700B MSOSM Thesis II 3 Credits (3,0)
This course is the second of a two-course sequence (SFTY 700A and 700b) to complete the degree program through the accomplishment of a thesis. The student will complete his or her thesis under the supervision of the student's Thesis Committee. The document is intended to demonstrate the student's mastery of the topic and be of satisfactory quality for publication. Following satisfactory performance within this course, the student will be permitted to graduate from the program.
Prerequisites: SFTY 700A.

System Engineering (SYSE)

Courses

SYSE 500 Fundamentals of Systems Engineering 3 Credits (3,0)
This course provides the student with a broad introduction to the fundamental principles, processes, and practices associated with the application of Systems Engineering across the system life cycle. The student will develop an understanding of the skills necessary to translate needs and priorities into system requirements, and develop derived requirements, forming the starting point for engineering of complex systems. Key topics include methods and standards; concept definition; interface definition; requirements development and management; system baseline definition and management; system architecture development; integrated schedule management and analysis; risk assessment; systems integration, verification and validation; mathematical and graphical tools for system analysis and control, testing and evaluation of system and technology alternatives; reliability and maintainability; design trade-offs and trade off models. The course will cover the integrative nature of systems engineering and the breadth and depth of the knowledge that the systems engineer must acquire concerning the characteristics of the diverse components that constitute the total system. Prerequisites: Students admitted to MSHF must complete all human performance core courses, as follows: MSHF 606, MSHF 612, MSHF 618 (Capstone option only), MSHF 624, RSCH 665, RSCH 670 prior to enrolling in SYSE 500.

SYSE 505 System Safety and Certification 3 Credits
Concepts, principles, methods and process applied for development of safety-critical and mission-critical software-intensive systems. The issues of system safety, requiring additional analysis and design techniques, are discussed from the perspective of computer hardware and software. The course discusses the safety requirements, hazard and risk analysis, failure modes and effect analysis, fault tolerance, basics of hardware and software reliability, levels of integrity, nature of faults and redundancy, and issues of verification, validation and certification. Safety standards across application domains, including SAE, ARP4754 & ARP4761 and RTCA DO-178C & DO-254 for safety considerations in development of aircraft systems are analyzed. The related certification roles, process, objectives, and activities are discussed. Selected software tools supporting safety and reliability assessment of hardware laboratory experiments with tools, and producing appropriate reports.

SYSE 530 System Requirements Analysis and Modeling 3 Credits (3,0)
This course is concerned with the development, definition, and management of requirements for system or product. Topics include the system requirements process, requirements elicitation techniques, alternative requirements analysis techniques, requirements specification, requirements verification and validation, requirements management, and requirements standards and tools. Issues such as stakeholder identification, risk analysis, trade off analysis as it relates to the requirements will be covered.

SYSE 560 Introduction to Systems Engineering Management 3 Credits (3,0)
This course addresses the fundamental principles of engineering management in the context of systems engineering and explores issues related to effective technical planning, scheduling and assessment of technical progress, and identifying the unique challenges of the technical aspects of complex systems and systems of systems and ability to control them. Topics will include techniques for life cycle costing, performance measurement, modern methods of effective engineering management, quality tools, quality management, configuration management, concurrent engineering, risk management, functional analysis, conceptual and detail design assessment, test evaluation, and systems engineering planning and organization, communication and SE management tools and techniques. The course covers an examination of processes and methods to identify, control, audit, and track the evolution of system characteristics throughout the system life cycle. The course includes the development of a Systems Engineering Management Plan, Integrated Master Schedule and/or Integrated Master Plan.

SYSE 610 System Architecture Design and Modeling 3 Credits (3,0)
This course is focused on concepts and techniques for architecting systems and the process of developing and evaluating architectures. The course includes generating a functional, physical and operational architecture from a top level operations concept for the allocation and derivation of component-level requirements. Variety of modeling and analysis approaches will be discussed as well as the generation of analyzable architecture models for evaluating the behavior and performance of candidate system concepts. Additional topics include interface design; architecture frameworks; enterprise engineering; design for reliability, maintainability, usability, supportability, producibility, disposability, and life cycle costs; validation and verification of systems architecture; the analysis of complexity; methods of decomposition and re-integration; trade-offs between optimality and reusability; the effective application of COTS; and practical heuristics for developing good architectures. Specialized areas of design and architecture may be addressed, such as spacecraft design, design of net centric systems, or smart engineering systems architecture.

SYSE 625 System Quality Assurance 3 Credits (3,0)
This course presents the managerial and mathematical principles and techniques of planning, organizing, controlling and improving the quality, safety, reliability and supportability of a system throughout the system life cycle. The course focuses on the importance of structuring and controlling integration and test activities. Topics include establishing a baseline control during the integration and test phases; cognitive systems engineering and the human-systems integration in complex systems environments; establishment of criteria for planning tests; the determination of test methods; subsystem and system test requirements; formal methodologies for measuring test coverage; sufficiency for test completeness; and development of formal test plans to demonstrate compliance. Also covered are methods of developing acceptance test procedures for evaluating supplier products. The quality related topics including fitness for use, quality costs, quality planning, statistical quality control, experimental design for quality improvement, concurrent engineering, continuous improvement and quality programs such as ISO 9001:2000, ISO 14001, CMMI, Malcolm Baldridge and TQM. Reliability related topics covered include reliability prediction using discrete and continuous distribution models. Supportability related topics include system supportability engineering methods, tools, and metrics and the development and optimization of specific elements of logistic support. Quality and safety is a key theme throughout the course.

SYSE 641 Systems Psychology 3 Credits (3,0)
This course emphasizes human performance and behavior as a component of larger systems of various complexities, and how human factors engineers integrate the human as a primary component in these systems. The course provides a working knowledge in areas of systems engineering and dynamics, engineering psychology, and systems analysis. Topics of emphasis examine systems theory, cognitive systems and human performance engineering, perception and control, system life cycle dynamics, and design synthesis and system validation to optimize properties and capabilities. A focus on current and emerging human systems incorporates human factors engineering principles in the design of complex enterprises by applying trade-off analysis, reliability analysis, and structural behavior modeling. Methods in the course employ scenario-based platforms and integrated learning from related disciplines. Prerequisites: STUDENT MUST BE ADMITTED TO MSYSE or MSHF. STUDENT MUST BE ADMITTED TO MSHF PRIOR TO ENROLLING IN SYSE 641 AND ALSO MUST COMPLETE ALL HUMAN PERFORMANCE CORE COURSES, AS FOLLOW: MSHF 606, MSHF 612, MSHF 618 (CAPSTONE OPTION ONLY), MSHF 624, RSCH 665, AND RSCH 670 BEFORE ENROLLING IN SYSE 641.
Prerequisites: Student must be admitted to MSYSE or MSHF.

SYSE 647 Human Factors in Complex Systems 3 Credits (3,0)
An examination of organizations and sustainable systems as socio-technical systems, including socio-technical approaches to design, implementation, and management is provided. The exploration of the understanding of effective interactions among people who work across organizational, geographical, cultural, technological, and temporal boundaries, as a means to design effective complex socio-technical systems is the focus of the course. Discussions include participative design and decision-making; quality of work life; semi-autonomous work groups; organizational ecology; and collective resource approaches to planning. Prerequisites: STUDENT MUST BE ADMITTED TO MSYSE or MSHF. STUDENT MUST BE ADMITTED TO MSHF PRIOR TO ENROLLING IN SYSE 647 AND ALSO MUST COMPLETE ALL HUMAN PERFORMANCE CORE COURSES, AS FOLLOW: MSHF 606, MSHF 612, MSHF 618 (CAPSTONE OPTION ONLY), MSHF 624, RSCH 665, AND RSCH 670 BEFORE ENROLLING IN SYSE 647.
Prerequisites: Student must be admitted to MSYSE or MSHF.

SYSE 653 Cognitive Systems Engineering 3 Credits (3,0)
Cognitive systems engineering with a focus on workplace environments and concerns with complex sociotechnical domains where interactions are based on expected behaviors of humans and automated agents will be studied. A foundation for cognitive systems engineering using formal methods of analysis and design to assure that cognitive work performed is efficient, robust, and safe will be provided. Topics of emphasis examine decision making in complex and dynamic information environments, distributed collaboration, networked systems, cognitive modeling, and the nonlinear nature of human cognition. Cognitive states, processes, and strategies to perform work and develop design solutions for decision and planning tools that support expert human cognition, including the system life cycle are addressed. Methods in the course employ scenario-based platforms and synthesizing learning from multiple disciplines. Prerequisites: STUDENT MUST BE ADMITTED TO MSYSE, MoET, or MSHF. THE MoET PROGRAM WILL NOT REQUIRE PREREQUISITES. STUDENT MUST BE ADMITTED TO MSHF PRIOR TO ENROLLING IN SYSE 653 AND ALSO MUST COMPLETE ALL HUMAN PERFORMANCE CORE COURSES, AS FOLLOW: MSHF 606, MSHF 612, MSHF 618 (CAPSTONE OPTION ONLY), MSHF 624, RSCH 665, AND RSCH 670 BEFORE ENROLLING IN SYSE 653.
Prerequisites: Student must be admitted to MSYSE or MoET or MSHF.

SYSE 660 Organizational Systems Management 3 Credits (3,0)
This course introduces concepts of organizational management and leadership, which are approached from a systems and complex systems perspective to explain the behavior of systems. Focus areas will include strategic management, organizational transformation, and organizational environments. Models will be drawn from a variety of areas including marketing, finance, organizational behavior, and strategic and operational management.

SYSE 697 Systems Engineering Project 3 Credits (3,0)
This course consists of a project in systems engineering that the student will undertake at the conclusion of the academic coursework for this program. It will culminate in a written document on a project chosen and carried out by the student under the guidance of the student's Systems Engineering Project Advisor. The project will be expected to demonstrate the student's mastery of his topic, and must be of a quality suitable for publication. Prerequisite: Students must be admitted to MSYSE and must have completed all other program course requirements including the approved elective set. This course must be the final course to complete the MSYSE program but a project advisor may be requested and a project proposal can be submitted at any time during the last course (core or elective) in which the student is enrolled prior to this course.
Prerequisites: student must be admitted to MSYSE.

Unmanned and Autonomous Systems (UASE)

Courses

UASE 501 Introduction to Unmanned Aircraft Systems Design 3 Credits (3,0)
Broad overview of unmanned aircraft system (UAS) design. Survey major UAS sub-systems including airframe, propulsion, power, communication, embedded computer hardware/software, detect-and-avoid, automation, and ground control station. Literature and case studies exploring current engineering practices, technologies used, and past lessons learned. Culminates with development of design specification for a UAS given requirements specification and knowledge acquired in the course.

UASE 691 Unmanned and Autonomous Systems Capstone Design Project I 3 Credits (3,0)
The Capstone Design Project courses provide a coherent and significant design experience resulting in fabrication of a prototype, and/or publication of refereed article. The emphasis will be on projects which require the synthesis of most of the topics emphasized by this degree including design of airframe, innovative propulsion systems, autonomy, guidance, navigation, and control systems, payloads, networking, electronics, advanced manufacturing, as well as systems engineering and end-to-end integration of components and systems in meeting requirements and specifications. Prerequisite: All preceding coursework in the MSUASE must be completed, prior to enrollment in UASE 691. An interruption in enrollment is permissible between 691 and 692; i.e. student is not required to enroll in term immediately following UASE 691. If such an occurrence is anticipated, it is recommended that an independent project, rather than team option, be pursued.

UASE 692 Unmanned and Autonomous Systems Capstone Design Project II 3 Credits (3,0)
The Capstone Design Project courses provide a coherent and significant design experience resulting in fabrication of a prototype, and/or publication of refereed article. The emphasis will be on projects which require the synthesis of most of the topics emphasized by this degree including design of airframe, innovative propulsion systems, autonomy, guidance and navigation and control systems, payloads, networking, electronics, advanced manufacturing, as well as systems engineering and end-to-end integration of components and systems in meeting requirements and specifications.Prerequisite: Successful completion of UASE 691. An interruption in enrollment is permissible between 691 and 692; i.e. student is not required to enroll in term immediately following UASE 691. If such an occurrence is anticipated, it is recommended that an independent project, rather than team option, be pursued.

Unmanned Systems (UNSY)

Courses

UNSY 501 Application of Unmanned Systems 3 Credits (3,0)
This course prepares students to understand the application of unmanned systems and their respective elements and technology to the operational domains, including atmospheric, exo-atmospheric, ground, and maritime environments. It includes applications, business cases, selection criteria, limitations and constraints, and ethical, safety, and legal considerations. Students will research, appraise, and recommend unmanned system tasking, environmental operational requirements, and system collaboration opportunities.

UNSY 515 sUAS Operation Fundamentals 3 Credits (3,0)
This course introduces graduate students to essential topics, concepts, and airmen knowledge associated with regulatory compliant use of small unmanned aircraft systems (sUAS) within the U.S. National Airspace System. Through participation in a sequence of modules featuring review of referenced documentation and use of interactive modeling and simulation tools, the student will gain exposure and comprehension of regulatory requirement compliance, required aeronautical knowledge, and application of best practices. With the successful completion of this course a student can expect to demonstrate appropriate acquisition of knowledge to prepare for the Federal Aviation Administration Part 107 Remote Pilot Certification examination, while attaining an understanding of key factors supporting productive, purposeful, responsible, and legal operation of sUAS.Prerequisites: RSCH 665 and 670; Ability to meet Transport Security Administration (TSA) clearance requirements; and acquisition of items detailed in the ERAU-Worldwide sUAS Toolkit.

UNSY 520 sUAS Practical Application and Assessment 3 Credits (3,0)
This course further prepares graduate students to safely and effectively perform small unmanned aircraft system (sUAS) operations in support of graduate level research and educational goals, through the practical application and practice of fundamental knowledge, skills, and abilities (KSA)s. Students will participate in the review and practice of basic to advanced aircraft controls (manual and automatic), checklist and emergency procedures, flight planning, review of platform specific traits, aerial photography and post-flight processing techniques, pilot application, crew resource management, and instructor-student practical assessment. The use of both interactive scenario-based modeling and simulation and actual (live) sUAS tools helps students to establish and improve unmanned airmanship skills in settings supporting incremental exposure, progression, and assessment combined with instructor-guided feedback and practice. With the successful completion of this course a student can expect to demonstrate appropriate application of unmanned airmanship, while attaining further comprehension of key factors supporting productive, purposeful, responsible, and legal operation of sUAS. Eligibility: Students must be U.S. citizens or permanent residents and must be physically located within the U.S., and hold an FAA Part 107 Remote Pilot Certificate while participating in the UNSY 520 course. Prerequisites: FAA Part 107 Remote Pilot Certificate, acquisition of items detailed in the ERAU-Worldwide sUAS Toolkit, RSCH 665, RSCH 670, and UNSY 515. Those already in possession of an FAA Part 107 Remote Pilot certificate, prior to starting the sUAS Operation concentration/specialization, may complete ASCI 530, in lieu of UNSY 515 to ensure sufficient credit, research experience, and topical exposure.

UNSY 601 Unmanned Systems Command, Control, and Communications 3 Credits (3,0)
This course provides a detailed examination of the command, control, and communication (C3) of unmanned systems. The student will examine and evaluate elements and components, interoperability, human factors, operator controls and interactions, situational awareness, teaming, supervisory control, infrastructure, and considerations associated with C3. Course applications include identifying current unmanned system C3 issues, recommending strategies or solutions to address issues, and evaluating appropriate C3 elements, components, or technology to support unmanned system missions and tasks.

UNSY 605 Unmanned Systems Sensing, Perception, and Processing 3 Credits (3,0)
This course provides a detailed examination of the sensing, perception, and processing of exteroceptive and proprioceptive data for unmanned systems. The student will examine and evaluate elements, components, technology, and processing methods associated with internal and external (payload) sensing systems. The content of the course includes identifying types of sensors, operational requirements, capture and format of data, feedback, control, depiction of state, and processing. This course prepares students to integrate environmental and state sensing into unmanned systems. It will include examinations of sensor selection, application, payload considerations, processing, and the latest technology advancements.

UNSY 610 Unmanned Systems Autonomy and Automation 3 Credits (3,0)
This course provides students with an opportunity to examine the benefits, limitations, and capabilities of autonomous control technology and support for unmanned systems. The student will examine and evaluate elements, components, technology, and processing methods associated with autonomous and semi-autonomous operation of unmanned systems. The content of the course includes supported capabilities, reference framework, man-machine collaboration, cognitive capability, interaction and manipulation, allocation of functions and responsibilities, high-level tradeoffs, limitations, and associated advancements. This course prepares students to better understand the implications and capabilities associated with autonomy in unmanned systems. It will include examinations of associated technology, programming, processing, and interoperability required to understand the application of autonomy and automation.

UNSY 615 Unmanned Systems Power, Propulsion, and Maneuvering 3 Credits (3,0)
This course represents a detailed examination of the power, propulsion, and maneuvering (actuation) elements of unmanned systems required to support interaction and operation in remote environments. The student will examine and evaluate the elements, components, and processing associated with the generation and storage of power, propulsion methods to achieve locomotion or motion, and actuation used to manipulate control surfaces and other controls in support of maneuvering. The course applications include identifying and analyzing current manipulation options, power storage and distribution, and propulsion methods for unmanned systems.

UNSY 620 sUAS Operational Planning and Safety Management 3 Credits (3,0)
This course builds upon previously attained small unmanned aircraft system (sUAS) operational knowledge, skills, and abilities (KSA)s within the context of performing effective planning and management for graduate level applied research. It includes comprehensive review and application of sUAS planning and management concepts, topics, and techniques in real-world scenarios featuring team exercises; environmental, platform suitability, and safety analysis; use of interactive modeling and simulation tools; and regulatory compliant live sUAS operation. Students will gain further sUAS operational exposure and practical experience to address common challenges, analyze options, determine feasibility of plans, and implement a final operational plan featuring appropriate application of safety risk management and analytical operational planning. With the successful completion of this course a student can expect to further demonstrate appropriate application of KSAs, while mastering comprehension of key factors supporting productive, purposeful, responsible, and legal operation of sUAS.Prerequisite: UNSY 520 sUAS Practical Application and Assessment.

UNSY 691 Graduate Capstone Course 3 Credits (3,0)
The Master of Science in Unmanned Systems Graduate Capstone Course is the culminating effort of the student's entire learning experience. The student will complete a project that provides significant evidence of experience in unmanned systems studies. Students will work with designated faculty to formulate, develop, and complete the project. The completion of the Capstone Course is designed to document significant evidence that all Program Outcomes have been met, and provides the student evidence of experience to show to current and prospective employers. The Capstone Course must be taken at the end of the student's degree program. Prerequisites: All Master of Science in Unmanned Systems degree program curriculum.
Prerequisites: UNSY 501 UNSY 601 UNSY 605 UNSY 610 UNSY 615 RSCH 665 and RSCH 670.

Office of Professional Education

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Professional Education Course Descriptions

The courses listed below are non-academic Continuing Education courses. Continuing Education Units (CEUs) are awarded for these courses and cannot be used toward degree requirements.

Business, Law, and Finance

ALF 3000	Essentials of Business Ownership
ALF 3001	Financial/Accounting Management
ALF 3002	Marketing Management
ALF 3003	Strategic Management in Operations
ALF 3004	Legal Issues in Operations
ALF 3005	Successful Selection Systems
ALF 3006	Human Resources as a Strategic Partner
ALF 3007	High Performance Organizations
ALF 3008	Legal Aspects of Contracts
ALF 3009	Tax Issues
ALF 3010	Business Plan Development
ALF 3011	Understanding Financial Statements
ALF 3012	Persuasive Communication
ALF 3013	Budgeting Essentials
ALF 3014	Organizational Leadership and Decision-Making
ALF 3015	Organizational Development and Change
ALF 3016	Principles of Buying or Selling a Business
ALF 3017	Business Best Practices
ALF 3018	Negotiating Strategies
ALF 3019	Seven Management Disciplines
ALF 3020	Management Issues in the IT Environment
ALF 3021	Collaborative Problem-Solving
ALF 3022	Financial Accounting for IT Managers
ALF 3023	Introduction to the Legal System
ALF 3024	Paralegal Fundamentals (Introduction to Legal Assistantship)
ALF 3025	Legal Writing
ALF 3026	Legal Research
ALF 3027	Ethics for Paralegals
ALF 3028	Introduction to Business Law (Transactions)
ALF 3029	Corporate Document Drafting
ALF 3030	Business Entity Formation
ALF 3031	Bankruptcy Law
ALF 3032	Intellectual Property Law
ALF 3033	Private Business Mergers and Acquisitions
ALF 3034	Real Estate Law
ALF 3035	Probate and Estate Planning
ALF 3036	Civil Litigation
ALF 3037	Transactional Drafting
ALF 3038	Trial Preparation
ALF 3039	Interviewing Skills for Paralegals
ALF 3040	Essentials of Purchasing
ALF 3041	The Supply Chain Process
ALF 3042	Management Essentials
ALF 3043	Positioning for and Finding Financing
ALF 3044	The Procurement Process
ALF 3045	Supplier Contracting
ALF 3046	Price and Cost Analysis
ALF 3047	An Introduction to Accounting: The Accounting Cycle
ALF 3048	Journals, Ledgers and Worksheets
ALF 3049	Payroll Accounting
ALF 3050	Accounting for Accounts Payable
ALF 3051	Accounting for Accounts Receivable
ALF 3052	Developing Effective Leadership Skills
ALF 3053	Performance Management
ALF 3054	Decision Making and Time Management
ALF 3055	Developing Effective Interpersonal Communication and Assertion Skills
ALF 3056	Productivity and Benchmarking
ALF 3057	Project Management
ALF 3058	E-Business Management Strategies
ALF 3059	E-Business Marketing Strategies
ALF 3060	E-Business Technology
ALF 3061	E-Business Legal Issues
ALF 3062	E-Business Operations
ALF 3063	E-Commerce
ALF 3064	Introduction to Grant Research
ALF 3065	Introduction to Grant Writing
ALF 3066	Specialized Techniques for Grant Writing
ALF 3067	Technical Writing
ALF 3068	Advanced Grant Writing
ALF 3069	Writing Effective Newsletters
ALF 3070	Persuasive Communication
ALF 3071	Effective Writing Skills
ALF 3072	Grammar Essentials
ALF 3073	Effective Communication
ALF 3074	Non-Profit Management and Governance
ALF 3075	Fundraising Fundamentals
ALF 3076	Contracts
ALF 3077	Torts
ALF 3078	Real Property
ALF 3079	Criminal Law and Procedure
ALF 3080	Civil Procedure
ALF 3081	Constitutional Law

Aviation Management Certificate

ALF 3003	Strategic Management in Operations
ALF 3007	High Performance Organizations
ALF 3019	Seven Management Disciplines
ALF 3052	Developing Effective Leadership Skills
ALF 3056	Productivity and Benchmarking
ALF 4000	Air Transportation Fundamentals
SFY 1000	Health, Wellness, Regulations, and the Environment

Aviation Maintenance

AMNT 2000	Aerospace Coatings Applicator Certification Training
AMNT 2100	Aerospace Coatings Inspector Training

Aviation Maintenance Technology

AMT 1000	Airframe and Powerplant Written Test Prep Course

Online Ground School

AVS 1000F	Private Pilot Ground School-Fixed Wing
AVS 1000H	Private Pilot Ground School-Helicopter
AVS 1100F	Instrument Rating Ground School-Fixed Wing
AVS 1100H	Instrument Rating Ground School-Helicopter
AVS 1200F	Commercial Pilot Ground School-Fixed Wing
AVS 1200H	Commercial Pilot Ground School-Helicopter
AVS 1200HA	Commercial Pilot Ground School-Helicopter CASA

Online Pilot Specialty

AVS 2000	Contaminated Runway Operations
AVS 2001	Controlled Flight into Terrain
AVS 2002	ETOPS
AVS 2003	Future Air Navigation System
AVS 2004	GPS
AVS 2005	High Altitude Training
AVS 2006	Jet Upset Training
AVS 2007	MNPS
AVS 2008	North Atlantic Procedures-NAT
AVS 2009	Performance Training - Tire Speed Limit
AVS 2010	Polar Operations
AVS 2011	Precision Runway Monitoring
AVS 2012	Required Navigation Performance
AVS 2013	Reduced Vertical Separation MINS
AVS 2014	RNAV SAAAR Approaches
AVS 2015	TCAS/ACAS
AVS 2016	Advanced Leadership
AVS 2017	CPDLC/ADS Operations
AVS 2018	CRM - Crew Resource Management
AVS 2019	EDTO - Extended Diversion Time Operation
AVS 2020	Fatigue
AVS 2021	Pacific Operations
AVS 2022	PBN-OPS - Performance Based Navigation Operations
AVS 2023	SMS - Safety Management Systems
AVS 2024	Security
SFY 2020	Dangerous Goods
WXR 2001	Cold Weather Winter Operations (C)
WXR 2002	Hot Weather Operations
WXR 2003	Low Visibility-Cat Ii/Cat III Ops
WXR 2004	Thunderstorm Avoidance
WXR 2005	Volcanic Ash Avoidance
WXR 2006	Wind Shear
WXR 2007	Weather & Meteorology

Aircraft-Specific Ground School

AVS 4000	DC-10 Refresher Course
AVS 4001	MD-11 Ground School
AVS 4100	MD-80 Ground School
AVS 4200	CRJ-200 with 700 and 900 Differences Ground School
AVS 4300	A319 with A320/321 Differences Ground School
AVS 4301	A330 with A340 Differences Ground School
AVS 4700	B737-200 Ground School
AVS 4701	B737 Next Generation (NG) Ground School
AVS 4702	B757 and 767 Ground School
AVS 4703	B747-400 Ground School
AVS 4704	B777 Ground School

Pilot and Crew Training

APN 1100	Aircraft Ditching, Escape and Survival
APN 1100E	Aircraft Ditching, Escape and Survival w/ EBS
APN 1101	Helicopter Landing Officer in Public Safety Environment
APN 1106	Crew Resource Management
APN 1108	Wire & Obstacle Environment Awareness Course

Business Management

CE 2111	Value Proposition Analysis for Corporate Aviation
CE 2112	Flight Department Finance, Budgeting and Accounting
CE 2113	Community Relations

Leadership

CE 2121	Strategic Vision and Planning
CE 2122	Leadership and Motivation
CE 2123	Managerial Communications
CE 2124	Professional Development
CE 2125	Human Factors

Corporate Aircraft Operations

CE 2131	Standard Operating Procedures and Processes
CE 2132	Scheduling and Dispatch
CE 2133	Record-Keeping and Regulatory Compliance

Human Resource Management

CE 2141	Workload Management and Staffing
CE 2142	Employee Training Programs
CE 2143	Staffing and Team Building
CE 2144	Performance Reviews and Feedback Systems
CE 2145	Compensation and Reward Programs
CE 2146	HRM Laws and Ethics

Corporate Aviation Technical Services

CE 2151	Aviation Safety Programs and Emergency Preparedness
CE 2152	Aviation Maintenance Management
CE 2153	Customer Service Programs
CE 2154	Aviation Security
CE 2155	Vendor Management
CE 2157	Aviation Safety Audits

Unmanned Aircraft Systems

SUAS 1000	History and Application of sUAS
SUAS 1100	sUAS Design and Configuration
SUAS 1200	sUAS Operations and Regulations
SUAS 1300	Global Unmanned Aircraft Systems Risk Management
SUAS 1400	SUAS Inspection Course
SUAS 1500	Fundamentals for Starting an sUAS Small Business
SUAS 2000	SUAS Ground School
SUAS 3000	sUAS Fundamentals for Public Safety
SUAS 6000	Airworthiness Certification of Unmanned Aircraft Systems

Supply Chain Management

LGM 100	Integrated Logistics Management
LGM 101	IATA Cargo Introductory Course
LGM 102	Logistics Management for Aviation
LGM 103	Cargo Advanced Rating and Marketing

Airport Planning Design and Development

MGM 2500	Airport Planning and Design Course
MGM 2600	Introduction to Airport Terminal Planning
MGM 2700	Airport Sustainability and Environmental Management
MGM 2900	Airport Security Course
MGM 3100	Airport Safety and Certification

Airport Risk Management and Safety

MGM 2800	Airport & Aviation Risk Management and Insurance
RCM 1100	Construction Industry Risk Management and Safety
MGM 3100	Airport Safety and Certification
MGM 2900	Airport Security Course

Aviation Risk Management

MGM 2000	Safety Management Systems
MGM 2100	Aviation Law and Risk Management
MGM 2300	Risk Management and Hazard Identification
MGM 2400	Financial Risk Management
MGM 2800	Airport & Aviation Risk Management and Insurance
MGM 3000	SMS Basics for Public Service Aviation

FBO Management

MSM 1000	Finance and Budgeting for the FBO
MSM 1100	Facilities Management for the FBO
MSM 1200	Fuel Services Management for the FBO
MSM 1300	Leadership for the FBO
MSM 1400	Safety and Security for the FBO

Project Management

PMG 2000	Project Management Fundamentals for PMP Exam Preparation

Construction Risk Management

RCM 1000	Project Management and Managing Construction Project Design Risk
RCM 1100	Construction Industry Risk Management and Safety
RCM 1200	Managing Risk at the Construction Site

Faculty and Administration

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Faculty

College of Aeronautics (p. 161)

- **Departments of:** Engineering and Technology | Flight | Undergraduate Studies | Graduate Studies

College of Arts and Sciences (p. 163)

- **Departments of:** Security and Emergency Services | Mathematics, Physical & Life Sciences | English, Humanities & Communications | Social Sciences & Economics

College of Business (p. 164)

- **Departments of:** Business Administration | Decision Sciences | Organizational Leadership | Management | Technology Management

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The **2018-2019** catalog is effective July 1, 2018 through June 30, 2019.

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Index

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