

graduate  
**Catalog 2006-2007**



**EMBRY-RIDDLE**  
AERONAUTICAL UNIVERSITY

# ***EMBRY-RIDDLE*** ***AERONAUTICAL UNIVERSITY***

*Leading the World in  
Aviation and Aerospace Education*

## **DAYTONA BEACH, FLORIDA, CAMPUS**

Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
(386) 226-6000

Admissions: (386) 226-6100 or (800) 862-2416

Financial Aid: (800) 943-6279

email (Admissions): [dbadmit@erau.edu](mailto:dbadmit@erau.edu)

## **PRESCOTT, ARIZONA, CAMPUS**

Embry-Riddle Aeronautical University  
3700 Willow Creek Road  
Prescott, AZ 86301-3720  
(928) 777-3728

Admissions: (928) 777-6600 or (800) 888-3728

Financial Aid: (928) 777-3765

email (Admissions): [pradmit@erau.edu](mailto:pradmit@erau.edu)

## **EXTENDED CAMPUS**

### **WORLDWIDE CENTERS AND DISTANCE LEARNING PROGRAMS**

Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
(386) 226-6910 or (800) 522-6787

Admissions: (866) 509-0743

Financial Aid: 800.943.6279

E-mail (Admissions): [ecinfo@erau.edu](mailto:ecinfo@erau.edu)

[www.embryriddle.edu/ec](http://www.embryriddle.edu/ec)

**<http://www.erau.edu>**



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# 2006-2007 GRADUATE PROGRAM CALENDAR

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## *Deadlines for Daytona Beach and Prescott Campuses*

	Fall Semester 2006	Spring Semester 2007	Summer Semesters 2007
<b>Admission</b>			
For U.S. Students	7/01/06	11/01/06	3/01/07
For International Students	7/01/06	11/01/06	3/01/07
<b>Graduation Application</b>	10/27/06	3/11/07	7/01/07
<b>Thesis Defense</b>	10/27/06	3/11/07	7/01/07

To be considered a Fall or Spring graduate, thesis defense must take place by specified dates.

To be considered a Summer A or Summer B graduate, students should check with their graduate program coordinator.

# 2006 - 2007 CALENDAR

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## Fall Semester 2006

### (August 28 - December 14)

August 23-25	Orientation and Registration
August 28	Classes begin
September 4	HOLIDAY - Labor Day
October 20	University Day - Prescott
October 27	University Day - Daytona Beach
November 22-24	HOLIDAY - Thanksgiving
December 7	Last day of classes
December 8	Study Day
December 9, 11-14	Final Examinations
December 16, 17	Commencement - Daytona Beach
December 16	Commencement - Prescott

## Spring Semester 2007

### (January 10 - May 3)

January 8-9	Orientation and Registration
January 10	Classes begin
January 15	HOLIDAY - Martin Luther King Day
February 19	HOLIDAY - President's Day
March 19-23	HOLIDAY - Spring Break
April 26	Last day of classes
April 27	Study Day
April 28,30	Final Examinations
May 1-3	Final Examinations
May 7	Commencement

## Summer Semester (Term A) 2007

### (May 10 - June 25)

May 8-9	Orientation and Registration
May 10	Classes begin
May 28	HOLIDAY - Memorial Day
June 21	Last day of classes
June 22	Study Day
June 23, 25	Final Examinations

## Summer Semester (Term B) 2007

### (June 28 - August 13)

June 26-27	Orientation and Registration
June 28	Classes begin
July 4	HOLIDAY - Independence Day
August 9	Last day of classes
August 10	Study Day
August 11, 13	Final Examinations

This 2006-2007 calendar applies to the residential campuses. It is presently under review and is subject to change. Extended Campus students should contact the local Embry-Riddle center director for the academic calendar applicable to their specific location.

Effective Date: This catalog becomes effective July 1, 2006, for all campuses.

# MESSAGE FROM THE PRESIDENT

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To Our Students:

Thank you for choosing Embry-Riddle Aeronautical University for one of the most important investments you will make in your future. With thousands of students enrolled in our programs today, and over 60,000 alumni, you are now a member of a worldwide family of leaders in the aviation and space industry.

Our commitment is to provide you with quality programs and faculty, as well as responsive and caring student services. In reviewing this catalog, you will see a broad range of academic programs that emphasize hands-on learning. Many courses are designed as projects in which you will work with others as a team to solve real world challenges.

As you read the history of Embry-Riddle, it will be clear that our University is evolving. In eighty years we have grown from the world's finest aviation institute to an internationally respected comprehensive university, committed to teaching, research, scholarship, and professional service to the aviation and space industry.

I welcome you to an exciting and dynamic University, and to the Embry-Riddle experience.



A handwritten signature in black ink that reads "J.P. Johnson". The signature is written in a cursive, flowing style.

John P. Johnson, Ph.D.  
Interim President

# MISSION OF THE UNIVERSITY

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Embry-Riddle Aeronautical University is an independent, nonsectarian, nonprofit, coeducational university with a history dating back to the early days of aviation. The University serves culturally diverse students motivated toward careers in aviation and aerospace. Residential campuses in Daytona Beach, Florida, and Prescott, Arizona, provide education in a traditional setting, while an extensive network of Extended Campus centers throughout the United States and abroad serves civilian and military working adults.

It is the purpose of Embry-Riddle to provide a comprehensive education to prepare graduates for productive careers and responsible citizenship with special emphasis on the needs of aviation,

aerospace, engineering, and related fields. To achieve this purpose, the University is dedicated to the following:

To offer undergraduate and graduate degree programs that prepare students for immediate productivity and career growth while providing a broad-based education, with emphasis on communication and analytical skills.

To emphasize academic excellence in the teaching of all courses and programs; to recruit and develop excellent faculty and staff; and to pursue research and creative activities that maintain and extend knowledge in aviation, aerospace, and related disciplines.

To develop mature, responsible gradu-

ates capable of examining, evaluating, and appreciating the economic, political, cultural, moral, and technological aspects of humankind and society, and to foster a better understanding of the workings of the free enterprise system and its social and economic benefits, and of the profit motive, as vital forces to the potential of individuals and groups.

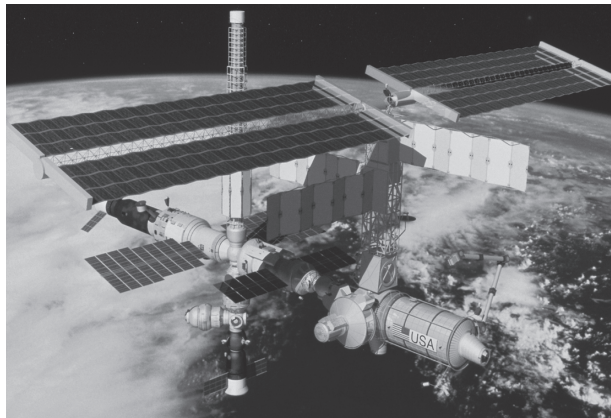
To promote ethical and responsible behavior among its students and graduates in the local, national, and international aviation and aerospace communities and in the community at large.

To develop and effectively deliver educational programs for the adult student and professional at the undergraduate and graduate levels,

including off-campus degree programs, short courses, distance learning, noncredit programs, seminars, workshops, and conferences.

To support each student's personal development by encouraging participation in programs and services that offer opportunities for enhanced physical, psychological, social, and spiritual growth; and by complementing the academic experience and contributing to the development of a well-rounded individual prepared for personal and professional success.

To engage in research, consulting services, and related activities that address the needs of aviation, aerospace, and related industries.





# EMBRY-RIDDLE AT A GLANCE

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# EMBRY-RIDDLE AT A GLANCE

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## *Aviation and Embry-Riddle: The Lifelong Partnership*

At the beginning of the last century no flying schools existed, much less an aviation university. It was not until 1903 that the Wright brothers achieved sustained, controlled flight by a powered aircraft and, in so doing, changed life on this planet forever.

It did not take long for aviation to come of age. By 1914, regular passenger service had been inaugurated in Florida between St. Petersburg and Tampa. Later that year, war



T. Higbee Embry

came to the European skies. The combined effect of military and commercial demands produced a dynamic new industry.

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.

This 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 December 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



John Paul Riddle

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.

Although it was a volatile time for aviation enterprises, the school prospered. Others came and went regularly, but Embry-Riddle was not affected.

Within three years the school had become a subsidiary of AVCO, the parent of American Airlines. The school remained dormant during most of the 1930s, mirroring the casualties of the Great Depression. 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.

The Lunken Airport operation had long since disappeared, but in 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.

# Embry-Riddle at a Glance

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Jack R. Hunt

In 1965, with Jack R. Hunt as president, Embry-Riddle consolidated its flight, ground school, and technical training programs into one location. 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 June 1970, Embry-Riddle changed its name from “Institute” to “University,” and resident centers were established at U.S. military aviation centers to serve the educational needs of active-duty military personnel. Application for Southern Association of Colleges and Schools accreditation through the Commission on Colleges was initiated in 1970 and received in 1972. The University has participated in the Self-Study process ever since.

Also 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.

Continuing the legacy left behind by Hunt was Lt. Gen. Kenneth L. Tallman.



Lt. Gen. Kenneth L. Tallman

Tallman was 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.



Steven M. Sliwa

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

## Embry-Riddle at a Glance

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FlightSafety International; a partnership with Cessna Aircraft Company; a technology alliance with IBM; and an exclusive educational partnership with 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



Dr. George H. Ebbs

University's core programs.

Embry-Riddle's fourth president, Dr. George H. Ebbs, led the University from 1998 through 2005. During his tenure the annual college guide produced by U.S. News & World Report consistently ranked

Embry-Riddle's aerospace engineering program No. 1 in the nation among schools without doctorate programs. Embry-Riddle's programs in aerospace engineering, aeronautical science, and engineering physics are the largest in the nation.

Under the leadership of Dr. Ebbs, new graduate degree programs in safety science and space science were introduced, as well as new undergraduate degree programs in computer science, global security and intel-

ligence studies, mechanical engineering, software engineering, and space physics. Major construction began on the Aviation Complex at the Daytona Beach Campus and the Academic Complex at the Prescott Campus.

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, trains Air Force pilots at the U.S. Air Force Academy in Colorado Springs, and trains Air Force, Air National Guard, and international flight safety officers at Kirtland Air Force Base in Albuquerque, N.M.

# Embry-Riddle at a Glance

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## ACCREDITATIONS AND AFFILIATIONS

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Embry-Riddle Aeronautical University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, GA 30033-4097, Telephone: 404-679-4501) to award degrees at the associate, bachelor, and master levels. The bachelor degree programs in aerospace engineering and computer engineering at the Daytona Beach and Prescott campuses, along with civil engineering, engineering physics, and software engineering at Daytona Beach, and electrical engineering at Prescott, are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) (111 Market Place, Suite 1050, Baltimore, MD 21102-4012, Telephone: 410-347-7700).

The following bachelor degree programs are accredited by the Aviation Accreditation Board International (AABI, formerly Council on Aviation Accreditation), 3410 Skyway Drive, Auburn, AL 86830, telephone: 334-844-2431: Aeronautical Science

(Daytona Beach and Prescott), Aviation Business Administration (Daytona Beach and Prescott), Applied Meteorology (Daytona Beach and Prescott), Safety Science (Daytona Beach) and Air Traffic Management (Daytona Beach). Under the College of Aviation at Daytona Beach, the Maintenance Management area of concentration and the Aerospace Electronics area of concentration are also accredited by AABI.

The bachelor degree programs in aviation business administration (Daytona Beach and Prescott) are also accredited by Association of Collegiate Business Schools and Programs (ACBSP). The MBA in aviation at the Daytona Beach campus is accredited by the ACBSP.

Federal Aviation Administration-approved certification programs include maintenance technology (airframe and power plant); flight (private, commercial, instrument, multi-engine, flight instructor, and instrument flight instructor ratings); and flight dispatch..

# Embry-Riddle's Statement of Values

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## *Student Success ...*

We understand that students are the lifeblood of Embry-Riddle. We focus and commit ourselves and our resources to the success of current, past, and future students. Our success is gauged by the difference we make in our students' lives.

## *Learning Environment ...*

We seek intellectual growth through study, research, questioning, listening, and debate. We value the enlightened interchange of ideas as we challenge one another to do more, to study, to learn, to share, and to grow. We expect members of the student body, faculty, and administration to exercise their academic freedoms and to preserve those of others. We commit ourselves to a lifelong endeavor of learning. We are all teachers and we are all students.

## *Safety ...*

We care deeply about the health and safety of our students and fellow employees. We believe that each one of us, from the administration to the flight instructors, has a responsibility to make our workplaces safer for everyone. We support the open sharing of information on all safety issues and encourage all employees and students to report significant safety hazards or concerns.

## *Integrity, Honesty, and Trust ...*

Integrity is the most valued employee trait. We believe that honesty is the foundation for interaction in all academic, administrative, and personal matters. The leadership team and each individual bear the responsibility for earning the trust of others.

## *Diversity ...*

We respect the rights and property of all individuals regardless of gender, race, ethnicity, national origin, age, physical disability, economic background, sexual orientation, or religious belief. We believe in a community where all members are welcome, and individuals or groups are free from harassment.

## *Communication ...*

We speak candidly and we listen well. We hold that if every involved party has taken part in a decision, then everyone will support the decision. We believe that clear and frequent communication is essential for our safety, our relationships, and our productivity.

# Embry-Riddle's Statement of Values

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## *Process and Teamwork ...*

We believe that the process of collegially making decisions is usually at least as important as the quality of the decisions. We also understand and appreciate that the most successful outcomes occur when organizational units work cooperatively as a team.

## *Character ...*

We accept responsibility for our actions. When we see a problem, we do not pass it off, we do not complain, we act. We involve others as appropriate to achieve our goals. We prize dedicated, committed, caring, conscientious, and creative individuals who strive for excellence in the performance of their duties and responsibilities.

## *Change and Growth ...*

We appreciate that great organizations like Embry-Riddle are constantly changing, adapting to external pressures, and growing. All of our work units are constantly improving quality. We realize that our jobs require us to grow professionally and take on more responsibility. Growth requires calculated risk-taking and we empower one another to take appropriate risks and learn from our mistakes. We believe in a willingness to challenge traditions and constantly seek innovative ways to manage and solve problems.

## *Fiscal Soundness and Investments ...*

We understand we must operate efficiently and effectively so that investments can be made in ourselves and our capabilities. We invest in technology as appropriate, principally to increase the quality and frequency of our interactions in support of our mission.

## *Attitude ...*

We recognize, endorse, and empower leadership at all levels. We understand the joy of living in harmony with one another and strive to maintain an open, productive environment. We prize an upbeat, can-do attitude. We are members of the Embry-Riddle community because we want to be here, and this positive attitude is reflected in our communications with one another and our students.

# Embry-Riddle's Employee Creed

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## *Employee Creed*

Adopted by Jack R. Hunt in 1975

Updated and reaffirmed by President George H. Ebbs, Ph.D., 2003

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**A STUDENT ...**

Is the most important person in this university.

**A STUDENT ...**

Is not an interruption of your work, but the purpose of it.

**A STUDENT ...**

Is not a cold statistic, but a flesh-and-blood human being with feelings and emotions like your own.

**A STUDENT ...**

Is not someone to argue or match wits with.

**A STUDENT ...**

Is a person who brings us needs - it is our job to fill those needs.

**A STUDENT ...**

Is deserving of the most courteous and attentive treatment we can provide.

**A STUDENT ...**

Is the person who makes it possible to pay your salary whether you are faculty or staff.

**A STUDENT ...**

Is the lifeblood of this and every university.

**A STUDENT ...**

Is something you once were, REMEMBER?



# UNIVERSITY INFORMATION

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Embry-Riddle Aeronautical University is the world's oldest and largest fully accredited university specializing in aviation and aerospace. As a global institution, the University educates more than 32,000 students annually at its residential campuses in Daytona Beach, Florida, and Prescott, Arizona, and through its Extended Campus.

The Daytona Beach campus has 4,400 undergraduate and 390 graduate students. The Prescott campus enrolls 1,700 undergraduate and 30 graduate students. The Extended Campus has 19,500 undergraduate students and 5,800 graduate students.

Our students hail from all 50 states and 93 nations. At the Prescott campus, the top five states of origin in descending order are California, Arizona, Oregon, Washington, and Texas. At the Daytona Beach campus,

the top five states of origin are Florida, Pennsylvania, New York, New Jersey, and Texas. International students make up 8 percent of the student body at Daytona Beach and 3 percent at Prescott, with India at the top, followed by Korea and Japan. At the residential campuses, females constitute 17 percent of the student population.

The 185-acre Daytona Beach campus is located next to Daytona Beach International Airport. High-technology industries in the Daytona Beach and Orlando areas, as well as the Kennedy Space Center, provide the University with an outstanding support base. The campus offers state-of-the-art facilities, including the new College of Aviation building, which has air traffic control simulation and research labs and a weather center. The Lehman Engineering



## University Information

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and Technology Center houses the technology for distance learning, videoconferencing, decision support systems, and three-dimensional modeling. The Advanced Flight Simulation Center contains an FAA-certified Level-6 CRJ-200 simulator and Level-6 Frasca FTDs that provide a level of on-campus training unique to higher education.

The University's 539-acre western campus is located in Prescott, Arizona, 100 miles north of Phoenix. Campus facilities include the new Aerospace Experimental and Fabrication Building; the new Academic Complex; the King Engineering and Technology Center, which is electronically linked to the Daytona Beach campus; the Robertson Aviation Safety Center, which is dedicated to the study of human factors, aircraft accident investigation, and aviation safety; and the Robertson Flight Simulation Center, which contains Frasca and Airbus A320 flight-training devices. In support of academic instruction are various laboratories for engineering graphics, materials, aircraft structures and composites, and basic circuits and electronic devices, in addition to a supersonic wind tunnel and shock tube.

The Extended Campus provides educational opportunities for civilian and military professionals who are unable to attend classes at one of the University's residential campuses. Its academic programs are offered in the classroom through a network of more than 130 centers in the United States, Canada, Europe, and the Middle East and through Web-based distance learning. The Extended Campus headquarters is in Daytona Beach.

Embry-Riddle offers the student a choice of more than 30 undergraduate and graduate degree programs in aviation, aerospace, business, engineering, and related high-tech fields. U.S. News & World Report's "Best Colleges" guide ranks Embry-Riddle's aerospace engineering program No. 1 in the nation among schools without doctorate programs. Our aerospace engineering program is also the largest in the nation. The University's engineering physics program is the largest of all ABET-accredited engineering physics programs and is considered to be one of the best in the nation.

Embry-Riddle's undergraduate aeronautical science (professional pilot) program is the largest in the world; it's as large as the other top 10 U.S. collegiate flight programs combined. The program is supported by 92 instructional aircraft and 41 simulators. Embry-Riddle's precision flight teams consistently rank among the top in the nation in the SAFECON competition sponsored by the National Intercollegiate Flying Association.

While pursuing their education, our students gain valuable experience through participation in cooperative education and internship programs. More than 419 students were awarded co-op or intern positions during the 2004-2005 academic year. Students also accrue skills by assisting faculty members in conducting solution-oriented research and consulting projects for the aviation, aerospace, and other industries. In fiscal year 2004-2005, some 110 faculty members were involved in research with 123 sponsored projects. Total funding was almost \$27 million.

# University Information

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Within one year of graduation, 95 percent of Embry-Riddle graduates are either employed or have decided to continue their education. The major airlines hire more alumni from Embry-Riddle than from any other collegiate aviation program, and Embry-Riddle is the nation's largest supplier of air traffic controllers with bachelor degrees to the FAA.

Over the decades, Embry-Riddle has educated and trained thousands of men and women of the U.S. armed forces. The two Air Force ROTC detachments at Embry-Riddle form the largest university-based Air Force commissioning source in the nation. The detachments also produce more commissioned officers and more pilots and other rated officers for the Air Force than any other institution in the nation except the Air Force Academy. The University also hosts Army and Navy ROTC units. Currently Embry-Riddle has a \$30 million contract with the U.S. Department of Defense that maintains the University's long-time status as the sole provider of aviation-related degree programs to the

U.S. military in Europe. Embry-Riddle also has a \$14.5 million contract to train Air Force pilots at the U.S. Air Force Academy in Colorado Springs. The 50-hour flight-training program results in a private pilot's license. Under a \$2.7 million contract with the U.S. Air Force, Embry-Riddle trains Air Force, Air National Guard, and international flight safety officers at Kirtland Air Force Base in Albuquerque, N.M.

As aviation and aerospace continue to evolve, so does Embry-Riddle. The University is committed to the expansion of opportunities for students to work more closely with the aviation industry in the United States and in other nations. 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.

# ADMISSION TO THE UNIVERSITY

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Embry-Riddle seeks graduate students of good character who have demonstrated scholastic achievement and capacity for future growth. Our admission process is aimed at identifying the best students who show the potential to succeed in one of our graduate programs. We use the guidelines in the next section to determine which applicants are to be granted full admission to a graduate program. Students who fail to meet these guidelines but who are judged to have potential for success in a graduate program may be granted conditional admission (subject, of course, to openings in the graduate program). Students admitted under conditional status will have to prove their ability to pursue a graduate program by meeting specific performance criteria after matriculation at the University.

Admission actions are often taken in the anticipation of the applicant successfully completing the baccalaureate or some other admission requirement. **Admission granted by such actions is provisional and is automatically rescinded if the applicant fails to meet the requirement before the specified date for the start of graduate study.**

Specific programs may require that potential degree candidates display a mastery of a number of topical areas critical to the initiation of graduate-level study in their fields. Candidates are informed of these requirements along with their notification of acceptance.

Any questions relating to the criteria or any other aspect of the admissions process should be addressed to the Graduate Admissions Office on the Daytona Beach or Prescott campus.

## GENERAL CRITERIA

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Applicants must possess an earned baccalaureate degree or equivalent.

If earned in the United States, this degree must be from an appropriately accredited college, university, or program.

If earned outside the United States, the degree must be from an institution that offers a degree program that is equivalent to one in an appropriately accredited college, university, or program in the United States. Applicants educated at foreign schools may be required to submit an evaluation by submitting official certified documentation of their educational achievements to an international education evaluation organization specified by Embry-Riddle.

A well-defined process will be used to determine whether or not a student is fully qualified for admission to a specific graduate program. Criteria for making this judgment will include: academic record, work experience, professional activities, publications, recommendations, written statements, and interviews, as appropriate.

Articulation of applicable courses to meet program requirements or course prerequisites may be required as a condition of admission.

In most cases, students required to complete undergraduate prerequisites as conditions of their admission will receive conditional status admission. Upon successful completion of the appropriate undergraduate prerequisite courses, these students will transition to full graduate student status. While in conditional status, these students are not eligible for assistantship opportunities.

# Admission to the University

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## PROGRAM-SPECIFIC CRITERIA

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In addition to the general criteria for admission, some of our graduate programs have additional program-specific admission criteria.

### **Master of Science in Aeronautics (MSA)**

Applicants for admission to the MSA program must have prerequisite knowledge in the areas of

- Psychology
- Economics
- Computer Applications
- Mathematics

If they do not possess such knowledge, they may be required to register for undergraduate prerequisite courses in these areas. The student should possess a strong academic record, generally evidenced by a CGPA of 2.50 or higher.

### **Master of Science in Aerospace Engineering (MSAE) and Master of Aerospace Engineering (MAE)**

An applicant's degree should be a Bachelor of Science degree in Aeronautical or Aerospace Engineering, or equivalent. If earned in the United States, the degree must be from an ABET-accredited program. The student should possess a strong academic record, generally evidenced by a CGPA of 3.00 or higher. The GRE exam, although not required, is strongly encouraged for this degree program.

Students with a Bachelor of Science or equivalent degree in other engineering disciplines, mathematics, or physical science, who otherwise meet the requirements for

full admission, may also be admitted to the MSAE or MAE program.

### **Master of Business Administration in Aviation (MBA/A)**

Applicants for admission to the MBA/A program are required to take the Graduate Management Admission Test (GMAT) prior to matriculation. Students who have not taken the GMAT and/or achieved the minimum score will not be permitted to register for MBA/A classes regardless of their status. Coordinators may waive the requirement if another master degree has been completed. The student should possess a strong academic record, generally evidenced by a CGPA of 3.00 or higher.

Applicants must have prerequisite knowledge in the areas of

- Management
- Quantitative Methods
- Accounting
- Marketing
- Finance
- Economics

If they do not possess such knowledge, they may be required to register for modules or undergraduate business courses in these areas.

For information on GMAT Administration, see <http://www.mba.com>.

### **Master of Science in Safety Science (MSSS)**

Applicants for admission to the MSSS program must have prerequisite knowledge in the areas of

- Psychology
- Statistics

# Admission to the University

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- Natural Science
- Mathematics
- Computer Applications

If they do not possess such knowledge, they may be required to register for undergraduate prerequisite courses in these areas. The student should possess a strong academic record, generally evidenced by a CGPA of 2.75 or higher.

## Master of Science in Human Factors and Systems (MSHFS)

Applicants for admission to the MSHFS program must have prerequisite knowledge in the areas of

- Psychology
- Statistics

If they do not possess such knowledge, they may be required to register for undergraduate prerequisite courses in these areas. The student should possess a strong academic record, generally evidenced by a CGPA of 3.0 or higher.

Applicants to the MSHFS program must submit GRE scores.

**Note: The MSHFS program starts new students only in the Fall semester of each academic year. All applications submitted will be processed for a Fall admission date.**

## Master of Software Engineering (MSE)

Applicants for admission to the MSE program must have prerequisite knowledge in the areas of

- Discrete Mathematics
- Data Structures and Algorithms
- Computing Systems (operating systems, computer architecture)

- Programming involving high-level language (for example, C/C++, JAVA, Ada, Visual Basic)

If they do not possess such knowledge, they may be required to register for undergraduate prerequisite courses in these areas. The student should possess a strong academic record, generally evidenced by a CGPA of 3.00 or higher, along with a creditable background in computing.

The GRE exam, although not required, is strongly encouraged for this degree program. For consideration of fellowship and assistantship award programs offered by the Department of Computing, GRE scores are required.

## Master of Science in Space Science (MSSPS)

Applicants for admission to the MSSPS program must possess a baccalaureate degree in engineering, physics, chemistry, or mathematics. The GRE exam, although not required, is strongly encouraged for this degree program. The student must possess a strong academic record, generally evidenced by a CGPA of 3.00 or higher.

## CONDITIONAL ADMISSION

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1. Students who fail to satisfy the guidelines for full admission but are judged to have potential for success in a graduate program may be granted conditional admission. Students admitted under conditional status must prove their ability to pursue a graduate program by meeting specific performance criteria after matriculation at the University.
2. Students admitted on conditional status will be monitored closely as to scholarly

# Admission to the University

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performance. Students who are admitted conditionally will be on conditional status until they have completed nine hours of graduate work. During this period, students may receive no grade lower than a B. Students will not be permitted to repeat courses during this period.

3. The conditions of admission will be communicated to applicants in the letter of admission. Students are fully admitted to the program when the conditions have been properly satisfied.

## PROCEDURES FOR ADMISSION

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Applications will not be processed until all required documents are received. Applications received after the submission deadlines stated in the following sections will be processed as quickly as possible, but acceptance for admission may not be early enough for the applicant to begin the program as soon as desired. From the day of the receipt of all application documentation, admission notifications are usually sent within three weeks.

Daytona Beach applicants should submit their applications for admission to Embry-Riddle Aeronautical University Graduate Admissions Office  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114  
(800) 388-3728 - **or** - (386) 226-6115  
fax: (386) 226-7070  
Financial Aid (800) 943-6279  
email: [graduate.admissions@erau.edu](mailto:graduate.admissions@erau.edu)  
<http://www.erau.edu/graduate>

Prescott applicants should submit their application to  
Embry-Riddle Aeronautical University

Graduate Admissions Office  
3700 Willow Creek Road  
Prescott, AZ 86301-3720  
(800) 888-3728 - **or** - (928) 777-6993  
fax: (928) 777-6958  
email: [prmsss@erau.edu](mailto:prmsss@erau.edu)  
<http://www.erau.edu/graduate>

## UNITED STATES CITIZENS AND PERMANENT RESIDENTS OF THE UNITED STATES

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All applicants must submit the following items to the Graduate Admissions Office prior to the application deadline:

1. **Completed application form and the \$50 application fee.**

Please note: Permanent residents must provide a photocopy of their ARC (Alien Registration Card).

2. **Transcripts.**

a) Official sealed transcripts for all college coursework earned (both graduate and undergraduate). Transcripts must be sent directly from the institutions attended to Embry-Riddle. A minimum of a bachelor degree is required.

b) Course descriptions for all graduate coursework to be considered for transfer.

3. **Statement of objectives.** The statement of objectives is an important part of your application. You should give your reasons for wishing to do graduate work in the field you have chosen, incorporating your interests and your background as well as your long-term professional goals, defining how Embry-Riddle's programs support those inter-

# Admission to the University

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ests and goals. This should be at least three or four paragraphs.

4. **Three graduate applicant reference forms**, two academic and one professional.
5. **Resume.** A current resume outlining your education, work experience, special activities, and awards.
6. **Assistantships.** If interested in assistantship opportunities, submit an assistantship application declaring your interest in research, teaching, or administrative fields. Indicate any special skills that you feel may qualify you for an assistantship. To be eligible for an assistantship, a student must have a minimum 3.00 GPA in their undergraduate degree and have full graduate status (conditional admission eliminates a student from eligibility until all conditions are removed). Additional departmental restrictions and test scores are required for some positions.
7. **Test Scores.**
  - a) MBA/A applicants should have GMAT scores sent directly to Embry-Riddle by the testing agency. For more information on the GMAT exam, refer to <http://www.mba.com>. Indicate school code number 5190.
  - b) GRE scores, although not required by all programs, are desired for review by some program coordinators. See specific requirements under the program of your choice in this section of the catalog. For more information on the GRE exam, refer to [www.gre.org](http://www.gre.org). Indicate school code 5190.

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and cannot be reproduced, returned, or forwarded.

## SPECIAL REQUIREMENTS FOR INTERNATIONAL APPLICANTS

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Embry-Riddle is authorized under federal laws to enroll nonimmigrant alien students. An international applicant is defined as a nonresident, nonimmigrant applicant entering the United States on a nontourist visa.

**In addition to the above required documents, international applicants must also submit the following:**

1. All applicants whose native language is not English, or who were educated at schools where English was not the language of instruction in all disciplines, must submit their official TOEFL scores sent directly from the testing authority. The minimum acceptable score is 550 written/213 computer-based/79 iTOEFL.
2. In addition to official sealed transcripts, for any transcript not in English, a notarized English translation must also be submitted.

## SEVIS

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SEVIS is the Student and Exchange Visitor Information System consisting of a governmental computerized system to maintain and manage data related to foreign students and exchange visitors during their stay in the United States. This system allows for real-time access to this information and assists colleges and universities in ensuring that students comply with the terms of the visas. For more information about SEVIS



# Admission to the University

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and visa requirements, please refer to the U.S. Immigration and Customs Enforcement (ICE) Web site at <http://www.ice.gov/sevis/>.

## I-20 REQUIREMENTS FOR INTERNATIONAL STUDENTS

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Upon application, international students who require an initial or renewed student visa must submit the following:

1. Affidavit of Financial Support.
2. Supporting bank letter verifying appropriate funds on deposit. Please refer to the student's acceptance packet for the specific dollar amount requirement. This amount will reflect the amount needed to cover tuition, fees, books, health insurance, and living expenses for one year, plus \$3,000 for each accompanying dependent. In the case of sponsored students, an official notification of public or private sponsorship will take the place of a bank letter. A University assistantship contract does not relieve a student from the requirement to provide both a financial affidavit and a supporting bank letter, unless waived by the appropriate University official. International students must be fully prepared upon arrival on campus to meet all normal living expenses and manage their finances for the period of time required to complete the degree.
3. The I-20 Form must be in the student's possession before departure and be presented to the nearest U.S. embassy or consulate to obtain the necessary entry visa before departure to the United States.

The I-20 will be issued to the student

upon admission to the University, if all required documentation has been received.

These rules and procedures apply equally to international students already studying in the United States who wish to pursue graduate study at Embry-Riddle. The only exception is that they must follow the procedures required by the U.S. Bureau of Immigration and Customs Enforcement to obtain approval for the transfer. Students should seek the assistance of the international student advisor at their current university to assist them with the transfer procedures. Transfer students should contact their current school's International Student Service Office and request that their SEVIS record be released to Embry-Riddle at the end of their last semester at their current school. This will allow our admissions office to issue a new I-20.

## ADMISSION TIME LIMIT

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Applicants who have been accepted for admission into Embry-Riddle graduate programs must enroll in Embry-Riddle graduate courses in one year from the date of the semester for which they were accepted. Those who do not enroll in the specified time period must reapply for admission according to the regulations and procedures in effect at the time of reapplication.

A student who cancels the application at any point in the application process may reactivate the application at any time up to one year from the date of application. After one year, a new application, fee, and supporting documents must be submitted.

## ADMISSION DEPOSIT

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At least 30 calendar days prior to matricula-

# Admission to the University

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tion, admitted students must submit a \$200 tuition deposit, along with an admitted student enrollment form to confirm enrollment at the University. This form is provided to admitted students by the Office of International and Graduate Admissions.

The deposit will be held in the student's account for one year and will be credited toward tuition during the first semester of attendance. After one year, if a student has not matriculated, the deposit is forfeited.

## CREDIT FOR PRIOR ACADEMIC WORK AND FOR COURSES TAKEN AT OTHER INSTITUTIONS

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Students applying prior academic work toward their Embry-Riddle graduate program requirements must submit appropriate documentation for such credit as part of the admission process. The request must be in writing and be accompanied by official transcripts or equivalent evidence of such work. Requests must be approved by the academic department chair or their designee.

Prior academic work and courses taken at other institutions by veteran students and/or other eligible students receiving Veterans Education Benefits will be evaluated and credit granted as appropriate and will be reported to the DVA as required by law.

Credit (called transfer credit) may be received for graduate work done at another appropriately accredited college or university.

Credit (called escrow credit) may be received for certain graduate courses taken by Embry-Riddle undergraduates.

Credit may be received for certain graduate courses taken as nondegree gradu-

ate work or as part of another (completed or noncompleted) Embry-Riddle graduate degree program. When transferring from one Embry-Riddle graduate program to another this credit may include prior work on a GRP or thesis.

The combined total credit applied to an Embry-Riddle graduate degree may not exceed 12 credit hours.

In order to satisfy a graduate degree program requirement, the academic work for which such credit is sought must be determined to be specifically relevant to the applicant's graduate degree program at Embry-Riddle. The content of the applicable course or other program should be used to determine the nature of the credit to be applied to the student's degree requirement. The appropriate Daytona Beach or Prescott academic department chair or designee shall make these determinations.

Credit will be granted only if the student demonstrated performance expected of a graduate student at Embry-Riddle (in the case of graduate courses, this normally means that the course was completed with a B or better [3.00 on a 4.00 system]).

Credit for academic work used to satisfy the requirements of an undergraduate degree will not be accepted toward the requirements for a graduate degree.

Credit will generally be accepted only for courses that were completed in the seven-year period immediately preceding the date that the student begins classes.

Permission to obtain graduate credit for courses to be taken outside the University after matriculation must be granted by the academic department chair or designee.

# Admission to the University

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The last nine hours of graduate credit on a degree program must be earned at Embry-Riddle.

A student may not be enrolled in more than one degree program. Upon completion of a Embry-Riddle graduate degree program, a student may elect to apply to another graduate degree program at this university. After meeting admissions requirements and receiving notification of acceptance, a student may request that up to 12 hours of credit be transferred to the new degree program if the hours are applicable to the newly elected degree program. The transfer of these hours is at the discretion of the appropriate college dean or their designee.

## INTRA-UNIVERSITY TRANSFER

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Graduate students who have matriculated on either the Daytona Beach, Prescott, or Extended Campuses who are continuously enrolled students, and who have met their financial obligations on the campus where they matriculated, may transfer from one campus to the other. Transfers are not automatic and certain conditions must be met. Additionally, a vacancy must exist in the program to which the student wishes to transfer, either permanently or as a visiting student.

Students are urged to begin this process at least 45 days before the first day of classes in order to avoid any interruption in the progress toward their degree.

# ACADEMIC REGULATIONS AND PROCEDURES

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All University graduate academic and non-academic procedures and regulations are subject to change. Therefore, all procedures and regulations in effect at a given time may not be reflected in the current catalog. When such changes do occur, notice of the change may be in the form of an addendum or in the next catalog. Catalog addenda are effective on the date published unless otherwise stated.

## STUDENT RESPONSIBILITIES

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Students are responsible for being fully informed about all procedures and regulations governing their participation in Embry-Riddle's graduate programs. The necessary information may be found in the current graduate catalog, Student Handbook, orientation and information packets published and distributed by the campuses, and periodic announcements published by the University. A student who requires clarification of any policy or regulation should seek help from his/her academic advisor or the office of Records and Registration. University regulations will not be waived because a student is unaware of established standards and procedures.

## ACADEMIC ADVISING

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The graduate program coordinator is the student's academic adviser. Academic advisers help students choose and schedule courses that meet their educational goals. The adviser's signature is required on all registration and add/drop forms.

Academic advisers post a schedule of office hours, and students should feel free to call on their advisers when assistance or discussion is needed.

## REGISTRATION

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Students are required to register for each term of enrollment. Tuition deposits, registration, and fee payments must be completed according to instructions published by the office of Records and Registration. Students are not officially enrolled until they complete all phases of registration, including financial requirements.

Late registration will be allowed during the first five days of classes if unusual circumstances prevent the student from registering during the normal registration period. Registration will not be allowed after the last day for late registration, as designated in the academic calendar of this catalog.

## SCHEDULE OF CLASSES

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A schedule of classes is prepared for each term. The University reserves the right to make necessary and appropriate adjustments to the published schedule to include cancellation or rescheduling of any class.

## ACADEMIC INTEGRITY

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Embry-Riddle is committed to maintaining and upholding intellectual integrity. The faculty, colleges, divisions, or campuses of the University may impose sanctions on students who commit the following academic integrity violations.

1. Cheating: The use of inappropriate sources of information on a test or being a party to obtaining or possessing an examination before the time the examination is scheduled.

# Academic Regulations and Procedures

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2. Plagiarism: Presenting as one's own the ideas, words, or products of another.
3. Forgery and unauthorized alteration or misuse of one's own or another's academic records or transcripts.
4. Knowingly furnishing fake or misleading information to the University when seeking admission to the University or campus.
5. Forging, altering, falsifying, destroying, or unauthorized use of a University document, record, or identification. This includes using the logo, stationery, or business cards of the University or otherwise identifying oneself as an agent of the University for personal, non-University business.
6. Misuse of computing facilities and/or security violations, including attempted violations of computing facilities.

Sanctions may include a failing grade on the assignment, a failing grade for the course, or dismissal from the University.

## EXCLUSION FROM COURSES

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A student making no real progress in a course or whose behavior is detracting from the course may be excluded from the course by the appropriate dean with a grade of W or WF. Students have five calendar days following written notification of this exclusion in which to appeal. Until the final disposition of the appeal, the student is considered enrolled in the course.

## COURSE LOADS

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Full-time graduate students normally take nine semester credit hours. Additional courses above this load require permission from the appropriate department chair. If a student demonstrates exceptional academic performance, the department chair or designee may approve a maximum one-course overload. A student's enrollment may be restricted when deemed in the best interest of the student.

## THE GRADING SYSTEM

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The following indicators 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
WF	Withdrawal from the University-Failing	0
W	Withdrawal from a course	N/A
AU	Audit	N/A
I	Passing but incomplete	N/A
IP	In progress	N/A
N	No grade submitted by instructor	N/A
P	Passing grade (credit)	N/A
S	Satisfactory (noncredit)	N/A
T	Transfer credit	N/A

## GRADE REPORTS

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Grade reports are issued at the end of each term. Students are solely responsible for informing the office of address changes.

The University is prohibited from releasing grade information without the express written authorization of the student. Such

# Academic Regulations and Procedures

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authorization must be granted each term because blanket authorizations are prohibited by law.

## UNIT OF CREDIT

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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.

## GRADE POINT AVERAGES: GPA, CGPA

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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 hours attempted in that period. The CGPA is determined by dividing the total number of grade points by the total number of hours attempted at the University. Grade points and hours attempted are accrued in courses graded A, B, C, F, and WF only.

## THESIS GRADING

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A final grade of P or F is awarded upon completion of the thesis. If the student is making progress, a grade of IP is awarded at the end of each term. The P grade will replace the IP grade for all terms. If the student has not made progress, a grade of F will be issued and will result in a change from IP to F for all thesis credits. A student enrolled for a thesis will receive a grade each term, as determined by the student's thesis committee. Students must continually

register for one credit hour of thesis until complete.

## GRADUATE RESEARCH PROJECT GRADING

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A final grade of P or F is awarded upon completion of the graduate research project. If the student is making progress, a grade of IP is awarded at the end of each term. If the student has not made progress, a grade of F will be issued and will result in a change from IP to F for the original three hours, and from IP to N for all remaining credits. Students who do not complete their graduate research project in the number of credit hours required by their degree program are required to register for one credit hour for every subsequent term, until completion.

## INTERNSHIP GRADING

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A final grade of P or F is awarded upon completion of a graduate internship.

## DROPPING A COURSE

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Students may drop a course, with no notation of course enrollment on their transcripts, during the drop period only. The drop period extends through the third week of Spring and Fall terms and the second week of Summer terms.

## AUDITING A COURSE (AU)

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Because students audit a course solely to enhance their knowledge, academic credit is not granted toward degree requirements for audited courses. Students may change their registration from audit to credit dur-

# Academic Regulations and Procedures

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ing 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.

## WITHDRAWING FROM A COURSE (W)

---

Students receive a grade of W if they withdraw from a course before the tenth week of Spring and Fall terms and the fifth week of Summer terms. If they withdraw from a course after this period, they receive a grade of F. If students stop attending their classes and fail to withdraw from the University, a grade of F is assigned for each course in which they were enrolled.

Students are not permitted to drop or withdraw from a course while a charge of academic dishonesty is pending. Students who withdraw from a flight course before the initial attempt at the final phase check receive a grade of W.

## INCOMPLETE GRADE (I)

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In exceptional cases, faculty may assign the temporary grade of incomplete (I) if a student is unable to complete the required work in a course because of medical emergency, death in the family, military duty, or other extenuating circumstances. If a student does not complete the course in the specified period, the grade of I automatically converts to an F.

The period to convert an I in a graduate course extends through a time period determined by the instructor, but no later than three calendar months following the end of the term in which the I grade was assigned.

## REPEATING A COURSE

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Students may petition to repeat one course in which a grade of less than a B was earned for the purpose of improving their grade point average. Both grades earned appear on the transcript, but only the replacement grade is included in the calculation of the grade point average.

## UNDERGRADUATE ENROLLMENT IN GRADUATE COURSES

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During their senior year, Embry-Riddle undergraduate students may take selected Embry-Riddle graduate courses, normally 500-level, for credit toward their undergraduate or graduate degree. Students must be within 10 hours of completion of the undergraduate degree, have the approval of the program coordinator of the appropriate graduate program, and have at least a 2.50 CGPA to qualify for enrollment in graduate courses while an undergraduate.

## ACADEMIC WARNING AND DISMISSAL

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### *Warning*

Full-time students whose cumulative grade point average (CGPA) falls below 3.00 are placed on Academic Warning. Students on Academic Warning must raise their cumulative grade point average to 3.00 in the next 12 hours of graduate work.

### *Dismissal*

1. Students on conditional status who fail to satisfy the conditions of their admission;
2. Earn less than a B in three graduate courses;

# Academic Regulations and Procedures

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3. Earn an F in any two graduate courses;
4. Are on Academic Warning and fail to earn a 3.00 CGPA in the next 12 hours of graduate work;
5. Earn less than a 2.50 cumulative grade point average.

Students may appeal their first academic dismissal from the University by submitting a petition in writing detailing the existence of any exceptional mitigating circumstances to the chancellor or designee in 30 days of the receipt of the dismissal notice. The chancellor or designee will refer the student petition to the appropriate appeals committee for recommendation. Upon recommendation of the appeals committee, the chancellor or designee reviews the case and makes the final determination of the action to be taken. Such action will be taken in a timely manner not to exceed 30 days of the receipt of the petition. If confirmed, academic dismissal is final.

Students whose academic dismissal is final will not be readmitted to the University for two years. Unless readmitted to the University, such students will not be permitted to take any further graduate courses with the University. After this two-year period has lapsed, a student must reapply and meet all admission requirements in effect at the time of application to be eligible for reconsideration.

## DISMISSAL FOR CAUSE

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The University reserves the right to 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.

## TRANSFER BETWEEN GRADUATE DEGREE PROGRAMS

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A graduate student who wishes to transfer from one program to another must prepare a written petition before the transfer will be considered. Requests for transfer of credits from Embry-Riddle or other institutions and/or advanced standing credits should be included in this petition.

The department responsible for the new program, however, has the prerogative to accept or reject the student's request and to determine the courses applicable to the new program. Students should contact the appropriate graduate program coordinator.

When a student elects to transfer from one degree program to another, the catalog in effect when the transfer is approved is applicable.

## ADDITIONAL GRADUATE DEGREES

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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 be awarded a second graduate degree, the student must satisfy all the requirements of the degree sought.



# Academic Regulations and Procedures

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## CATALOG APPLICABILITY

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1. A petition to come under the provisions of a later catalog requires approval from the department chair or designee.
2. Former graduate students who reapply for admission to the University will, if readmission is granted, come under the provisions of the catalog in effect at the time of readmission.
3. Students who change from one graduate degree program to another come under the provisions of the catalog in effect on the date the change of program petition was approved.

## TIME LIMITATION FOR DEGREE COMPLETION

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The student has seven years from the date of admission to the master degree program to complete the degree. No Embry-Riddle course older than seven years at the time of graduation may be used in the program of study for a master degree. (Prerequisite courses are exempt from this requirement.) Transfer courses older than seven years, earned at other universities, may be accepted at the discretion of the appropriate program coordinator. Students who do not maintain continuous enrollment (missing enrollment at the University for a period of two years) must file for readmission to the University, although seven years is measured from when the student was first admitted to the program.

## LOSS OF GRADUATE STATUS AND READMISSION

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Under certain circumstances (other than graduation), a graduate student may lose graduate status and will no longer be considered a student at Embry-Riddle. This can occur when:

1. A student voluntarily withdraws from the University.
2. A student is dismissed from the University and the dismissal becomes final.
3. A student fails to meet the requirement for continuous enrollment. This occurs when a student does not enroll in at least one term in a two-year period.
4. A student does not complete the degree requirements of a graduate program within seven years of starting the graduate program.

Students who fail to maintain continuous enrollment for any reason are required to apply for readmission under the catalog in effect at that time.

## WITHDRAWAL FROM THE UNIVERSITY

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Students who leave the University for any reason must officially process a withdrawal clearance through the office of Records and Registration. When a student withdraws from the University after the end of the scheduled withdrawal period, a WF grade will be assigned for all courses in which the student is enrolled unless an exception is granted for medical reasons or other extenuating circumstances by the appropriate chancellor or designee.

# Academic Regulations and Procedures

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## GRADUATION REQUIREMENTS

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The following summary of graduation requirements is provided for all students. An Embry-Riddle master degree will be conferred upon the successful completion of the general requirements of the University and the specific requirements of the degree sought.

1. All course, thesis, GRP, and other academic requirements, as appropriate, must be met.
2. The student is not on Academic Warning.
3. All debts and obligations to the University are satisfied.
4. The student is not under University investigation for misconduct or other disciplinary matters.
5. A student must be enrolled in the term in which he/she graduates.
6. An application for graduation must be initiated by the student and received in the time limit specified by the appropriate campus records office.
7. Participation in graduation exercises will not be permitted, a diploma will not be awarded, nor a transcript annotated as complete, until all of the degree requirements have been satisfied.

## GRADUATION HONORS

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Students who have completed a graduate degree program and who have excelled academically throughout their graduate careers are recognized through the publication of graduation honors. To be eligible, graduate students must have completed their degree program with a cumulative grade point

average of 4.00 based on grades received in all courses that apply to specific degree requirements.

## TRANSCRIPT REQUESTS

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A signed request for an academic transcript, accompanied by a fee, may be submitted by the student to the appropriate Records and Registration office. Transcripts will not be released to students who have failed to meet their financial obligations to the University.

## PRIVACY OF STUDENT RECORDS

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The University respects the rights and the 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 nondisclosure request. Students are required to file their request for nondisclosure on an annual basis. Directory information consists of the student's name, address, telephone number, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, the most recent education institution attended by the student, and other similar information.

FERPA allows disclosure of educational records or components thereof under certain conditions. Students desiring additional information regarding FERPA should contact the office of Records and Registration.

# Academic Regulations and Procedures

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## STUDENT GRIEVANCES

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It is the policy of Embry-Riddle to administer its educational programs in a fair, equitable, academically sound manner and in accordance with the appropriate regulations and criteria of its governing board, accrediting associations, and federal and state laws and regulations. To this end, graduate students are provided an opportunity to express any complaint, grievance, or dispute that upon investigation may be redressed.

## SUBSTANCE ABUSE

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Embry-Riddle promotes substance abuse awareness by sponsoring educational programs and distributing literature. The University is additionally committed to assisting students in the resolution of problems associated with substance abuse and encourages students to seek additional help through referrals from University Health Services and Counseling offices.

# FINANCIAL INFORMATION

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Embry-Riddle Aeronautical University is committed to providing high-quality education at a reasonable cost. For more detailed information about tuition, fees, and other University expenses, Daytona Beach students should contact Student Accounting at (800) 943-6279. Prescott students should contact Student Accounting at (928) 777-3726.

## FALL 2006/SPRING 2007 TUITION

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Detailed tuition rates are described in the 2006/2007 financial insert:

<http://www.erau.edu/er/costs.html>.

Bills for tuition and fees, issued at the end of registration, are payable on the first day of class. If full payment cannot be made by this date, tuition payment agreements on outstanding balances are available at the rate of 1.5% per month. Tuition payment agreements are available in the Student Accounting Office.

## DINING SERVICES

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A variety of meal plans are offered. Please refer to the dining service brochure at the Daytona Beach or Prescott campus for a complete description of plans and services.

## FEES

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A Graduate Internship Fee based on the cost of one credit hour in a student's degree program is charged for the semester of internship.

Contact Student Accounting at the appropriate campus for other miscellaneous fees.

## REFUND POLICY

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Students who officially withdraw from all classes are eligible for a partial refund of tuition. Spring and Fall tuition refunds for reduction of hours are not available after the last day of add/drop. Summer term refunds are calculated on a per-course basis.

During all terms the effective date of the withdrawal, as determined by the Records and Registration Office, governs refund computations. Students who are suspended for disciplinary reasons will not be eligible for a full or percentage refund.

Please reference the Withdrawal/Refund Schedule applicable to the campus you are attending.

The following are refundable according to the Withdrawal/Refund Schedules:

- Tuition
- Student Government Association fees
- Housing fees (less housing processing fee)
- International Student Service fee
- Health Service fee
- Technology Fee
- Meal Plans – unused balance at time of withdrawal

## WITHDRAWAL/REFUND SCHEDULE

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### Fall/Spring Semesters

Period I	Class days 1-5	*100%
Period II	Class days 6-10	80%
Period III	Class days 11-15	60%
Period IV	Class days 16-20	40%
Period V	Class days 21-25	20%
Period VI	Class days 26 and after	0%

\*Less \$100 administrative fee

# Financial Information

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## Summer A/B

Period I	Class days 1-3	*100%
Period II	Class days 4-6	80%
Period III	Class days 7-9	60%
Period IV	Class days 10-12	40%
Period V	Class days 13-15	20%
Period VI	Class days 16 and after	0%

\*Less \$100 administrative fee

Requests for refunds due to circumstances clearly beyond the student's control, such as illness, required military service, etc., must be accompanied by appropriate documentation, such as a physician's statement, or military orders.

A request for a refund must be submitted within 60 days of the date the student completed a change of registration. Refund petition requests will normally be processed in 10 business days. Personal appeals for denied requests must contain additional documentation not previously presented.

## STUDENT ACCOUNTS

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At the time of acceptance for admission, a University account is opened for each student. This account remains open until graduation. The primary use of this account is for University charges and payments. If an account shows credit balances, a student may request a refund in the form of cash, a check, or a transfer to an Eagle Card account. Each student is encouraged to open and maintain an account at a local bank for personal matters.

## PAYMENT PROCEDURES

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Cash, Visa, MasterCard, Discover, AMEX, and personal checks are acceptable forms of payment. Payments may be made via ERAU Online. A credit card is the only method accepted at this Web site payment location.

An ERAU Online password must be used to access information. Payments made by mail should be addressed to the campus Cashier Office and timed to arrive prior to the first day of class.

The University offers a Flex payment plan where the student determines the amount and terms of the agreement. The student may sign up for the plan as early as February for the academic year's costs or to spread out these out-of-pocket expenses over three to six months. There will be fees incurred for deferring payment. Fees may vary depending on the campus attended.

Charges incurred subsequent to registration are due 30 days from the date of invoice or the last day of class, whichever occurs first. All payments should include the student's name and identification number.

## BOOKS AND SUPPLIES

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Purchases are made directly from the University Bookstore. Cash, checks, Eagle Dollars, Visa, MasterCard, and AMEX are accepted. Students whose estimated financial aid is higher than the total amount for tuition and fees may request to use these funds for book purchases from the Cashier Office.

## DELINQUENT ACCOUNTS

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When a student's account is delinquent, registration for that term is subject to cancellation, and registration for any subsequent semester will be denied. A delinquent student account will result in suspension of all academic processing, and information on class performance, grades, and transcripts will be withheld. Continued delinquency may result in administrative withdrawal

from the University. Administrative withdrawal will not relieve a student of the obligation to pay outstanding debts. Sums remaining unpaid will be charged interest at the maximum rate allowed by law. The student is also subject to the costs of collection, including collection agency fees and reasonable attorney fees for making such collection. Delinquent accounts may be reported to one or all three major credit bureaus.

## FINANCIAL ASSISTANCE

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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.

A complete description of financial assistance programs and optional financing programs available to students and their parents is published annually by the Financial Aid Office. Students should consult this publication for information about eligibility criteria, application procedures, and deadline dates. Published information is available on the Web under the Financial Aid section (<http://www.embryriddle.edu>). Students who expect to need help in meeting their financial obligations are encouraged to

seek such assistance through one or more of the programs available for this purpose.

## ELIGIBILITY REQUIREMENTS

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To be considered eligible to apply for most financial programs, students must

1. Be U.S. citizens or eligible noncitizens;
2. Cannot be accepted conditionally in a program;
3. Be enrolled or accepted for enrollment as at least a half-time student in a degree program. For financial aid purposes, graduate students must register for a minimum of three graduate hours.
4. Be maintaining satisfactory academic progress toward a degree;
5. Be registered with Selective Service if required to do so;
6. Establish financial need;
7. Not be in default on a loan or owe a repayment on a previous financial aid award received at any institution.

## THE APPLICATION PROCESS

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After applying for admission to the University, domestic students may complete the Federal Application (FAFSA) through the Internet at <http://www.fafsa.ed.gov>. Each year, students are required to reapply for financial aid. Students are mailed a federal PIN by the Department of Education to renew their aid application each year online at <http://www.fafsa.ed.gov>. Returning students may also request application materials from the Financial Aid Office. Students attending the Extended Campus may request financial aid materials through the center, the Financial Aid Office, or online at <http://www>.

# Financial Information

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*fafsa.ed.gov*. Notices will be posted on ERAU Online to remind students of the availability of the forms.

## EXTENDED PAYMENTS

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Students who use financial assistance to pay their University expenses may have the payment date extended for the amount of their award if their funds are not ready to be disbursed by the date payment is due. This is called a payment extension. Any difference between the total charges and the amount of the extension granted must be paid according to the University's payment procedure. Financial assistance is credited to student accounts after the official registration period.

To qualify for a payment extension, students must have applied for financial assistance and must have received final approval of their award.

## PROGRAMS AVAILABLE

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The major categories of financial assistance programs include scholarships, grants, loans, and student employment. Loans from state and federal government sources or from private lenders must be repaid; however, the interest rate is usually low and the repayment period is extended. Grants and scholarships do not have to be repaid, nor does the income earned through student employment. Most of these programs are based on the student's financial need.

### *Federal Loans*

- Federal Stafford Loan
- Federal Unsubsidized Stafford Loan

### *Embry-Riddle Employment*

- Embry-Riddle Student Employment
- Off-Campus Referral Program

### *Financing Options*

- Various privately sponsored loans for education

Consult the financial aid information on the Embry-Riddle Web site for additional information.

## ATHLETIC GRANTS

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The University offers a limited number of athletic grants for qualified students. Awards are available for baseball, basketball, golf, soccer, tennis, wrestling, cross-country track, and women's volleyball. The maximum value permitted by the NAIA is the actual cost of tuition, room, board, books, and fees. However, most grants are awarded as partial tuition waivers. To qualify, students must meet both University and NAIA eligibility requirements. Specifically, NAIA requires that student-athletes must be graduate students at the institution from which they earned their undergraduate degree and have a maximum of 10 semesters of full-time student status in which to compete. The grants are highly competitive, and interested students should contact the Athletic Department for specific details.

## OTHER FINANCIAL ASSISTANCE PROGRAMS

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### *Veterans Education Benefits*

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 U.S. Department of Veterans Affairs (DVA).

Students must be pursuing a degree in a specific program to be eligible to receive benefits. Admission procedures for veterans and other eligible persons are the same as those for other students. Students who do not satisfy all requirements for full admission may be certified for two terms; however, they may be required to repay the DVA for some or all benefits received if they do not achieve full admission status during that time.

Title 38, United States Code, sections 3474 and 3524, requires that education assistance to veterans and other eligible persons be discontinued when the student ceases to make satisfactory progress toward completion of the training objective. Accordingly, benefits will be interrupted for graduate students who are on academic warning and fail to earn a 3.00 CGPA in the next 12 credit hours of graduate work or are otherwise subject to dismissal. The DVA 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 DVA 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 this catalog, and the rules and regulations of the DVA 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 are responsible for notifying the 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 program. Students who receive DVA benefits are subject to strict academic regulations and should be aware of how auditing a course, repeating a course, changing degree programs or enrollment status, and other actions may affect their eligibility to receive benefits.

For further information on approved programs and the application process, eligible persons should contact the Veterans Certifying Official at the campus they plan to attend.

### *Military Tuition Assistance*

Military tuition assistance may be available to graduate students on active military duty. For further information, students should contact the educational services officer at their assigned installation.

### *Graduate Assistantships*

Graduate assistantships are academic appointments that are normally reserved for qualified graduate students at the Daytona Beach and Prescott campuses. A graduate teaching assistant helps in teaching undergraduate students in specified courses or laboratories under the general supervision of a faculty member. A graduate research assistant is involved in research activities under the direction of a faculty member or a research associate. A graduate administra-



## Financial Information

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tive assistant assists departments or faculty with curriculum development, special projects, and other duties as assigned. To be eligible for a graduate assistantship, a student must have full graduate status in a degree program, must have maintained a CGPA of 3.00 out of a possible 4.00 or above through the end of the semester (graduate or undergraduate) preceding the appointment, and must demonstrate adequate communication and technical skills.

Each department has the responsibility to post the availability of its graduate assistantships. Students interested in applying should submit a resume directly to the department. Incoming students should contact departments directly about the availability of assistantships.

Full graduate assistantships carry a stipend set by the University and a tuition waiver for up to nine graduate

credits per semester. Graduate assistants with such appointments are expected to devote 20 hours each week to effectively carry out their assignments. Under some circumstances, partial assistantships providing either tuition or a stipend may be granted. In such cases, expected time to be devoted is set by the assigning department. Graduate assistants are permitted to accept other University employment; however, University policies limit all students to a total of 25 hours of work per week, including the graduate assistantship. All graduate teaching, research, and administrative assistantships, both full and partial, require that the recipient be registered for at least three graduate credits at Embry-Riddle for any semester of their appointment. Summer registration is not required, but encouraged.

# STUDENT LIFE AND SERVICES

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Embry-Riddle believes that a well-rounded education goes beyond the classroom. The opportunities for co-curricular involvement are limitless and are designed to encourage the personal and educational development of all students.

## STUDENT ACTIVITIES

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The mission of the Department of Student Activities is to provide students with the opportunity to experience co-curricular programs that support and complement the educational process and contribute to a well-rounded education. Student Activities works with other areas of the campus to offer cultural, intellectual, recreational, and entertainment events for all Embry-Riddle students, while providing a learning experience not available in other academic settings.

There are over 100 clubs on the Daytona Beach campus and over 65 on the Prescott campus. Each campus has sports clubs, special interest groups, Greek life (sororities and fraternities), honor societies, aviation clubs, military organizations, and religious clubs. The Department of Student Activities provides support for all these organizations in addition to assisting students in starting a new club/organization. Involvement in any club or organization develops social responsibility, strong group dynamics, leadership, communication, management, budgeting, and decision-making skills. Students have the opportunity to learn about all the organizations at the fall and spring Activities/Club Fair.

The Department of Student Activities is also the point of contact for the Programming Board (Touch-N-Go Productions in Daytona Beach and Board of

# Student Life and Services

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Campus Activities in Prescott) Leadership Development and Homecoming Activities.

For specific campus information, visit the Office of Student Activities in Daytona Beach located in room 106 in the John Paul Riddle Student Center or in Prescott in the lower level of the Student Hangar.

## DELTA MU DELTA

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The Delta Mu Delta National Honor Society is a nationally recognized organization that identifies business administration students who have distinguished themselves scholastically. Founded in 1913, Delta Mu Delta has grown to encompass 76,000 members from over 150 chapters. The Society has established an affiliation with the Association of Collegiate Business Schools and Programs (ACBSP), which requires that Delta Mu Delta chapters be established exclusively at colleges and universities with business programs accredited by ACBSP. Graduate students who achieve a 3.65 cumulative grade point average and who complete 12 credit hours of graduate work are considered for membership in Delta Mu Delta.



a wide variety of activities ranging from team sports such as flag football, volleyball, basketball, floor hockey, and softball to individual competition in such sports as table tennis, racquetball, and tennis. Other sports are also available on request. The director assists chartered clubs and organizations with the use of sports facilities and equipment. An equipment loan program offers many items for free checkout on an

overnight basis with a valid University I.D. card. Students are encouraged to use all on-campus sports-related facilities: outdoor swimming pool, tennis and basketball courts, playing fields, indoor racquetball, gymnasium, and fitness center. Hours vary for each facility and are posted.

In addition to on-campus recreational activities, each area offers a virtually unlimited variety of outdoor recreational opportunities. Hiking, camping, fishing, sailing, and skiing are a few of the activities available in the surrounding area.

Whether students seek a highly competitive league to demonstrate their athletic skills or select a competition that encourages group participation for fun and to stay in shape and reduce the stress in their lives, they are sure to find what they are looking for in intramural recreational sports.

## INTRAMURAL AND RECREATIONAL SPORTS

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Intramural and Recreational Sports at each residential campus strives to create an atmosphere of competition and fun by offering

## STUDENT EMPLOYMENT

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The Student Employment office provides assistance to students seeking part-time

## Student Life and Services

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employment on or off campus at the Daytona Beach and Prescott locations. On-campus employment is available to students regardless of financial need. Working on or off campus not only gives students more financial support, but also helps them develop self-confidence, gain valuable employment and credit references, establish a work record, and acquire useful skills in time management, financial planning, and communication.

At Embry-Riddle, because students work and serve each other, a sense of community is created. Students are participants in the life and work of the University as well as consumers of the educational program.

Embry-Riddle depends on student workers for much of the work essential to sustain day-to-day operations.

Embry-Riddle adheres to the principle of equal employment opportunities for all students.

### SAFETY AND SECURITY

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Safety and security at Embry-Riddle is provided by the University's Safety department. The Safety department is an in-house segment of the University consisting of both full-time officers and part-time student assistants. The Safety department includes patrol and escort services, parking and traffic services, life safety systems, crime prevention, communications/dispatch services, and locksmith services.

The patrol and communications sections provide 24-hour service to the University and its satellite locations. Safety officers respond to routine requests for service as well as emergency conditions throughout

the University. They also conduct field investigations as required and provide specialized security service to the University's flightline. The parking and traffic services section manages campus parking, traffic, and associated enforcement functions. It also provides support for special events. The crime prevention section actively engages in safety education and crime prevention programs for students, faculty, and staff. The department maintains a close liaison with local law enforcement agencies to provide the safest possible learning environment.

### CAMPUS MINISTRY

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The University recognizes that the typical student feels challenged by the many questions, experiences, and world views encountered on campus. It also recognizes that because students are faced with a consuming social life and the subtle influence of peers, it is important to encourage and promote spiritual development. Special opportunities for deepening faith, such as student religious-club sponsored meetings and programs and pastoral counseling, are offered during the regular scholastic year. At the Prescott campus, a Community Interfaith Directory is distributed at New Student Orientation and local church groups are invited to offer their worship services to the new students. At the Daytona Beach campus, worship services are available each Sunday at the Interfaith Chapel.

### DISABILITY SUPPORT SERVICES

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The University is committed to ensuring access and providing reasonable accommodation for students with documented

# Student Life and Services

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disabilities who request assistance. The Disability Services advocate is the Director of Disability Services; the director of Student Success Programs coordinates Disability Support Services for students at the Prescott campus.

Students' needs are addressed on an individual basis with regard to their specific disabilities, academic and career goals, learning styles, and objectives for personal development. Campus-specific services might include academic advisement or assistance with planning academic schedules, registration assistance and advance registration, academic intervention programs, time management training, study skills assistance, arrangements for peer tutoring, testing modifications, advocacy, and facilitation of physical access. The University does not provide diagnostic testing but will make referrals for evaluation by area specialists. Costs associated with testing referrals are the responsibility of the individual student. Because certain academic programs are FAA certified, those programs are subject to regulation by that agency. Therefore, regulatory limitations may delay or preclude participation or licensure in those programs by persons with certain disabilities. Prospective students considering a program of study are encouraged to contact the Disability Support Services coordinator for information on eligibility concerns or campus-specific services.

## HEALTH SERVICES

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Maintaining good health promotes a productive university experience. The Health Services staff is committed to facilitating students' wellness through direct care, edu-

cation, and assistance with lifestyle modification.

Services include assessment, prescriptive and nursing care, referrals, wellness education and counseling, women's health care, medical grounding of flight students, and assistance with aerospace medical concerns.

Prospective flight students should be aware that certain sensory impairments, medical, neurobiological, and psychological conditions, and prescriptive medications may delay or preclude medical certification by the FAA. These issues should be discussed with an aviation medical examiner (AME) to ensure participation in flight instruction. Students may also contact the Health Services clinical staff for information on eligibility for medical certification. A copy of the student's FAA Medical Certificate, Class I or II, must be submitted to Admissions at least 60 calendar days prior to the desired enrollment date. Failure to meet this requirement may delay entry into the flight training curriculum.

Health insurance is strongly recommended for all students. Individual policies should be reviewed prior to enrollment to ascertain adequate coverage and determine approved providers should off-campus referrals be indicated or desired. A campus group policy is available for purchase with rates determined annually. Information on benefits, premiums, enrollment, and claims is available by visiting <http://www.studentresources.com> or by calling, toll free, (800) 237-0903.

International students should contact the International Student Services department about their specific insurance requirements.

## COUNSELING SERVICES

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# Student Life and Services

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The college experience is highly complicated, offering students tremendous intellectual and personal opportunities as well as difficult challenges and demands. Many students find themselves seeking counseling as a way of learning, growing, and dealing with these experiences.

Individual counseling provides an avenue for students to meet one-to-one with a counselor to discuss and explore the issues, concerns, and feelings they are experiencing. Issues addressed in counseling vary from adjustment to college life, relationship problems and stress, to more serious problems. Counseling is available without cost to students, and the content and records of sessions are confidential.

## INFORMATION TECHNOLOGY SERVICES

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Information Technology strives to excel in service at every opportunity. Our goal is to provide our students with stable, secure, highly available, always-on systems via the Web that offer a leading edge in technology. Our www-based Portal, known as ERAU Online, can be found at <http://erau.blackboard.com>. ERAU Online accounts are provided to all students. ERAU Online provides students one-stop-shopping for class and University information as well as events on campus. ERAU Online also gives a number of services that students can access, such as email, unofficial transcripts, class grades, class schedules, account balances, and flight schedules. Additional services are available and are continually being expanded. ERAU Online can be accessed from any computer with an Internet connection.

In addition to Web resources that can be accessed from any Internet connection, the

Information Technology Department also provides the following services:

- Computerized labs and classrooms
- Account IDs and email addresses
- Network storage space for class assignments
- Storage space for personal Web pages
- Assistance for connecting to the Residential Network (ResNet) for on-campus housing
- Voicemail accounts for on-campus housing
- Popular Microsoft software titles available to all students
- Telecommunications support for University Housing
- Wireless Internet access in many buildings on the Daytona Beach campus (and expanding for both residential campuses)

As the technology used in the aviation and aerospace industries grows and advances, so are the tools for teaching our future aviation and aerospace pioneers.

## LIBRARIES

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The mission of the Embry-Riddle libraries is to provide materials, services, and facilities to students, faculty, and staff in support of the University's commitment to excellence in teaching, learning, and research. Library services and resources are provided through two main libraries: the Jack R. Hunt Library in Daytona Beach serves the Florida campus and the students of the Extended Campus, and the Prescott Library serves the Arizona campus. Both facilities are state-of-the-art and hold a combined total of over 120,000 volumes and 1,800 periodical titles in addition to government docu-

# Student Life and Services

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ments, reports, conference proceedings, and multimedia sources. The libraries are fully automated with online catalogs and Internet access from staff and public workstations. Both offer specialized electronic databases to students of Embry-Riddle and various public access sources for the general public. The Prescott Library holds special materials relating to aviation safety and the Hunt Library houses a historical aviation collection dating from 1909. The libraries participate in local, state, and national networking consortia that give students access to virtually unlimited information worldwide via the Internet and through local arrangements and reciprocal borrowing agreements. Both facilities are open over 90 hours per week (with extended hours during exam periods). Information professionals with specialized training in aviation and aerospace assist students and teach research skills, including how to identify, evaluate, and use information in all formats.

## DAYTONA BEACH EAGLE CARD

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The Eagle Card serves as a student's identification and is required for borrowing library books, cashing checks, and attending University-sponsored events. Continuing Embry-Riddle students can use their existing "Student" Eagle card. Students new to the University will be issued their Eagle Card during Graduate Orientation. Its optional debit card feature makes purchasing goods and services on campus easy and provides a convenient way to track expenses. Students simply deposit money into an Eagle Dollars account and, when a purchase is made at a campus dining location, the University Bookstore, a des-

ignated vending machine, etc., the amount of the purchase is deducted from the value remaining on the account. For added convenience, all monies deposited but not used are carried forward from semester to semester. There are no early withdrawals from any Eagle Card account. For a full disclosure of the terms and conditions, visit our Web site at <http://www.erau.edu/eaglecard>

## DINING SERVICES

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A variety of nutritious and satisfying dining services and meal plan options are offered on both the Daytona Beach and Prescott campuses. At both locations, dining facilities are located in or near residence halls and offer a wide range of food selections from full hot meals to fast food and snacks. Students can also enjoy weekly specials and events such as cookouts, buffets, and celebrations. Dining service hours are designed to meet the needs of students, with meals available throughout the day.

Accommodations can be made for students with special dietary needs or medical conditions. Dining service personnel are available to consult with students on an individual basis. Requests for special services should be made to the director of Dining Services at each campus.

## MAIL

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### Daytona Beach Campus

Prior to a student's arrival, all personal mail, UPS, Federal Express, deliveries, etc., should be addressed as follows:

Student Name  
"New Student"

# Student Life and Services

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Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900

## Prescott Campus

Prior to a student's arrival, all personal mail, UPS, Federal Express, deliveries, etc., should be addressed as follows:

Student Name  
"New Student"  
Embry-Riddle Aeronautical University  
3700 Willow Creek Road  
Prescott, AZ 86301-3720

All students are assigned a mailbox that they are required to check on a daily basis. University and personal communications are placed in the student mailboxes each day.

## INTERNATIONAL STUDENT SERVICES

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The International Student Services Office serves as the central point of contact for issues concerning international students at Embry-Riddle. An International Student Orientation is held each semester to familiarize students with University policies and procedures as well as the American education system generally. The office provides services that include advising students on immigration regulations and financial and personal matters. The office also assists international students with the processing of forms and documentation of status required by foreign governments, sponsors, the U.S. government, and the University.

International Student Services staff members continually strive to provide opportunities for international students to become involved in campus and community programs that facilitate a cross-cultural

awareness with University faculty, staff, and students as well as the local communities of Daytona Beach and Prescott. Some of these activities include International Days on both campuses, programs with local families to introduce students to the community, speaking engagements in local schools and at community service organizations, and trips to area attractions such as amusement parks, national parks, and cultural festivals.

All international students are expected to check in on arrival at Embry-Riddle with passport and immigration documents to the International Student Services Office, Student Center Annex, (386) 226-6579 for Daytona Beach students, or (928) 777-3774 for Prescott students.

## CAREER SERVICES OFFICE

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The Career Services Office provides career resources and career development assistance to all students and alumni of Embry-Riddle. The Career Services Web site offers students and alumni a virtual library of job search aids, including interview tips, sample resumes and cover letters, company profiles, direct links to employment Web sites, cooperative education/internship opportunities, current job listings, and a Web-based resume referral service.

Industry/Career Expos are held in the fall on both campuses. Over 100 companies visit the campuses to recruit students for full-time, cooperative education, and internship opportunities and to provide information on the industry. On-campus interviews and informational presentations are also scheduled year-round.

The Career Services Office employs a staff of program managers to provide one-



## Student Life and Services

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on-one career advisement, mock interviews, and resume-critique services. The Career Services Office encourages students to contact them early in their education to explore career options and to develop a successful job search strategy.

Career Services

Daytona Beach: (386) 226-6054

email: [careers@erau.edu](mailto:careers@erau.edu)

Prescott: (928) 777-3823

email: [prcareer@erau.edu](mailto:prcareer@erau.edu)

Extended Campus

email: [eccareer@erau.edu](mailto:eccareer@erau.edu)

<http://www.embryriddle.edu>

Graduate internship experiences are designed as academically based experiential education. A student enrolled in a University-approved graduate internship and registered for three credit hours will be considered full-time by all University departments other than Financial Aid. The Financial Aid Office will consider a three-hour internship as half-time enrollment and will process financial aid accordingly. They will report enrollment to the outside agencies as half-time, thus keeping them out of repayment on their student loans.

### EMBRY-RIDDLE LANGUAGE INSTITUTE

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The Embry-Riddle Language Institute (ERLI) at the Daytona Beach campus is an intensive English program providing English-language instruction and cultural orientation to nonnative speakers of English. Most of our students plan to attend Embry-Riddle, but we also welcome others who

just want to improve their English-language ability. If you desire to become more proficient in listening, speaking, reading, and writing the English language, this intensive English program is for you. Students benefit from a computer laboratory with up-to-date language-learning software and TOEFL preparation software. Students who wish to attend Embry-Riddle can be granted conditional acceptance pending completion of our program or a passing TOEFL score, assuming they meet all other University admission requirements. Eligible students are also able to earn a part-time recommendation after successful completion of a semester at ERLI, which allows them to begin their University studies while continuing their English-language studies. Other benefits to our program include field trips, social events, and full access to all Embry-Riddle facilities.

For more information, contact:

Embry-Riddle Language Institute

600 S. Clyde Morris Blvd.

Daytona Beach, FL 32114-3900

(386) 226-6192

fax: (386) 226-6165

email: [erli@erau.edu](mailto:erli@erau.edu)

# ACADEMIC PROGRAMS

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## INTRODUCTION

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Status quo is virtually an unknown concept in the aviation industry. The technology with which aviation works and the national and international regulations by which it must abide are subject to rapid, frequent, and sweeping change. Aviation touches every sphere of modern personal and business life and, therefore, must be sensitive to and respond to stimuli from a variety of unrelated sources. A healthy aviation industry is

critical to the nation's economic well-being and security.

Embry-Riddle graduate degree programs are designed to stress pragmatic solutions to the managerial, technological, and organizational challenges in the aviation and aerospace industry today. The problems presently confronting industry are brought into the classroom for analysis, making use of the latest theories, tools, and techniques available to engineers, operations personnel, and managers. Case studies, simulations, com-

# Academic Programs

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puter-aided analysis, and computer-assisted design, as well as experiential exercises are interspersed throughout the curricula to achieve a balance between theory and the realities of the aviation/aerospace industrial world of the 21st century.

In most programs, opportunities are provided in each degree program to tailor the curriculum to meet specific, individual career objectives. Classes are scheduled to accommodate both full-time and part-time study. Many of the graduate courses are nonsequential, allowing study to begin in any term. Electives needed to complete the requirements of any graduate degree are selected from among the 500/600 numbered courses (except BA 503 and the AED course series) listed in this catalog.

## GRADUATE INTERNSHIPS

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Graduate internships are temporary professional or industrial work opportunities available to graduate students in some programs. There are two types of internships: resident and nonresident. Resident internships are professional work activities supported by a partnership between the University and industry and conducted on campus under the supervision of a faculty/staff sponsor. Nonresident internships are professional work activities conducted off campus at the supporting organization facility. Full-time employees of the offering organization are not eligible for an internship appointment and cannot receive elective credit for their professional work service.

Graduate students who have full graduate status in a degree program and are in good standing with a minimum of six completed graduate credit hours, and who earn a cumulative GPA of 3.00 on a 4.00 basis, are

eligible to apply for graduate internships. Students must demonstrate adequate communication and technical skills.

Students selected for an internship must register for the approved number of credit hours in the appropriate departmental internship course, and pay all fees. Graduate academic credit is awarded at a rate of one credit hour for every 200 clock hours of work completed, up to a maximum of three credit hours in one semester. Three internship credit hours may be applied as an elective toward degree requirements in most degree programs. Students are advised to consult with their graduate program coordinator for approval to use internship credits toward their degree program.

## THESIS AND GRADUATE RESEARCH PROJECT OPTIONS

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### Requirements

Students who elect a thesis or graduate research project must obtain approval of the research topic. The University encourages graduate students to select thesis and graduate research project topics that permit them to participate in faculty research. Once approved, a research advisor and one or more additional committee members are selected and approved by the department coordinator or designee. Normally, if a student is working with a faculty research team as part of his/her thesis or graduate research project, the faculty member who is directing the student's research should generally be the student's research advisor. The graduate research project option may not be available for all programs.

### *College of Arts and Sciences*

*Dr. Rodney Piercey, Dean*

The College of Arts and Sciences is home to several outstanding degree programs and, in addition, is the primary provider of the curricula that fulfill the university's general education goals. At the graduate level the College offers the Master of Science in Space Science and the Master of Science in Human Factors and Systems.

The College of Arts and Sciences' primary responsibility is to provide a high-quality educational opportunity to all adequately prepared students. It seeks to inculcate in its students a lifelong love of learning and an appreciation of the cultural, intellectual, and historical impact of the search for truth and knowledge. The College seeks to develop in its students the ability to think independently and to accept responsibility. Students are expected to master the skills that enable them to communicate clearly and to interact with people different from themselves.

The College endorses and encourages the use of nontraditional experiences to enhance learning, including cooperative education, industry internships, study abroad, and research involvement.

Our faculty are actively involved in research and scholarly activities that often involve students. The Space Physics Research Lab, the Atmospheric Physics Research Lab, and the Laboratory for Advanced Instrumentation Research are operated by the faculty in our academic departments and provide ample opportunities for research. The Arts and Letters program promotes campus activities in the arts and humanities that enrich the lives of faculty as well as students.

Our excellent faculty and energetic, enthusiastic student body make the College of Arts and Sciences a wonderful place to work and learn.

# Academic Programs

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## *Master of Science in Human Factors and Systems (MSHFS)*

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Daytona Beach Campus College of Arts and Sciences

DEPARTMENT CHAIR

*Fran Greene*

PROGRAM COORDINATOR

*Shawn Doherty*

### INTRODUCTION

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The Department of Human Factors and Systems offers graduate instruction leading to the Master of Science degree in Human Factors and Systems with two distinct tracks in Human Factors and in Systems. These programs are designed to meet the highest academic standards, fully preparing students for doctoral-level studies while at the same time preparing students for immediate employment in the real world of cost sensitive and operationally driven aviation/aerospace environments.

The Human Factors track will develop a graduate with the capacity to design, conduct, and apply human factors research in support of the design of simple and complex systems. It will develop a student's ability to work as a human factors professional in aviation and aerospace environments based on their academic preparation and to actively participate in human factors projects at the graduate level. A variety of research, consulting, and internship arrangements are included in the program.

This track is based on the scientist-practitioner model of the American Psychological Association (APA) and adheres to guidelines

established by the committee for Education and Training of APA's Division 21 (Applied Experimental and Engineering Psychology). The program has been designed to meet the accreditation requirements of the Education Committee of the Human Factors and Ergonomics Society, as well as the International Ergonomics Association.

Students receive education in the content and techniques of human factors, including statistical and quantitative procedures, experimental design, survey methods, computer techniques, and other research methodologies.

The Systems track provides a systemic focus to the transformation of an operational need into a defined system configuration through the iterative process of functional analysis, synthesis, optimization, and design integration.

History indicates that a properly coordinated and functioning system that has a minimum of undesirable side effects cannot be achieved unless the system designer is sensitive to operational feasibility during the early stages of system development and assumes the responsibility for a user-centered life cycle. Therefore, a major focus of the Systems Track is an appreciation of the total life cycle

# Academic Programs

of the system, including design, development, testing, production, operations, sustaining support, and disposal.

The track addresses considerations of human factors, reliability, maintainability, logistic support, safety, producibility, economic, and related parameters as they apply to system design, integration, and evaluation. The goal of the track is to produce graduates who understand the proper balance between operational, behavioral, economic, and logistic factors.

Finally, the Systems track produces graduates who can move easily across disciplines. The graduates will understand the relative capabilities and limitations of each and thus know where trade-offs can effectively be made. This interdisciplinary prerequisite also requires that the graduate be able to use the tools and techniques of the various disciplines in both traditional and nontraditional applications.

\* A five-year Human Factors and Systems program is available. Please see the undergraduate catalog for details.

## DEGREE REQUIREMENTS

### HUMAN FACTORS TRACK

Core Courses	Credits
HFS 500 Systems Concepts, Theory, and Tools	3
HFS 510 Research Design and Analysis I	3
HFS 600 Human Factors in Systems	3
HFS 610 Research Design and Analysis II	3
HFS 615 Sensation and Perception	3
HFS 620 Memory and Cognition	3
Electives*	Credits
BA 511 Operations Research	3
HFS 515 Ergonomics	3
HFS 520 Team Resource Management	3
HFS 525 Human and Organizational Factors in Technological Systems	3
HFS 530 Systems Psychology	3
HFS 590 Graduate Seminar	3
HFS 625 Applied Testing and Selection	3

HFS 630 Cognitive Systems	3
HFS 635 Human Computer Interaction	3
HFS 640 Aviation/Aerospace Psychology	3
HFS 645 Underpinnings of Human Factors and Ergonomics	3
HFS 650 Human Factors of Aviation/Aerospace Applications	3
HFS 696 Internship in Human Factors and Systems (highly recommended)	3
HFS 699 Special Topics in Human Factors and Systems	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 612 Aviation/Aerospace Industrial Safety Management	3
MSE 500 Software Engineering Discipline	3
TM 605 Organization Theory in a Technical Environment	3
TM 610 Managing Effective Technical Work Teams	3

\* Electives are selected with the consent of the student's graduate advisor. Other elective courses may be selected with the approval of the graduate advisor. A total of four electives must be fulfilled for degree completion.

**Credits**

#### Option I

HFS 700 Thesis	6
-OR-	

#### Option II

HFS 515 Ergonomics	3
-AND-	
HFS 611 Work Physiology	3
-AND-	
Comprehensive Exam	0

**Total Required** **36**

### SYSTEMS TRACK

Core Courses	Credits
HFS 500 Systems Concepts, Theory, and Tools	3
HFS 505 System Engineering I	3
HFS 510 Research Design and Analysis I	3
HFS 600 Human Factors in Systems	3
HFS 605 System Engineering II	3
HFS 610 Research Design and Analysis II	3
Electives *	Credits
BA 511 Operations Research	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
BA 521 Global Information and Technology Management	3

# Academic Programs

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HFS 515 Ergonomics	3	TM 505 Computer Applications in Systems Management	3
HFS 520 Team Resource Management	3	TM 510 Project Development Techniques with Statistical Applications	3
HFS 525 Human and Organizational Factors in Technological Systems	3	TM 610 Managing Effective Technical Work Teams	3
HFS 530 Systems Psychology	3	TM 615 Planning for Systems Development and Operations	3
HFS 590 Graduate Seminar	3	TM 645 Advanced Operations Research and Management Science	3
HFS 625 Applied Testing and Selection	3		
HFS 635 Human Computer Interaction	3		
HFS 640 Aviation/Aerospace Psychology	3		
HFS 645 Underpinnings of Human Factors and Ergonomics	3		
HFS 650 Human Factors of Aviation/Aerospace Applications	3		
HFS 696 Internship in Human Factors and Systems (highly recommended)	3		
HFS 699 Special Topics in Human Factors and Systems	3		
MSA 611 Aviation/Aerospace System Safety	3		
MSA 612 Aviation/Aerospace Industrial Safety Management	3		
MSA 641 Production & Procurement Management in the Aviation/Aerospace Industry	3		
MSA 643 Management of Research & Development in the Aviation/Aerospace Industry	3		
MSE 500 Software Engineering Discipline	3		
MSE 520 Formal Methods for Software Engineering	3		
MSE 540 Simulation and Software Engineering	3		
MSE 545 Specification and Design of Real-Time Systems	3		
		* Electives are selected with the consent of the student's graduate advisor. Other elective courses may be selected with the approval of the graduate advisor. A total of four electives must be fulfilled for degree completion.	
			<b>Credits</b>
		<i>Option I</i>	
		HFS 700 Thesis	6
		-OR-	
		<i>Option II</i>	
		HFS 515 Ergonomics	3
		-AND-	
		HFS 611 Work Physiology	3
		-AND-	
		Comprehensive Exam	
		<b>Total Required</b>	<b>36</b>

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## *Master of Science in Space Science (MSSPS)*

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Daytona Beach Campus College of Arts and Sciences

DEPARTMENT CHAIR

*John Olivero*

PROGRAM COORDINATOR

*Peter Erdman*

### INTRODUCTION

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The Master of Science in Space Science (Engineering Physics) degree program provides graduate-level education and training in space science and space systems engineering. The goal is to provide graduates with the skills that will allow them to make an immediate contribution to the space-related industries or to proceed to doctoral studies in a wide variety of disciplines. This program's objectives are:

- Fundamental understanding of scientific and engineering approaches to conceiving and designing complex spacecraft systems.
- Development of the diverse set of research skills required to evolve the state of the art in the areas of space science and engineering.

The program specifically emphasizes scientific instrumentation, applied optics, remote sensing, spacecraft subsystems (power, attitude and thermal control), and a wide variety, of topics in space science and engineering.

This program is heavily research oriented, with a majority of the faculty in the Department of Physical Sciences actively involved in scholarly activities in the space sciences and engineering. The research areas include experimental programs with satellite systems, sounding rockets, ground-based remote-sensing experiments, and a parallel program of theoretical studies in the areas of space systems engineering, upper atmospheric physics, space physics, and plasma and magnetospheric physics.

### DEGREE REQUIREMENTS

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The curriculum consists of 15 credits of required coursework, with an additional 15 credits of electives and/or thesis research. The core courses emphasize the heavily technical nature of the space sciences and require an undergraduate degree in Physics, Engineering, or a related field (such as Mathematics or Chemistry) for preparation.



# Academic Programs

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## MASTER OF SCIENCE IN SPACE SCIENCE

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Option	Core Courses	Electives	Thesis	Total
Thesis	15	9	9	33
NonThesis	15	18	0	33

### Core Courses

	Credits
EP 501 Numerical Methods for Engineers and Scientists	3
EP 505 Advanced Spacecraft Dynamics and Control	3
EP 509 Advanced Space Physics	3
EP 600 Experimental Methods in Space Science	3
EP 605 Spacecraft Power and Thermal Design	3

### Electives

AE 508 Heat Transfer	3
AE 514 Introduction to the Finite Element Method	3
AE 520 Perturbation Methods in Engineering	3
AE 524 Rocket Engine Propulsion Systems	3
BA 511 Operations Research	3
EP 696 Graduate Internship in Eng. Physics	1-3
EP 699 Special Topics in Eng. Physics	1-3
EP 700 MSSPS Thesis	1-9
MA 502 Boundary Value Problems	3
MA 504 Potential Theory	3
MA 506 Probability for Engineers	3
MA 510 Fundamentals of Optimization	3
MSE 500 Software Engineering Concepts	3
MSE 545 Specification and Design of Real-Time Systems	3
MSE 585 Metrics and Statistical Methods for Software Engineering	3
MSE 610 Software Architecture and Design	3
MSE 655 Performance Analysis of Real-Time Systems	3

### *College of Aviation*

*Dr. Tim Brady, Dean*

The College of Aviation integrates into one unit the departments of Aeronautical Science, Applied Aviation Sciences, and Flight Training. This cohesive unit takes advantage of the various talents and expertise of faculty and staff in these related areas. By having these areas in one complex composed of the Aviation Building, the Simulation Center, the Flight Laboratory, and the Maintenance Complex, the College provides an atmosphere in which students are able to immerse themselves in an environment designed to provide them with the best resources available for the highest quality degree possible.

The Aviation Building, a strikingly beautiful state-of-the-art facility opened in 2002, houses the academic departments, classrooms, and laboratories, including the Air Traffic Simulation laboratory, providing a unique experience for students in various curricula. The Simulation Center contains the most advanced ab-initio aircraft simulation devices on the planet: aircraft-specific Cessna 172 and Piper Seminole Flight Training Devices, plus a CRJ FTD. Each of these devices exactly simulates the air-

craft, including the flying qualities, and each has powerful, realistic visuals.

The College of Aviation complex also serves as a living laboratory that can research all elements of an air transportation system, including dynamic modeling of air traffic control interfaces, security systems, and safety systems, through its highly sophisticated aircraft and air traffic simulation. These simulations can then be incorporated into the real world where a fleet of airplanes can bring the simulation scenarios to life in an in-flight laboratory.

The College offers the Master of Science degree in Aeronautics with specializations in Aviation/Aerospace Education, Management, and Operations, as well as Human Factors and Safety Systems.

Embry-Riddle has positioned the College of Aviation to serve its students with distinction while investigating and developing new education and programs for pilots, air traffic managers, meteorologists, and safety and security professionals of the new century.

# Academic Programs

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## *Master of Science in Aeronautics (MSA)*

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Daytona Beach Campus College of Aviation

DEPARTMENT CHAIR  
*Mark Friend*

PROGRAM COORDINATOR  
*Marvin Smith*

### INTRODUCTION

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The Master of Science in Aeronautics (MSA) degree program is designed to provide the aviation/aerospace professional with a rigorous academic approach to a generalist education oriented degree. It provides an unequalled opportunity for flight crew members, air traffic control personnel, flight operations specialists, industry technical representatives, and aviation educators to enhance their knowledge and pursue additional career opportunities.

Entry into the MSA program requires possession of an undergraduate foundation in the areas of college-level mathematics, introduction to computers, economics, and behavioral science.

The student may choose from four specializations: Aviation/Aerospace

Education Technology, Aviation/Aerospace Management, Aviation/Aerospace Operations, Aviation/Aerospace Safety Systems. Students must complete the Advanced Aviation/Aerospace Science core consisting of 12 credits. Students then complete the 12 credits that make up the selected specialization. The remaining credits consist of electives, and either a thesis or a graduate research project.

MSA students can also complete courses leading to multiple specializations. The multiple specialization is declared prior to the completion of the degree program. **Students wishing to complete multiple specializations must have 12 unduplicated credits in each of the specializations and a minimum of 39 credit hours.**

# Academic Programs

## DEGREE REQUIREMENTS

### Aviation/Aerospace Education Technology Specialization

Advanced Aviation/Aerospace Science Core	Credits
MSA 602 The Air Transportation System	3
MSA 604 Human Factors in the Aviation/Aerospace Industry	3
MSA 605 Research Methods and Statistics	3
MSA 606 Aviation/Aerospace Communications/Controls Systems	3

### Education Technology Specialization

Students must complete 12 credit hours from the following list of courses:	Credits
MSA 514 Computer-Based Instruction	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 550 Aviation Education Foundations	3
MSA 614 Advanced Aviation/Aerospace Curriculum Development	3
MSA 652 Continuing Education's Role in Aviation	3
MSA 654 Adult Teaching and Learning Techniques	3
MSA 663 Memory and Cognition	3

### Electives

Option I	Credits
MSA/BA Electives (500-600 Level) -AND-	6
MSA 700 Thesis -OR-	6

Option II	Credits
MSA 690 Graduate Research Project -AND-	3
MSA/BA Electives (500-600 Level)	9

**Total Required** **36**

### Aviation/Aerospace Management Specialization

Advanced Aviation/Aerospace Science Core	Credits
MSA 602 The Air Transportation System	3
MSA 604 Human Factors in the Aviation/Aerospace Industry	3

MSA 605 Research Methods and Statistics	3
MSA 606 Aviation/Aerospace Communications/Controls Systems	3

### Management Specialization

*Students must complete 12 credit hours from the following list of courses:*

	Credits
BA 511 Operations Research	3
BA 521 Global Information and Technology Management	3
BA 607 Human Resource Development	3
BA 632 Seminar in Aviation Labor Relations	3
BA 645 Airport Operations and Management	3
MSA 508 Advanced Airport Modeling	3
MSA 609 Aircraft Maintenance Management	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 612 Aviation/Aerospace Industrial Safety Management	3
MSA 636 Advanced Aviation/Aerospace Planning Systems	3
MSA 641 Production and Procurement Management in the Aviation/Aerospace Industry	3
MSA 643 Management of Research and Development for the Aviation/Aerospace Industry	3
MSA 644 Integrated Logistics Support in Aviation/Aerospace	3

### Electives

Option I	Credits
MSA/BA Electives (500-600 Level) -AND-	6
MSA 700 Thesis -OR-	6

Option II	Credits
MSA 690 Graduate Research Project -AND-	3
MSA/BA Electives (500-600 Level)	9

**Total Required** **36**  
(At least 18 credits must be MAS courses)

### Aviation/Aerospace Operations Specialization

Advanced Aviation/Aerospace Science Core	Credits
MSA 602 The Air Transportation System	3
MSA 604 Human Factors in the Aviation/Aerospace Industry	3

# Academic Programs

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MSA 605 Research Methods and Statistics	3
MSA 606 Aviation/Aerospace Communications/ Controls Systems	3

## Operations Specialization Credits

*Students must choose 12 credit hours from the following list:*

BA 511 Operations Research	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
MSA 508 Advanced Airport Modeling	3
MSA 515 Aviation/Aerospace Simulation Systems	3
MSA 560 Rotorcraft Operations	3
MSA 606 Aviation/Aerospace Communication/ Control Systems	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 620 Air Carrier Operations	3
MSA 622 Corporate Aviation Operations	3

## Electives Credits

### Option I

MSA/BA Electives (500-600 Level)	6
-AND-	
MSA 700 Thesis	6
-OR-	

### Option II

MSA 690 Graduate Research Project	3
-AND-	
MSA/BA Electives (500-600 Level)	9

**Total Required** 36

## Aviation/Aerospace Safety Systems Specialization

### Advanced Aviation/Aerospace Science Core Credits

MSA 602 The Air Transportation System	3
MSA 604 Human Factors in the Aviation/Aerospace Industry	3
MSA 605 Research Methods and Statistics	3
MSA 606 Aviation/Aerospace Communications/ Controls Systems	3

### Safety Systems Specialization Credits

*Students must complete 12 credit hours from the following list of courses:*

MSA 508 Advanced Airport Modeling	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 612 Aviation/Aerospace Industrial Safety Management	3
MSA 613 Airport Operations Safety	3
MSA 634 Aviation/Aerospace Psychology	3

## Electives Credits

### Option I

MSA/BA Electives	6
-AND-	
MSA 700 Thesis	6
-OR-	

### Option II

MSA 690 Graduate Research Project	3
-AND-	
MSA/BA Electives (500-600 Level)	9

**Total Required** 36

### *College of Business*

*Dr. Daniel Petree, Dean*

Our aim is to provide a world-class business and management education in an aviation/aerospace context. That means we have assembled a community of faculty scholars with global reputations and reach. That means we have designed curricula at the graduate and undergraduate levels that set the standard in aviation/aerospace management education. That means our faculty and students have the opportunity to focus on cutting-edge solutions to real-world problems and opportunities found in aviation, aerospace, and transportation-related industries and organizations. Our dedication to excellence is manifest by our accreditation by ACBPS (the Association of Collegiate Business Programs and Schools) for all our degree programs.

The College consists of two departments: the department of Management,

Marketing, and Operations and the department of Economics, Finance and Information Systems. Both departments are responsible for designing and delivering our MBA Programs.

We offer the only Master in Business Administration in Aviation (MBA/A) in the United States. This degree is intended to provide the individual who already holds an undergraduate degree, often in technical areas like engineering, with the tools necessary to become a credible professional manager in aviation, aerospace, or related industries. The program of study combines common general management courses with areas of concentration in Airline Management, Airport Management, Aviation System Management, Aviation Policy and Planning, and Aviation Human Resources.

# Academic Programs

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## *Master of Business Administration in Aviation (MBA/A)*

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College of Business

DEAN

*Daniel Petree*

PROGRAM COORDINATOR

*Blaise Waguespack*

### INTRODUCTION

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The Master of Business Administration degree program is designed to emphasize the application of modern management concepts, methods, and tools to the challenges of aviation and general business. The special intricacies of aviation are woven into a strong, traditional business foundation and examined in greater detail through a wide variety of specified electives. By combining these focused electives into a distinct set, students may select a unique area of specialization in the MBA program.

The demand for professional managers continues to grow in response to the increasing need to improve the efficient and effective use of scarce resources, of operating in an atmosphere of heightened national and international competition, of accommodating the expansion of emerging nations, and of responding to the call to preserve our fragile environment. The MBA curriculum is oriented toward the needs of the strategic decision-maker in the management hierarchy.

Versatility and analytical resourcefulness are two of the key aims of the MBA. For students wishing to study a wide range of aviation subject matter, the MBA in Aviation (MBA/A) allows the most flex-

ibility in elective choices. For those wishing to specialize in a unique area of aviation or aerospace, part of the program can be individually molded to satisfy personal interests. Specializations in the program are the MBA in Airport Management, the MBA in Airline Management, the MBA in Aviation Human Resources, the MBA in Aviation System Management, and the MBA in Aviation Policy and Planning. Students are allowed to select only one specialization, and not all specializations are offered at all campus locations or through every mode of delivery.

Specific prerequisite knowledge for each graduate course in the MBA is contained in the Course Description section of this catalog. 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 one or all of the modules contained in BA 503 (A through F): management, quantitative methods, marketing, accounting, economics, and/or finance. 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.

# Academic Programs

## DEGREE REQUIREMENTS

### Master of Business Administration in Aviation

Aviation Business Core	Credits
BA 511 Operations Research	3
BA 514 Strategic Marketing Management in Aviation	3
BA 517 Accounting for Decision Making	3
BA 518 Managerial Finance	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
BA 521 Global Information and Technology Management	3
BA 522 Business Research Methods	3
BA 523 Advanced Aviation Economics	3
BA 635 Business Policy and Decision Making	3
<b>Total Core Hours</b>	<b>27</b>

#### Specified Electives Credits

*Students must complete a combination of 12 hours from the courses listed below:*

BA 590 Graduate Seminar	1-3
BA 603 Aerospace Production and Operations Management	3
BA 604 International Management and Aviation Policy	3
BA 607 Human Resource Development	3
BA 609 Airline Operations and Management	3
BA 610 Airline Optimization and Simulation Systems	3
BA 625 Airline Marketing	3
BA 630 Aviation/Aerospace Systems Analysis	3
BA 632 Seminar in Aviation Labor Relations	3
BA 645 Airport Operations and Management	3
BA 650 Airline/Airport Relations	3
BA 651 Strategic Airport Planning	3
BA 655 Aviation Law and Insurance	3
BA 696 Internship**	1-3
BA 699 Special Topics in Business Administration	1-3
BA 700 Thesis	6
<b>Total Credits Required</b>	<b>39</b>

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.

### Master of Business Administration in Airport Management

Aviation Business Core	Credits
BA 511 Operations Research	3
BA 514 Strategic Marketing Management in Aviation	3
BA 517 Accounting for Decision Making	3
BA 518 Managerial Finance	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
BA 521 Global Information and Technology Management	3
BA 522 Business Research Methods	3
BA 523 Advanced Aviation Economics	3
BA 635 Business Policy and Decision Making	3

#### Core Credits Required 27

#### Specialization Required Courses Credits

*Students must complete these six hours.*

BA 645 Airport Operations and Management	3
BA 651 Strategic Airport Planning	3

#### Electives Credits

*Students must complete a combination of six hours from the courses listed below.*

BA 590 Graduate Seminar	1-3
BA 603 Aerospace Production and Operations Management	3
BA 604 International Management and Aviation Policy	3
BA 607 Human Resource Development	3
BA 609 Airline Operations and Management	3
BA 610 Airline Optimization and Simulation Systems	3
BA 625 Airline Marketing	3
BA 630 Aviation/Aerospace Systems Analysis	3
BA 650 Airline/Airport Relations	3
BA 655 Aviation Law and Insurance	3
BA 696 Internship**	1-3
BA 699 Special Topics in Business Administration	1-3
BA 700 Thesis	6
MSA 508 Advanced Airport Planning	3
MSA 613 Airport Operations Safety	3
<b>Total Credits Required</b>	<b>39</b>

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.



# Academic Programs

## Master of Business Administration in Airline Management

Aviation Business Core		Credits
BA 511	Operations Research	3
BA 514	Strategic Marketing Management in Aviation	3
BA 517	Accounting for Decision Making	3
BA 518	Managerial Finance	3
BA 520	Organizational Behavior, Theory, and Applications in Aviation	3
BA 521	Global Information and Technology Management	3
BA 522	Business Research Methods	3
BA 523	Advanced Aviation Economics	3
BA 635	Business Policy and Decision Making	3

**Core Credits Required** 27

### Specialization Required Courses

*Students must complete these six hours.*

BA 609	Airline Operations and Management	3
BA 650	Airline/Airport Relations	3

### Electives

*Students must complete a combination of six hours from the courses listed below.*

BA 590	Graduate Seminar	1-3
BA 603	Aerospace Production and Operations Management	3
BA 604	International Management and Aviation Policy	3
BA 607	Human Resource Development	3
BA 610	Airline Optimization and Simulation Systems	3
BA 625	Airline Marketing	3
BA 630	Aviation/Aerospace Systems Analysis	3
BA 632	Seminar in Aviation Labor Relations	3
BA 645	Airport Operations and Management	3
BA 655	Aviation Law and Insurance	3
BA 696	Internship**	1-3
BA 699	Special Topics in Business Administration	1-3
BA 700	Thesis	6

**Total Credits Required** 39

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.

## Master of Business Administration in Aviation Human Resources

Aviation Business Core		Credits
BA 511	Operations Research	3
BA 514	Strategic Marketing Management in Aviation	3
BA 517	Accounting for Decision Making	3
BA 518	Managerial Finance	3
BA 520	Organizational Behavior, Theory, and Applications in Aviation	3
BA 521	Global Information and Technology Management	3
BA 522	Business Research Methods	3
BA 523	Advanced Aviation Economics	3
BA 635	Business Policy and Decision Making	3

**Core Credits Required** 27

### Specialization Required Courses

*Students must complete these six hours.*

BA 607	Human Resources Development	3
BA 632	Seminar in Aviation Labor Relations	3

### Electives

*Students must complete a combination of six hours from the courses listed below.*

BA 590	Graduate Seminar	1-3
BA 603	Aerospace Production and Operations Management	3
BA 604	International Management and Aviation Policy	3
BA 609	Airline Operations and Management	3
BA 625	Airline Marketing	3
BA 630	Aviation/Aerospace Systems Analysis	3
BA 645	Airport Operations and Management	3
BA 655	Aviation Law and Insurance	3
BA 696	Internship**	1-3
BA 699	Special Topics in Business Administration	1-3
BA 700	Thesis	6
MSA 516	Applications in Crew Resource Management	3
MSA 604	Human Factors in Aviation/Aerospace Applications	3

**Total Credits Required** 39

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.

# Academic Programs

## Master of Business Administration in Aviation System Management

Aviation Business Core	Credits
BA 511 Operations Research	3
BA 514 Strategic Marketing Management in Aviation	3
BA 517 Accounting for Decision Making	3
BA 518 Managerial Finance	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
BA 521 Global Information and Technology Management	3
BA 522 Business Research Methods	3
BA 523 Advanced Aviation Economics	3
BA 635 Business Policy and Decision Making	3

**Core Credits Required** 27

### Specialization Required Courses

*Students must complete these six hours.*

BA 610 Airline Optimization and Simulation Systems	3
BA 630 Airline/Aerospace Systems Analysis	3

### Electives

*Students must complete a combination of six hours from the courses listed below.*

BA 590 Graduate Seminar	1-3
BA 603 Aerospace Production and Operations Management	3
BA 604 International Management and Aviation Policy	3
BA 607 Human Resource Development	3
BA 609 Airline Operations and Management	3
BA 645 Airport Operations and Management	3
BA 655 Aviation Law and Insurance	3
BA 696 Internship**	1-3
BA 699 Special Topics in Business Administration	1-3
BA 700 Thesis	6
MSA 570 Advanced Avionics	3
MSA 603 Aircraft and Spacecraft Development	3
MSA 609 Aircraft Maintenance Management	3
MSA 641 Production and Procurement Management in Aviation/Aerospace Industry	3

**Total Credits Required** 39

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.

## Master of Business Administration in Aviation Policy and Planning

Aviation Business Core	Credits
BA 511 Operations Research	3
BA 514 Strategic Marketing Management in Aviation	3
BA 517 Accounting for Decision Making	3
BA 518 Managerial Finance	3
BA 520 Organizational Behavior, Theory, and Applications in Aviation	3
BA 521 Global Information and Technology Management	3
BA 522 Business Research Methods	3
BA 523 Advanced Aviation Economics	3
BA 635 Business Policy and Decision Making	3

**Core Credits Required** 27

### Specialization Required Courses

*Students must complete these six hours.*

BA 604 International Management and Aviation Policy	3
BA 655 Aviation Law and Insurance	3

### Electives

*Students must complete a combination of six hours from the courses listed below.*

BA 590 Graduate Seminar	1-3
BA 603 Aerospace Production and Operations Management	3
BA 609 Airline Operations and Management	3
BA 610 Airline Optimization and Simulation Systems	3
BA 625 Airline Marketing	3
BA 630 Aviation/Aerospace Systems Analysis	3
BA 632 Seminar in Aviation Labor Relations	3
BA 645 Airport Operations and Management	3
BA 696 Internship**	1-3
BA 699 Special Topics in Business Administration	1-3
BA 700 Thesis	6
MSA 508 Advanced Airport Planning	3
MSA 601 Applications in Space: Commerce, Defense, and Exploration	3
MSA 641 Production and Procurement Management in Aviation/Aerospace Industry	3

**Total Credits Required** 39

\*\* Students may petition for an internship credit with prior approval of the graduate program coordinator or chair as appropriate.

# Academic Programs

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## *Executive Master of Business Administration (EMBA)*

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(The Executive MBA is closed to new students.)

College of Business

DEAN

*Daniel Petree*

PROGRAM COORDINATOR

*Blaise Waguespack*

### INTRODUCTION

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The Executive MBA is a 14-month program designed to accelerate career progression and to prepare promising executives to assume leadership roles in their organizations.

The program is conducted in large part on Embry-Riddle's Daytona Beach campus. The program includes a series of six two-week residency sessions, held approximately every 10 weeks. Between these residency sessions, participants are expected to complete course-related reading, individual and group assignments, and the comprehensive Executive Project. During these interim periods, participants remain in contact with professors and one another via phone, fax, and email, and through discussion forums and chat rooms on course Web pages.

Prior to each module, EMBA participants receive a packet of instructional materials, giving them sufficient time to prepare for the classes. During residency sessions, classes meet during the normal business day so that evenings can be devoted to individual study and group projects.

The curriculum of the EMBA embodies the goals of the University's MBA in Aviation by providing a solid foundation of knowledge in such areas as strategic

management, leadership, communication, and teamwork, as well as other main-stream executive disciplines, all presented in the context of the aviation and aerospace industry. Four specific areas of focus drive the curriculum: Organizational Evolution, Cross-Functional Competencies, Leadership and Entrepreneurship, and Global Strategic Thinking.

The Executive Project, as the program's capstone activity, is designed to benefit both the participant and the sponsoring organization by giving the participant the opportunity to apply the knowledge and diagnostic competencies learned throughout the program to a specific business issue of the sponsor. Issues are selected by the sponsor and participant and are approved by the faculty project advisor in module #3. Working from the perspective of a consultant, the participant thoroughly investigates the issue and proposes specific actions, using the analysis, planning, and management tools developed during each course. Continuous guidance and feedback are provided by the faculty advisor and sponsor during the project. The completed project requires a comprehensive written report, as well as a formal oral presentation.

# Academic Programs

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## DEGREE REQUIREMENTS

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### Required Courses

### Credits

#### *Module #1*

EMBA 540	Organizational Communication and Information Systems . . . . .	3
EMBA 544	Quantitative Analysis for Management Decision Making I . . . . .	2
EMBA 662	Personal Communication and Teamwork . . . . .	3

#### *Module #2*

EMBA 542	Accounting for Decision Making . . . . .	3
EMBA 545	Quantitative Analysis for Management Decision Making II . . . . .	2
EMBA 548	Global Economic Analysis for Managers . . . . .	3

#### *Module #3*

EMBA 546	Production/Operations Management . . . . .	3
EMBA 550	Global Marketing Management . . . . .	3
EMBA 552	Managerial Finance I . . . . .	2

EMBA 700	Executive Project . . . . .	3
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#### *Module #4*

EMBA 553	Managerial Finance II . . . . .	2
EMBA 660	Applications of Organizational Behavior . . . . .	3
EMBA 664	Global Market Forces and Ethical Responsibility . . . . .	3

#### *Module #5*

EMBA 554	Leadership and Entrepreneurship . . . . .	3
EMBA 668	Culture and the Diverse Workforce . . . . .	3
EMBA 674	Strategic Management I . . . . .	2

#### *Module #6*

EMBA 670	Technology and Innovation Management . . . . .	3
EMBA 672	Designing the High Performance Organization . . . . .	3
EMBA 675	Strategic Management II . . . . .	2

<b>Total Required</b>		<b>51</b>
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## Academic Programs

### *College of Engineering*

*Dr. Ray Mankbadi, Dean*

The College of Engineering at Embry-Riddle offers master degrees in Aerospace Engineering and Software Engineering. The College emphasizes high-quality education and research activities that bring to the students the latest developments in the field. Students are continually encouraged and supported by faculty to strive for ingenious and creative solutions to today's technological problems through research projects.

Students acquire valuable hands-on experience using cutting-edge technology in several areas of concentration,

such as safety-critical software development, computational aerospace propulsion and aerodynamics, astronomical engineering, and aeronautical structures and materials. The College also holds many seminars and workshops for engineering students with academic and industry speakers. This interaction with industry enables students to stay abreast of current industry conditions and advancements. College of Engineering graduates are regarded as some of the most knowledgeable and best-trained professionals entering their chosen fields.

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## *Master of Science in Aerospace Engineering (MSAE)* *Master of Aerospace Engineering (MAE)*

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Daytona Beach Campus College Of Engineering

DEPARTMENT CHAIR  
*Habib Eslami*

### INTRODUCTION

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The Master of Science in Aerospace Engineering (MSAE) and the Master of Aerospace Engineering (MAE) provide formal advanced study, preparing students for careers in the aerospace industry and in research and development. Both degree programs are planned to augment the individual student's engineering and science background with adequate depth in areas of aeroacoustics, nondestructive testing,

aerodynamics, design and optimization, propulsion, aerospace structures, composites, computational fluid dynamics, or other areas of aerospace engineering. Candidates for both degree programs can select courses that prepare them for the aerospace engineering profession or that prepare them to continue on to doctoral studies.

Both degree programs require a minimum of 30 credit hours of graduate-level work.

### DEGREE REQUIREMENTS

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#### *MSAE (Thesis option)*

3 hours	MA 502 or equivalent
18 hours	Electives
9 hours	Thesis
<hr/>	
30 hours	

#### *MAE (Nonthesis option)*

3 hours	MA 502 or equivalent
27 hours	Electives
	<i>(at least six hours should be 600-level)</i>
<hr/>	
30 hours	

# Academic Programs

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## AREAS OF CONCENTRATION

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### Aerospace Structures

This area includes Structural Analysis, Vibration, Nondestructive Testing, Composite Materials, Elasticity, Flight Dynamics, Controls, and Design Optimization.

### Electives for Structures Concentration

- AE 502 Strength and Fatigue of Materials
- AE 506 Airplane Dynamic Stability
- AE 510 Aircraft Structural Dynamics
- AE 514 Introduction to the Finite Element Method
- AE 518 Acoustic Emission Nondestructive Testing
- AE 520 Perturbation Methods in Engineering
- AE 522 Analysis of Aircraft Composite Materials
- AE 526 Engineering Optimization
- AE 606 Finite Element Aerospace Applications
- AE 612 Analysis of Aircraft Plate and Shell Structures
- AE 616 Advanced Aircraft Structural Dynamics
- AE 646 Nonlinear Dynamical Systems and Chaos
- AE 648 Thermal Stresses in Aerospace Engineering
- AE 699 Special Topics in Aerospace Engineering

### Aerodynamics and Propulsion

This area includes Aerodynamics, Propulsion, Computational Aero and Fluid Dynamics, Transition and Turbulence, Aeroacoustics, Heat Transfer, and Combustion.

### Electives for Aerodynamics and Propulsion Concentration

- AE 504 Advanced Compressible Flow
- AE 508 Heat Transfer
- AE 512 Combustion
- AE 516 Computational Aeronautical Fluid Dynamics
- AE 524 Rocket Engine Propulsion Systems
- AE 528 Advanced Incompressible Aerodynamics
- AE 530 Aeroacoustics
- AE 610 Advanced Computational Fluid Dynamics
- AE 620 Boundary Layer Theory
- AE 640 Turbine Engine Propulsion Systems
- AE 650 Special Topics in Aerodynamics and Propulsion Engineering
- AE 652 Turbulent Flows

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## *Master of Software Engineering (MSE)\**

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Daytona Beach Campus College of Engineering

DEPARTMENT CHAIR

*Massood Towhidnejad*

PROGRAM COORDINATOR

*Massood Towhidnejad*

### INTRODUCTION

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The Master of Software Engineering (MSE) degree program is designed to give recent college graduates, or college graduates who have had several years of professional life, an opportunity to enhance their careers and work on the cutting edge of modern software development. Software engineers who complete the program can rapidly assume positions of substantial responsibility in a software development organization.

The MSE degree program achieves its purpose by providing students not only with the technical tools and techniques of the field but also with skills in communication, group interaction, management, and planning. The program emphasizes a process-centered quantitative approach to the engineering of software systems. The goal of the program is to give graduates an in-depth understanding of the tools, techniques, and appropriate processes for the management of software development, elicitation and analysis of requirements, architecture and design, implementation, and verification and validation of software systems. In addition, the program pays special attention to the issues related to communication and teamwork.

A special emphasis is on real-time embedded software systems encountered

in such applications as the FAA air traffic control computer system, aircraft avionics, NASA's space station, and others. In addition, the MSE curriculum takes full notice of the Software Engineering Institute's (SEI) capability maturity model (CMM) by incorporating the key practices throughout the coursework.

The curriculum is structured into two groups of courses: core (18 credits) and specified electives (12 credits). As part of the core, each MSE student must complete a "capstone experience," which entails a major project that involves applications of the theory, practices, and technology studied in the other core courses. Typically students will take SE 69X to satisfy the capstone experience. In special cases, the capstone experience can be satisfied by completing a Graduate Research Project (SE 690). In such cases and prior to registering for SE 690, a faculty member must agree to be a GRP advisor and the student must obtain approval of a GRP research area.

Courses available as specified electives include metrics and statistical methods for software engineering, performance analysis of software systems, concurrent and distributed systems, software safety, and formal methods for software engineering.



# Academic Programs

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\* A five-year Computer Engineering/Master of Software Engineering program and a five-year Software Engineering/Master of Software Engineering program are available. See the undergraduate catalog for details.

## DEGREE REQUIREMENTS

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Required Courses	Credits
Students must complete 18 credit hours of core courses.	
SE 500 Software Engineering Discipline	3
SE 510 Software Project Management	3
SE 530 Software Requirements Engineering	3
SE 555 Object-Oriented Software Construction	3
SE 610 Software Systems Architecture and Design	3
SE 697 Software Engineering Practicum	3
-OR-	
SE 690 Graduate Research Project Specified Electives	3 12
<b>Total</b>	<b>30</b>

**Students must complete 12 credit hours from the following list of courses:**

SE 505 Model-Based Verification of Software	3
SE 520 Formal Methods for Software Engineering	3
SE 535 Graphical User Interface Design and Evaluation	3
SE 565 Concurrent and Distributed Systems	3
SE 675 Software Safety	3
SE 545 Specification and Design of Real-Time Systems	3
SE 550 Current Trends in Software Engineering	3
SE 580 Software Process Definition and Modeling	3
SE 585 Metrics and Statistical Methods for Software Engineering	3
SE 590 Graduate Seminar	3
SE 625 Software Quality Engineering and Assurance	3
SE 655 Performance Analysis of Real-Time Systems	3
SE 660 Formal Methods for Concurrent and Real-Time Systems	3
SE 699 Special Topics in Software Engineering	3

Note: Other electives may be authorized based on the student's background, program of study, performance during the MSE, and approval of the MSE program coordinator.

### *College of Aviation*

*Prescott Campus*

*Dr. Jackie Luedtke, Dean*

The College of Aviation is composed of the departments of Aeronautical Science, Meteorology, Safety Science, and Flight.

The College offers the Master of Science in Safety Science. This degree program provides the graduate with experiences to enhance the practice of occupational health and safety. The MSSS degree program prepares graduates for several job settings, such as director of safety in industry and government, operational and maintenance safety personnel, and aircraft accident investigator.

The college has an enrollment of approximately 800 students and a fleet of

38 aircraft, including Cessna 172s, Cessna 182s, Piper Seminoles, and American Champion Decathlons. The College also has state-of-the-art Level 6 Cessna 172 and PA 44 Flight Training Devices and an Airbus A-320 simulator.

Embry-Riddle has positioned the College of Aviation to serve its students with distinction while investigating and developing new education and programs for pilots and safety and security professionals.

# Academic Programs

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## *Master of Science in Safety Science (MSSS)*

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Prescott Campus College of Aviation

DEPARTMENT CHAIR

*Gary Northam*

PROGRAM COORDINATOR

*Max Fogleman*

### INTRODUCTION

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The Master of Science in Safety Science (MSSS) degree program is designed to provide students with a practical course of study in safety and occupational health. The degree will produce safety professionals who are skilled in providing safety management expertise in a variety of industries. Graduates will be able to provide leadership and guidance in compliance issues involving EPA, OSHA, DOD, FAA, DOE, NTSB and state health, hygiene, and workplace standards, and will be prepared for service in numerous industries, including but not limited to the aviation/aerospace industry and the military.

The MSSS degree prepares graduates for professional safety positions in a variety of industrial settings including aviation. Students will qualify for jobs such as aircraft accident investigator, aviation or general safety management, operations safety, and safety design. The degree offers the opportunity for students to explore both the theoretical and pragmatic discipline that occupational health and safety has become. Particularly in light of extensive interest by

the private sector and by government entities, this degree offers occupational health and safety professionals the advanced education and credentials necessary to succeed in the practice of safety.

The MSSS is a 36 credit hour program of study composed of a General Core (12 credit house), a Research Core (six to nine credit hours), and electives (15 to 18 credit hours). Elective coursework must be selected from the elective list on the following page. All elective courses may not be offered every year. **Check with an advisor for a schedule of course offerings.**

Preference will be given to applicants with an undergraduate background in college-level mathematics, the physical and natural sciences, computer applications, behavioral science, and statistics. Students who lack prerequisite knowledge in algebra and trigonometry, physics, and chemistry will be required to take deficiency coursework. The prerequisite knowledge for any graduate course must be satisfied before enrollment in the course is permitted.

# Academic Programs

## DEGREE REQUIREMENTS

Courses	Credits
<b>Safety Science General Core</b>	
MSF 580 Industrial Hygiene and Environmental Protection	3
MSF 601 Ergonomics	3
MSF 602 Human Factors	3
MSF 603 Occupational Safety	3
<b>Total Credits</b>	<b>12</b>
<b>Safety Science Research Core</b>	
MSF 604 Quantitative Methods in Occupational Safety and Health	3
-AND-	
<b>Option I</b>	
MSF 700 Thesis	6
-OR-	
<b>Option II</b>	
MSF 690 Graduate Research Project	3
<b>Total Credits</b>	<b>6-9</b>

## Electives

Courses	Credits
MSA 602 The Air Transportation System	3
MSA 608 Aviation/Aerospace Accident Investigation and Safety Systems	3
MSA 611 Aviation/Aerospace System Safety	3
MSA 613 Airport Operations Safety	3
MSF 530 Aircraft Accident Investigation	3
MSF 605 Industrial Hygiene Measurement	3
MSF 606 Control Methods in Occupational Safety and Health	3
MSF 607 Epidemiology	3
MSF 608 Toxicology	3
MSF 609 System Safety	3
MSF 610 Industrial Security	3
MSF 630 Aircraft Accident Analysis	3
MSF 635 Advanced Aircraft Survivability Analysis and Design	3
MSF 655 Airline and Operations Safety Management	3
MSF 675 Aviation Maintenance Safety	3
MSF 685 Aviation Security	3
MSF 696 Graduate Internship in Safety Science	1-3
MSF 699 Special Topics in Safety Science	1-3
TM 621 Regulations, Ethics, and the Legal System	3
<b>Total Credits</b>	<b>15-18</b>

# Special Academic Programs and Opportunities

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## STUDY ABROAD

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Embry-Riddle offers students in all programs, but especially in the engineering and computer science disciplines, the chance to study abroad for a year at minimal cost. Qualified students from both residential campuses receive language and cultural training and enroll at partner institutions in Europe, Central and South America, Asia, or Australia. While abroad, students study subjects applicable to their degree programs at the University. During the last six months of their year abroad, students may qualify to complete a paid internship in industry, working on technical problems related to their field of study. After successful completion of the French or German programs, students may receive the Euronational Certificate. A double diploma program and graduate programs are also available through EPF in Paris and ENAC in Toulouse, France.

Embry-Riddle is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, GA 30033-4097; phone: 404-679-4501) to award associate, bachelor, and master degrees. International exchange partner institutions are not accredited by the Commission on Colleges and

the accreditation of Embry-Riddle does not extend to or include the partner institutions or their students. Although Embry-Riddle accepts certain partner institution coursework in transfer, other colleges and universities may not accept this work in transfer, even if it appears on a transcript from Embry-Riddle. Each institution decides for itself whether it should accept transfer credit from another institution.

In the case of approved double diploma arrangements, Embry-Riddle must provide direct instruction for at least 25 percent of the coursework leading to an Embry-Riddle undergraduate degree, or at least 50 percent of the coursework leading to an Embry-Riddle graduate degree.

Four- and five-week Summer Term Abroad programs on three continents offer students from all degree programs opportunities for academic experiences at foreign universities, accompanied by Embry-Riddle professors.

Contracted ROTC students will have specific restrictions for travel to designated foreign countries and must advise cadre and obtain approval prior to applying for this program.

# Special Academic Programs and Opportunities

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## AVIATION MAINTENANCE SCIENCE (AMS)

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### **Airframe & Powerplant Technician Certification Program**

The Airframe & Powerplant Technician Certification program provides the student with the training required to qualify for Federal Aviation Administration (FAA) Airframe and Powerplant Technician Certification. The 16-month program, offered only at the Daytona Beach campus, presents a carefully selected blend of theory and practical applications that qualifies the student to take the FAA certification examinations.

Students perform repairs and overhaul engines and accessories, including those used in the Embry-Riddle pilot training fleet. The curriculum, facilities, equipment, and instructional staff are fully approved under the Code of Federal Regulations (CFR) Title 14 Part 147. Embry-Riddle holds Air Agency Certificate No. NX4T404M and FAA Repair Station Certificate No. NX42404M.

### **Avionics Line Maintenance Specialization Program**

The Avionics Line Maintenance program provides the student with training needed to successfully obtain the FCC General Radiotelephone Operators License (GROL) and with advanced avionics training using current industry standards and procedures. Students will learn basic wiring and electronics concepts, system installations, and advanced avionics line maintenance troubleshooting.

### **Sources of Information**

For general academic and admissions information regarding the Aviation Maintenance programs:

Aviation Maintenance Science Dept.  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114  
(386) 323-5086 - or - (877) 904-3746  
Fax: (386) 226-6778  
[www.embryriddle.edu/amt](http://www.embryriddle.edu/amt)

Note: For the purpose of calculating VA training time for both programs, break times are excluded.

# COURSE DESCRIPTIONS

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Embry-Riddle course offerings are listed in alphabetical order, according to the following course designations:

<b>AE</b>	Master of Aerospace Engineering/Master of Science in Aerospace Engineering
<b>AED</b>	Aviation Education
<b>BA</b>	Master of Business Administration in Aviation
<b>EMBA</b>	Executive Master of Business Administration
<b>EP</b>	Engineering Physics
<b>HFS</b>	Master of Science in Human Factors and Systems
<b>MA</b>	Mathematics
<b>MAAF</b>	USAF Safety Education
<b>MSA</b>	Master of Aeronautical Science
<b>MSF</b>	Master of Science in Safety Science
<b>SE</b>	Software Engineering
<b>TM</b>	Technical Management

The following courses are not necessarily offered every term, nor are they necessarily offered at all campus locations.

## AE - Aerospace Engineering

### AE 501

Numerical Methods for Engineers and Scientists  
3 Credits

Numerical methods for the solution of engineering physics problems; systems of linear equations, ordinary differential equations, including one-dimensional initial value problems and boundary value problems; partial differential equations (PDEs), including elliptic, parabolic, and hyperbolic PDEs; finite difference method. Application to problems such as diffusion, transport, remote sensing, inversion, and plasma waves. Emphasis will be on computer implementation of numerical solutions.

### AE 502

Strength and Fatigue of Materials  
3 Credits

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.

*Prerequisite:* Consent of the department.

### AE 504

Advanced Compressible Flow  
3 Credits

Classification and solution of compressible flow problem, basic conservation laws, and fundamental theorems of compressible flows. Wave phenomena; normal and oblique shocks. Method of characteristics and wave interactions. Perturbation theories and similarity rules. Linearized supersonic flow, axisymmetric flow wing theory, and wave drag. Nonlinear theories of transonic and supersonic flows.

*Prerequisite:* Consent of the department.

### AE 506

Airplane Dynamic Stability  
3 Credits

Small-disturbance theory and linearized solutions of the general equations of motions. Aerodynamic derivatives, derivative analysis, aerodynamic transfer functions. Dynamic stability of uncontrolled longitudinal and lateral motions. Computer solution of dynamic stability problems. Inverse problems.

Automatic stability and control. An introduction to automatic flight controls and feedback control system analysis.

*Prerequisite:* Consent of the department.

### AE 508

Heat Transfer  
3 Credits

One- and two-dimensional steady and unsteady-state conduction heat transfer including an introduction to finite difference and finite element methods of analysis. Free and forced convection heat transfer. Radiation heat transfer.

*Prerequisite:* Consent of the department.

### AE 510

Aircraft Structural Dynamics  
3 Credits

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.

*Prerequisite:* Consent of the department.

### AE 512

Combustion  
3 Credits

Equilibrium and kinetics of combustion processes. Law of mass action, Arrhenius reaction rate law, heat of reaction, and adiabatic flame temperature. Conservation equations of reacting flows. Applications of conservation equations.

*Prerequisite:* Consent of the department.

### AE 514

Introduction to the Finite Element Method  
3 Credits

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.



# Course Descriptions

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## AE 516

### Computational Aeronautical Fluid Dynamics 3 Credits

Potential flow theory. Panel methods. Applications of numerical methods and the digital computer to inviscid flow analysis. Lifting line, vortex lattice fundamentals. Use of computer codes.

*Prerequisite:* Graduate standing.

## AE 518

### Acoustic Emission Nondestructive Testing 3 Credits

Fundamentals of acoustic emission testing. Macroscopic origins. Wave propagation. Acoustic emission sensors and their calibration. Source location. Applications. Survey of commercial acoustic emission sensors and systems. Current research.

## AE 520

### Perturbation Methods in Engineering 3 Credits

Investigation of gauge functions, asymptotic expansions and singular perturbation problems. Use is made of the method of straining parameters and method of multiple scales along with the evaluation of self-excited systems. The Duffing equation. The Mathieu equation. Boundary-layer problems and gyroscopic problems are reviewed.

## AE 522

### Analysis of Aircraft Composite Materials 3 Credits

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.

*Prerequisite:* Graduate standing.

## AE 524

### Rocket Engine Propulsion Systems 3 Credits

Analysis of combustion and expansion processes. Thrust nozzle performance analysis and design techniques. Characteristics of liquid propellants and liquid propellant rocket motors. Characteristics of solid propellants and interior ballistics of solid propellant rocket motors. Cooling techniques. Thrust vector control methods.

*Prerequisite:* Graduate standing.

## AE 526

### Engineering Optimization 3 Credits

Numerical optimization methods are presented and applied to the solution of engineering problems. Constrained problems and the Kuhn-Tucker conditions. Optimization model construction. Sequential unconstrained optimization. Direct methods for constrained problems. Structural optimization. Genetic algorithms and the method of simulated annealing and their applications in research and engineering problems. Case studies in mechanical and aerospace engineering.

## AE 528

### Advanced Incompressible Aerodynamics 3 Credits

Kinematics and dynamics, thin airfoil theory, finite wing theory, bluff body flow, the Panel Method, numerical techniques, unsteady loads, vortex flows.

## AE 530

### Aeroacoustics 3 Credits

Sound and wave characteristics, levels and directives, hearing and physiological effects of noise, noise control criteria and regulations, instrumentation, acoustic materials and structures, aircraft components, acoustic analogy, computational aeroacoustics.

## AE 590

### Graduate Seminar 1-3 Credits

A study of the most current advancements in a particular field of study as determined by the instructor of the course. The course will have a different topic each term depending on the varied interests of the students, the graduate faculty, or the research requirements of the Aerospace Engineering department.

*Prerequisite:* Consent of the department.

## AE 606

### Finite Element Aerospace Applications 3 Credits

Development of finite element representation of continuum using Galerkin and variational techniques. Boundary elements. Applications to statics and dynamics of solids, structures, fluids, and heat flow. Includes the use of finite element codes.

*Prerequisite:* Graduate standing.

# Course Descriptions

## AE 610

### Advanced Computational Fluid Dynamics

3 Credits

Application of vortex lattice, panel element, and boundary element methods to incompressible and compressible three-dimensional aerodynamics flow problems. Wing and wing-body analysis. Incorporation of boundary integration for more complete modeling.

*Prerequisite:* Graduate standing.

## AE 612

### Analysis of Aircraft Plate and Shell Structures

3 Credits

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.

*Prerequisite:* Graduate standing.

## AE 616

### Advanced Aircraft Structural Dynamics

3 Credits

Analysis of structures subjected to dynamic loads. Hamilton's principle and Lagrange's equations. Rayleigh's principle. Numerical evaluation of natural frequencies and modes. Mode superposition and direct integration methods for dynamic response. Finite element modeling. Component mode synthesis. Computer applications.

*Prerequisite:* Graduate standing.

## AE 620

### Boundary Layer Theory

3 Credits

Navier-Stokes equations for laminar and turbulent flows. Boundary layers. Jets, wakes, elementary turbulence modeling. Skin friction, separation, drag and aerodynamic heating. Approximate and exact finite-difference solutions including the effect of suction and blowing. Solutions of turbulent boundary layer equations.

*Prerequisite:* Graduate standing.

## AE 640

### Turbine Engine Propulsion Systems

3 Credits

Advanced theory of turbojet, multispool fan jet, variable cycle engines, and bypass air-breathing propulsion systems. Design and off-design per-

formance analysis, theory and design of inlets, compressors, burners, and turbines. Component matching, cooling, regenerative systems, test methods, and corrections. Engine post-stall behavior.

*Prerequisite:* Graduate standing.

## AE 646

### Nonlinear Dynamical Systems and Chaos

3 Credits

Mathematical and experimental methods for the study of bifurcation and chaos in dynamical systems are described. Systems described by difference equations. Bifurcations of equilibrium points. Systems described by ordinary differential equations. Phase plane analysis. Limit cycles, nonlinear oscillations, and chaotic vibrations. Chaotic transitions, period doubling, and intermittency. Examples of chaos in mechanical, electrical, magnetic, fluid, chemical, and biological systems.

## AE 648

### Thermal Stresses in Aerospace Engineering

3 Credits

Basic equations of thermoelasticity. Thermal structures problems; rods, beams, and plates. Thermally induced vibration. Thermal buckling. Thermoviscoplasticity.

## AE 650

### Special Topics in Aerodynamics and Propulsion Engineering

3 Credits

Guided independent study of selected topics not offered in regularly scheduled classes. Arrangements and work requirements established by prior agreement of the instructor and students. Students should expect to spend at least 60 hours of reading and studying for each credit hour. May be repeated.

## AE 652

### Turbulent Flows

3 Credits

Laminar-turbulent transition, turbulent flow equations of motion. Definition of turbulence. Modeling, coherent structure, and large-Eddy simulations. Longitudinal and lateral correlations in homogeneous turbulence. Integral scales of turbulence. Eulerian space and time correlations. Lagrangian time correlations and diffusion. One- and three-dimensional energy spectrums. Hot-film anemometry.

# Course Descriptions

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## AE 696

Graduate Internship in Aerospace Engineering  
1-3 Credits

Temporary professional or industrial work appointments 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 common to the workplace. They are academic/professional activities coordinated by the University between offering organizations and the graduate student.

*Prerequisite:* Graduate standing.

## AE 699

Special Topics in Aerospace Engineering  
1-3 Credits

Guided independent study of selected topics not offered in regularly scheduled classes. Arrangements and work requirements established by prior agreement of instructor and students. Students should expect to spend at least 60 hours of research for each credit hour.

*Prerequisite:* Graduate standing.

## AE 700

M.S.A.E. Thesis  
9 Credits

A master-level research project in Aerospace Engineering conducted under the supervision of the student's advisor and thesis committee. Submission of a final report, approved by the thesis committee, and an oral defense of the research work are required for thesis credits to be earned.

### AED - Aviation Education

The University recognizes that certified elementary and secondary school educators interested in incorporating aviation/aerospace concepts into their existing curricula may not have the necessary background or resources to fulfill this desire. Courses developed and offered as summer workshops address these deficiencies during a time that is compatible with educators' schedules. The course length of two weeks fulfills the requirements of the Florida Department of Education for earning three graduate course credits, or 60 in-service points. These courses may not fulfill other states' Department of Education requirements.

## AED 501

Aviation/Aerospace Foundations for the Elementary Curriculum

3 Credits

A foundations course that provides elementary teachers who have little background in integrating aerospace and aeronautical concepts into the classroom curriculum with an opportunity to enhance their knowledge in these areas. This course includes such subjects as engineering, space sciences, historical aviation/aerospace applications, meteorology, astronomy, environmental sciences, aviation literature, and human physiology. This course also provides a survey of methods and demonstrations to adapt materials to the educators' respective grade level. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

## AED 502

Aviation/Aerospace/Earth Science Foundations for the Secondary Curriculum

3 Credits

A foundations course that provides a comprehensive examination of aviation/aerospace teaching concepts using state-of-the-art simulator applications, emphasizing the classroom organizational skills needed in today's high-technology environment. Topics from engineering, space sciences, historical aviation/aerospace applications, meteorology, geography, environmental sciences, geology, and human physiology are examined in detail. Each student has the opportunity to become familiar with a specific area of aviation by developing a sample curriculum that is presented to the rest of the class at the end of the course. Each student uses simulators, videos, computers, and other resources to supplement his/her academic instruction. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

## AED 503

Natural Sciences with Aviation Applications

3 Credits

An applications course providing educators who have a background in science with the opportunity to experience real-world applications using aviation and aerospace concepts. This applications course also provides strategies and techniques to facilitate the use of aviation/aerospace applications in natural science instruction in the classroom.

*Prerequisite:* Basic algebra and trigonometry. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

## AED 504

### Introduction to Space Flight

3 Credits

A study of the concepts, development, and application of space flight technology, emphasizing the U.S. role in current and future space operations. Topics covered include history of space flight, space shuttle operations and crew training, commercial space applications, spacecraft systems, and the outlook for the future. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

## AED 601

### Advanced Pedagogical Applications of Aviation/ Aerospace Concepts

3 Credits

An advanced course that provides educators with background in mathematical, meteorological, engineering, psychological, and physiological principles as applied to the aviation and aerospace fields. The course also provides educators with techniques and strategies used to implement aviation and aerospace concepts into the classroom.

*Prerequisites:* AED 501 and/or AED 502, or Flight Training. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

## BA - Business Administration in Aviation

### BA 503

Business Foundations (503A, 503B, 503C, 503D,  
503E, 503F)

1 Credit Each

This course examines in depth the major competencies that have been identified as essential prerequisite knowledge for a graduate student enrolled in the MBA/A degree program to successfully complete the coursework. The course is broken down into six stand-alone modules in the discipline areas of management, quantitative methods, marketing, accounting, economics, and finance. Each student will take only those modules identified through advisement as being required. Emphasis is placed on understanding the core knowledge and skills in each of the disciplines. Credit for this course is not applicable to the requirements of any Embry-Riddle degree.

### BA 511

### Operations Research

3 Credits

An advanced study in the use of mathematical and scientific tools and techniques in managerial decision making. Operations research seeks to determine how best to design and operate a system, usually under conditions requiring the allocation of scarce resources. Emphasis will be on the applications of these methods in aviation and aviation-related industries. Topics include linear programming, probabilistic dynamic programming, game theory, forecasting, queuing theory, transportation, decision making under uncertainty, network models, and Markov Chains.

*Prerequisites:* Satisfactory completion of Business Foundation courses, and/or permission of the graduate program chair.

### BA 514

### Strategic Marketing Management in Aviation

3 Credits

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 in the aviation industry.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

### BA 517

### Accounting for Decision Making

3 Credits

A study of management's use of accounting information to make decisions related to planning, controlling, and evaluating the organization's operations. Using electronic spreadsheets, the budgeting function and use of performance reports is demonstrated. The behavior and management of costs, as well as techniques used to evaluate and control results of operations, are discussed. Topics include cost-volume-profit analysis, activity-based costing in production and service companies, decentralized operations, and differential analysis techniques.

# Course Descriptions

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Through the use of case studies, current readings, and course projects, emphasis is placed on aviation and aviation-related industries.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 518

### Managerial Finance

3 Credits

A study of 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 the aviation and aviation-related industries. Topics include capital budgeting, risk and diversification, asset liability management, airport financing, aircraft financing, financial derivatives, financial engineering, swaps, options, financial future, and international finance.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 520

### Organizational Behavior, Theory, and Applications in Aviation

3 Credits

This course focuses on current organizational issues that 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 that must be resolved for successful leadership. Topics will provide insights into behavior, structure, authority, motivation, leadership, organizational development, and social responsibility.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 521

### Global Information and Technology Management

3 Credits

The course will develop knowledgeable and effective users of information technology in aviation and aerospace management occupations. A combination of technical and managerial material is presented. This material is necessary to achieve an understanding of the operations and strategic uses of manage-

ment information systems in the aviation industry. Emphasis is placed on the use of computers as an information processor, a decision tool, and a means of linking management more closely to the organization. In addition, topics relating to the management of information resources are presented.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 522

### Business Research Methods

3 Credits

An introduction to the art and science of solving aviation business research problems and making students 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. The application of statistics, sampling surveys, decision analysis, management science techniques, and the use of statistical/operations research computer software are studied. An introduction of a style manual for the preparation of a research proposal. Weekly lab session required.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 523

### Advanced Aviation Economics

3 Credits

A study of economic applications to the aviation and aerospace industry. Students will examine the evolution of market forces in the industry with particular emphasis on airlines, airports, and manufacturing. Concepts of yield management, air passenger demand forecasting, price and cost study, airport economics, air and land space optimization strategies, government's role in aviation, international implications of competition and government regulation, economic analysis of safety, and other relevant industry issues are examined. Emphasis is placed on an increasingly international air transportation environment.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

# Course Descriptions

## BA 590

### Graduate Seminar

1-3 Credits

A study of the most current advancements in a particular field of study as determined by the instructor. The course will have a different topic each term depending on the varied interests of the students, the graduate faculty, or the research requirements of the Aviation Business Administration department.

*Prerequisites:* As announced by the instructor conducting the seminar.

## BA 603

### Aerospace Production and Operations Management

3 Credits

An advanced study of production and operations management as it relates to the planning, coordinating, and executing of all activities that create goods and services in a global aeronautic/aerospace environment. Special quantitative and qualitative emphasis is placed on the blending of the concepts of industrial engineering, cost accounting, reliability and availability, and general management in the context of core production and control decision activities, such as capacity planning, product design, layout of facilities, selecting of locations for facilities, quality assurance, fleet planning, scheduling, inventory management, and project management. Special emphasis is placed on the examination of recent trends in global competition, increased reliance of quality for competitive technology transfer into production systems, and the increased value added by worker involvement in problem solving and decision making.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 604

### International Management and Aviation Policy

3 Credits

An advanced study of 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 organiza-

tion 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.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 607

### Human Resource Development

3 Credits

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:* Successful completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 609

### Airline Operations and Management

3 Credits

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.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 610

### Airline Optimization and Simulation Systems

3 Credits

The airline industry provides an application-rich environment for the field of optimization and simulation systems. This course explores a variety of optimization models and simulation techniques commonly adopted by and integrated into airline decision making for the solution of multiple sched-

# Course Descriptions

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uling and planning problems. This course examines the technical aspects of modeling in network transportation systems, including issues involved in optimizing scheduling, fleet assignment, aircraft routing, crew pairing, gate assignment, and irregular operations. Discrete-event simulation models will be explored to determine their applications in the schedule-planning process. The course explores how airline companies handle their short, medium, and long-term schedule planning using these methodologies.

**Prerequisite:** Successful completion of BA 511.

## BA 625

### Airline Marketing

3 Credits

A study of the functions and basic concepts of marketing air transportation services. Discussion includes passenger and cargo markets, determinants of travel demand, growth factors, seasonality, and cargo traffic categories characteristics. Product and service elements, roles of advertising and travel agents, marketing unit structure, pricing and cost environment, and schedule planning are also among the topics examined.

**Prerequisites:** Demonstrated completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 630

### Aviation/Aerospace Systems Analysis

3 Credits

This course is a study of systems theory and its relationship to aviation/aerospace systems management. The course covers a brief history of systems theory and the system life cycle concept, and explains the major activities in each phase of a system's life cycle. Also examined are specific topics related to system design and support, including reliability, maintainability, availability, customer support, product improvement, and the role of data collection and analysis. Related topics covered are cost effectiveness analysis and sensitivity analysis. The course examines applications and case studies specific to aviation/aerospace, including military applications and computer simulation models.

## BA 632

### Seminar in Aviation Labor Relations

3 Credits

A study of union movement, labor legislation, representation elections, the collective bargaining process,

contract administration, and conflict resolution. The focus of the course will be on current issues in labor relations, and the evolution of private and public sector bargaining practices in the aviation industry. The impact on human resource management is analyzed.

**Prerequisites:** Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 635

### Business Policy and Decision Making

3 Credits

A capstone course in the MBA/A program that expands on the skills, knowledge, and abilities the students have achieved in their core courses. Students will examine applications of long-term planning and management tools in aviation-related industries and will be able to formulate the strategic vision and policies to achieve such a perspective. Concepts of strategic management, total quality management, continuous quality improvement, reengineering, customer-driven management, and other evolving management methodologies will be examined. Applications of the concepts will be applied to the domestic and international activities of airlines, airports, manufacturing, and government to sustain a long-term competitive advantage.

**Prerequisites:** Completion of all MBA/A core courses.

## BA 645

### Airport Operations and Management

3 Credits

A study of the management and operation of public-use airports. Specifically, 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 will be covered.

**Prerequisites:** Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

# Course Descriptions

## BA 650

### Airline/Airport Relations

3 Credits

A comprehensive examination and analysis of the symbiotic and often volatile relationship between airline management and airport management is provided. This course focuses on the varying perspectives toward issues that airline and airport management must address in order to effectively operate. The student will develop an understanding of current global issues impacting the relationship between airlines and airports. Airline scheduling, fleet management, finance agreements, contracts and negotiation, service agreements, marketing issues, passenger and baggage handling, ground transportation, labor relations, public/media relations, and strategic management are studied.

*Prerequisite:* Successful completion of either BA 645 *Airport Operations and Management* or BA 609 *Airline Operations and Management*.

## BA 651

### Strategic Airport Planning

3 Credits

An advanced study of airport operations and management designed from a strategic management perspective. In the course, a number of management tools emphasizing computer software applications used in strategic airport planning will be introduced.

*Prerequisite:* Successful completion of either BA 645 *Airport Operations and Management*, BA 609 *Airline Operations and Management*, or BA 650 *Airline/Airport Relations*.

## BA 655

### Aviation Law and Insurance

3 Credits

Examination of the governmental regulatory functions affecting statutory and administrative law pertaining to aviation. The national and international impact of these laws on aviation policies and operations are studied. The legal aspects of business contracts, negotiable instruments, and commercial code as they relate to aviation are analyzed. The course concludes with an overview of the principles of insurance and risk applied to aviation.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.

## BA 690

### Graduate Research Project

3 Credits

A written document on an aviation/aerospace topic that exposes the student to the technical aspects of writing. This course is included in the MBA/A curriculum to provide the student with the opportunity to pursue a project of special interest, but not to the level of a thesis. This is an elective course for those students who may wish the opportunity to research in-depth a topic in consultation with a project advisor. The Graduate Research Project is not offered at the Daytona Beach campus.

*Prerequisite:* BA 522 or MSA 605.

## BA 696

### Graduate Internship in Aviation Business Administration

1-3 Credits

Temporary professional or industrial work appointments 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 common to the workplace. They are academic/professional activities coordinated by the University between offering organizations and the graduate student. Prior approval of the graduate program coordinator is required.

## BA 699

### Special Topics in Business Administration

1-3 Credits

The election 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.

*Prerequisites:* Satisfactory completion of Business Foundation courses and/or permission of the graduate program chair.



# Course Descriptions

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## BA 700

### Thesis Research

6 Credits

A written document on an aviation/aerospace 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.

*Prerequisite:* ABA 522 or MSA 605.

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## EMBA - Business Administration

### EMBA 540

#### Organizational Communication and Information Systems

3 Credits

The information age is vastly different from the industrial age, and information is rapidly being accepted as a key economic resource alongside traditional factors of industrial production. Course participants undertake an advanced study of information management trends and technologies and their strategic uses in aviation and aerospace industry settings. The case method is used to investigate rapidly emerging topics such as cyberspace and the Internet, as well as more traditional subjects such as the use of state-of-the-art hardware and software suites to find and sustain a competitive edge. Complete information systems, and the structures, dynamics, and linkages of global, information-based organizations, are afforded special attention.

### EMBA 542

#### Accounting for Decision Making

3 Credits

This course examines the role of accounting in the information flow of the organization and emphasizes the needs and requirements of aviation and aerospace executives in their efforts to measure and control performance. The focus is on understanding how information is generated, assessed for reliability, and used for performance assessment and resource allocation in an aviation/aerospace context. Participants cover the basic concepts, standards, and practices of financial reporting from the point of view of an executive user. The impact of managerial decisions on financial statements, as well as the impact of accounting policy on corporate strategy, are addressed. Topics include analysis of basic

financial statements, valuation problems, cost analysis, activity-based costing, the use of budgets, and the design of management control systems. Specific aviation applications are emphasized throughout the course.

### EMBA 544 and 545

#### Quantitative Analysis for Management Decision Making I & II

4 Credits

This course develops the theory and methods of business decision making, including intelligence, design, and choice, with special emphasis on aviation and aerospace applications. Participants will master the conceptual application of statistical methods and reasoning in the context of an aviation business environment. This course is designed to improve the industry managers' decision-making skills as they encounter uncertainty and competing decisions. Topics include statistical sampling and estimation, regression analysis and forecasting, decision theory, game theory, linear programming, and queuing theory.

### EMBA 546

#### Production/Operations Management

3 Credits

Aviation industry trends point to the re-emerging importance of finding ways to add value in the technologies and techniques that transform basic resources into marketable products and services. This course is an advanced study of production and operations management as it relates to the planning, coordination, and execution of all activities that create goods and services in the global aviation/aerospace industry. A strategic perspective of operations is maintained throughout. Case analysis and group participation are used to investigate topics such as manufacturing, capacity planning, facility layout, location planning, services scheduling, inventory management, aircraft maintenance, and the quality imperative.

### EMBA 548

#### Global Economic Analysis for Executives

3 Credits

This course defines the importance of the global external economic constraints in which business decisions are made. Participants will develop an awareness of the broad implications of market mechanisms as the guiding force in the world economy. Participants will use quantitative tools and techniques to solve a variety of global eco-

# Course Descriptions

conomic problems faced by today's managers. The unique economic challenges facing aviation and aerospace executives will be emphasized. Topics to be examined include profit maximization and cost minimization, input and output pricing, price determination under different market structures, national economic measures, monetary and fiscal policy, interest rates, international economics, stabilization policies, and labor economics.

## EMBA 550

### Global Marketing Management

3 Credits

As global competition becomes the norm in the aviation and aerospace industry, it is increasingly important for firms to focus on building and maintaining successful customer relationships. This course examines how firms respond to internal and external forces that impact global marketplace behavior, meet increasing customer expectations, and manage competitive pressures. Strategic models and frameworks are examined for their usefulness in aiding the aviation or aerospace executive to meet the demands of the global customer. Topics to be covered include environmental scanning, market research, consumer and organizational markets, segmentation and database marketing using the computer reservation system, marketing communications, building a global image, and product positioning and pricing.

## EMBA 552 and 553

### Managerial Finance I & II

4 Credits

This course explores the principal challenges faced by corporate finance managers in their quest to maximize shareholder value. Participants develop an analytical framework using the fundamental building blocks of financial theory, including the concepts of risk, return, and the time value of money. Course content focuses on investment and financing decision making in areas such as capital budgeting, capital structure, dividend policy, and working capital management. Additional topics include the costs and benefits of using financial instruments to manage risk, the impact of financial markets, financial institutions, and government policy on strategic decisions such as corporate restructuring, mergers and acquisitions, and joint ventures in the international marketplace. Specific industry-related topics, such as aircraft and airport financing, are also covered.

## EMBA 554

### Leadership and Entrepreneurship

3 Credits

Leadership and entrepreneurship require creating organizational direction, setting strategy, and developing new ventures. In the increasingly competitive global economy, aviation and aerospace managers must develop the necessary skills to lead organizational development and change and to motivate their employees to innovate. This course explores the interpersonal competencies necessary for effective leadership in situations requiring motivation of both individuals and teams. In addition, the course examines how these competencies enhance a positive environment for organizational change and entrepreneurship. Through case analysis and application, concepts such as managerial leadership, individual and team motivation, venture capital, global partnerships, innovation venture, formation of wealth among venture founders and investors, and the entrepreneurial act will be applied to aviation and aerospace industry problems.

## EMBA 660

### Applications of Organizational Behavior

3 Credits

The successful manager has subordinates who willingly put forth their best effort to accomplish organizational goals. Achieving this managerial success requires knowledge of individual and group behavior. Global competition in the aviation/aerospace industry demands that firms balance the demands of higher productivity and lower costs. This course is designed to provide executives with a thorough understanding of the application of organizational theories and concepts to issues facing the aviation and aerospace industry such as motivating and managing part-time, temporary, and contract employees. Selected readings, individual and group exercises, and case analysis will be used to investigate topics such as individual motivation, decision-making, group dynamics, and communication. A special section on human resource management will deal with issues of personnel selection and placement, team design, performance appraisal, and labor relations.

## EMBA 662

### Personal Communication and Teamwork

3 Credits

As aviation and aerospace organizations continue to evolve, executives who wish to lead the orga-

# Course Descriptions

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nization must understand and appreciate the role of effective personal communication. Teamwork is becoming increasingly important for global organizations as hierarchical management structures are replaced by cross-functional teams composed of multicultural employees selected from varying organizational departments. This course examines the role of communication in managing teams and its impact on team dynamics. How a manager/coach/team leader communicates with team members and the effect of that leader's communication on group participation and performance is investigated. Topics include interpersonal communication skills in a global organization, communication skills in a group setting, team building, group dynamics, and role incongruity.

## EMBA 664

### Global Market Forces and Ethical Responsibility

3 Credits

Aviation and aerospace executives face a new set of global market challenges at an ever-increasing pace. Managers must address many legal, ethical, technological, and competitive issues. These global forces must be dealt with, while at the same time recognizing the increased burden placed on organizations to conduct their activities in a legal and responsible manner. This course leads the participant in an examination of societal, government, and legal forces and their impact on the formulation of global strategy. Participants will analyze how to recognize and respond to these forces. Topics include governments and the law, demographic trends, telecommunications and the growth of satellite communications, the growth of the Internet as a global marketplace, and societal and ethical responsibility.

## EMBA 668

### Culture and the Diverse Workplace

3 Credits

Today's workforce is more diverse than in the past. In the increasingly global aviation/aerospace industry, this workforce spans continents and cultures. Managing this new workforce creates new problems and new opportunities for organizations and the people who run them. This course examines the issues of national and organizational culture in the context of the modern workplace. Executives will investigate cultural differences that affect perception, motivation, performance, and team effectiveness in the global workplace. They will also develop an in-depth portrait of the organizational culture of selected firms. These portraits will be used to

illustrate the role of organizational culture, as well as to demonstrate ways to maintain, strengthen, and change culture. Other topics include communicating in a diverse environment, the global transfer of organizational culture and practices, and conflict management and negotiation strategies.

## EMBA 670

### Technology and Innovation Management

3 Credits

Technology is a ubiquitous global force that must be understood to be managed well. This course examines strategic and tactical problems found in aviation/aerospace industry scenarios where innovation in products and processes is critical, and where the technical performance of products and services is a main criteria of success in time-constrained projects. The strategic view emphasizes evolutionary models of technological evolution and revolution, and addresses issues such as paradoxical management, technology transfer, intellectual property protection, and the productivity dilemma. The tactical view emphasizes contemporary tools and techniques for managing projects and addresses issues such as project selection, concept-to-commercialization product development, organizational forms and processes, monitoring and auditing, and project termination.

## EMBA 672

### Designing the High Performance Organization

3 Credits

This course is an advanced study of the theory and principles behind organizational design. An examination of real-world organizational structures will be used to illustrate the role of structure in effective internal and external communications, information gathering, service delivery, and financial and managerial control. Executives will investigate the impact of reengineering and organizational change on employee and firm performance. There will be an in-depth study of transformations in the constraints and opportunities facing firms in the aviation/aerospace industry that necessitate change, and the signs of dysfunctional structures. Other topics include designing the global corporation, designing for innovation, and designing for a networked organization. There will be a special focus on the role of strategic alliances, including partner selection, desired outcomes, and alliance stability.

# Course Descriptions

## EMBA 674 and 675

### Strategic Management I & II

4 Credits

This is an integrative course that promotes the development of a cross-functional management perspective. Participants focus on the analysis of the firm's external and internal environments to identify and create competitive advantage in a global context. Aviation and aerospace business case studies will be used to explore the issues of defining corporate objectives, evaluating opportunities and threats, and formulating strategies and tactics. The course content emphasizes the cultural, ethical, political, and regulatory facets of the global business environment, and highlights the need for leadership and organizational evolution in the successful management of strategic change. Topics include total quality management, continuous quality improvement, reengineering, and other evolving management methodologies.

## EMBA 700

### Executive Project

3 Credits

As the program's capstone activity, the executive project is designed to benefit both the participant and the sponsoring organization by giving the participant the opportunity to apply the knowledge and diagnostic competencies learned throughout the program to a specific business issue of the sponsor. Issues are selected by the sponsor and participant and approved by a faculty project advisor in module #3. Working from the perspective of a consultant, the participant thoroughly investigates the issue and proposes specific actions, using the analysis, planning, and management tools developed during each course. Continuous guidance and feedback are provided by the faculty project advisor and sponsor during the project. The completed project will require a comprehensive written report as well as a formal oral presentation.

## *EP - Engineering Physics*

### EP 501

#### Numerical Methods for Engineers and Scientists

3 Credits

Numerical methods for the solution of engineering physics problems; systems of linear equations, ordinary differential equations including one-dimensional initial value problems and boundary value problems; partial differential equations (PDEs)

including elliptic, parabolic, and hyperbolic PDEs; finite difference method. Application to problems such as diffusion, transport, remote sensing, inversion, and plasma waves. Emphasis will be on computer implementation of numerical solutions.

### EP 505

#### Advanced Spacecraft Dynamics and Control

3 Credits

Review of dynamic systems modeling, analysis, and control; orbital dynamics, orbital maneuvers, and control. Attitude sensors and sensing techniques are especially emphasized. Techniques for limb sensing, lunar and solar sensing, and ultra high accuracy stellar imaging techniques are explored. Passive attitude control techniques including spin, dual-spin, gravity-gradient, and magnetic stabilization. Active control using cold and hot gas jet thrusters, momentum wheels, reaction wheels, and control moment gyros. Robust optimal attitude control maneuvers of a complex spacecraft required for scientific instruments and the requirements of the measurements that they are performing, such as velocity vector alignment, limb scanning, and image stabilization, are emphasized.

### EP 509

#### Advanced Space Physics

3 Credits

Plasma physics applied to the interplanetary medium and planetary magnetospheres: Solar wind. Magnetohydrodynamics. Interaction between planetary magnetospheres and the solar wind. Auroral dynamics. Planetary atmospheres and ionospheres. Magnetosphere-ionosphere coupling. Energetic particle dynamics. Ring currents. The space radiation environment. Space weather. Satellite missions to Earth and other planets.

### EP 600

#### Experimental Methods in Space Science

3 Credits

Measurement techniques for ground-based, rocket, and satellite-borne experiments are explored. Advantages, disadvantages, and limitations are quantitatively developed. In situ atmospheric composition measurements, charged particle detection for plasma characterization, optical remote sensing, and imaging techniques are included.

# Course Descriptions

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## EP 605

Spacecraft Power and Thermal Design  
3 Credits

Spacecraft power and thermal energy management. Spacecraft power systems; sources of power; power subsystem function and design; energy storage devices; future concepts in spacecraft power systems. Review of the modes of heat transfer: conduction, radiation, and convection. Space environment, heating fluxes. Spacecraft thermal analysis. Thermal control hardware and design; active and passive thermal control. Emphasis on the design needs of instruments and their detector systems' power and thermal requirements.

## EP 696

Graduate Internship in Engineering Physics  
1-3 Credits

Temporary professional or industrial work appointments are 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 common to the workplace. They are academic /professional activities coordinated by the University between offering organizations and the graduate student. Prior approval of the graduate program coordinator is required.

## EP 699

Special Topics in Engineering Physics  
1-3 Credits

Guided independent study of selected topics not offered in regularly scheduled classes. Arrangements and work requirements established by prior agreement of the instructor and students, subject to approval of the program committee and department chairman.

## EP 700

Master of Science in Space Science Thesis  
1-9 Credits

A master-level research project in Space Science/Engineering Physics including an oral thesis defense and a written report satisfying all graduate school guidelines. The work is supervised by the student's advisor and thesis committee. The approval of the thesis committee is required to receive final thesis credit.

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## HFS - Human Factors and Systems

### HFS 500

Systems Concepts, Theory, and Tools  
3 Credits

The ability to think at a systems level will be developed. Formal systems principles; systems requirements analysis; knowledge acquisition techniques; information modeling; information management; decision support; systems evaluation.

### HFS 505

Systems Engineering I  
3 Credits

Practical application of design, build, and test processes applied to systems that incorporate hardware, software, and human components. Focus is on the integration of system components throughout the product life cycle. Lab is a required part of this course.

*Prerequisite:* HFS 500 Systems Concepts, Theory, and Tools.

### HFS 510

Research Design and Analysis I  
3 Credits

Foundation and procedures of research techniques, tools, and methods. Course reviews the principle concepts of research design and evaluation. The application of experimental, case-study, survey, and nonexperimental techniques are explored. Identification, isolation, and treatment of dependent and independent variables is covered. Use of existing published research or data is used to highlight principles. Lab is a required part of this course.

*Prerequisite:* Completion of an undergraduate course in statistics. (This course is the same as MSA 665.)

### HFS 515

Ergonomics  
3 Credits

This class will address the basic concepts of ergonomics and their application to the design of human-machine systems and products. Consideration of human physiological, biomechanical, and biological capabilities and limitations in design for human efficiency, safety, and comfort; anthropometry. Ergonomic issues related to the

# Course Descriptions

design of control and display systems, instrument panels, workplaces, seating, and tools will be addressed.

**Prerequisites:** HFS 500 *Systems Concepts, Theory, and Tools*, and completion of an undergraduate course in human factors.

## HFS 520

### Team Resource Management

3 Credits

This course addresses the social-psychology underpinnings of what is commonly referred to as team resource management and cockpit resource management (CRM). The class will review and discuss the basic theoretical concepts from social psychology and relate them to the effective operation of aviation teams. It will identify and discuss the basic issues associated with the effective evaluation of CRM-type programs.

## HFS 525

### Human and Organizational Factors in Technological Systems

3 Credits

Theoretical paradigms in human computer interaction and their application to interface design; advanced interface technologies such as multimodal input/output, hypertext, and knowledge-based systems.

## HFS 530

### Systems Psychology

3 Credits

This course will be designed to provide the student with a very level view of human factors and ergonomics and how they fit into the overall system design and evaluation process. This class will address the human's role and effectiveness as a system constituent. It will take a very high level, systemic, and theoretical approach, rather than a detailed empirical one. It will provide an overview of the system science and the time-phased, iterative systems approach. It will also review the assumptions and limitations of the analytic tools used to incorporate people into complex systems including systems test and evaluation tools.

## HFS 590

### Graduate Seminar

3 Credits

A study of current topics and advancements in human factors, aviation psychology, and related

areas as determined by the instructor of the course. The course will have a different topic each time it is offered depending on the varied interests of the faculty, students, or availability of visiting professors.

**Prerequisite:** As announced by the instructor conducting the seminar.

## HFS 600

### Human Factors in Systems

3 Credits

Survey of human factors literature. Introduction to topics including human capabilities and human interfaces with human-machine systems, workload, anthropometrics, perception, workspace design, visual momentum. The course will study human limitations in the light of human engineering, human reliability, stress, and human physiology. The course will discuss human behavior as it relates to the aviator's adaptation to the flight, air traffic, and maintenance environments.

## HFS 605

### Systems Engineering II

3 Credits

Studies on the value of prototyping in the application of design, build and test processes. In-depth focus on the innovation, of conceptual designs in short time-cycle engineering. Lab is a required part of this course.

**Prerequisites:** HFS 500, *Systems Concepts, Theory, and Tools* and HFS 505 *Systems Engineering I*.

## HFS 610

### Research Design and Analysis II

3 Credits

This course is the advanced program in experimental design and analysis. The focus in this course is the design, planning, and considerations involved in complex, multivariate experiments. Major areas of examination will include factorial designs, nested variables, linear models, multiple regression, measures of covariance, and latin square designs. Considerations in selecting the appropriate experimental design is the focus of this course. Examination of appropriate statistical techniques is integrated with the theoretical and practical concepts of experimental design. Lab is a required part of this course.

**Prerequisite:** HFS 510 *Research Design and Analysis I*.

# Course Descriptions

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## HFS 611

### Work Physiology

3 Credits

This course will focus on the human as a biomechanical entity and evaluate the physiological loads and stresses of which we are capable. Topics include anthropometric applications, muscle and strength exertions, metabolism and work, the redesign of deteriorated and artificial body parts, and circadian rhythms in work design. The student will gain knowledge of the architecture, functioning, and biomechanics of bones, joints, muscles, tendons, and ligaments and the forces and torques that move the body at work or sports. The course will examine energy extraction from food and drink, and how human ability depends on the cooperation of the respiratory, circulatory, and metabolic systems. The effects of environmental conditions (lighting, noise, heat, cold, humidity, air movement) and shift work (day, evening, and night work; shift schedules) on task performance will be discussed in practical terms.

*Prerequisite:* HFS 600.

## HFS 615

### Sensation and Perception

3 Credits

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. Attention will be paid to all the human sensors, with particular focus on perceptual issues related to system design, evaluation, and certification. While all the senses will be covered, special attention will be paid to the visual and auditory senses. Lab is a required part of this course.

*Prerequisite:* Completion of an undergraduate course in the area of sensation and perception. (This course is the same as MSA 660.)

## HFS 620

### Memory and Cognition

3 Credits

This course will examine the tremendous gains in memory and cognition research to obtain an understanding of how these theoretical and empirical advances have been, or might be, applied to problems of human-machine interactions and system design. Topics include the total range of memory and cognitive processes and their potential application to systems design: sensation perception, pattern

recognition, attention, language, memory, concept formation, thinking, decision making, problem solving, time-sharing, reaction time, action, manual control, and the impact of automation. Lab is a required part of this course.

*Prerequisite:* Completion of an undergraduate course in the area of memory and cognition. (This course is the same as MSA 663.)

## HFS 625

### Applied Testing and Selection

3 Credits

Issues in selecting and testing applicants for a broad range of positions in aviation and related industries are the focus of this course. An examination of the methodologies used since World War I through the present is covered. The change in methodologies used and the level of sophistication of assessment techniques involved is examined across pilot, air traffic controller, maintenance, and aviation security screener personnel. A significant portion of this course is devoted to an understanding of the performance assessment techniques used to evaluate selection systems as well as the personnel selection instruments used. Problems in both criterion and assessment measurement are discussed in detail.

*Prerequisites:* HFS 510 *Research Design and Analysis I* and HFS 610 *Research Design and Analysis II*.

## HFS 630

### Cognitive Systems

3 Credits

The course addresses applied cognitive science, which draws on the knowledge and techniques of cognitive psychology and related disciplines to provide the basis for principle-driven design. Specifically it addresses human cognitive behavior in complex worlds that exist without the artificial boundaries of the laboratory. It specifically addresses those domains where there are multiple agents (that is, cognitive systems) and that are problem-driven and tool-constrained. The course also addresses the impact of mismatches between the models of the designers, their software, and the users.

*Prerequisites:* HFS 600 *Human Factors in Systems* and HFS 620 *Memory and Cognition*.

# Course Descriptions

## HFS 635

### Human-Computer Interaction

3 Credits

This course stresses the importance of good interfaces and the relationship of user interface design to human-computer interaction. Other topics include: interface quality and methods of evaluation interface design examples; dimensions of interface variability; dialogue genre; dialogue tools and techniques; user-centered design and task analysis; prototyping and the iterative design cycle; user interface implementation; prototyping tools and environments; I/O devices; basic computer graphics; color and sound. A lab is a required part of this course.

*Prerequisite:* Completion of an undergraduate course in human factors or human/computer interaction. (This course is the same as MSA 661.)

## HFS 640

### Aviation/Aerospace Psychology

3 Credits

This survey course covers the primary areas of work in the aviation psychology specialization. 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, and crew resource management. The topic areas change from semester to semester depending on the focus of the current research environment. This course has a strong emphasis on methodological issues, problematic research concerns, and statistical issues. The majority of coursework involves extensive readings in the specialization from conference proceedings, journal articles, and training manuals. A critical analysis of research is the focal point for this course.

*Prerequisite:* Completion of an undergraduate course in the area of aviation/aerospace psychology.

## HFS 645

### Underpinnings of Human Factors and Ergonomics

3 Credits

Survey of historic human factors literature, particularly those papers considered classics. The class will review the key personalities, papers, theories, and research programs that provide the basis of current theory and best practice. The key historic papers

addressing human capabilities, human-machine systems, workload, anthropometrics, perception, workspace design, and visual momentum will be read and critically discussed. The course pays particular attention to the key research addressing aviation psychology, cockpit design, cognitive engineering, and human physiology.

## HFS 650

### Human Factors of Aviation/Aerospace Applications

3 Credits

This class will address the basic concepts of the application of human factors principles and theories to the effective design and operation of various aviation/aerospace applications. It will address these areas from a historical perspective and in relation to the future operational concepts of the applications. Issues to be addressed could include function allocation between human and machine, human computer interface, work environment (for example, stress circadian rhythms), person-to-person communications, performance measurement, and research and development needed.

*Prerequisite:* Completion of an undergraduate course in human factors.

## HFS 660

### Human Factors and Aircraft Safety and Airworthiness I

3 Credits

Aircraft safety and airworthiness will be considered as a coherent process running from the design of the aircraft to the monitoring of its condition in airline service. This class covers the technical aspects of certification along with the legal and economic implications. This class will specifically address the certification of an airliner, the safety of complex systems, and on-board software. This class is offered only at the Ecole Nationale de l'Aviation Civile.

*Prerequisites:* HFS 500, HFS 590, HFS 600.

## HFS 665

### Human Factors and Aircraft Safety and Airworthiness II

3 Credits

Aircraft safety and airworthiness will be considered as a coherent process running from the design of the aircraft to the monitoring of its condition in airline service. This class covers the technical aspects of certification along with the legal and economic implications. This class will specifically address the



# Course Descriptions

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human factors of air transport safety and quality approval and concept. This class is offered only at the Ecole Nationale de l'Aviation Civile.

*Prerequisites:* HFS 500, HFS 590, HFS 600, HFS 660.

## HFS 670

Human Factors and Aircraft Safety and Airworthiness III

3 Credits

Aircraft safety and airworthiness will be considered as a coherent process running from the design of the aircraft to the monitoring of its condition in airline service. This class covers the technical aspects of certification along with the legal and economic implications. This class will specifically address operational procedures, maintenance procedures, and continuing airworthiness. This class is offered only at the Ecole Nationale de l'Aviation Civile.

*Prerequisites:* HFS 500, HFS 590, HFS 600, HFS 660, HFS 665.

## HFS 696

Graduate Internship in Human Factors and Systems

3 Credits

Supervised placement in an industrial, governmental, or consulting setting. The student completes a specific project under the supervision of an organizational sponsor and a faculty member.

*Prerequisite:* As announced by the instructor.

## HFS 699

Special Topics in Human Factors and Systems

3 Credits

Completion of an area of study under the direct supervision of a faculty member. The course requirements and area of study are negotiated between the faculty member and the student with the approval of the department chair.

## HFS 700

Thesis

1-6 Credits

The performance and a written description of a master-level research project. The topic of the thesis will be approved and supervised throughout its preparation by the student's major professor and thesis committee. This project will provide evidence of the student's ability to perform applied research at the graduate level.

*Prerequisites:* Completion of all core courses in the Human Factors Engineering track or the Systems Engineering track.

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## MA - Mathematics

### MA 502

Boundary Value Problems

3 Credits

Basic techniques 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.

*Prerequisite:* MA 441 or equivalent.

### MA 504

Theory of the Potential

3 Credits

Potential theory and Green's function. Method of characteristics and solution of Cauchy's initial value problem for first and second order equations. Numerical methods. Application to fluid mechanics, electromagnetic fields, heat conduction, and other areas. Computer applications.

*Prerequisite:* MA 502.

### MA 505

Statistics

3 Credits

Descriptive statistics and graphical depiction of data; confidence intervals and hypothesis testing for the mean, difference between two means, variance, ratio of two variances, proportion, and difference between two proportions; simple and multiple regression, including model development, inferences, residual analysis, outlier identification, and verification of assumptions; fundamental concepts of design of experiments; justification of linear models; construction and analysis of basic designs including one-way, block designs, and Latin squares; multiple comparisons.

*Corequisite:* MA 503 or MA 441.

# Course Descriptions

## MA 506

### Probability for Engineers

3 Credits

Foundations, combinations, conditional probability, expectations, and applications to discrete sample spaces. Random variable in one or more dimensions. Various continuum distributions. Characteristic functions. Applications to engineering problems. Computer applications.

*Prerequisite:* MA 441 or equivalent.

## MA 510

### Fundamentals of Optimization

3 Credits

Overview of several important general types of optimization problems; development of mathematical models; linear programming; the simplex method; introduction to sensitivity analysis, networks; applications involving Maple and Excel.

*Prerequisite:* MA 345 (*Differential Equations and Matrix Methods*).

## MA 520

### Mathematical Programming and Decision-Making

3 Credits

A continuation of MA 510. Development of mathematical modeling techniques with an emphasis on integer programming, nonlinear programming, and multiple-criteria decision-making techniques; case studies from aviation/aerospace involving mathematical programming and decision-making.

*Prerequisite:* MA 510.

## MA 605

### Statistical Quality Analysis

3 Credits

Fundamental concepts of statistical quality control, including Shewhart charts, cusum charts, EWMA charts, multivariate charts, tolerance limits, and capability analysis. Further development of concepts in statistical design of experiments including use of factorial designs, fractional factorial designs, and use of central composite designs. Several non-parametric statistical techniques, including sign test, signed-rank test, rank-sum test, Kruskal-Wallis test, runs test, and Kendall's Tau. Advanced regression topics, including the use of transformations, weighted least squares regression, and detection of

influential points. Throughout the course, industrial applications will be emphasized, including the use of several case studies.

*Prerequisite:* MA 505.

## MA 610

### Multivariate Optimization

3 Credits

Multiple objective optimization with an emphasis on response surface methodologies and goal programming; inclusion of group decision-making techniques in model development; case studies from aviation/aerospace emphasizing multivariate model development, and determination of optimal solutions.

*Prerequisites:* MA 520 and MA 605.

## MA 690

### Graduate Research Project

3 Credits

An applied problem on an aviation/aerospace topic that requires the use of optimization and/or quality improvement skills.

## MA 699

### Special Topics in Mathematics

1-3 Credits

Students may elect to perform a special, directed analysis and/or independent study in an aviation area of particular interest. A detailed proposal of the desired project must be developed and presented to the department chair or center director for faculty review and recommendation, three weeks prior to the end of registration for the term.

## MA 700

### Thesis

6 Credits

Written and defended documentation of a research project conducted under the supervision of a faculty committee. The research must be at the level of a published paper in an appropriate journal, as determined by the faculty committee.

# Course Descriptions

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## MAAF - USAF Safety Education

### MAAF 608

#### Aircraft Mishap Investigation

3 Credits

This course is an overview of aircraft mishap investigation and the management of a mishap investigation. The course will enable the student to understand and to apply aircraft mishap investigation techniques and procedures, including the collection, preservation, and analysis of mishap site data. The course will familiarize the student with aircraft structures, aircraft systems, records and performance, and their associated involvement in aircraft mishaps. The course will equip the student with knowledge of human factors, human performance, physiological, and psychological limitations that apply to mishap investigation. The course prepares the student with the skills needed to analyze evidence collected and to develop findings, causes, and recommendations required from an aircraft mishap. Use of a site laboratory will provide practical field experience. Equivalent to MSA 608.

### MAAF 611

#### Aviation/Aerospace Mishap Prevention Management

3 Credits

This course is an overview of aviation/aerospace safety management and the application of safety management principles and techniques to the management of aviation/aerospace operations. Topics include hazard identification, risk analysis and management, flight safety programs, cabin safety, ground and maintenance safety, safety cultures in organizations, and emergency response programs. The course emphasizes accident prevention through systems engineering and safety management in all phases of a system's life-cycle. Equivalent to MSA 611.

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## MSA - Aeronautical Science

### MSA 508

#### Advanced Airport Modeling

3 Credits

A study of advanced airport and airspace planning to support day-to-day operations, resource allocation, and strategic analysis. Emphasis is put on the

use of computer software to create working airport and airspace models to solve common airport and airspace operational problems. Airport and airspace background material and procedures will be covered in supplemental lectures. The Total Airport and Airspace Modeler (TAAM) software will be used as the primary planning and analysis tool. TAAM is the most advanced and comprehensive interactive software available for this type of analysis. Students are taught how to use the TAAM software on a UNIX-based SUN workstation. To accomplish this task, students will be divided into research teams for purposes of developing a simulation and conducting the group object portion of the course. Each team will be assigned a project of completing a realistic working simulation model of an actual airport, which they will then use to solve an operational problem.

*Prerequisites: Demonstrated knowledge of flight rules and regulations and basic knowledge of the aviation industry, airports, and commercial aircraft used in the national air transportation system.*

### MSA 514

#### Computer-Based Instruction

3 Credits

This course addresses the design, development, and evaluation of instructional software as it applies to the aviation/aerospace industry. The course offers 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.

*Prerequisite: Demonstrated knowledge of basic computer operations.*

### MSA 515

#### Aviation/Aerospace Simulation Systems

3 Credits

A comprehensive examination of simulation in modern aviation/aerospace that includes history, state-of-the-art, and current research and development. Discussion focuses on the extent and impact of simulator applications throughout the industry and the effects on training costs and safety. Topics include the flight crew being checked out, updated, evaluated, or retrained in aircraft and systems simulators to the simulation models used in management, flight operations, scheduling, or air traffic control.

# Course Descriptions

## MSA 516

### Applications in Crew Resource Management

3 Credits

This course examines the common concepts of crew resource management (CRM) as developed by major air carriers and explores the theoretical basis of such training. Topics such as supervision of crewmembers, counseling, manner and style, accountability, and role management are 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. Additionally, each student uses simulators and computer-based instruction to supplement their academic instruction.

## MSA 550

### Aviation Education Foundations

3 Credits

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.

## MSA 590

### Graduate Seminar

1-3 Credits

A study of the most current advancements in a particular field of study as determined by the instructor of the course. The course has a different topic each term depending on the varied interests of the students, the graduate faculty, or the research requirements of the Aeronautical Science department.

*Prerequisites:* As announced by the instructor conducting the seminar.

## MSA 601

### Applications in Space: Commerce, Defense, and Exploration

3 Credits

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 the 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.

*Prerequisite:* Demonstrated knowledge of spacecraft or satellite technology.

## MSA 602

### The Air Transportation System

3 Credits

A study of air transportation as part of a global, multimodal transportation system. The course reviews the evolution of the technological, social, environmental, and political aspects of this system since its inception at the beginning of the 20th century. The long-term and short-term effects of deregulation, energy shortages, governmental restraints, and national and international issues are examined. Passenger and cargo transportation as well as military and private aircraft modes are studied in relation to the ever-changing transportation requirements.

*Prerequisites:* Demonstrated knowledge of aviation rules and regulations and economics.

## MSA 603

### Aircraft and Spacecraft Development

3 Credits

This course is an overview of aircraft and spacecraft development. Included are vehicle mission, the requirements directed by economics, military and defense considerations, and research and developmental processes needed to meet vehicle requirements. Aviation and aerospace manufacturing organizations and techniques are addressed, including planning, scheduling, production, procurement, supply, and distribution systems. The course studies the aviation and aerospace maintenance systems from the built-in test equipment to the latest product support activities.

*Prerequisites:* Demonstrated knowledge of college-level mathematics and economics.

## MSA 604

### Human Factors in the Aviation/Aerospace Industry

3 Credits

This course presents an overview of the importance of the human role in all aspects of the aviation and aerospace industries. It emphasizes the 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. The course will study

# Course Descriptions

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human limitations in the light of human engineering, human reliability, stress, medical standards, drug abuse, and human physiology. The course will discuss 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.

*Prerequisite:* Demonstrated knowledge of behavioral science.

## MSA 605

Research Methods and Statistics

3 Credits

A study of current aviation research methods that includes techniques of problem identification, hypothesis formulation, design and use of data-gathering instruments, and data analysis. Research reports that appear in professional publications are examined through the use of statistical terminology and computations. A formal research proposal will be developed and presented by each student as a basic course requirement.

*Prerequisites:* Demonstrated knowledge of college-level mathematics, including introductory statistics, and basic computer operations.

## MSA 606

Aviation/Aerospace Communications/Control Systems

3 Credits

A detailed analysis of current and future developments and trends in the control of air traffic, including the evolution of current national policies and plans and their objectives. The most recent planned improvements for each major component of the ATC system are examined individually and as part of the system as a whole.

*Prerequisites:* Demonstrated knowledge of flight rules and regulations and basic navigation.

## MSA 607

Advanced Aircraft/Spacecraft Systems

3 Credits

State-of-the-art aircraft/spacecraft systems and projections of research trends for future air vehicle requirements and applications are studied. Topics include the development, capabilities, and limitations of current aircraft/spacecraft propulsion, electrical, environmental, control, hydraulic systems, and subsystems. The total aircraft design, and the

interdependence of aircraft system design constraints are emphasized, as well as current problems and solutions.

*Prerequisites:* Demonstrated knowledge of college-level mathematics, aircraft systems, and components.

## MSA 608

Aviation/Aerospace Accident Investigation and Safety Systems

3 Credits

A critical analysis of selected aircraft accidents and an evaluation of causal factors. Particular emphasis is placed on the study of human factors connected with flight and support crew activities in aviation operations. Identification and implementation of accident prevention measures are stressed as integral parts of the development of a complete safety program.

## MSA 609

Aircraft Maintenance Management

3 Credits

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 used. A major course objective is to heighten awareness of the critical interface of maintenance with flight, supply, and training activities.

*Prerequisite:* Demonstrated knowledge of management principles.

## MSA 611

Aviation/Aerospace System Safety

3 Credits

This course emphasizes the specialized integration of safety skills and resources into all phases of a system's 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.

# Course Descriptions

## MSA 612

Aviation/Aerospace Industrial Safety Management  
3 Credits

This course examines the modern work setting from an aviation and aerospace safety and health point of view. Examination 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.

## MSA 613

Airport Operations Safety  
3 Credits

A study of airport operations safety as applied to day-to-day operations. A review and analysis of all federal regulations applicable to operations and safety are conducted.

*Prerequisites:* Demonstrated knowledge of performance of airports and airline operations management or related field.

## MSA 614

Advanced Aviation/Aerospace Curriculum Development  
3 Credits

This course will investigate the traditional manner of curriculum development and then proceed to prepare an instructional framework for a variety of aviation and aerospace instructional programs.

## MSA 620

Air Carrier Operations  
3 Credits

A study of air carrier flight operations systems from the viewpoints of the ground-based dispatcher, operations specialists, managers, and the cockpit flight crew. Topics include advanced flight planning, aircraft performance and loading considerations, impact of weather conditions, and routing priorities.

*Prerequisites:* Demonstrated knowledge of flight rules and regulations, basic meteorology, basic navigation, and basic aircraft performance.

## MSA 622

Corporate Aviation Operations  
3 Credits

The establishment and operations of a corporate flight department are examined along with the pro-

cedures and techniques generally accepted as standards by professional corporate flight operations. Included is a practical view of the corporate aviation mission of management mobility and use of the resources available to accomplish it.

## MSA 634

Aviation/Aerospace Psychology  
3 Credits

A study of the complexities of human factors research in aviation, which draws 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 and attempts to design an occupant-friendly flight deck module.

## MSA 636

Advanced Aviation/Aerospace Planning Systems  
3 Credits

Planning and decision-making techniques and strategies used in the aviation industry are emphasized. The types and sources of data needed for decisions about route development and expansion, fleet modernization, and new markets are examined. The methods of collecting, analyzing, and applying the data through computer applications, modeling, heuristic, value theory, and payoff tables are studied. The limitations and problems associated with strategic planning are discussed.

*Prerequisites:* Demonstrated knowledge of management principles and economics.

## MSA 641

Production and Procurement Management in the Aviation/Aerospace Industry  
3 Credits

The evolution of an air carrier aircraft from design concept to delivery is examined from the perspectives of the purchaser, manufacturer, component manufacturers, operators, and certifier/regulator. The study of the process begins with demand analysis and continues through purchase contracting, manufacturing, marketing, certification, predelivery activities, and introduction into service.

*Prerequisites:* Demonstrated knowledge of management principles and economics.

# Course Descriptions

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## MSA 643

Management of Research and Development for the Aviation/Aerospace Industry

3 Credits

The types and sources of aviation/aerospace research and development are analyzed through study of 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.

*Prerequisites:* Demonstrated knowledge of management principles and economics.

## MSA 644

Integrated Logistics Support in Aviation/Aerospace

3 Credits

This course is a study of the 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. The economic feasibility of a logistics system, including a life-cycle cost analysis, is explored. 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.

*Prerequisites:* Demonstrated knowledge of management principles and economics.

## MSA 652

Continuing Education's Role in Aviation

3 Credits

Emphasis on assessing community needs relative to developing programs in continuing education for

the adult learner, evaluation of existing programs, and the processes used in developing curricula for an adult continuing education program related to aviation.

## MSA 654

Adult Teaching and Learning Techniques

3 Credits

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.

## MSA 660

Sensation and Perception

3 Credits

This course examines how the human senses transform stimulus patterns of physical energy into the neural codes that become our perceptions of the world. Topics include vision, audition, smell, taste, touch, balance; and phenomena common to all sensory modalities: feature enhancement, inhibition, adaptation, and stages of neural coding.

*Prerequisite:* Demonstrated knowledge of basic psychology or completion of an undergraduate course in psychology. (This course is the same as HFS 615.)

## MSA 661

Human-Computer Interaction

3 Credits

This course discusses the importance of good interfaces and the relationship of user interface design to human-computer interaction (HCI). Topics include interface quality and methods of evaluation; interface design examples; dimensions of interface variability; dialogue genre; dialogue tools and techniques; user-centered design and task analysis; prototyping and the iterative design cycle; user interface implementation; prototyping tools and environments; I/O devices; basic computer graphics; and color and sound.

*Prerequisite:* Demonstrated knowledge of the use of computers, including programming familiarity with a high-level language.

# Course Descriptions

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## MSA 663

### Memory and Cognition

3 Credits

This course examines recent advances in memory and cognition research to obtain an understanding of how these theoretical and empirical advances have been, or might be, applied to problems of human-machine interactions and system design. Topics include the total range of memory and cognitive processes and their potential application to systems design such as sensation perception, pattern recognition, attention, language, memory, concept formation, thinking, decision making, problem solving, time sharing, reaction time, action, manual control, and the impact of automation.

*Prerequisite:* Demonstrated knowledge of basic psychology or completion of an undergraduate course in psychology. (This course is the same as HFS 620.)

## MSA 665

### Applied Experimental Design

3 Credits

The design, conduct, statistical analysis, and interpretation of common behavioral science research designs are covered in the context of aviation science topics. Students learn to differentiate research designs along dimensions of experimental/non-experimental approaches, questions of group differences, and questions of relationships between variables, adequacy of statistical power, "statistical significance," and practical importance. Student projects include conducting statistical analyses and writing research results sections based on standard American Psychological Association format.

*Prerequisite:* MSA 605 or completion of an undergraduate experimental psychology course. (This course is the same as HFS 510.)

## MSA 690

### Graduate Research Project

3 Credits

A written document on an aviation/aerospace topic that exposes the student to the technical aspects of writing. This course is included in the MSA curriculum to provide the student with the opportunity to pursue 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.

*Prerequisite:* MSA 605.

## MSA 696

### Graduate Internship in Aeronautical Science

1-3 Credits

Temporary professional or industrial work appointments 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 common to the workplace. They are academic/professional activities coordinated by the University between offering organizations and a graduate student.

## MSA 699

### Special Topics in Aeronautical Science

1-3 Credits

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 center director or department chair for faculty review and recommendation at least three weeks prior to the end of registration for a term.

## MSA 700

### Thesis

6 Credits

A written document on an aviation/aerospace 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.

*Prerequisite:* MSA 605.

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## MSF - Safety Science

### MSF 500

#### Safety Science Foundations

1-6 Credits

Provided for students who may need to resolve deficiencies from undergraduate studies to be properly prepared for the advanced level courses. A review of algebra and trigonometry, basic calculus, statistics, physics, chemistry, and biological science as they relate to the safety profession. (Credit not applicable to any degree.)



# Course Descriptions

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A. Algebra and Trigonometry. A study of the basic laws of fractions, exponents, radicals, inequalities, quadratic equations, complex numbers, and the elements of trigonometry.

B. Basic Calculus. Differentiation and integration of algebraic functions; applications to velocity, accelerations, area, curve sketching, and computation of extreme values.

C. Statistics. Descriptive statistics; populations and samples; measures of central tendency and dispersion; elementary probability; binomial and normal distributions and their interrelationship; random variables; one-and two-sample hypothesis testing involving proportions and means for large and small samples; estimation and confidence intervals; Chi square distribution; correlation coefficient; least squares line.

D. Physics. Survey course in physics. Stress will be placed on basic concepts and principles of physics. Presentation will include selected topics in mechanics, heat, light, sound, electricity and magnetism, and modern physics.

E. Chemistry. Covers basic atomic theory, elements, compounds, and mixtures, calculation of weight and weight volume relationships, basic descriptive chemistry. An overview of the present applications of chemistry and its future potential in human affairs. Applications to scientific decision-making in the business and industrial environment.

F. Biological Science. A survey course in general biological science, with emphasis on human biology. Includes basic cellular anatomy, biology, and biochemistry; viruses, bacteria, and protista; aerobic respiration and photosynthesis; mitosis and meiosis; genetics and inheritance, hereditary disorders in humans; and human tissues, organs, and organ systems.

## MSF 530

### Aircraft Accident Investigation

3 Credits

An examination of investigation as it pertains to aircraft accidents from the perspectives of the administrative, regulatory, and practical field investigation aspects. Emphasis will be on the evidence gathering, preservation, and processing phases of accident investigation. An overview of organizations that conduct and participate in investigations, and an analysis of their roles in those investigations will be completed. Use of a laboratory will provide practical field experience. Research into investigative concepts and techniques will be an integral part of the course.

## MSF 580

### Industrial Hygiene and Environmental Protection

3 Credits

A study of the role and responsibilities of an industrial hygienist employed in technical industries. The course reviews the application of methods for the identification, evaluation, and control of industrial hygiene and environmental hazards encountered in the aviation and other workplaces. Specific hazards to be addressed include noise, vibration, ionizing and nonionizing radiation, thermal conditions, pressure, chemicals, airborne contaminants, and biological substances. Engineering and nonengineering controls as well as regulatory requirements will also be covered.

## MSF 601

### Ergonomics

3 Credits

This course studies the most common source of musculoskeletal injuries in the American workplace. These injuries, commonly labeled as overexertion or repetitive stress, are found in various forms in all workplaces. The course begins with a study of work physiology and its implications for workplace design and workplace safety. It covers biomechanics and its implications for workplace design, low back pain, and other overexertion injuries. It covers the various cumulative trauma disorders including the importance of risk factors such as force, frequency, and posture. Setting up and managing an ergonomics program are discussed.

## MSF 602

### Human Factors

3 Credits

This course studies the role of human factors in workplace and work task design with emphasis on complex technical industries including aviation/aerospace. This study of human factors includes 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. It also includes the human role as it relates to unsafe acts, attitudes, errors, and deliberate actions. Finally, the course studies the interface between human factors in workplace design and human error.

**Prerequisites:** Demonstrated knowledge of behavioral science, college-level mathematics, including introductory statistics, and basic computer operations.

# Course Descriptions

## MSF 603

### Occupational Safety

3 Credits

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 a series of specific hazards. These hazards include machine guarding, material handling equipment, fall protection, fire protection, building design, and lighting. The application of safety and health management principles to the management of complex technical industries including aviation/aerospace are covered using scenario evaluations to determine OSHA compliance, accident/injury data evaluation and analysis, and OSHA log completion.

## MSF 604

### Quantitative Methods in Occupational Safety and Health

3 Credits

This course is a survey of quantitative methods pertinent to occupational safety and health. Topics include descriptive statistics, probability distributions, the idea of statistical significance, the distinction between parametric and nonparametric statistics, confidence intervals and hypothesis testing, correlation, regression, analysis of variance (ANOVA), and epidemiology. A formal research proposal may be developed and presented by each student as a basic course requirement.

**Prerequisites:** *Demonstrated knowledge of college-level mathematics, including introductory statistics, and basic computer operations.*

## MSF 605

### Industrial Hygiene Measurement

3 Credits

This course provides students with the knowledge and skills necessary to conduct basic industrial hygiene surveys. Hands-on laboratory experience is provided for the students, starting with equipment calibration and ending with completing a field-sampling project. Particulate sampling for both total and respirable, gravimetric analysis, gas/vapor sampling with tubes and impingers, dosimeters, use of direct reading instruments and detector tubes, are all covered. The fundamentals of sample analysis are presented. Case studies are presented to emphasize the strategies used to select sampling locations, times, and individuals.

## MSF 606

### Control Methods in Occupational Safety and Health

3 Credits

This course studies the methods commonly used by OSH professionals to control aviation and industrial workplace exposures to health and safety hazards. The most commonly used control for industrial health hazards is industrial ventilation, so this control method is studied in detail, with students learning to complete basic ventilation system designs and to evaluate moderately complex designs. Students may also learn to use ventilation system testing equipment to verify a system is working as designed and to troubleshoot a system that is not working properly. The proper use of and the potential failure modes associated with personal protective equipment are evaluated. In addition, measurement and control methods for noise and vibration are examined through a series of lectures and class projects.

## MSF 607

### Epidemiology

3 Credits

Epidemiology is the basic science underlying all public health programs, whether implemented privately in industry or publicly by government organizations. This course will deal with the distribution and causes of diseases (including all forms of illness, injury, and accidents) in specified populations. This will be applied to the control of health problems through the understanding of the causes of those problems.

## MSF 608

### Toxicology

3 Credits

Toxicology is the study of the adverse effects of chemicals on living organisms. Its relevance to OSH is that most occupational diseases are the result of workplace exposures to chemicals. Our job as OSH professionals is to prevent the adverse effects of these exposures, and to do this we must understand the toxic effects and their mechanisms. This introduction to toxicology will provide students with the basic knowledge needed to interpret the toxicological aspects of the OSH literature including OSHA/NIOSH/EPA reports; to discuss toxicological issues with toxicologists and understand them; and to provide elementary explanations of toxicological issues to the people they serve.

# Course Descriptions

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## MSF 609

### System Safety

3 Credits

An in-depth review of system safety management principles and system safety engineering techniques are combined in this course to enable students to fully comprehend their vital roles in preventing accidents. This course emphasizes the specialized integration of system safety analytical techniques and risk management into all phases of a system's life-cycle using a system safety program that is tailored to an organization's mission. System safety's relationship with other disciplines such as reliability, maintainability, human factors, and product liability will be examined in the context of government, military, and general industry.

*Prerequisite:* Demonstrated knowledge of college-level mathematics, including introductory statistics.

## MSF 610

### Industrial Security

3 Credits

This course will intensively focus on the various aspects of business intelligence and industrial security as they apply to complex and technical industries. Of prime concern are risks, threats, and countermeasures. Topics include intelligence theory and intelligence operations; foreign and domestic organized crime; industrial espionage; riots and disasters; terrorism; sabotage; hijacking; internal security; cybercrime; legal and ethical issues; de facto and regulatory roles of local, regional, and national governments, international agencies, and nongovernmental organizations; social and cultural factors; strategic planning and investment vulnerabilities; physical, operations, communications, and personnel securities.

## MSF 615

### Aerospace Occupational Safety and Health Program Management

3 Credits

Addresses the application of management principles and techniques to the management of aviation safety and health programs. Topics include planning, organizing, budgeting, resourcing, training, operating, and evaluating management processes as they relate to aviation safety and health programs. Regulatory requirements and other standards along with the measurement and evaluation of safety performance and loss control accountability are included throughout the course.

## MSF 630

### Aircraft Accident Analysis

3 Credits

A critical analysis of selected aircraft accidents that involves extensive field work, teaming, a thorough investigation, detailed examination, group-process discussions, and decision making. Each team of student investigators will produce a professional report that includes the facts, the scenario, and an analysis of all potential factors, findings, and recommendations. Identification of accident prevention measures as a product of the analysis process is stressed. Identification and analysis of available and future loss-prevention technologies will be completed.

## MSF 635

### Advanced Aircraft Survivability Analysis and Design

3 Credits

Entails a detailed analysis of the aircraft accident environment with particular emphasis on survivability factors. Explores factors and forces that cause injury and examines the injury-role played by impact forces and occupiable space compromises. Examines crashworthiness and delethalization technologies and concepts with a focus on the best ways to protect occupants during a crash. Selected aircraft accidents will be used as case studies. An in-depth review of basic kinematics and development of injury-related information will be completed.

## MSF 645

### Aircraft Fire Survivability Analysis and Design

3 Credits

Involves a detailed examination of basic fire science and the relationship of fire to aircraft accident survival. Examines current fire crashworthiness factors including fire development and propagation, injury and fatality mechanisms related to fire, and current evacuation systems in use. The focus will be on the configurational, procedural, environmental, and biobehavioral factors that influence survival in a fire situation. Case studies of accidents involving both in-flight and crash-related fires will be used. Identification and analysis of available and future fire-protection technologies will be completed.

## MSF 655

### Airline and Operations Safety Management

3 Credits

This course addresses the application of safety management principles and techniques to the manage-

# Course Descriptions

ment of airline operations and safety. Topics include hazard identification, accident/incident investigation, flight safety, cabin safety, ground safety, and emergency response programs. Regulatory requirements and airline standards as well as accident prevention strategies are included throughout the course.

*Prerequisite:* MSF 615.

## MSF 675

### Aviation Maintenance Safety

3 Credits

A study of the aviation maintenance safety practices, procedures, and policies in use throughout the aviation industry. Includes the role of maintenance safety in relation to the overall safety management program in the organization. Case studies of maintenance-related accident prevention and loss control scenarios. The influence and role of the regulatory and compliance agencies in aviation maintenance safety.

## MSF 680

### Integrated Safety Operations - Capstone

3 Credits

Study of management theory, integrated arrangements, common constraints, developmental level, essential guidelines, staff liaison, project improvement, effectiveness audits, and collaboration needed to ensure success of the safety function. May include a written document on a safety topic, which exposes the student to the technical aspects of writing. This course is included in the MSS curriculum to provide the student with the opportunity to study how the various domains of the safety and health occupation are integrated into a single program.

## MSF 685

### Aviation Security

3 Credits

This course will intensively focus on the various aspects of business intelligence and industrial security as they apply to aviation and to aviation safety. Of prime concern are risks, threats, and countermeasures. Topics include intelligence theory and intelligence operations; foreign and domestic organized crime; industrial espionage; riots and disasters; terrorism; sabotage; hijacking; internal security; cybercrime; legal and ethical issues; de facto and regulatory roles of local, regional, and national governments, international agencies, and nongovernmental organizations; social and cultural factors; strategic planning and investment vulner-

abilities; and physical, operations, communications, and personnel securities. Readings, lectures, discussions, and case studies will be supplemented by team exercises resulting in security plans addressing risks, threats, countermeasures, and evaluative mechanisms.

## MSF 686

### Emergency Preparedness and Preplanning

3 Credits

This course is designed to increase the student's knowledge of emergency response procedures, safety and health hazards, and enforcement issues for industry. Topics include a thorough discussion of scope, application, definitions, and other related standards; elements of an emergency response plan; training requirements; the incident command system; medical surveillance; and postemergency response. Major elements involved in disasters and emergencies, preparedness planning, systems use, and attention to essential human services, with emphasis on community action and the development of successful, cost-effective strategies for implementing emergency and mitigation plans.

## MSF 690

### Graduate Research Project

3 Credits

A written document on a safety topic, which exposes the student to the technical aspects of writing. This course is included in the MSSS curriculum to provide students with the opportunity to pursue 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.

*Prerequisite:* MSF 604.

## MSF 696

### Graduate Internship in Safety Science

1-3 Credits

Temporary professional or industrial work appointments 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 common to the workplace. They are academic/professional activities coordinated by the University between offering organizations and a graduate student.

# Course Descriptions

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## MSF 699

### Special Topics in Safety Science

1-3 Credits

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 center director or department chair for faculty review and recommendation at least three weeks prior to the end of registration for a term.

## MSF 700

### Thesis

3 Credits

A written document on a safety 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.

*Prerequisite: MSF 604.*

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## SE - Software Engineering

### SE 500

#### Software Engineering Discipline

3 Credits

This course introduces students to the concepts and methods for disciplined software engineering processes. Students learn about and practice individual planning, tracking, analyzing, and managing of their time and defects, to fit the needs of small-scale program development. Students also study and use a team project process. The course provides a framework for the application and analysis of managed software engineering practices. Also discussed are the latest common and practical processes used in industry. Students will work individually and as a team to complete the course assignments.

*Prerequisite: Practical knowledge of a modern programming language (e.g., Ada, C, C++, Java)*

### SE 505

#### Model-Based Verification of Software

3 Credits

This course is concerned with engineering practices that use formalized models as a basis for analyzing software artifacts. The course covers the key software engineering skills required, surveys a variety of techniques for model building and analysis, and includes sample problems and real-world systems

for discussion and analysis. Applications of the techniques in the requirements, design, and coding phases of software development are investigated.

*Corequisite: SE 500 or consent of instructor.*

### SE 510

#### Software Project Management

3 Credits

This course addresses management considerations in software systems development. It provides advanced material in software planning mechanisms for monitoring and controlling projects, and leadership and team building.

*Corequisite: SE 500 or consent of instructor.*

### SE 520

#### Formal Methods for Software Engineering

3 Credits

A study of mathematical logic and proof techniques, discrete structures, and other mathematical topics that are used in software engineering; the use of formal methods in software specification; and an overview of the use of formal methods throughout the software life-cycle.

*Prerequisite: course in discrete mathematics or consent of instructor.*

### SE 530

#### Software Requirements Engineering

3 Credits

This course is concerned with the development, definition, and management of requirements for a software system or product. Topics include the software requirements process, requirements elicitation, requirements analysis, requirements specification, requirements verification and validation, requirements management, and requirements standards and tools. Students will participate in individual and group exercises related to software requirements engineering tasks.

*Corequisite: SE 500.*

### SE 535

#### User Interface Design and Evaluation

3 Credits

This course provides an introduction to designing, implementing, and evaluating human-computer interfaces of various types. The theoretical foundation for designing interfaces is complemented by practical classroom exercises and the design and development of a prototype in a team-based setting

using previously learned software engineering principles. Students will become acquainted with the literature related to user interface design and with the design of experiments for evaluating user interfaces.

## SE 545

### Specification and Design of Real-Time Systems 3 Credits

This course addresses basic concepts and methods used in software specification and design of real-time systems. The characteristics of real-time systems and the role of software design in software development are explored. The course reviews software design methods specifically suited for real-time systems. Selected methods are analyzed and case studies are used to illustrate the design process. The course material may require research in real-time aspects of software design, laboratory experiments with software development tools and real-time development environment, and producing appropriate reports.

*Prerequisite:* SE 500.

## SE 550

### Current Trends in Software Engineering 3 Credits

Current techniques, methods, procedures, and paradigms of software engineering are studied. Students perform literature searches, collect data from software development experiments, and prepare written and oral reports on current software engineering practices.

*Prerequisite:* SE 500.

## SE 555

### Object-Oriented Software Construction 3 Credits

This course addresses the basic concepts of object-oriented software development. It provides an integrated view of subjects related to the different phases of software development using object-oriented techniques. The course covers object-oriented analysis and design (OOA/OOD), object-oriented programming (oop), and object-oriented testing (OOT) techniques. Also covered in the course are object-oriented metrics and case studies in object-oriented software development.

*Prerequisites:* SE 500, proficiency in use of modern OO programming languages (e.g., Ada, C++, Java).

## SE 565

### Concurrent and Distributed Systems 3 Credits

The objective of this course is to teach principles of software development for concurrent and distributed systems. Specification, design, implementation, and performance evaluation techniques for concurrent and distributed applications will be presented and complemented by examples and practical exercises. The various paradigms used for concurrent and distributed systems, including high performance clusters, along with the implementation issues for each will be discussed. A survey of languages suitable for implementing concurrent solutions will also be covered.

*Prerequisite:* SE 500 or consent of instructor.

## SE 575

### Software Safety 3 Credits

The objective of this course is to teach principles of software development for safety and mission critical systems. Safety related specification, design and implementation techniques are described and illustrated by examples and practical exercises. Principles and practices of safe software development, including a survey of programming language and operating system level issues for implementing safety related software are discussed. The course discusses the safety requirements, hazard and risk analyses, fault tolerance, basics of software reliability, and issues of verification, validation, and certification. Various safety standards and guidelines across application domain and selected tools supporting safety assurance of software products are introduced. The course material may require research in development of safe systems, laboratory experiments with tools, and producing appropriate reports.

*Prerequisite:* SE 500 or consent of instructor.

## SE 580

### Software Process Definition and Modeling 3 Credits

This course provides students with the fundamental knowledge for software process definition and modeling. Software process content includes a framework for process definition and modeling, process evaluation, enactment of processes, process tailoring, and description of the process properties. Course projects include analysis of existing process and design and modeling of new processes.

*Prerequisite:* SE 500 or consent of the instructor.

# Course Descriptions

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## SE 585

### Metrics and Statistical Methods for Software Engineering

3 Credits

This course is concerned with the topics of software measurement, statistical tools and methods, and applied experimental design in software engineering. Students will be introduced to the principles and concepts relevant to measurement in software engineering, including the representational theory of measurement, collection, analysis, and validation of data. Also studied are frameworks such as Goal-Question-Metric and Quality Function Deployment paradigms for guiding measurement efforts. Also explored are the concepts of experimental design, analysis of experiments, model building, ethics, and presentation of experiments.

*Prerequisite:* SE 500 or consent of instructor.

## SE 590

### Graduate Seminar

3 Credits

This course is a study of the current advancements in a particular field of software engineering, as determined by the instructor of the course. The course will focus on a different topic each term, depending on the varied interests of students, the graduate faculty, and the existing departmental research requirements.

## SE 610

### Software Systems Architecture and Design

3 Credits

This course is concerned with the principles and concepts of engineering of large software systems and programs. Software architecture is an abstraction of system details that helps in managing the inherent complexity of software systems development. Software architecture provides opportunities for early evaluation of user needs, analysis of requirements and design, and prediction of system properties. Architectural styles, views, notations, and description languages provide systematic frameworks for engineering decisions and design practices. The focus of the course is on advanced topics related to software architecture practices, technologies, and artifacts. Students participate in individual or group projects related to developing architectural representations of software systems.

*Prerequisite:* SE 530.

## SE 625

### Software Quality Engineering and Assurance

3 Credits

This course describes the overall approach to specifying software quality, achieving quality, and mapping a quality specification into a set of engineering activities. This course provides a framework for understanding the application of software verification and validation (V&V) processes and techniques throughout the software development life cycle. The course covers the economics of software quality and provides a guide to organizing a project to achieve quality both in terms of the software product and the software process.

*Prerequisite:* SE 530 or consent of instructor.

## SE 655

### Performance Analysis of Real-Time Systems

3 Credits

The objective of this course is to teach principles of performance analysis of computer systems, with a focus on real-time applications. Performance modeling and analysis techniques are described and illustrated by examples and practical exercises using elements of mathematical statistics. Principles and practices of software development to achieve required or optimal performance, including design analysis and assessment of the implementation in terms of works case execution time and schedulability, will be addressed. An actual project in instrumentation of software for performance evaluation is an essential element of this course.

*Prerequisites:* SE 500 or consent of instructor, knowledge of basic statistics.

## SE 660

### Formal Methods for Concurrent and Real-Time Systems

3 Credits

The course includes study of the formal specification of reactive systems, temporal logic, and current research in the specification of concurrent and real-time systems. There is also discussion of verifying software designs based on formal specifications.

*Prerequisite:* SE 520 or consent of instructor.

## SE 690

### Graduate Research Project

3 Credits

This course provides the student with an opportunity to pursue a topic area of special interest. The

graduate research project is an individual investigation or software development effort culminating in a formal written report, requisite artifacts, and an oral presentation to the faculty. The focus is on an advanced topic in software engineering that may be theoretical or practical.

*Prerequisite:* Consent of instructor.

## SE 696

### Graduate Internship in Software Engineering

1-3 Credits

This course involves temporary professional or industrial work appointments 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 common to the work place. Internships are academic/professional activities coordinated by the University between participating organizations and a graduate student.

## SE 697

### Software Engineering Practicum

3 Credits

The practicum is a capstone course that builds on the other core MSE courses. It consists of a faculty-mentored team software development project that extends from concept to delivery. All phases of the development life-cycle are included: requirements, architecture, detailed design, implementation, and verification and validation. Disciplined software engineering practices are used (e.g. PSP, TSP, project management). Deliverables for the course are a validated functioning system, a comprehensive set of development artifacts, a final report, and a formal presentation.

*Prerequisites:* SE 510, SE 555, and SE 610, or permission of instructor.

## SE 699

### Special Topics in Software Engineering

1-3 Credits

Students may elect to perform a special, directed analysis and/or independent study in an area of particular interest. The student should submit to the department chair and graduate committee a detailed proposal of the desired project and identify a faculty sponsor.

## TM - Technical Management

### TM 501

#### Computer Skills for a Technical Environment

3 Credits

Introductory graduate-level skills in computers are developed through application to current business-related problems. Computer techniques are used to solve problems and enhance technical communications. Computer techniques will be covered as an efficient method to achieve higher-level analytical and communicative skills. Emphasis is placed on supporting and enhancing technical communications with computer technology. Computer presentation graphics will be explored as a tool to develop and augment high-impact presentations. Successful completion is necessary in order to proceed in the MSTM program.

### TM 502

#### Communication Skills in a Technical Environment

3 Credits

Introductory graduate-level skills in business communications are explained through the development of solutions applied to a series of interconnected management science problems. Students learn to communicate results in a clear and understandable fashion. Emphasis is placed on communicating conclusions in concise and persuasive writing and speaking. Written assignments will involve reports, business letters, memoranda, and resumes. Successful completion is necessary in order to proceed in the MSTM program.

### TM 503

#### Quantitative Methods and Statistics

3 Credits

The integration of graduate-level skills in quantitative management methods through the development of solutions applied to a series of interconnected management science problems. Computer techniques are also used to solve problems and to communicate the results in a clear and understandable fashion. Emphasis is placed on understanding analytical methodologies, interpreting quantitative results, and communicating conclusions. Descriptive and inferential statistical applications will be explored. Successful completion is necessary in order to proceed in the MSTM program.



# Course Descriptions

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## TM 605

Organizational Theory in a Technical Environment  
3 Credits

Effectively using the organization to build a technical management team. Leadership versus management; conflict between functional management; matrix versus hierarchical organizations; organizational alternatives; human response in the organization; 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; industry perspective.

## TM 610

Managing Effective Technical Work Teams  
3 Credits

This course encompasses the study of managing work teams in the technical environment. Specific topics include two-way communications and feedback; participative management techniques pertaining to motivation; small-group processes and group decision support systems; attraction and retention of quality personnel; skills in writing employee evaluations, responsibility, authority, accountability; conflict resolution; initiative; creativity; horizontal and vertical communication; personality/temperament; logic versus heuristic/detail versus holistic; management strategies; motivation, recognition, and reward.

## TM 616

Production Operations Management  
3 Credits

An in-depth analysis of production/operations concepts, methods, and techniques from a systems perspective.

## TM 621

Regulations, Ethics, and the Legal System  
3 Credits

Understanding the complex regulatory and legal setting surrounding management. The Federal Acquisition Regulations and how they affect all projects' legal responsibility and accountability, ethical considerations in and external to the organization, the international environment and how it may affect projects.

## TM 625

Marketing in the Technical Environment  
3 Credits

Effective use of communications to describe and/or market projects, programs, or products to a hostile or friendly audience. Understanding products and the marketplace; collecting data to accurately reflect the situation; the use of accurate, clear, and meaningful presentations; highlighting the positive; reporting the negative; internal versus external presentations; dealing with the media; video and computer techniques; analyzing your audience; communications level; public relations. Students will be required to develop a marketing plan and, working as a team, conduct a marketing research project based on the needs of their organization.

## TM 630

Technical Management Information Systems  
3 Credits

This course provides an end-user orientation to management information systems with both managerial and technical components. The course will develop managerial skills in using information systems to conduct daily operations, to plan business strategies, and to solve business problems. A systems approach to planning, scheduling, and controlling will provide the student with effective decision-making resources. In addition, the course will provide hands-on experience with laptop computer exercises in computerized MIS to develop the information management proficiency required by the corporate environment. The emphasis of this course is on data resource management; electronic commerce; enterprise collaboration systems; telecommunications (internet, intranet, extranet and client/server systems); decision support systems (DSS); executive support systems (ESS); and security, control, and ethical issues.

## TM 635

Financial and Managerial Accounting and Control for Technical Managers  
3 Credits

Financial control procedures for a systems approach to program management are presented. Cost elements in manufacturing, research and development, and 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

# Course Descriptions

analysis; profit planning and its relationship to cost; using spreadsheets for budget and overhead analysis; pricing, capital budgeting, and investment decisions.

## TM 641

### Project Management: Concepts and Practices

3 Credits

This course encompasses the study of project management, paying particular attention to the nine knowledge areas: scope, time, cost, risk, quality, procurement, human resources, communication, and integration, as they relate to the process areas of initiation, planning, execution, control, and closure of projects. Examples and student-initiated projects and project simulations are used to emphasize the integrated relationships. Project management software is used throughout the course, particularly to demonstrate the usefulness of automated calculations, record keeping, and reporting as related to planning and controlling projects. Throughout, the merger of technical skills, general management skills, and project management skills for the successful project is emphasized. Where applicable, the information delivered in this course is compliant with ISO 9,000, 10,000 series standards and the Project Management Institute generated Project Management Body of Knowledge.

## TM 646

### Operations Research and Management Science

3 Credits

Quantitative methods for program management. Forecasting and probability distributions; decisions theory and decision-making under conditions of risk and uncertainty; marginal analysis; linear programming applications including problems of minimization and maximization, transportation and warehousing, assignment and scheduling and ingredient blending; queuing theory and waiting lines; network models such as minimum spanning tree, maximal flow, and shortest route techniques; simulation and modeling; regression analysis; and time series analysis.

## TM 651

### Quality Management and Quality Control

3 Credits

Instilling quality concepts in a project. Continuous improvement; quality management; designing for and cost of quality; organizing for QM; alternative approaches to quality; understanding the corporate culture; developing the quality plan; implementing QM; introducing the concept; work meetings and project teams; informing; motivating; recording; using technology; key approaches and when to use them; reward and recognition; and followup, evaluation, and feedback.

## TM 660

### Project Development Techniques

2 Credits

A study of current scientific research methods that includes techniques of problem identification, hypothesis formulation, literature search strategies of libraries and online databases, design and use of data-gathering instruments, formulation of a research model and plan, and appropriate statistical data analysis. The TMRP Guidelines format and American Psychological Association (APA) style will be introduced and followed. A formal Technical Management Research Project proposal will be developed and presented by each student as a basic course requirement.

*Prerequisite:* TM 646.

## TM 660L

### Technical Management Research Project

1 Credit

A written document on a technical management topic, that exposes the graduate student to the technical aspects of writing. This course is included in the MSTM curriculum to provide the graduate student with the opportunity to pursue a project of special interest, but not to the level of a thesis.

*Prerequisite:* TM 660.

# EXTENDED CAMPUS

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## SOURCES OF ADDITIONAL INFORMATION

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Extended Campus students should contact their Center Director or Distance Learning Enrollment Office, or any of the offices listed below for more information and guidance:

### **General Information**

Telephone: (386) 226-6910  
or (800) 522-6787  
Email: [ecinfo@erau.edu](mailto:ecinfo@erau.edu)

## OFFICE OF STUDENT SERVICES

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Extended Campus  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900

Admissions: (866) 509-0743  
Email: [ecssc@erau.edu](mailto:ecssc@erau.edu)

Registrar: (866) 393-9046  
Email: [ecregist@erau.edu](mailto:ecregist@erau.edu)

Portfolio Assessment: (877) 362-7970  
Fax: (386) 226-6984

Disability Support Services  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 226-7917  
Fax: (386)-226-6082

Career Services  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 226-6054  
Email: [eccareer@erau.edu](mailto:eccareer@erau.edu)

## CENTER FOR PROFESSIONAL EDUCATION

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Extended Campus  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 323-8669  
Fax: (386) 323-8692  
Toll free: 1-866-574-9125

## FINANCIAL SERVICES

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Financial Aid Office  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 226-6300  
-or- (800) 943-6279

Veterans Education Benefits:  
University Veterans' Affairs Office  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 226-6350

Student Financial Services  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (386) 226-6280

## DISTANCE LEARNING ENROLLMENT OFFICE

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Extended Campus  
Embry-Riddle Aeronautical University  
600 S. Clyde Morris Blvd.  
Daytona Beach, FL 32114-3900  
Telephone: (800)-359-3728  
Worldwide: (386) 226-6397  
Fax: (386) 226-7627

## Extended Campus

### EMBRY-RIDDLE AERONAUTICAL UNIVERSITY EXTENDED CAMPUS CENTER LISTING BY STATE / COUNTRY

#### ALABAMA

FORT RUCKER	Enterprise	(334) 598-6232
Teaching Sites:		
Mobile Teaching Site (out of Pensacola)		(251) 441-6737
HUNTSVILLE	Huntsville	(256) 876-9763

#### ALASKA

ANCHORAGE	Anchorage	(907) 753-9367
FAIRBANKS	Fairbanks	(907) 356-7773
Teaching Site: Eielson AFB		(907) 377-2977

#### ARIZONA

LUKE	Glendale	(623) 935-4000
Classroom Locations:		
Glendale Municipal Airport		
Lockheed-Martin Goodyear (MSTM ONLY)		
SKY HARBOR	Phoenix	(602) 275-5533
TUCSON	Tucson	(520) 747-5540
WILLIAMS GATEWAY	Mesa	(480) 279-1150

#### ARKANSAS

LITTLE ROCK	N. Little Rock	(501) 983-9300
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#### CALIFORNIA

BEALE	Marysville	(530) 788-0900
Classroom Location: McClellan AFB		
CAMP PENDLETON	Oceanside	(760) 385-4423
CHINA LAKE	Ridgecrest	(760) 939-4557
EDWARDS	Rosamond	(661) 258-1264
FORT IRWIN	Fort Irwin	(760) 386-7997
Classroom Location : MCLB Barstow		
INLAND EMPIRE	Riverside	(951) 653-4074
Classroom Location: Riverside Airport		
LEMOORE	Lemoore	(559) 998-6026
LONG BEACH	Los Angeles (Metro Center)	(562) 627-5870
NORTH ISLAND	San Diego	(619) 435-1293
OAKLAND	Oakland	(510) 636-2424
Classroom Locations: Hayward, Livermore, Oakland, and San Carlos Airports		
PALMDALE	Palmdale	(661) 947-4025
SAN DIEGO	San Diego	(858) 576-4375

# Extended Campus

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TRAVIS	Fairfield	(707) 437-5464
VANDENBERG	Lompoc	(805) 734-4076
Classroom Location: Lompoc		
VENTURA	Point Mugu	(805) 271-9691

## COLORADO

COLORADO SPRINGS	Ft. Carson	(719) 526-3387
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## FLORIDA

FT. LAUDERDALE	Pompano Beach	(954) 497-3774
Classroom Locations:		
Palm Beach Lakes H.S.		
Signature Flight Support, FLL/HWY International Airport		
U.S. Coast Guard Air Station, Opa Locka		
Pratt & Whitney, West Palm Beach		
FORT WALTON BEACH	Fort Walton Beach	(850) 678-3137
HURLBURT FIELD		(850) 581-2106
JACKSONVILLE	Jacksonville	(904) 779-0246
Teaching Site: Mayport		(904) 249-6700
Classroom Locations:		
Craig Airfield	Jacksonville	
Northrop Grumman	St. Augustine	
Jacksonville Int'l Airport	Jacksonville	
MIAMI	Miami	(305) 871-3855
Teaching Site: Key West		(305) 871-3855
ORLANDO Metro	Orlando	(407) 352-7575
PENSACOLA	Pensacola	(850) 458-1098
Teaching Sites:		
NAS Whiting Field	Milton	(850) 623-7787
US Coast Guard ATC		
Mobile (see Alabama)	ALABAMA	
SPACE COAST	Cocoa	(321) 783-5020
MSTM Teaching Site: Barry University	Merrit Island MSTM ONLY	
Classroom Locations:		
Vero Beach		
Sarno		
United Space Alliance	Kennedy Space Center	
Brevard County Adult Ed. Center	Titusville	
TAMPA	Tampa	(813) 828-3772
Teaching Site: St. Petersburg College		(727) 394-6218
Classroom Location: Tampa Coast Guard Air Station		
TYNDALL	Panama City	(850) 283-4557
Teaching Site: Tallahassee		

## Extended Campus

### GEORGIA

ATLANTA METRO	Marietta	(770) 426-9990
Teaching Site: Delta Airlines		(404) 714-3248
Classroom Location: Virginia Crossings		
MOODY	Moody AFB	(229) 244-9400
ROBINS	Warner Robins	(478) 926-1727
Teaching Site: Columbus, Georgia	Fort Benning Pratt & Whitney	(706) 685-0105
SAVANNAH	Savannah	(912) 355-0644
Classroom Location: Fort Stewart		

### HAWAII

HONOLULU	Honolulu, Oahu Island	(808) 422-0835
Classroom Location: Honolulu Airport Site		
KANEOHE	Kailua, Oahu Island	(808) 254-2106
SCHOFIELD BARRACKS	Mililani	(808) 624-2334
Classroom Location: Coast Guard Air Station	Barbers Point	

### IDAHO

MOUNTAIN HOME	Mountain Home	(208) 832-2222
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### INDIANA

INDIANAPOLIS	Indianapolis	(317) 487-6281
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### KANSAS

MCCONNELL	Wichita	(316) 687-3006
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### KENTUCKY

FORT CAMPBELL	Clarksville	(270) 798-2775
LOUISVILLE	Louisville	(502) 964-9204

### LOUISIANA

BARKSDALE	Shreveport	(318) 747-4508
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### MAINE

BRUNSWICK	Brunswick	(207) 721-0664
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### MARYLAND

ANDREWS	Andrews	(301) 735-6340
PATUXENT RIVER	Lexington Park	(301) 863-8776

### MINNESOTA

MINNEAPOLIS	Eagan	(651) 905-9595
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## Extended Campus

### OKLAHOMA

ALTUS	Altus	(580) 481-5991
OKLAHOMA CITY	Oklahoma City	(405) 739-0397
VANCE	Enid	(580) 213-7320

### OREGON

PORTLAND		(503) 288-8690
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### SOUTH CAROLINA

CHARLESTON	Charleston	(843) 767-8912
MCAS BEAUFORT	Beaufort	(843) 228-7585
SHAW	Sumter	(803) 666-7401
Teaching Site: McEntire Air National Guard Base		

### TENNESSEE

MEMPHIS	Memphis Airport	(901) 507-9969
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### TEXAS

CORPUS CHRISTI	Corpus Christi	(361) 937-4951
DYESS	Abilene	(325) 692-2007
FORT WORTH	Dallas/Fort Worth	(817) 737-8180
MSTM Teaching Site: Lockheed-Martin		
HOUSTON	Houston	(281) 244-9456
SAN ANTONIO	San Antonio	(210) 659-0801
SHEPPARD		(940) 851-6458

### UTAH

NORTHERN UTAH	Ogden	(801) 777-0952
Classroom Locations:		
Ogden Airport	(AMT ONLY)	
Clearfield Town Square		

### VIRGINIA

FORT EUSTIS	Newport News	(757) 887-0980
LANGLEY	Hampton	(757) 764-2662
NORFOLK	Norfolk	(757) 440-5078
Teaching Site: Oceana		(757) 437-8061

### WASHINGTON

EVERETT	Everett	(425) 514-0220
SEATTLE	Seattle	(426) 226-2484
SPOKANE	Spokane	(509) 244-3832
TACOMA	Tacoma	(253) 589-1728
WHIDBEY ISLAND	Oak Harbor	(360) 279-0959



# Extended Campus

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## WYOMING

CHEYENNE	Cheyenne	(307) 634-9693
Classroom Location: Aims Community College	Greeley, CO	

## WORLDWIDE CAMPUS CENTER (EUROPE-CIVILIAN)

### UNITED ARAB EMIRATES

ABU DHABI	Abu Dhabi	011-971-24451514
DUBAI	Dubai	011-971-43260333

## EUROPEAN CENTERS LIST BY COUNTRY

### ENGLAND

RAF LAKENHEATH	Lakenheath	011-44-1638-522464
Teaching Site: Keflavik	Iceland	011-354-425-4772
RAF MILDENHALL	Mildenhall	011-44-1638-542916
Teaching Site: Lajes Field	Portugal	011-351-295-57-3375

### GERMANY

GIEBELSTADT AAF	Giebelstadt	011-49-9334-87-7578
Teaching Site: Camp Bondsteel	Kosovo	011-49-621-730-781-4684
HANAU AAF	Hanau	011-49-6181-9540337
Classroom Location: Wiesbaden AAF Wiesbaden		
KATTERBACH AAF	Katterbach	011-49-9802-8757
Classroom Location: Illesheim		
RAMSTEIN AB	Ramstein	011-49-6371-44204
SPANGDAHLEM AB	Spangdahlem	011-49-6565-7297
Teaching Site: Geilenkirchen		

### ITALY

AVIANO AB	Aviano	011-39-0434-66-0631
Teaching Site: Vicenza	Italy	011-39-0444-717570
SIGONELLA	Italy	011-39-095-56-4550
Teaching Site: Naples	Italy	011-39-081-568-4364

### SPAIN

ROTA	Rota	011-34-956-822984
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### TURKEY

INCIRLIK		
Teaching Site: Down Range Class Division		011-90-322-316-1098

### LUXEMBOURG

LUXEMBOURG	Luxembourg	011-352-42-59-91314
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# FACULTY AND ADMINISTRATION

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the administration and faculty of Embry-Riddle are listed below. Where applicable, the numeral one (1) denotes the Daytona Beach Campus; the numeral two (2) denotes the Prescott Campus; the numeral (3) denotes the Extended Campus. All others are assigned to the University administration.

## *Legend*

Letter designations for aviation qualifications are as follows:

A – Airplane	ME – Multi-Engine	DWE – Designated Written Examiner
C – Commercial Pilot	SE – Single-Engine	HTA – Heavier Than Air
G – Glider	A&P – Airframe and Powerplant Maintenance Technician	IGI – Instrument Ground Instructor
H – Helicopter	AGI – Advanced Ground Instructor	LTA – Lighter Than Air
I – Instrument	ATP – Airline Transport Pilot	SME – Single- and Multi-Engine
L – Land	BGI – Basic Ground Instructor	FCC – Federal Communication Commission
P – Private Pilot	CFI – Certified Flight Instructor	FE – Flight Engineer
S – Seaplane	CTO – Control Tower Operations	AC – Advanced Graduate Credit
AD – Aircraft Dispatcher	DME – Designated Mechanic Examiner	
IA – Inspection Authorization		

## *Officials of the University*

### **JOHNSON, JOHN P.**

*Interim President and Provost; Professor, College of Arts and Sciences.  
B.A. and M.S., Florida State University; Ph.D., Kent State University.*

### **CARRELL, DANIEL L. <sup>2</sup>**

*Chancellor, Prescott Campus. B.A., Northwestern State University; M.A.S., Embry-Riddle Aeronautical University; C-H.*

### **CONNOLLY, THOMAS J. <sup>1</sup>**

*Chancellor, Daytona Beach Campus; Endowed Chair in Aviation; Professor of Aeronautical Science. Ed.D., Nova University; ATP-MEL; CE-500; C-SEL; CFI-ASMEL & IA; AGI; IGI.*

### **JOST, ROBERT A.**

*Vice President - Chief Business Officer. B.B.A. and M.B.A., Stetson University.*

### **METZNER, JOHN**

*Vice President, External Relations. B.A. and M.A., Midwestern State University.*

### **RAMSEY, PAT**

*Interim Vice President of Development. B.S., University of Tennessee.*

### **SMITH, MARTIN <sup>3</sup>**

*Chancellor, Extended Campus. B.A., University of Massachusetts; M.B.A., Western New England College.*

### **STACKPOOLE, KENNETH**

*Vice President of Government Relation. B.S. and M.A.S., Embry-Riddle Aeronautical University; Ph.D., University of Central Florida; ATP, CFI-AI-ME.*

### **WEEKES, ERIC**

*Vice President - Chief Financial Officer. B.S., New York Institute of Technology; M.B.A., New York University.*

# Faculty and Administration

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## Academic Administration

**ABRAMOWITZ, JEFFREY D., MAJOR, U.S. ARMY**

*Professor of Military Science, Army ROTC, Prescott Campus.* B.A., Beaver College; M.A., Rutgers University; J.D., Rutgers University School of Law.

**AYERS, FRANCIS H. JR.**

*Associate Professor of Aeronautical Science and Chair, Flight Department, Daytona Beach Campus.* B.A., Virginia Polytechnic Institute and State University; M.S., Embry-Riddle Aeronautical University.

**BARBIE, DONNA J.**

*Professor of Humanities and Communications; Chair, Department of Humanities and Social Sciences, Daytona Beach Campus.* B.S., Mary University; M.A., North Dakota State University; Ph.D., Emory University.

**BERGERON, KEITH**

*Associate Professor of Mathematics and Chair, Department of Mathematics and Computer Science, Prescott Campus.* B.S., U.S. Air Force Academy; M.S. and Ph.D., University of New Mexico.

**BLOOM, RICHARD**

*Professor of Psychology, Social Thought, and Global Security/Intelligence Studies; Dean, College of Arts and Sciences, Prescott Campus.* B.A., Columbia University; M.A., New School for Social Research; Ph.D., Kent State University.

**BRADY, TIM**

*Professor of Safety Science; Dean of the College of Aviation, Daytona Beach Campus.* B.S., Troy State University; M.S., Abilene Christian University; Ph.D., St. Louis University; ATP-MEL; C-SEL.

**BROWN, JAMES M.**

*Associate Dean, College of Career Education, Extended Campus.* B.S., California State University; M.S., Troy State University; P-ASEL.

**CONE, MILTON L.**

*Associate Professor of Electrical Engineering; Chair, Department of Electrical and Computer Engineering, Prescott Campus.* B.S.E.E. and M.S.E.E., University of Missouri; Ph.D., Air Force Institute of Technology.

**DICKEY, ARCHIE**

*Associate Professor of Biology; Chair, Department of Global Studies, Prescott Campus.* B.A., Adams State College; M.S., Northern Arizona University; Ph.D., Arizona State University.

**ESLAMI, HABIB**

*Professor and Chair, Department of Aerospace Engineering, Daytona Beach Campus.* B.S., Iran University of Science and Technology; M.S., University of Arkansas; Ph.D., Old Dominion University.

**FAIRCHILD, ANN R., COLONEL, U.S. AIR FORCE**

*Professor of Aerospace Studies, Air Force, ROTC, Prescott Campus.* B.S., Arizona State University; M.S., Troy State University; M.S., National Defense University.

**FELTON, RICHARD F.**

*Professor of Aerospace Engineering; Associate Dean, College of Engineering, Prescott Campus.* B.S.M.E., West Virginia University; M.S.N.E. and Ph.D., Air Force Institute of Technology; Professional Engineer.

**FREDERICK-RECASCINO, CHRISTINA**

*Professor of Human Factors and Systems and Associate Provost.* B.A., State University of New York; M.S. and Ph.D., University of Rochester.

**FRIEND, MARK A.**

*Professor and Chair, Department of Applied Aviation Sciences, Daytona Beach Campus.* B.S., M.S., and Ed.D., West Virginia University.

**GALLY, THOMAS A.**

*Associate Professor and Chair, Aerospace Engineering, Prescott Campus.* B.S., M.S., and Ph.D., Texas A&M University.

**GRANT, CHRISTOPHER D.**

*Associate Professor of Civil Engineering; Associate Dean, College of Engineering and Chair, Freshman Program, Daytona Beach Campus.* B.S. and M.E., University of Louisville; Ph.D., Georgia Institute of Technology; Professional Engineer.

**GREENE, FRANCES**

*Associate Professor and Chair, Department of Human Factors and Systems, Daytona Beach Campus.* B.S., Wright State University; M.S.I.S.E., Ohio State University; Ph.D., Texas A&M University.

**HAMPTON, STEVE**

*Professor of Aeronautical Science and Associate Dean for Research, College of Aviation, Daytona Beach Campus.* B.S. and M.B.A./A., Embry-Riddle Aeronautical University; Ed.D., Nova University; C-ASMELIA; CFI-ASME-LA; AGI; A&P.

**HELFRICK, ALBERT**

*Professor of Engineering Technology and Chair, Departments of Electrical and Systems Engineering and Mechanical, Civil, and Engineering Sciences, Daytona Beach Campus.* B.S., Upsala College; M.S., New Jersey Institute of Technology; Registered Professional Engineer; FCC Radiotelephone Operators License, Radar Endorsement.

**HICKEY, MICHAEL P.**

*Professor of Physics; Associate Dean, College of Arts and Sciences, Daytona Beach Campus.* B.Sc. and Ph.D., Latrobe University.

**HOWELL, CASS D.**

*Associate Professor and Chair, Department of Aeronautical Science, Daytona Beach Campus.* B.S., Troy State University; M.S., University of Northern Colorado; Ed.D., University of Southern California; C-ASMELIA; CFI-ASE.

**JENKINS, JOHN**

*Professor of Mathematics; Associate Dean for Academic Support, Prescott Campus.* B.A., University of Tennessee; M.A.T., University of Florida.

**JERALDS, SEAN**

*Assistant Professor and Chair, Flight Department, Prescott Campus.* B.S. and M.S., Embry-Riddle Aeronautical University; SEL; MEL-I; CFII; MEI; AGI.

# Faculty and Administration

---

**KAIN, GEOFFREY**

*Professor of Humanities and Communications; Director of the Honors Program, Daytona Beach Campus. B.A. and M.A., Rosary College; Ph.D., Idaho State University.*

**LESSARD, DENNIS**

*Assistant Professor and Chair, Department of Aeronautical Science, Prescott Campus. B.A., Arizona State University; M.A., Central Michigan University.*

**LUEDTKE, JACQUELINE**

*Associate Professor of Aeronautical Science; Dean, College of Aviation, Prescott Campus. B.B.A. and M.B.A., Wichita State University; Ph.D., Oklahoma State University; CFI-I; C-ASMEI-I; AGI; IGI.*

**MANKBADI, REDA R.**

*Professor of Aerospace Engineering; Dean, College of Engineering, Daytona Beach Campus. B.S. and M.S., Cairo University; Ph.D., Brown University.*

**MC ELWAIN, PATRIC**

*Assistant Professor and Chair, Department of Humanities and Communications, Prescott Campus. B.A., Bryan College; M.A., Edinboro State University; Ph.D., Indiana University of Pennsylvania.*

**MOORE, ALAN R., CAPTAIN, U.S. NAVY**

*Professor of Naval Science, Navy ROTC, Daytona Beach Campus. B.S., University of Kansas; M.A., Naval War College.*

**NORDSTROM, BRIAN H.**

*Professor of Chemistry and Associate Dean, College of Arts and Sciences, Prescott Campus. B.A. and M.S., University of California, Berkeley; Ed.D., Northern Arizona University.*

**NORTHAM, GARY**

*Professor and Chair, Department of Safety Science, Prescott Campus. B.A. and M.Th., Harding University; Ph.D., the University of Nebraska.*

**OLIVERO, JOHN J.**

*Professor of Physics and Chair, Department of Physical Sciences, Daytona Beach Campus. B.S., Florida State University; M.S., College of William and Mary; Ph.D., University of Michigan.*

**PARKER, NANCY E.**

*Professor of Humanities and Communications, University Director of Diversity Advancement. B.A., Hollins College; M.A., Johns Hopkins University; Ed.D., University of Central Florida.*

**PETREE, DANIEL L.**

*Professor of Management; Dean of the College of Business, Daytona Beach Campus. B.S.B.A. and M.B.A., Rockhurst College; Ph.D., University of Kansas School of Business.*

**PIERCEY, RODNEY B.**

*Professor of Physics; Dean of the College of Arts and Sciences, Daytona Beach Campus. B.A., Center College of Kentucky; Ph.D., Vanderbilt University.*

**RABERN, DONALD**

*Professor of Aerospace Engineering; Dean of the College of Engineering, Prescott Campus. B.S., University of Utah; M.S. and Ph.D., University of Arizona.*

**REHBACK, RANDY**

*University Director of Flight Operations. B.S. and M.A.S., Embry-Riddle Aeronautical University; A&P; ATP; CE-500; CFI.*

**RHOADES, DAWNA L.**

*Professor of Strategy and Chair, Department of Management, Marketing, Strategy, and Operations, Daytona Beach Campus. B.A., University of Alabama, Huntsville; M.P.A., University of Washington; Ph.D., University of Houston.*

**RICHEY, FRANKLIN D.**

*Professor of Aeronautical Science, Associate Dean, College of Aviation, Daytona Beach Campus. D.B.A., Nova Southeastern University; ATP-ASMEL; AGI; IGI.*

**ROACH, RICHARD D.**

*Assistant Provost for Institutional Effectiveness. B.A., University of Houston; M.Div. and D.Min., Southwestern Baptist theological Seminary.*

**SAJJADI, SHAHRDAD**

*Professor and Chair, Mathematics Department, Daytona Beach Campus. B.Sc. and Ph.D., Coventry University.*

**SCHAEFER, MICHAEL P., MAJOR, U.S. ARMY**

*Professor of Military Science, Army ROTC, Daytona Beach Campus. B.S., Texas Tech University; M.S., Central Michigan University; M.M.A.S., Air University.*

**SCHRADER, THOMAS J., COLONEL, U.S. AIR FORCE**

*Professor of Aerospace Studies, Air Force ROTC, Daytona Beach Campus. B.A., University of Southern Mississippi; M.S., Golden Gate University; Command Pilot.*

**SHEHI, KAREN B.**

*Dean, Worldwide Center Operations, College of Career Education, Extended Campus. B.S., Kansas State University; M.S.A., Central Michigan University; Ed.D., Nova Southeastern University.*

**SIELAND, THOMAS E.**

*Dean, College of Career Education, Dean of Academics, Extended Campus. B.S., Florida State University; M.S., University of Michigan; Ph.D., Texas A&M University.*

**SINCLAIR, MARK R.**

*Associate Professor and Chair of Meteorology, Prescott Campus. B.S., Otago University, New Zealand; Ph.D., Naval Postgraduate School.*

**SMITH, DARREL W.**

*Professor of Physics; Chair, Department of Physics, Prescott Campus. B.A., M.A., and Ph.D., University of California, Irvine.*

**TOWHIDNEJAD, MASSOOD**

*Professor of Computing and Chair, Department of Computer and Software Engineering, Daytona Beach Campus. B.S.E., M.S., and Ph.D., University of Central Florida.*

**WATERHOUSE, SHIRLEY**

*Director of Educational Technology. B.S., University of Georgia; M.S., University of Central Florida; Ed.D., Nova Southeastern University.*

**WATRET, JOHN ROBERT**

*Associate Professor of Mathematics; Associate Provost. B.Sc., Heriot-Watt University; M.S. and Ph.D., Texas A&M University; P-ASEL.*

**WILLIAMS, MICHAEL J.**

*Professor of Management and Chair, Department of Economics, Finance, Accounting, Risk Management, and Information Systems, Daytona Beach Campus. B.S. and M.A.M., Embry-Riddle Aeronautical University; Ph.D., Nova Southeastern University; A&P; DME.*

# Faculty and Administration

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## Daytona Beach Campus Faculty

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### College of Arts and Sciences

---

**ABREU, RAFAEL E., LIEUTENANT, U.S. NAVY**

*Assistant Professor of Naval Science, Navy ROTC.* B.S., Embry-Riddle Aeronautical University.

**AGGARWAL, SHIV KUMAR**

*Professor of Physics.* B.Sc., M.Sc., and M.A., Panjab University; M.S., University of North Carolina; M.S. and Ph.D., Ohio University.

**AZEEM, IRFAN**

*Assistant Professor of Engineering Physics.* M.S., University of Michigan.

**BADRAN, STACIE**

*Assistant Professor of Mathematics.* B.S., M.S., and Ph.D., Florida State University.

**BALLARD, JONATHAN L., CAPTAIN, U.S. ARMY**

*Assistant Professor of Military Science, Army ROTC.* B.S., Western Kentucky University.

**BERHANE, BEREKET H.**

*Assistant Professor of Physics.* M.S. and Ph.D., Georgia Institute of Technology.

**BISHOP, CHARLES W.**

*Assistant Professor of Physics.* B.S., Stockton State University; M.S., University of Central Florida.

**BLANTON, GABRIEL C., LIEUTENANT, U.S. NAVY**

*Assistant Professor of Naval Science, Navy ROTC.* B.S., Embry-Riddle Aeronautical University.

**BLICKENSERFER, ELIZABETH L.**

*Associate Professor of Human Factors and Systems.* B.S., University of Nebraska, Kearney; M.S. and Ph.D., University of Central Florida.

**BOENER, HENRY B., COMMANDER, U.S. NAVY**

*Associate Professor of Naval Science, Navy ROTC.* B.S., United States Naval Academy; M.A., Naval Postgraduate School.

**BOGART, JESSE B., CAPTAIN, U.S. AIR FORCE**

*Assistant Professor of Aerospace Studies, Air Force ROTC.* B.A., U.S. Air Force Academy; M.S., Embry-Riddle Aeronautical University.

**BOQUET, ALBERT J.**

*Associate Professor of Human Factors and Systems.* B.A., Nicholls State University; M.A. and Ph.D., University of Southern Mississippi.

**BROWN, NORMAN M.**

*Associate Professor of Humanities, Social Sciences, and Psychology.* B.A. University of California, Berkeley; M.A., Middlebury College; M.A., Sonoma State University; Ph.D., Stanford University.

**BROWN, ROBERT S. JR.**

*Professor of Physics.* B.S. and M.S., Lowell Technological University; Ph.D., University of Connecticut.

**CAMARA, MOHAMED S.**

*Assistant Professor of Social Sciences.* Ph.D., Northwestern University.

**CAMERON, DAVID L.**

*Associate Professor of Chemistry.* B.A., University of Colorado; Ph.D., Colorado State University.

**CARNEY, JENNIFER**

*Instructor of Humanities.* B.A., Flagler College; M.A., Stetson University.

**CHIVINGTON, KEVIN D., CAPTAIN, U.S. AIR FORCE**

*Assistant Professor of Aerospace Studies, Air Force ROTC.* B.A., Miami University; M.B.A., Touro University.

**CLARK, BRETT M., MAJOR, U.S. ARMY**

*Assistant Professor of Military Science, Army ROTC.* B.S. and M.A.S., Embry-Riddle Aeronautical University; Senior Army Aviator; CI-AMEL; CI-HMEL.

**COLLINS, JAN S.**

*Associate Professor of Mathematics.* B.S., Embry-Riddle Aeronautical University; M.A., University of Central Florida; P-ASEL.

**CRAFT, STEPHEN**

*Associate Professor of Social Sciences.* M.A., Ohio University; Ph.D., University of Illinois, Urbana-Champaign.

**CUNNINGHAM, JAMES M.**

*Professor of Humanities and Communications.* B.A., University of Vermont; M.A.T. and M.A., Stetson University; Ed.D., Florida Atlantic University.

**DETORE-NAKAMURA, JOANNE**

*Assistant Professor of Humanities and Communications.* B.S., Utica College of Syracuse University; M.A., College of St. Rose; Ph.D., Southern Illinois University.

**DEVI, NIRMAL**

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<i>Robert N. Buck, 1981</i>	<i>John Paul Riddle, 1988</i>	<i>Steven M. Sliwa, 1998</i>
<i>Len Povey, 1982</i>	<i>Tony LeVier, 1989</i>	<i>Gordon M. Bethune, 1999</i>
<i>Robert F. Overmyer, 1985</i>	<i>James A. Justice, 1993</i>	<i>Edward W. Stimpson, 1999</i>
<i>Anesia Pinheiro Machado, 1986</i>	<i>David R. Hinson, 1994</i>	<i>Frederick W. Smith, 2001</i>
<i>Richard G. Rutan, 1987</i>	<i>Charlie Hilliard, 1995</i>	<i>James Raisbeck, 2005</i>
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