EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

Graduate Catalog
2003-2004

Leading the World in Aviation and Aerospace Education

EMBRY-RIDDLE
AERONAUTICAL UNIVERSITY

Master of Science in Aeronautics

Master of Aerospace Engineering

Master of Science in Aerospace Engineering

Master of Business Administration in Aviation

Master of Science in Human Factors and Systems

Master of Software Engineering

Master of Science in Safety Science

Master of Science in Space Science

Daytona Beach Campus
Embry-Riddle Aeronautical University
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Daytona Beach, FL 32114-3900
Graduate Admissions
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3700 Willow Creek Road
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2003-2004 CALENDAR

Fall Semester 2003 *(August 25 - December 11)*

August 20-22	Orientation and Registration - Prescott
August 27-29	Orientation and Registration - Daytona Beach
August 25	Classes begin - Prescott
September 1	HOLIDAY - Labor Day
September 2	Classes begin - Daytona Beach
November 7	University Day
November 26-28	HOLIDAY - Thanksgiving
December 4	Last day of classes
December 5	Study day
December 6, 8-10	Final examinations - Daytona Beach
December 6, 8-11	Final examinations - Prescott
December 13	Commencement

Spring Semester 2004 *(January 7 - April 29)*

January 5-6	Orientation and Registration
January 7	Classes begin
January 19	HOLIDAY - Martin Luther King Day
February 16	HOLIDAY - President's Day
March 15-19	HOLIDAY - Spring Break
April 22	Last day of classes
April 23	Study day
April 24, 26-29	Final examinations
May 1	Commencement

Summer Semester (Term A) 2004 *(May 6-June 21)*

May 4-5	Orientation
May 6	Classes begin
May 31	HOLIDAY - Memorial Day
June 17	Last day of classes
June 18	Study day
June 19, 21	Final examinations

Summer Semester (Term B) 2004 *(June 24 - August 9)*

June 22-23	Orientation
June 24	Classes begin
July 5	HOLIDAY-Independence Day
August 5	Last day of classes
August 6	Study day
August 7, 9	Final examinations

This 2003-2004 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, 2003, for all campuses.

Deadlines

	DAYTONA BEACH AND PRESCOTT CAMPUSES		
	Fall Semester 2003	Spring Semester 2004	Summer Semesters 2004
Admission			
For U.S. Students	7/01/03	11/01/03	3/01/04
For International Students	6/01/03	10/01/03	2/01/04
Graduation Application	10/27/03	3/11/04	7/01/04
Thesis Defense	10/27/03	3/11/04	7/01/04

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.

MESSAGE FROM THE PRESIDENT

Changes in technology are swift and frequent. At Embry-Riddle Aeronautical University, we pride ourselves on responding to these changes and, in many cases, leading the charge. We offer a number of challenging graduate degree programs in aviation, business, computer science, engineering, and human factors which prepare graduates to become effective leaders of aviation professionals in a rapidly growing and ever-changing environment.

Graduate students at Embry-Riddle associate with others who share their commitment to excellence. They learn and work with a faculty of distinguished aviation professionals, many of whom have enjoyed successful careers in aviation and remain at the forefront of the industry. And all of our students -- undergraduate and graduate alike -- participate with faculty on interdisciplinary research teams. This depth and breadth of experience gives students at Embry-Riddle a unique education and a link to lifelong learning.

To complement their classroom activity, Embry-Riddle offers students a range of research and study facilities. These include a large, diverse fleet of aircraft, modern laboratories in the Airway Science Simulation Laboratory, the Center for Aerospace Safety Education, the Center for Applied Human Factor Research, and the Lehman Engineering and Technology Center. Our Academic Computing Labs, Jack Hunt Memorial Library, and network of computing services are the envy of students and faculty across the country.

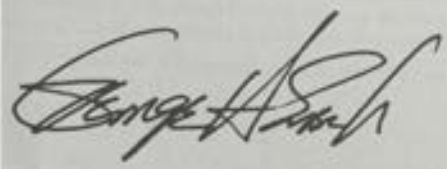
Our strong ties to the aviation industry ensure exciting off-campus work opportunities on government and industry projects across the United States and worldwide. Several million dollars in sponsored research funds from industry and government sources also provide our students with research assistantships and on-campus job opportunities.

We recognize that those who undertake graduate studies have varying schedules and study needs. To respond, we have diversified our offerings to allow almost anyone to pursue their educational goals. For those who can make a full-time commitment, we offer graduate programs at our residential Daytona Beach, FL, and Prescott, AZ campuses. For those who must combine their studies with current employment, we offer programs at more than 100 Extended Campus sites throughout the world. And for those who cannot come to us, our flexible distance learning technologies take the classroom to them.

As a member of the Embry-Riddle family, students learn to develop communication and teamwork skills, along with practical application of technical skills. That membership also includes help with their job searches from our Career Services office and our vast, influential alumni network.

A graduate education at Embry-Riddle provides students with the necessary tools to emerge successfully as leaders who are prepared to make a difference.

Best wishes for a success in your educational pursuits. I look forward to seeing you on campus.



George H. Ebbs,
President

PURPOSE OF THE UNIVERSITY

Embry-Riddle Aeronautical University is an independent, non-sectarian, non-profit, 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 graduates 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, non-credit 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

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 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 in Cincinnati, Ohio. The following spring the company opened the Embry-Riddle School of Aviation.

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.

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 510-acre site of a former college. With superb flying weather, expansive grounds, and many buildings, 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. 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.

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

In 1998 the University chose Dr. George H. Ebbs to become its fourth president in recognition of his experience and his vision for the future. Ebbs was also selected as a member of the Commission on the Future of Aeronautics and Space in Florida, established by the Florida state legislature. Embry-Riddle is the only university represented on the commission.

Ebbs was formerly the CEO and president of The Canaan Group, a management consulting firm to the commercial aviation industry. Other positions he has held include senior vice president of Booz-Allen & Hamilton Inc.; vice president and managing officer at Fry Consulting Group; and senior facilities engineer for the Boeing Company, where he worked on the supersonic transport proposal to the U.S. government. He also served on the faculties of Columbia University's Graduate School of Business and the Polytechnic Institute of Brooklyn.

Embry-Riddle is a global institution that holds a prominent position in aviation/aerospace education. The University is the world's largest independent aeronautical university and boasts a student body of 25,000 who come from all 50 states and more than 100 nations. The University offers more than 30 degree programs, with eight offered at the master's level. Embry-Riddle provides flexible educational services to thousands of working adults through the Extended Campus. Many students receive their degrees from more than 150 teaching centers and teaching sites located in the United States and Europe or through distance learning.

Accreditations and Affiliations

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 number: (404) 679-4501) to award degrees at the associate, bachelor's, and master's levels. The MBA/A program at the Daytona Beach Campus is nationally accredited by the Association of Collegiate Business Schools and Programs (ACBSP).

Research and Creative Activities

An important role for any university is the creation of new knowledge. At Embry-Riddle this function is closely tied to the graduate program with a strong emphasis on applied research. The University's up-to-date laboratories, wind tunnels, computer equipment, flight simulators, and fleet of aircraft provide a perfect setting for research projects involving students working under the direction of faculty members. Much of this work is funded by the University, but in the past several years the amount of externally funded work has been steadily growing. Areas of investigation include aerodynamics, acoustics, structures, propulsion, satellite development, space physics, aviation weather, simulation, pilot and air traffic controller training, human factors affecting the cockpit, air crew, the National Airspace System, software engineering, safety research, and aviation business management.

The pace of research in aviation and related fields at Embry-Riddle is expected to continue accelerating. Development and use of the extensive, and often unique resources available at the University will increase. The combination of the University's technically advanced resources, highly skilled faculty, staff, and students with strong spirits of inquiry, will make lasting contributions to air travel safety and efficiency, fulfilling in part Embry-Riddle's role as a world leader in aviation and aerospace higher education.

Graduate Students

Many graduate students have established careers in aerospace engineering, flight, aviation management, maintenance, maintenance management, air traffic control, computer science, software engineering, and engineering. Their experience enhances the interaction within the classroom by providing insight from their current experience within the military and civilian aviation and aerospace industry.

Embry-Riddle At A Glance

Alumni Association

Upon graduation, the alumni of Embry-Riddle Aeronautical University join a very "elite" network comprised of over 48,000 members who share that special bond of being an Embry-Riddle Aeronautical University alumnus. The Office of Alumni Relations maintains contact with this network, supplying services to the members of the alumni body, and providing opportunities to them through organized programs to assist themselves, their fellow alumni, and their alma mater.

Services and Opportunities Available to the Alumni:

Alumni Chapters: Alumni Chapters form the grass roots level of support for Embry-Riddle, promoting the welfare and interests of the University and its alumni in local communities across the nation and around the globe. They encourage alumni in their area to become acquainted, engage in community activities, take part in career networking opportunities, and enjoy social activities, all in the name of Embry-Riddle.

Career Networking: Where once students looked to their alma maters for help only in finding their first postgraduation jobs, more recently it has become customary for graduates to turn to their universities for job assistance throughout their careers. At Embry-Riddle, graduates may use the Career Services Office for assistance with resume development, tips on job searches, establishing a job file, and career networking.

Communications: The "Alumni Network Newsletter" provides the alumni with an up-to-date calendar of University events, athletic team scores and schedules, alumni class notes, and University happenings. The "Leader" is a bi-annual magazine that features in-depth stories on alumni, the industry, and the University. Communication with the University can also be maintained by means of the Internet. Embry-Riddle has a home page on the World Wide Web that can be accessed as *http://www.embryriddle.edu*.

The excellence of any educational institution depends heavily upon the quality, interest, and participation of its alumni. Embry-Riddle's alumni participate as guest speakers, serve on advisory councils, supply media experts, and are active in many other activities. They provide role models for the current students to emulate, thus continually elevating the status of the University. For more information, please contact the Office of Alumni Relations at (386) 226-6160, or (800) 727-3728.

Embry-Riddle's Statement of Values

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 line 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, national origin, physical disability, economic background, sexual orientation, or religious belief. We believe in a community where all members are welcome and are made to feel comfortable. We are intolerant of harassment of individuals or groups.

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

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.

CAMPUS INFORMATION

Daytona Beach Campus

The Daytona Beach Campus is located next to the Daytona Beach International Airport. The high-technology industry in the Orlando area, as well as nearby Kennedy Space Center, provide the University with an outstanding support base.

The Lehman Engineering and Technology Center on the Daytona Beach campus feature laboratories with the latest research and computer equipment. The building has subsonic and supersonic wind tunnels and a smoke tunnel as well as structures, materials, aircraft design, and composite materials laboratories. A grant from the National Science Foundation made possible the purchase of the first stereolithography unit to be used by students in this country. The revolutionary process lets design students produce prototypes of aircraft structures and test their designs in a short period of time.

Distance learning, a cornerstone of 21st century education at Embry-Riddle, is now available through an electronic link from the center to the Prescott campus. As a result, faculty members at one campus are able to teach students at another campus, enabling students at different locations to work together on joint projects. It also allows the University to demonstrate its world leadership in distributed design and management education.

Embry-Riddle is proud of its multi-million dollar Airway Science Simulation Laboratory at Daytona Beach, which simulates the elements of the National Airspace System. This center for aviation research and education contains state-of-the-art equipment used for instruction in air traffic control, pilot simulation, weather information, airports and airways, and pilot and aircraft performance.

The John Paul Riddle Student Service Center offers a full-service cafeteria, fully equipped bookstore, mailroom, health services, records and registration, parking office, Safety, information center, communication office, Flight Deck grill, Landing Strip snack bar, student activities offices, conference rooms, and the Department of Judicial Affairs.

Spruance Hall, at the main entrance to the campus, incorporates a floor plan designed for student convenience. The building houses the admissions office, student financial services, student employment, cashier, financial aid, career services office, and some classrooms. The offices of the President and Provost are also located in the building.

The Jack R. Hunt Memorial Library is a 48,000-square-foot facility with a seating capacity of 800. The building holds more than 90,000 books, as well as periodicals, documents, newspapers, microfilm,

media programs, and a historical aviation collection with materials from 1909 to the present. Complete service is provided seven days a week throughout the academic term, with extended hours during final examinations. A computer link is maintained with the Southeastern Library Network (Solinet), which connects thousands of libraries worldwide for shared cataloging, reciprocal borrowing of documents, reports, conference proceedings, journal articles, doctoral dissertations, and many other kinds of information.

Additional facilities include a multi-functional auditorium and instructional media center, a field house with adjacent athletic fields, and an Interfaith Chapel.

Prescott Campus

Home of the newest graduate program and located in one of the most picturesque portions of the Grand Canyon State only 100 miles north of Phoenix, the mile-high Prescott Campus covers 510 acres.

The Robertson Aviation Safety Center, located at Embry-Riddle's Prescott, Arizona Campus, is home to the University's newest graduate offering: the Master's degree in Safety Science. The Center also serves as the focal point for Aviation Safety education at Embry-Riddle. The Robertson Aviation Safety Center was made possible through the efforts and generous donations of world-recognized safety expert Dr. Harry Robertson.

A new addition to the building now accommodates two state-of-the-art classrooms, research facilities and faculty office space. Additionally, the Center boasts a nationally recognized "crash lab" containing several recreated accident sites that are used in many graduate and undergraduate accident investigation courses.

The year-round flying weather and the western community surrounding the campus in Prescott, Arizona, offer students an outstanding environment in which to study, fly, and enjoy recreational activities.

The Flight Training Center includes the flight operations center and simulator laboratory. Prescott enjoys over 300 days of clear flying weather a year. Flight instruction is provided in a modern, well-equipped fleet of single and multi-engine aircraft and flight simulation equipment. The Flight Department maintains a fleet of 52 aircraft, including the Cessna Skyhawk, Cessna 340, and Beechcraft Duchess. Flight simulation equipment include FRASCA and AST single-engine and multi-engine trainers and Boeing 727 full-motion simulators.

Campus Information

The King Engineering and Technology Center is the hub of the engineering programs of the Prescott Campus. A 20,000 square foot complex named for Ed King, founder of King Radio, the facility houses distance learning classrooms, Linear Circuitry Lab, Power Lab, Control Lab, Communications Lab and Senior Design Lab, conventional classrooms, and engineering and computer science faculty office space.

In addition to the labs located in the King Center, engineering students also work with a variety of other labs. The wind tunnel laboratory contains a research-quality subsonic wind tunnel with a 3x4 foot test section. In addition, a state-of-the-art 1x1 foot test section is used extensively to investigate the principles of aerodynamics. A modern supersonic wind tunnel and a shock tube allow investigations of flow with shock. A materials laboratory contains the latest equipment to study the properties of materials, including heat treatment. The engineering graphics and aircraft design labs have modern computer-aided design equipment. The aircraft structures and composite labs analyze structural aspects of aerospace vehicles and include an electron microscope capable of magnifying images 70,000 times.

Admission To The University

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 should the applicant fail 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.

Admission To The University

General Criteria

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. Such equivalency will be judged on the basis of past admission experience. Applicants educated at foreign schools must obtain 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 specific graduate program. Criteria for making this judgement 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.

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.

Program Specific Criteria

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 a 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 CGPA of 2.5 or higher.

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

An applicant's baccalaureate degrees 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 CGPA of 3.0 or higher.

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.

GRE exam, although not required, is strongly encouraged for this degree 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. Minimum score requirement is 450. 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 acceptance status. Coordinators may waive if another master's degree has been completed. The student should possess a strong academic record, generally evidenced by CGPA of 3.0 or higher.

Applicants must have a 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, please contact ETS at (609) 771-7330 or *www.mba.com*

Master of Science in Safety Science (MSSS)

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

- Psychology
- Statistics
- 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 CGPA of 2.75 or higher.

Master of Science in Human Factors and Systems

Applicants for admission to the MSHFS program must have a 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 2.75 or higher.
GRE exam, although not required, is strongly encouraged for this degree program.

Master of Software Engineering (MSE)

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

- Discrete Mathematics
- Data Structures and Algorithms
- Computing Systems (operating systems, computer architecture)
- Programming involving high-level language (e.g., 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 CGPA of 3.0 or higher, along with a creditable background in computing.

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 will be 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 general GRE and a subject test in physics, chemistry or mathematics is preferred to be part of the application, although not required. The student must possess a strong academic record, generally evidenced by CGPA of 3.0 or higher.

Conditional Admission

1. Students who fail to satisfy the guidelines for full admission, but who 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 performance. Students who are admitted conditionally will be on conditional status until they have completed nine hours of graduate work. During this period, students must maintain a B average or better, and receive no more than one grade of C and no grade of F. 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

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. Decision on any application will require a minimum of 45 days from the receipt of all application documentation.

Daytona Beach applicants should submit their applications for admission to:

Admission To The University

Embry-Riddle Aeronautical University
Graduate Admissions Office
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900
(800) 388-3728 - **or** - (386) 226-6115
FAX: (386) 226-7111
Financial Aid (800) 943-6279
email: gradadm@erau.edu
http://www.embryriddle.edu

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
http://www.embryriddle.edu

United States Citizens and Permanent Residents of the United States

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

1. **Completed application form and the application fee.** ($75 for U.S citizens and permanent residents or $100 for international applicants.)
   Please note: Permanent residents must provide a photocopy of their ARC (Alien Registration Card).
2. **Transcripts.**
   a) Official sealed transcripts for all college coursework, both undergraduate and graduate, from all colleges and universities attended (minimum of a bachelor's degree 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 interests and goals. This should be at least three or four paragraphs.
4. **Three endorser's references (recommendations),** two academic and one professional. Forms are included in the application booklet.

5. **Resume.** A current resume outlining your education, work experience, special activities and awards.
6. **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 *www.gmac.org*. Indicate school code number 5190.
   b) GRE scores, although not required by all programs, are desirable 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*. Indicate school code 5190.

Special Requirements for International Applicants

Embry-Riddle is authorized under federal laws to enroll non-immigrant alien students. An international applicant is defined as a nonresident, non-immigrant applicant entering the United States on an F-1 or J-1 student 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.
2. An evaluation of all college coursework earned outside of the United States. The University requires both a course-by-course and CGPA evaluation of all international transcripts. This evaluation must be completed by an international evaluation service approved by Embry-Riddle. We recommend that you explore the websites of our preferred providers of this service to learn more about this process: *www.jsilny.com, www.wes.org, www.ece.org*.

I-20 Requirements for International Students

Upon acceptance, international students must submit the following before an I-20 will be issued:

1. Completed request for I-20 (form will be provided) along with financial documentation.
2. Financial affidavit (form will be provided).
3. Supporting bank letter verifying at least $29,000 U.S. dollars on deposit plus $3,000 for each accompanying dependent **or** official notification of public or private sponsorship.
4. $5,000 tuition deposit.

Admission To The University

International students must be fully prepared upon arrival on campus to meet all normal living expenses and manage their finances throughout their stay.

Upon notification of acceptance for graduate study, international applicants must remit the required advance tuition deposit. Upon receipt of the deposit and financial documentation, the University will issue the Certificate of Eligibility (U.S. Immigration and Naturalization Service Form I-20). The I-20 Form must be in the students' possession before departure and presented to the nearest U.S. embassy or consulate to obtain the necessary entry visa before departure to the United States.

The foregoing 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 school to assist them with the transfer procedures.

Admission Time Limit

Applicants who have been accepted for admission into Embry-Riddle graduate programs must enroll in Embry-Riddle graduate courses within one year from the date of the letter notifying them of acceptance. Those who do not enroll within 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 admissions process may reactivate the application at any time up to one year from the date of acceptance. After one year, a new application, fee, and supporting documents must be submitted.

Admission Deposit For The Daytona Beach Campus

Students accepted for admission must submit a $150 advance tuition deposit, no later than 30 calendar days before matriculation. This deposit confirms admission to the University and is credited toward the first semester's tuition.

The deposit will be held in the student's account for one year should the student enroll during that year. After one year, the deposit is forfeited.

Credit for Prior Academic Work and For Courses Taken at Other Institutions

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 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 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 non-degree graduate work or as part of another (completed or non-completed) 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 twelve 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 (3.0 on a 4.0 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 within the seven year period immediately preceding the date the application is received at the appropriate admissions office.

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.

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

Intra-University Transfer

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.

The time required for the transfer of the necessary records is apt to be lengthy and students will not be allowed to attend classes until all elements of the process are complete. 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

Academic Regulations and Procedures

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

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

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

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 three 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.

Academic Regulations and Procedures

Schedule of Classes

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

Embry-Riddle Aeronautical University 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.
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

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

The normal maximum course load for graduate students is nine credit hours per term. If a student demonstrates exceptional acade-

mic 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

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
N	No grade submitted by instructor	N/A
P	Passing grade (credit)	N/A
IP	In Progress	N/A
S	Satisfactory (non-credit)	N/A
T	Transfer Credit	N/A

Grade Reports

Grade reports are issued at the end of each term. All reports of grades are mailed directly to the student at the most current address on file in the office of Records and Registration. 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 authorization must be granted each term because blanket authorizations are prohibited by law.

Unit of Credit

Semester credits are used throughout the University system. Transferred quarter hours will be converted to semester credit hours on the following basis: A quarter hour equals two-thirds of a semester hour.

Grade Point Averages: GPA, CGPA

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

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

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 within the number of credit hours required by their degree program, are normally required to register for one credit hour for every subsequent term.

Internship Grading

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

Dropping a Course

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)

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 during the add period only. They may change from credit to audit until the last day of the withdrawal period. When a student auditing a course fails to maintain satisfactory attendance, as determined by the instructor, a grade of W will be assigned.

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 Grades (I)

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 within 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

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

During their senior year, Embry-Riddle undergraduate students may take selected Embry-Riddle graduate courses, normally 500 level, for credit towards 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 2.5 CGPA to qualify for enrollment in the graduate courses while an undergraduate.

Academic Warning and Dismissal

Warning

Students on full-status 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 within the next twelve 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;
3. Earn an F in any two graduate courses;
4. Are on academic warning and fail to earn a 3.00 CGPA within the next twelve hours of graduate work;
5. Earn less than a 2.5 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 within 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.

Dismissal for Cause

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.

Withdrawal For Academic Misconduct

Students may be forced to withdraw from the University for habitual delinquency from class, habitual idleness, or any other situation or condition which prevents the student from fulfilling the purpose implied by registration at the University. Grades of "W" or "WF" (withdrawal) will be entered for each of the courses in which students were registered. Students who have been forced to withdraw must apply for readmission to the appropriate dean of academics in the same manner as a dismissed student.

Transfer Between Graduate Degree Programs

A graduate student may apply at any time to transfer from one program to another. A student must prepare a written petition to transfer from one degree program to another. 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

A graduate student is allowed to apply up to twelve 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

Catalog Applicability

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 re-apply 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 of the change of program petition was approved.

Degree Completion Time Limit

All requirements for an Embry-Riddle master's degree must be completed within seven years from the date of initial enrollment.

Loss of Graduate Status and Readmission

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:

A. A student voluntarily withdraws from the University.
B. A student is dismissed from the University and the dismissal becomes final.
C. 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.
D. 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

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

Graduation Requirements

The following summary of graduation requirements is provided for all students. An Embry-Riddle Masters 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 within 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 the degree requirements have been satisfied.

Graduation Honors

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

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

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 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.

Student Grievances

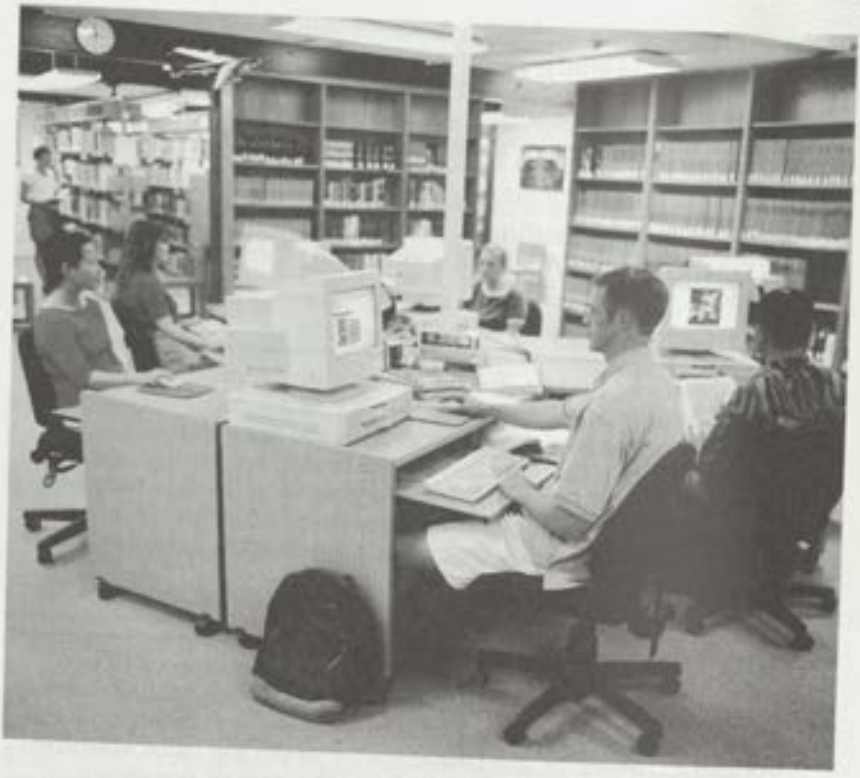
It is the policy of Embry-Riddle Aeronautical University to administer its educational programs in a fair, equitable, academically sound manner and in accordance with the appropriate regulations and criteria of its governing board, accrediting associations, and federal and state laws and regulations.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

Substance Abuse

Success in the aviation industry requires a commitment to excel and the discipline to avoid unsafe practices. The use of illegal drugs constitutes an unsafe practice and is incompatible with an aviation environment. Therefore, the University reserves the right to immediately suspend or dismiss any student who uses or possesses illegal drugs.

Embry-Riddle Aeronautical University 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 departments.

Financial Information



Financial Information

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 Campus students contact Student Accounting at (928) 777-3729.

Fall 2003/Spring 2004 Tuition

Detailed tuition rates are described in the 2003/2004 financial insert.

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

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

Fees

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

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

Financial Information

Refund Policy

Students who officially withdraw from all classes are eligible for 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 $200 housing processing fee)
International Student Service fee
Health Service fee
Technology Fee
Meal Plans – unused balance at time of withdrawal.

Withdrawal/Refund Schedule

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

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, military orders, etc.

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

Student Accounts

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, 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

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 website payment location. An ERAU online password must be used to access information. Payments made by mail should be addressed to the campus Cashier's Office and timed to arrive prior to the first day of class. If full payment cannot be made by this date, tuition payment agreements on outstanding balances are available. 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 student's name and identification number.

Books and Supplies

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's Office.

Financial Information

Delinquent Accounts

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's fees for making such collection. Delinquent accounts may be reported to one or all three major credit bureaus.

Financial Assistance

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.

The Financial Aid Office publishes a complete description of financial assistance programs and optional financing programs available to students and their parents annually. Students should consult this publication for information about eligibility criteria, application procedures, and deadline dates. 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

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

1. Be U.S. citizens or eligible non-citizens;
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, gradu-

ate students must register for a minimum of 6 graduate hours during the summer terms. Students may register for 6 graduate credit hours in one term, or 3 graduate credit hours in summer A and in summer B. Financial aid regulations do not consider 3 graduate credit hours as half-time during the summer terms.

4. Be making satisfactory 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

Financial applications are mailed to students after they apply for admission to the University. Renewal applications will be mailed to returning students by the Department of Education. Returning students who do not receive a renewal application may pick up their application materials at the Financial Aid Office. Notices will be posted on campus to remind students of the availability of the forms.

Extended Payments

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.

Financial Information

Programs Available

The major categories of financial assistance programs include loans, grants, scholarships, 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.

Loans

Federal—
- FSSL (Federal Stafford Student Loan)
- FUSSL (Federal Unsubsidized Stafford Student Loan

Employment

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

Financing Options
- EXCEL Loan
- Knight Extended Repayment Loan
- Educational Line of Credit
- Citiassist Optional Loan
- Key Bank Achiever Loan

Scholarships

University scholarships are awarded to students according to their academic achievement and high probability of success in an aviation career. Students may submit a Scholarship Application after completing at least one semester with a cumulative grade point average of at least 3.00. Scholarships are very competitive. For more information about scholarships, students should contact the Financial Aid Office of the campus they plan to attend.

Athletic Grants

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 ten 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

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).

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

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 residential campus students who remain on academic probation beyond two semesters and for Continuing Education students who remain on academic probation beyond two consecutive periods of 12 credit hours. The DVA will be appropriately notified of the unsatisfactory progress. A specific request must be submitted by the student to reinstate benefits. The DVA will determine eligibility for reinstatement of benefits.

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 courses, repeating a course, changing degree programs or enrollment status, and other actions may affect their eligibility to receive benefits.

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 administrative 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, and 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 is responsible to post availability of Graduate Assistantships. Students interested in applying should submit a resume directly to the department. Incoming students should contact departments directly for availability of assistantships.

Full graduate assistantships carry a stipend set by the University and a tuition waiver for up to nine (9) graduate credits per semester. Graduate assistants with such appointments are expected to devote twenty (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 six (6) graduate credits at Embry-Riddle for any semester of their appointment. Summer registration is not required, but encouraged.

Student Life and Services

Student Services and Activities

Embry-Riddle Aeronautical University 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

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 which is 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 of 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 of 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 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 107 in the John Paul Riddle Student Center or in Prescott in the lower level of the Student Hangar.

Delta Mu Delta

The Delta Mu Delta National Honor Society is a nationally recognized organization which 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 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.

Intramural and Recreational Sports

Intramural and Recreational Sports at each residential campus strives to create an atmosphere of competition and fun by offering 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 (i.e., 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.

Student Employment

The Student Employment office provides assistance to students seeking part-time 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 ERAU, 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 upon student workers for much of the work essential to sustain day-to-day operations.

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

Safety and Security

Safety and security at Embry-Riddle Aeronautical University 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 flight line. 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

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, that 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.

Student Life and Services

Disability Support Services

The University is committed to ensuring access and providing reasonable accommodation for students with documented disabilities who request assistance. The Director of Health Services is the coordinator of Disability Support Services at the Daytona Beach campus; 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 regarding eligibility concerns or campus-specific services.

Health Services

Maintaining good health promotes a productive university experience. The Health Services staff is committed to facilitating students' wellness through direct care, education and assistance with lifestyle modification.

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

Students must satisfy the mandatory immunization requirement prior to enrollment or participate in campus-based clinics. The Medical Report form supplied by University Admissions indicates those immunizations which students must document in order to register for courses and reside in university-managed housing.

Prospective flight students should be aware that certain sensory impairments, medical, neurobiological and psychological conditions and prescriptive medications might 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 regarding eligibility for medical certification.

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 about benefits and premiums is available at Health Services.

Counseling Services

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 that they are experiencing. Issues addressed in counseling vary from adjustment to college life, study skills, relationship problems, and stress, to more serious problems. Counseling is available without cost to students, and the content and records of sessions are confidential. For after hours and weekend emergencies, students may call Campus Safety at (386) 226-6480 for the Daytona Beach Campus, or (928) 777-6671 for the Prescott Campus. The safety dispatcher will attempt to contact a counselor who will promptly return the student's call.

Other services provided by the Counseling Center include:

- Consultation and referral
- Department web site
- Informational outreach via campus newspaper and/or bulletin boards
- Instruction programs
- Lending libraries
- Personal development groups
- Personal assessment services

Daytona Beach Eagle Card

The Eagle Card serves as a student's identification and is required for borrowing library books, cashing checks and attending University sponsored events. 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 bookstore, a designated 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.

Dining Services

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 conveniently located to 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

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"
Embry-Riddle Aeronautical
University
600 S. Clyde Morris Boulevard
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"
3700 Willow Creek Road
Prescott, AZ 86301-3720

All students, with the exception of the Executive MBA, are assigned a mailbox which they are required to check on a daily basis. University and personal communications are placed in the student mailboxes each day.

International Student Services

The Office of International Student Services assumes primary responsibility for the general welfare of international students. The staff conducts international student orientation to familiarize students with the University and the American educational system and also assists with local housing, transportation, and other adjustment arrangements. Services include advising related to immigration regulations, financial and personal matters, and preparation of specialized letters and documents required by foreign governments, sponsors, the U.S. government, and the University. The office coordinates campus and community programs and trips designed to facilitate cultural interchange. The Friendship Family Program matches students with community families to share friendship across cultures. A highlight of the year is International Day which features exhibits, food, and entertainment presented by students of the nationalities represented on campus. Foreign journals and newspapers are available in the office to help students stay informed of events in their countries. All international students are expected to check in on arrival with passport and immigration documents to the office, Student Center Annex, (386) 226-6579 for Daytona Beach students, or (928) 777-3774 for Prescott students.

Career Services Office

The Career Services office provides career resources and career development assistance to all students and alumni of Embry-Riddle Aeronautical University. 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 opportunities, current job listings and a web based resume referral service.

Industry/Career Expos are held in the fall on the Daytona Beach campus and in the spring on the Prescott campus. Over 100 companies visit the campuses to recruit students for both full-time and cooperative education, and to provide information on industry. On campus interviews are also scheduled year around.

The Career Services office employs a staff of Program Managers to provide one-on-one career guidance, counseling, 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 and Placement Service
Daytona Beach: (386) 226-6054
Prescott: (928) 777-3823
email: careers@erau.edu
http://www.embryriddle.edu

Embry-Riddle Language Institute

The Embry-Riddle Language Institute offers an intensive program in English as a second language for prospective students and other aviation professionals. Classes provide instruction for communication in reading, writing, speaking and listening, as well as courses focusing on grammar, computer skills, and TOEFL practice. Classes are small in the year-round program, providing opportunities for individual attention. A rich social and cultural program provides many opportunities for interaction with native English speakers and a computer laboratory provides additional learning options. Students who are successful in ERLI may earn a Recommendation for English Language Proficiency without a TOEFL score.

In addition, Embry-Riddle offers specialized courses in Aviation English.

To find out more information for the Daytona Beach Campus, please contact us at (386) 226-6192, or email us at: grazi384@erau.edu.

To find out more information at the Prescott Campus, call (928) 777-3827, or email us at: prerli@erau.edu.

ACADEMIC PROGRAMS

Academic Programs

Introduction

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 Aeronautical University 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, computer-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 within each degree program to tailor the curriculum to meet specific, individual career objectives. Classes are scheduled to accommodate both full and part-time study. Many of the graduate courses are non-sequential, 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

Graduate internships are externally funded, temporary professional or industrial work appointments available to graduate students in some programs. There are two types of internships: resident and non-resident. Resident internships are professional work activities supported by the University or industry, and conducted on-campus under the supervision of a faculty/staff sponsor. Non-resident internships are professional work activities conducted off-campus at the supporting organization facility, or equivalent. 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 12 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 accepted in the internship program must register for the approved number of credit hours in the appropriate departmental internship course, and pay all tuition and 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 normally be applied as an elective towards a degree program. Students are advised to consult with their graduate program coordinator for availability of internship credits, toward their specific degree program.

Thesis and Graduate Research Project Options

Requirements

Thesis and Graduate Research Project Option

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

Message from the Dean, College of Arts and Sciences, Dr. Rodney Piercey

Welcome from the College of Arts and Sciences. 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 non-traditional experiences to enhance learning including: cooperative education, industry internships, study abroad, and research involvement.

Our faculty are actively involved in research and scholarly activities often involving 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 which 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.

Master of Science in Human Factors and Systems (MSHFS)

DAYTONA BEACH CAMPUS

College of Arts and Sciences

DEPARTMENT CHAIR:
F. Greene

PROGRAM POINT OF CONTACT:
S. Doherty

INTRODUCTION

The Department of Human Factors and Systems offers graduate instruction leading to the Master of Science degree in Human Factors and Systems with distinct tracks in (a) human factors engineering, and (b) systems engineering. These programs are designed to meet the highest academic rigors (i.e., fully prepared for doctoral-level studies), while at the same time preparing the students for immediate employment in the real world of cost sensitive and operationally driven aviation/aerospace environments.

The human factors engineering 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 active participation 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 engineering 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 1) sensitive to operational feasibility during the early stages of system development, and 2) assumes the responsibility for user-centered life cycle engineering. Therefore, a major focus of the system engineering track is an appreciation of the total life cycle 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 engineering track produces graduates that 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 non-traditional applications.

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

Degree Requirements

Human Factors Engineering 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.

		Credits
HFS 700	Thesis	6

Total Required	**36**

Systems Engineering 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
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 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
TM 505	Computer Applications in Systems Management	3
TM 510	Project Development Techniques with Statistical Applications	3
TM 610	Managing Effective Technical Work Teams	3
TM 615	Planning for Systems Development and Operations	3
TM 645	Advanced Operations Research and Management Science	3
TM 645	Advanced Operations Research and Management Science	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.

		Credits
HFS 700	Thesis	6
Total Required		**36**

Master of Science in Space Science (MSSPS)

DAYTONA BEACH CAMPUS

College of Arts and Sciences

DEPARTMENT CHAIR:
J. J. Olivero

PROGRAM POINT OF CONTACT:
P. Erdman

INTRODUCTION

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, plasma and magnetospheric physics.

Degree Requirements

The curriculum consists of 15 credits of required course work, with an additional 18 credits of electives and/or thesis research. The core courses emphasize the heavily technical nature of the space sciences, and requires an undergraduate degree in Physics, Engineering, or a related field (such as Math or Chemistry) for preparation.

Option	Core Courses	Electives	Thesis	Total
Thesis	15	9	9	33
Non-Thesis	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

		Credits
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
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

Message from the Dean, College of Aviation, Dr. Tim Brady

The College of Aviation integrates into one unit the departments of Aeronautical Science, Applied Aviation Sciences and the Flight Training Department. This cohesive unit takes advantage of the various talents and expertise of faculty and staff within these related areas. By having these areas in one complex comprised 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, which provides 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 aircraft 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.

Master of Science in Aeronautics (MSA)

DAYTONA BEACH CAMPUS

College of Aviation

DEPARTMENT CHAIR:
M. Friend

PROGRAM POINT OF CONTACT:
M. Smith

INTRODUCTION

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 unequaled 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.

There are five specializations from which the student may choose: Aviation/Aerospace Education Technology, Aviation/Aerospace Management, Aviation/Aerospace Operations, Aviation/Aerospace Safety Systems, and Human Factors in Aviation Systems. Students must complete the Advanced Aviation/Aerospace Science core consisting of twelve credits. Students then complete twelve credits which 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.**

Degree Requirements

Aviation/Aerospace Education Technology Specialization

Advanced Aviation/Aerospace Science Core		Credits
MSA 602	The Air Transportation System	3
MSA 603	Aircraft and Spacecraft Development	3
MSA 604	Human Factors in the Aviation/Aerospace Industry	3
MSA 605	Research Methods and Statistics	3

Education Technology Specialization		Credits
Students must complete 12 credit hours from the following list of courses:		
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		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 Management Specialization

Advanced Aviation/Aerospace Science Core		Credits
MSA 602	The Air Transportation System	3
MSA 603	Aircraft and Spacecraft Development	3
MSA 604	Human Factors in the Aviation/Aerospace Industry	3
MSA 605	Research Methods and Statistics	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)	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
(At least 18 credits must be MAS courses) 36

Aviation/Aerospace Operations Specialization

Advanced Aviation/Aerospace Science Core

		Credits
MSA 602	The Air Transportation System	3
MSA 603	Aircraft and Spacecraft Development	3
MSA 604	Human Factors in the Aviation/Aerospace Industry	3
MSA 605	Research Methods and Statistics	3

Operations Specialization		Credits
Students must complete 12 credit hours from the following list of courses:		
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
BA 511	Operations Research	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
MAS 603	Aircraft and Spacecraft Development	3
MSA 604	Human Factors in the Aviation/Aerospace Industry	3
MSA 605	Research Methods and Statistics	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

Option I		Credits
MSA/BA	Electives	
	AND	6
MSA 700	Thesis	
	OR	6
Option II		
MSA 690	Graduate Research Project	
	AND	3
MSA/BA	Electives (500-600 Level)	9
Total Required		36

Human Factors in Aviation Systems Specialization

Advanced Aviation/Aerospace Science Core

		Credits
MSA 602	The Air Transportation System	3
MSA 603	Aircraft and Spacecraft Development	3
MSA 604	Human Factors in the Aviation/Aerospace Industry	3
MSA 605	Research Methods and Statistics	3

Human Factors Specialization

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

		Credits
MSA 634	Aviation/Aerospace Psychology	3
MSA 643	Management of Research and Development for the Aviation/Aerospace Industry	3
MSA 660	Sensation and Perception	3
MSA 661	Human-Computer Interaction	3
MSA 663	Memory and Cognition	3
MSA 665	Applied Experimental Design	3

Electives

Option I		Credits
MSA/BA	Electives	
	AND	6
MSA 700	Thesis	
	OR	6
Option II		
MSA 690	Graduate Research Project	
	AND	3
MSA/BA	Electives (500-600 Level)	9
Total Required		36

College of Business

Message from the Dean, College of Business, Dr. Daniel Petree

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 ACBSP (the Association of Collegiate Business Programs and Schools) for all our degree programs.

The College consists of two departments, the department of management, marketing, strategy and operations and the department of economics, finance, accounting and risk management. Both of these departments are responsible for designing and delivering our MBA Programs.

We offer the only Masters in Business Administration in Aviation (MBA/A) in the United States. This degree is intended to provide individuals who already hold undergraduate degrees, often in technical areas like engineering, with the tools necessary to become a credible professional manager in aviation, aerospace or related industry. 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.

Master of Business Administration in Aviation (MBA/A)

DAYTONA BEACH CAMPUS

College of Business

DEPARTMENT CHAIR:
D. Petree

PROGRAM POINT OF CONTACT:
B. Waguespack

INTRODUCTION

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 the wide variety of specified electives. By combining these focused electives into a distinct set, students may select a unique area of specialization within 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 the 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 flexibility 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 within 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 via 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.

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
Total Core Hours		**27**

Specified Electives (students must complete a combination of 12 hours from the courses listed below)		**Credits**
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
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 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 (students must complete these six hours)

BA 645	Airport Operations and Management	3
BA 651	Strategic Airport Planning	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 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**	3
BA 699	Special Topics in Business Administration	1-3
BA 700	Thesis	1-3
MSA 508	Advanced Airport Planning	6
MSA 613	Airport Operations Safety	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 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.

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**	3
BA 699	Special Topics in Business Administration	1-3
BA 700	Thesis	1-3
MSA 508	Advanced Airport Planning	6
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.

Executive Master of Business Administration (EMBA)

(The Executive MBA is closed to new students.)

DAYTONA BEACH CAMPUS

College of Business

Department Chair:
D. Petree

Program Point of Contact:
B. Waguespack

Introduction

The Executive MBA is a 14-month program is 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, both individual and group assignments and, finally, the comprehensive Executive Project. During these interim periods, participants remain in contact with professors and one another via phone, fax, email and 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 forthcoming 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 and objectives of the University's MBA in Aviation by providing a solid foundation of knowledge in such areas as strategic management, leadership, communication, teamwork, as well as other mainstream 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 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.

Degree Requirements

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
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
Total Required		**51**

College of Engineering

Message from the Dean, College of Engineering, Dr. Ray Mankbadi

The College of Engineering at Embry-Riddle offers masters 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 concentrations areas, such as Safety critical software development, Computational Aerospace Propulsion and Aerodynamics, Astronautical Engineering, and Aeronautical Structures & Materials. The College also holds many seminars and workshops for engineering students with both 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.

Master of Science in Aerospace Engineering (MSAE)

Master of Aerospace Engineering (MAE)

DAYTONA BEACH CAMPUS

College of Engineering

DEPARTMENT CHAIR:
E. HILL

PROGRAM POINT OF CONTACT:
L. NARAYANASWAMI

INTRODUCTION

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 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 prepares them for the aerospace engineering profession, or that prepares them to continue on to doctoral studies.

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

DEGREE REQUIREMENTS

MSAE (thesis option)
3 hrs. Engineering Analysis
18 hrs. Electives
9 hrs. Thesis

30 hrs

MAE (non-thesis option)
3 hrs. Engineering Analysis
27 hrs Electives (at least 9 hours should be 600-level)

30 hrs

Areas of Concentration:

Aeronautical 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 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 612	Analysis of Aircraft Plate and Shell Structures
AE 616	Advanced Aircraft Structural Dynamics
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

Astronautics and Control
This area includes: Space Vehicles, Space Power, and Systems Control.

Electives for Astronautics Concentration:

AE 508	Heat Transfer
AE 524	Rocket Engine Propulsion Systems
AE 526	Engineering Optimization
AE 606	Finite Element Aerospace Applications
AE 620	Boundary Layer Theory
AE 646	Nonlinear Dynamical Systems and Chaos

*Master of Software Engineering (MSE)**

DAYTONA BEACH CAMPUS

College of Engineering

DEPARTMENT CHAIR:
T. HILBURN

PROGRAM POINT OF CONTACT:
D. Gluch

INTRODUCTION

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 in the cutting edge of modern software development. Software engineers who complete the program can rapidly assume positions of substantial responsibility within 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 the 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 provide graduates with an in-depth understanding of tools and techniques, along with 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 communications 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 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 course work.

The curriculum is structured into two groups of courses: core (15 credits) and specified electives (15 credits). Students may elect to complete a graduate research project in lieu of three (3) credit hours of electives. 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.

* A five-year Computer Science/Master of Software Engineering program is available. Please see the undergraduate catalog for details.

Degree Requirements

Required Courses		Credits
Students must complete 15 credit hours of core courses.		
MSE 500	Software Engineering Discipline	3
MSE 510	Software Project Management	3
MSE 530	Software Requirements Engineering	3
MSE 555	Object-Oriented Software Construction	3
MSE 610	Software Systems Architecture and Design	3

Specified Elective Courses		Credits
Students must complete 12 to 15 credit hours from the following list of courses:		
MSE 520	Formal Methods for Software Engineering	3
MSE 535	Graphical User Interface Design and Evaluation	3
MSE 545	Specification and Design of Real-Time Systems	3
MSE 550	Current Trends in Software Engineering	3
MSE 580	Software Process Definition and Modeling	3
MSE 585	Metrics and Statistical Methods for Software Engineering	3
MSE 590	Graduate Seminar	3
MSE 625	Quality Engineering and Assurance	3
MSE 640	Concurrent and Distributed Systems	3
MSE 650	Software Safety	3
MSE 655	Performance Analysis of Real-Time Systems	3
MSE 660	Formal Methods for Concurrent and Real-Time Systems	3
MSE 699	Special Topics in Software Engineering	3

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

Thesis/Graduate Research Project		Credits
MSE 690	Graduate Research Project	3

In addition to 15 credit hours of core courses, students must take 15 credit hours of electives - **or** - 12 credit hours of electives and a graduate research project. If the graduate research project is selected, students must consult with their advisor and the MSE Program Coordinator for the most recent requirements on how to conduct their graduate research project.

Total Required	30

College of Aviation

PRESCOTT CAMPUS

Message from the Dean, College of Aviation, Dr. Randy Johnson

The College of Aviation is comprised of the Department of Aviation Sciences, Department of Meteorology, Department of Safety Science, and the Department of 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 investigation.

The college has an enrollment of approximately 800 students and a fleet of 52 aircraft, including Cessna 172s, Piper Seminoles, Beechcraft Bonanzas, and Cessna 340s. The College also has state-of-the-art Level 6 Cessna 172 and PA 44 Flight training Devices.

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.

Master of Science in Safety Science (MSSS)

PRESCOTT CAMPUS

College of Aviation

Department Chair:
T. Stobbe

Program Point of Contact:
M. Fogleman

Introduction

The Master of Science in Safety Science (MSSS) degree program is designed to provide the safety and aviation professional with an experiential and practical educational experience to enhance the practice of occupational health and safety. The degree will produce safety professionals who are (1) skilled in providing safety management expertise, and (2) who can provide leadership and guidance in compliance issues involving EPA, OSHA, DOD, FAA, DOE and state health, hygiene, and workplace standards. These safety professionals will be prepared for service in either the aviation/aerospace industry or other industries and organizations.

The MSSS degree prepares graduates for several professional job settings such as: director of safety in industry and in government, operational and maintenance safety personnel, aviation or industrial safety personnel, flight safety personnel, aircraft accident investigators, designers, and manufacturers in technological industries including aerospace. It offers an opportunity to explore not only the theoretical, but the hands-on and pragmatic discipline that occupational health and safety has become. Particularly in light of the public and government interest in safety within the aerospace and technical industries, 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 Safety Science Core (12 credit hours), a Research Core (6 to 9 credit hours), and electives (15 to 18 hours).

Entry into the MSSS program requires possession of an undergraduate foundation in the areas of college-level mathematics, physical and natural science, introduction to computer applications, behavioral science, and statistics. Students who lack prerequisite knowledge in one of the following areas may be asked

to register for deficiency coursework: algebra and trigonometry, basic calculus, statistics, physics, chemistry and/or biological science. The prerequisite knowledge for any graduate course must be satisfied before enrollment in the course is permitted.

Degree Requirements

Courses		Credits
Safety Science General Core		
MSF 580	Industrial Hygiene and Environmental Protection	3
MSF 601	Ergonomics	3
MSF 602	Human Factors	3
MSF 603	Occupational Safety	3
Total Credits		**12**
Safety Science Research Core		
MSF 604	Quantitative Methods in Occupational Safety and Health **- and -**	3
Option 1		
MSF 700	Thesis **- or -**	6
Option 2		
MSF 690	Graduate Research Project	3
Total Credits		**6-9**
Electives		**15 - 18**
MSA 602	The Air Transportation System	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 615	Aviation Safety and Health Program Management	3
MSF 630	Aircraft Accident Analysis	3
MSF 635	Advanced Aircraft Survivability Analysis and Design	3
MSF 645	Aircraft Fire Survivability Analysis and Design	3
MSF 655	Airline and Operations Safety Management	3
MSF 675	Aviation Maintenance Safety	3
MSF 680	Integrated Safety Operations	3
MSF 685	Aviation Security	3
MSF 686	Emergency Preparedness and Preplanning	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

Special Academic Programs and Opportunities

Study Abroad

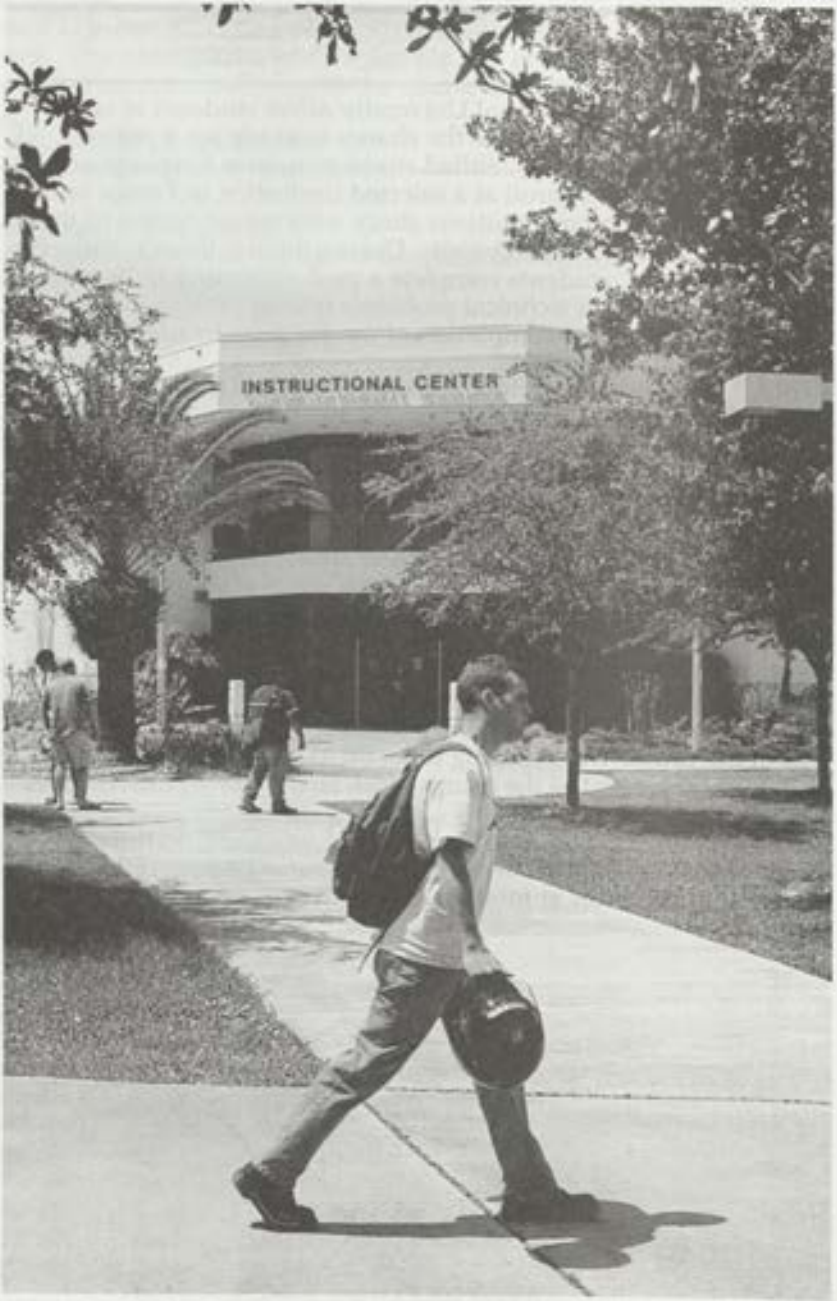
Embry-Riddle Aeronautical University offers students in engineering and computer science the chance to study for a year in Europe at minimal cost. Qualified students receive language and cultural training and enroll at a selected institution in France or Germany. While abroad, students study subjects applicable to their degree programs at the University. During the last three months of their year abroad, students complete a paid internship in European industry, working on technical problems related to their field of study. After successful completion of the program, students receive the Euronational Certificate.

ERAU is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia, 30033-4097: Telephone number 404-679-4501) to award associate, bachelors, and masters degrees. International exchange partner institutions are not accredited by the Commission on Colleges and the accreditation of ERAU does not extend to or include the partner institutions or their students. Although ERAU accepts certain partner institution course work in transfer, other colleges and universities may not accept this work in transfer, even if it appears on a transcript from ERAU. Each institution decides for itself whether to 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 course work leading to an ERAU undergraduate degree, or at least 50 percent of the course work leading to an ERAU graduate degree.

Five-week, Summer Term Abroad programs on three different continents offer students in all programs opportunities for academic experiences at foreign universities.

COURSE DESCRIPTIONS



Course Descriptions

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

AE	Master of Aerospace Engineering/ Master of Science Aerospace Engineering
AED	Aviation Education
BA	Master of Business Administration in Aviation
EMBA	Executive Master of Business Administration
EP	Engineering Physics
HFS	Master of Science in Human Factors and Systems
MA	Mathematics
MSA	Master of Aeronautical Science
MSE	Master of Software Engineering
MSF	Master of Science in Safety Science
TM	Master of Science in 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.

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 anistropic 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 algorighms and he method of simulated annealing and their applications in search 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 upon 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.

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, multi-spool fan jet, variable cycle engines, and bypass air-breathing propulsion systems. Design and off-design performance analysis, theory and design of inlets, compressors, burners, and turbines. Component matching, cooling, regenerative systems, test methods and corrections. Engine poststall 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 the thermoelasticity. Thermal structures problems; Rods, Beams, and Plates. Thermally induced vibration. Thermal buckling. Thermoviscoplasiticity.

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 sixty 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.

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 work place. 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 sixty hours of research for each credit hour. Prerequisite: Graduate standing.

AE 700

M.S.A.E. Thesis
9 Credits

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 sixty in-service points. These courses may not fulfill other States' Department of Education requirements.

AED - Aviation Education

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, and 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 which have been identified as essential prerequisite knowledge for a graduate student enrolled in the MBA/A degree program to successfully complete the course work. The course is broken down into six stand-alone modules in the discipline areas of management/quantitative methods, marketing/accounting, and economics/finance. Each student will only take those modules which have been 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 within 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. 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 and financial engineering, swaps, options and 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 which have a direct impact on management in the aviation industry. The emphasis is on human development and the development of effective work elements,

as well as the personnel concerns which must be resolved for successful leadership. Topics will provide insights to 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 management information systems within the aviation industry. Emphasis is placed on the use of computers as an information processor, decision tool, and as 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 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 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.

BA - Business Administration

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 upon 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 all activities that create goods and services within 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 within 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 organization and staffing. Managing workforce diversity is examined from culture-based and comparative perspectives, along with the function of control through the examination of effective control systems for overseas operations that ensure environmental interdependence through social responsibility and ethical behavior. 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. Prerequisite: Successful completion of Business Foundation courses and/or permission of 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 scheduling 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 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.

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. Prerequisites: 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. Within the course, a number of management tools, emphasizing computer software applications, used in strategic airport planning, will be introduced. Prerequisites: Successful completion of either BA 645 - Airport Operations and Management, BA 609 - Airline Operations and Management or BA 6BB - 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 instru-

ments, 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 which 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: ABA 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 work place. They are academic/professional activities coordinated by the University between offering organizations and 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.

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.

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, 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 utilized for performance assessment and resource allocation within 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 economic 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 that 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 organization 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 multi-cultural 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 within 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.

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 strate-

gies 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.

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.

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 - Human Factors and Systems

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. Prerequisites: 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 non-experimental 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 same as MSA 665.)

HFS 515

Ergonomics
3 Credits

This class will address the basic concepts of ergonomics and their application to 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 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 related 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 multimodel 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 the 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.

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 sensory and perceptual phenomena. Attention will be paid to all of 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 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.
Prerequisites: Completion of an undergraduate course in the area memory and cognition. (This course same as MSA 663.)

HFS 625

Applied Testing and Selection
3 credits

Issues in selecting and testing applicants for a broad range of aviation and related industries positions is the focus of this course. An examina-

tion 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 addressed applied cognitive science, that draws on the knowledge and techniques of cognitive psychology and related disciplines to provide the basis for principle-driven design. Specifically it will address human cognitive behavior in complex worlds, that exist without the artificial boundaries of the laboratory. It specifically addresses those worlds where there have multiple agents (i.e., cognitive systems) and which are problem driven and tool constrained. The course will also address 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.

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 required part of this course. Prerequisites: Completion of an undergraduate course in human factors or human/computer interaction. (This course same as MSA 661.)

HFS 640

Aviation/Aerospace Psychology

3 Credits

This is a survey course that 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, crew resource management, and other areas of current interest. The topic areas change from semester to semester depending on the focus of cur-

rent 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 of 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, visual momentum will be read and critically discussed. The course pay 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 both an 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 (e.g., 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: certification an airliner, safety of complex systems and on-board software. This class is only offered 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: human factors of air transport safety and quality approval and concept. This class is only offered 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 only offered 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. 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's 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. Prerequisite: Completion of all core courses in Human Factors Engineering track or Systems Engineering track.

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 503

Mathematical Methods
3 Credits

Visual representation of data; fitting curves to data; single variable calculus; differentiation and integration; functions of several variables; level curves and level surfaces; partial derivatives; vectors and matrices; gradient; directional derivative; maximum/minimum for functions of two variables; multiple integration; Lagrange multipliers; linear systems of equations; matrix operations, LU-decomposition; eigenvalues and eigenvectors.

MA 504

Theory of the Potential
3 Credits

Potential theory and Green's function. Method of characteristics and solution in the large 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, oulier 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.

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 503.

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 nonparametric 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 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.

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 511

Earth Observation and Remote Sensing
3 Credits

U.S. and international solar system exploration programs are reviewed and related to the current and proposed Earth-research projects. Examination of these research programs will be structured towards defining problems related to environmental changes and resource exploration. Formatted research data from Earth-resource satellites and EOS sources will be used for demonstrating specific research techniques, exploration methods, and economic and social elements of exploration. Prerequisite: Demonstrated knowledge of spacecraft or satellite operations.

MSA 512

Space Mission and Launch Operations
3 Credits

This course introduces the student to launch, mission operations, and facilities for manned and unmanned missions at U.S. and foreign sites. Satellite and spacecraft launch facility system discussion covers safety, meteorology, communications and tracking, navigation and control systems. Examples of mission control, operations, and systems include spacecraft project descriptions, and control site operations. Computer-based simulation instruction provides mission- and site-specific operation detail. Prerequisite: Demonstrated knowledge of spacecraft or satellite operations.

MSA 513

Space Habitation and Life Support Systems
3 Credits

This course addresses the problems related to space-flight induced changes in the major body systems which need to be solved in this decade, to develop countermeasures for maintaining the health of crewmembers on long duration space operations. Physiological elements of zero gravity environment, radiation hazards, and protection measures are explored, along with physical and chemical closed-loop life support systems for long duration space missions. More elaborate life support systems for larger manned missions and colonies are outlined for further student development. Prerequisite: Demonstrated knowledge of manned spaceflight programs.

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 - Aeronautical Science

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, from 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, are examined in detail.

MSA 516

Applications in Crew Resource Management
3 Credits

This course will examine the common concepts of Crew Resource Management (CRM) as developed by major air carriers and explore the theoretical basis of such training. Topics such as supervision of crewmembers, counseling, manner and style, accountability, and role management will be studied. Each student will have 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 will use simulators and computer-based instruction to supplement their academic instruction.

MSA 517

Advanced Meteorology
3 Credits

Course topics include the derivation and application of the hydrostatic equation, atmospheric kinematics, derivation of the equation of continuity, development of thermal wind, fundamental weather analysis, high altitude and radar meteorology, air pollution, and solar impact on weather. The student practices current weather analysis and short range weather forecasting using much of the latest equipment available in aviation. Prerequisites: Demonstrated knowledge of mathematics and basic meteorology.

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, its historical and philosophical foundations.

MSA 560

Rotorcraft Operations
3 Credits

The course introduces the complexities of rotary wing flight systems and

the advancements made to overcome them. The unique problems facing an organization involved in rotorcraft operations are studied from the initial inception of a program to the government rules and regulations, environmental and noise considerations, special landing and take-off facilities, flight and maintenance ratings, and techniques of control. Special consideration is given to the unique problems and issues facing such rotorcraft operations as police, medical evacuation, forestry service and corporate aviation.

MSA 570

Advanced Avionics
3 Credits

An advanced study of electronic communication, navigation, and landing equipment used in aircraft and spacecraft is the basis for this course. Discussions will include electronic pulse type equipment, surveillance systems, low frequency and area navigation systems, flight control systems, and systems integration. Prerequisite: Demonstrated knowledge of avionics systems.

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 will have a different topic each term depending upon 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 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, multi-modal 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 to include 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 will emphasize 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 the 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 that includes the evolution of current national policies, 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 sub-systems. 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, and 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 utilized. 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 the student 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.

MSA 612

Aviation/Aerospace Industrial Safety Management
3 Credits

The Aviation/Aerospace Industrial Safety Management 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. Prerequisite: 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 procedures 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 certificator/regulator. The study of the process begins with demand analysis and continues through purchase contracting, manufacturing, marketing, certification, pre-delivery activities, and introduction into service. Prerequisites: Demonstrated knowledge of management principles and economics.

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. Prerequisite: 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 utilized 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. (Same course 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; color and sound. Prerequisite: Demonstrated knowledge of the use of computers, including programming familiarity with a high-level language.

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—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. (Same course 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 within 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. (Same course as HFS 510.)

MSA 690

Graduate Research Project
3 Credits

A written document on an aviation/aerospace topic which 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 work place. 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.

MSE - Software Engineering

MSE 500

Software Engineering Discipline

3 Credits

This course introduces students to the concepts and methods for a disciplined software engineering process. Students will be introduced to the scales down industrial practices for planning, tracking, analysis, and defect management to fit the needs of small-scale program development. The course demonstrates how small project disciplines provide a solid base for larger projects and how it provides a framework for a statistically managed software engineering discipline. Also discussed is the cost and benefit of a Personal Software Process (PSP). Students will work individually to complete the course assignments. Prerequisite: Practical knowledge of a modern programming language (e.g., Ada, C, C++).

MSE 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. Prerequisites: Basis knowledge of computer science. Prerequisite/Co-requisite: MSE 500.

MSE 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 the use of formal methods throughout the software life-cycle. Prerequisite: CS 222 or consent of instructor.

MSE 530

Software Requirements Engineering

3 Credits

This course is concerned with the software engineering process of determining what is to be produced and the products generated as a result of following the process. Software requirements engineering is studied as a three step process of requirements, elicitation, analysis/validation and specification. In-depth study of methods such as Prototyping and Scenario Analysis for requirements elicitation, Object- or Function-Oriented methodologies and Quality Function Deployment for requirements analysis and validation, and standards such as ANSI/IEEE Std 830 and DoD 2167A for requirements specification. The course also includes use of Computer Aided Software Engineering (CASE) tools and review techniques (e.g., Peer Review, Inspection, Structured Walkthroughs) in requirements engineering of software systems.

Students will participate in individual and group projects on performing software requirements engineering task. In addition, the course requires definition and development of a process guidelines for requirements engineering task. Prerequisite/Corequisite: MSE 500.

MSE 535

Graphical User Interface Design and Evaluation
3 Credits

An introduction to designing, implementing, and evaluating computer-human interfaces with emphasis on graphical user interfaces. The approach is both theoretical and practical. Students participate in small team development of a prototype graphical user interface, using an available interface design software tool such as TAE. A paper evaluating a graphical user interface, as described in the literature and/or evidenced in existing software is required.

MSE 545

Specification and Design of Real-Time Systems
3 Credits

This course addresses basic concepts and methods used in software specification and design of concurrent and real-time systems. The characteristics of concurrent and real-time systems, the role of software design in software development. Review and comparison of a number of software design methods specifically suited for concurrent and real-time systems will be explored. Two of the methods will be analyzed in detail and some case studies will illustrate the design process. The course material may require research in real-time aspects of software design and to produce appropriate reports. Prerequisite: MSE 500.

MSE 550

Current Trends in Software Engineering
3 Credits

Current techniques, methods, procedures and paradigms of software engineering are studied. Students perform literature searches and prepare written and oral reports on current software engineering practices. Prerequisite: MSE 500.

MSE 555

Object-Oriented Software Construction
3 Credits

This course addresses 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. It discusses and evaluates the suitability of different software development life cycles for object-oriented paradigm. Also covered in the course are object-oriented metrics and case studies in object-oriented software development. Prerequisites: MSE

500, proficiency in use of modern programming languages (e.g., Ada, C, C++).

MSE 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, engineering of process, enactment of the processes, and description of the process properties. Other subject related to process definition covered are Process, Process Step, Process Element, and Process Script. The course also addresses various representation to process modeling, such as text-based, template-based, and graphical-based. Executable presentations, in the form of process program, are studied. These executable presentations include process definition and modeling tools, such as State Transition Diagrams, Entry-Task-Validation-Exit, Statecharts, and Petri-Nets, and automated tools for process representations. Prerequisite: MSE 500 or Consent of instructor.

MSE 585

Metrics and Statistical Methods for Software Engineering
3 Credits

This course is concerned with three related 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-metrics and Quality Function Deployment paradigms for guiding measurement efforts. Statistical methods along with Statistical Process Control (SPC) tools such as Control Charts, Fishbon Diagram, scatter Diagrams and advanced subjects such as Taguchi's Robust Design technique and their application in software engineering are covered. Also explored are the concepts of experimental design, analysis of experiments, model building, ethics and presentation of experiments. Prerequisite: MSE 500 or consent of instructor.

MSE 590

Graduate Seminar
3 Credits

A study of the current advancements in a particular field of software engineering as determined by the instructor of the course. The course will have a different topic each term depending upon the varied interests of students, the graduate faculty, or the research requirements of the Aviation Computer Science Department.

MSE - Software Engineering

MSE 610

Software Systems Architecture and Design
3 Credits

This course is concerned with the principles and concepts relevant to the software engineering process of designing large programs and systems, and the products generated as a result of enacting the process. Software design is studied as a two-step process of building an abstract model for the software system and refining this model into an implementation form, along with the products of the design process such as high-level and detailed designs. The course provides an introduction to a range of design methodologies, together with a description of their uses and limitations as well as principles that are used to assess the quality of a design process and products. In-depth study of Object- and Function-Oriented design methods, and use of Computer Aided Software Engineering (CASE) tools and review techniques (e.g., Peer Review, Inspection, Structured Walkthroughs) in the design process. Also covered are advanced topics related to software architectures and design patterns. Students will participate in individual and group project on high-level and detailed designs of a software system. The course also includes definition and development of a process guideline for design process. Prerequisite: MSE 530.

MSE 625

Quality Engineering and Assurance
3 Credits

This course describes the overall approach to specifying software quality, achieving quality, and mapping a quality specification into an engineerable set of activities. It describes the major activities used to cross-check the quality of software artifact and its development process. This course provides a framework for understanding the application of software verifications and validation (V&V) processes and techniques throughout the software development life cycle. Typical products of V&V processes are identified along with their possible V&V objectives. The course will analyze five categories of V&V approaches: 1) technical reviews, 2) software testing, 3) proof of correctness (program verification), 4) simulation and prototyping, and 5) requirements tracing. For each category some representative techniques will be identified and assessed. The course emphasis is on validating the system at the requirements and design stages. This validation is then coherently extended into a discussion of testing concepts, planning and controlling of testing activity, and integration-level testing. The course covers the economics of software quality and provides a guide to organizing the project to achieve quality in both the software product and process. Prerequisite: MSE 530 or consent of instructor.

MSE 640

Concurrent and Distributed Systems
3 Credits

The objective of this course is to teach principles of software develop-

ment for concurrent and distributed systems. Specification, design, and implementation techniques will be described and illustrated by examples and practical exercises. Principles and practices of concurrent programming, including synchronization and communication issues, and a survey of languages suitable for implementing concurrent solutions will be covered. Prerequisite: MSE 530.

MSE 650

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 will be 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 will be discussed. An essential element of this course is a group project on the development of safety related software, including its design, implementation and testing. Prerequisite: MSE 500 or consent of instructor.

MSE 655

Performance Analysis of Real-Time Systems

3 Credits

The objective of this course is to teach principles of performance analysis of real-time systems on the design and implementation levels. Performance modeling and analysis techniques will be described and illustrated by examples and practical exercises. Principles and practices of software development to achieve required or optimal performance, including design analysis and assessment of the implementation, will be addressed. An actual project in instrumentation of software for performance evaluation is an essential element of this course. Prerequisite: MSE 640 or consent of instructor.

MSE 660

Formal Methods for Concurrent and Real-Time Systems

3 Credits

A study of the formal specification of reactive systems, temporal logic, and current research in the specification of concurrent and real-time systems. There also will be some discussion of verifying software designs based on formal specifications. Prerequisite: MSE 520 or consent of instructor.

MSE 690

Graduate Research Project

3 Credits

A written document on aviation/aerospace software engineering topics which exposes the student to the technical aspects of writing. The document is an individual work based on student involvement in a team

software development activity representing a significant element of the software development life cycle. It provides the student with an opportunity to pursue a project of special interest at a practical level. This is a required course for students who choose not to write a thesis.

MSE 696

Graduate Internship in Software 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 work place. They are academic/professional activities coordinated by the University between organizations and a graduate student.

MSE 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. A detailed proposal of the desired project must be developed and presented to the department chair for faculty review and recommendation.

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 the relate to the safety profession. (Credit not applicable to any degree.)

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 investigation, 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 non-ionizing radiation, thermal conditions, pressure, chemicals, airborne contaminants, and biological substances. Engineering and non-engineering controls as well as regulatory requirements will also be covered.

MSF 601

Egonomics

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

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 the 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 will be a survey of quantitative methods pertinent to occupational safety and health. Topics will 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 in 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.

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 the student 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, national governments, international agencies, and non-governmental 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 which 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 which includes the facts, the scenario, an analysis of all potential factors, findings and recommen-

dations. 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 which 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. 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 utilized. 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 management 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 to the overall safety management program within 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 - Safety Science

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 assure 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 all the various domains of the safety and health occupation are integrated in to 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, national governments, international agencies, and non-governmental organizations; social and cultural factors; strategic planning and investment vulnerabilities; physical, operations, communications, and personnel securities. Readings, lectures, discussions, and case studies will be supplemented by team exercises resulting in security plans comprising risks, threats, and 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, other related standards; elements of an emergency response plan; training requirements; the incident command system; medical surveillance; and post-emergency response. Major elements involved in disasters and emergencies, preparedness planning, systems utilization, 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 cur-

riculum to provide the 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 work place. They are academic/ professional activities coordinated by the University between offering organizations and a Graduate student.

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.

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 - Technical Management

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. Communicate the 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.

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 prospective.

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 within 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 market place; 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 upon 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 upon 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, logistic and support services are explored. Included will be the introduction of fixed and variable costs; computing and using overhead; process and job order costing methods; preparation of income statements in the contribution format; ratio analysis; profit planning and its relationship to cost; 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 utilized to emphasize the integrated relationships. Project management software is utilized 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; and simulation and modeling; regression analysis; 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; follow-up, 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 on-line databases, design and use of date-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, which 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.

Daytona Beach Campus

For general academic and graduate admission information:

Embry-Riddle Aeronautical University
600 S. Clyde Morris Blvd.
Daytona Beach, FL 32114-3900
Telephone: (386) 226-6115 - **or** - (800) 388-3728
Fax: (386) 226-7111
Financial aid: (800) 943-6279
email: gradadm@erau.edu
http://www.embryriddle.edu

Prescott Campus

For general academic and graduate admission information:

Embry-Riddle Aeronautical University
Graduate Admissions Office
3700 Willow Creek Road
Prescott, AZ 86301-3720
Telephone: (928) 777-6993 or (800) 888-3728
Fax: (928) 777-6958
email: prmsss@erau.edu
http://www.embryriddle.edu

Extended Campus

For 30 years Embry-Riddle has recognized that the people who work in aviation and aerospace regard education and professional development as top priorities. Opportunities to learn and grow are actively sought because aviation and aerospace are linked to advancing technology and must respond quickly to changes in their environments.

However, not long ago the educational goals of working adults were often frustrated. Common hurdles in aviation jobs included irregular work schedules, frequent travel, job relocations, and family responsibilities. Navigating around the obstacles to get an education was difficult because few colleges or universities were configured to respond to the needs of adult learners. Embry-Riddle established the Extended Campus to serve the needs of adult learners. Innovation has been, and continues to be, the primary catalyst for the growth and success of the Campus. Three pathways to higher education have been developed to deliver courses and programs to students wherever they may be:

- Classroom instruction at approximately 120 centers and teaching sites,
- Distance learning classes through the centers,
- Distance learning classes anywhere in the world.

The Campus maintains a comprehensive system of academic control to ensure that the same learning objectives are consistently achieved regardless of where or by what means the content of a course may be taught. The same degree curricula, academic policies and academic standards are utilized by all University campuses. Procedures may differ somewhat to accommodate variances in structure, organization and location.

Students may transfer among the campuses confident that academic work will be of comparable quality and integrate with the courses to be taken at the new location. The applicability of University and transfer courses may vary slightly in one or two degree programs due to specialized accreditation. Acceptance and application of Embry-Riddle courses by other institutions is in accordance with the policies of the individual institution.

Selection of Extended Campus faculty is based on academic credentials and professional experience. Emphasis is given to aviation relevance and knowledge and understanding of current information and issues. Appointment and certification are determined in accordance with the criteria and standards followed throughout the University.

Extended Campus

Extended Campus classes are scheduled to accommodate the needs of adult students, most of whom participate on a part-time basis. Terms are shorter than the standard semester but more class time is scheduled per week. The same amount of classroom instruction is provided for each course as would be provided in a full semester. Classes may be scheduled in the early morning, during lunch periods, in the evening, or on a series of weekends. The length and starting and ending dates of terms vary by location.

The Jack R. Hunt Library assists students, faculty, and staff of the Extended Campus with access to materials, to support their informational, instructional, and research needs. The library provides the centers with aviation-related reserve book collections, periodical subscriptions, Aviation Tradescan Index subscriptions, and a videotape collection. The library also develops and publishes a video catalog, a substantial assembly of aviation reference materials referred to as the Riddle Aviation Collection (RAC), and library guides for each center. Additionally, the library offers an article reprint service, reference services, inter-library loan services, and has a home page on the World Wide Web.

Extended Campus

OFF CAMPUS and DISTANCE LEARNING PROGRAMS
EXTENDED CAMPUS
Embry-Riddle Aeronautical University
600 S. Clyde Morris Boulevard
Daytona Beach, FL 32114-3900
(386) 226-6910 or (800) 522-6787
email (admissions): ecinfo@erau.edu
http:/ /www.embryriddle.edu

IN EUROPE CONTACT:
Embry-Riddle Aeronautical University
CMR429
APO AE 09054
Telephone Number from
U.S.: 011-49-631-98843
email: ecaiasst@erau.edu

Locations

Air Force

United States:

Albuquerque Center, New Mexico
Altus Center, Oklahoma
Anchorage Center, Alaska
Andrews Center, Maryland
Barksdale Center, Louisiana
Beale Center, California
Cannon Center, New Mexico
Charleston Air Force Base, South Carolina
Cheyenne Center, Wyoming
China Lake Center, California
Dyess Center, Texas
Edwards Center, California
Eielson Air Force Base, (Anchorage) Alaska*
Ellsworth Center, South Dakota
Ft. Walton Beach Center, Florida
Grand Forks Center, North Dakota
Holloman Center, New Mexico
Honolulu Center, Hawaii
Hurlburt Field Center, Florida
Keesler Center, Mississippi
Langley Center, Virginia
Las Vegas Center, Nevada
Little Rock Center, Arkansas

Extended Campus

Luke Center, Arizona
March Center, California
McConnell Center, Kansas
McGuire Center, New Jersey
Minot Center, North Dakota
Moody Center, Georgia
Mountain Home Center, Idaho
Northern Utah Center, Utah
Offutt Center, Nebraska
Pope AFB, North Carolina
Robins Center, Georgia
San Antonio Center, Texas
Seymour Johnson Center, North Carolina
Shaw Center, South Carolina
Sheppard Center, Texas
Space Coast Center, Florida
Spokane Center, Washington
Tacoma Center, Washington
Tampa Center, Florida
Travis Center, California
Tucson Center, Arizona
Tyndall Center, Florida
Vance Center, Oklahoma
Vandenburg AFB, California
Wright-Patterson Center, Ohio

Europe:
Aviano Center, Italy
Geilenkirchen/NATO AB (Spangdahlem), Germany*
Lakenheath Center, England
Mildenhall Center, England
Ramstein Center, Germany
Spangdahlem Center, Germany
Wiesbaden AAF (Hanau), Germany*

Army

United States:
Columbus (Robins), Georgia*
Fairbanks Center, Alaska
Fort Bragg Center, North Carolina
Fort Campbell Center, Kentucky
Colorado Springs, Colorado
Fort Eustis Center, Virginia
Fort Irwin Center, California

Fort Knox Center, Kentucky
Fort Lewis (McChord), Washington*
Fort Rucker Center, Alabama
Mililani Center, Hawaii
Savannah Center, Georgia

Europe:
Giebelstadt Center, Germany
Hanau Center, Germany
Illesheim (Katterbach), Germany*
Katterbach Center, Germany
Vicenza (Aviano), Italy*
Wiesbaden AAF (Hanau), Germany*

Navy

United States:
Anti-Submarine Warfare San Diego, California
Naval Air Station, Atlanta Center, Georgia
Naval Air Station Brunswick Center, Maine
Naval Air Station Corpus Christi Center, Texas
Naval Air Station Fallon Center, Nevada
Naval Air Station Jacksonville Center, Florida
Naval Station Mayport (Jacksonville), Florida*
Naval Air Station Norfolk Center, Virginia
Naval Air Station North Island (San Diego) California*
Naval Air Station Oceana (Norfolk), Virginia*
Naval Air Station Patuxent Center, Maryland
Naval Air Station Pensacola Center, Florida
Naval Air Station Whidbey Island Center, Washington
Naval Air Station Whiting Field (Pensacola), Florida*
Naval Reserve Center, South Bay Center, California
NAWS Point Mugu, Ventura Center, California
NAWS China Lake (Edwards), California*
San Joaquin Valley Center, California

Europe:
Sigonella Center, Italy
Rota Center, Spain

Marine Corps

United States:
Marine Corps Base, Kaneohe Bay, Hawaii
Barstow Marine Corps Logistics Base (Ft. Irwin), California*

Extended Campus

MCAS Beaufort (Charleston), South Carolina*
MCAS Camp Pendleton (San Diego), California*

National Guard

United States:
McEntire ANGB (Shaw), South Carolina*

Coast Guard

United States:
US Coast Guard ATC/Mobile (Pensacola), Alabama*

Civilian

United States:
Atlanta, Georgia
Barry University (MSTM only), Florida (Space Coast)*
Birmingham (Ft. Rucker), Alabama*
Cincinnati, Ohio
Cincinnati-Kentucky Airport (Cincinnati), Ohio*
Columbus, Georgia (Robins)*
Columbus State C.C., Ohio (Wright-Patterson)*
Delta Air Lines, Inc., (Atlanta), Georgia*
Fort Lauderdale, Florida
Fort Worth, Texas
Great Falls, Montana
Houston (NASA), Texas
Indianapolis, Indiana
Key West (Miami), Florida*
Lakewood C.C., (McChord), Washington*
Lockhead Martin Goodyear (MSTM only), Arizona (Luke)*
Long Beach, California
Memphis Center, Tennessee
Miami, Florida
Minneapolis, Minnesota
NASA Ames Research Center (South Bay), California*
Mobile, Alabama (Pensacola)*
Northrop-Grumman (MSTM only), Florida (Space Coast)*
Oakland Center, California
Oklahoma City Center, Oklahoma
Orlando, Florida
Paine Field/BF Goodrich Aerospace, (Whidbey Island), Washington*
Palmdale, California
Portland, Oregon

Extended Campus

Pratt and Whitney (Robins), Georgia*
Seattle, Washington
Sky Harbor Center/Phoenix, Arizona
South Bay (Oakland), California
Space Coast, Florida
Tallahassee (Tyndall), Florida*
Williams Gateway Center, Arizona
Wilmington (Cincinnati), Ohio*

* Denotes Teaching Sites

Extended Campus

Sources of Additional Information

Extended Campus students may contact the director of any of the offices listed below for more information and guidance:

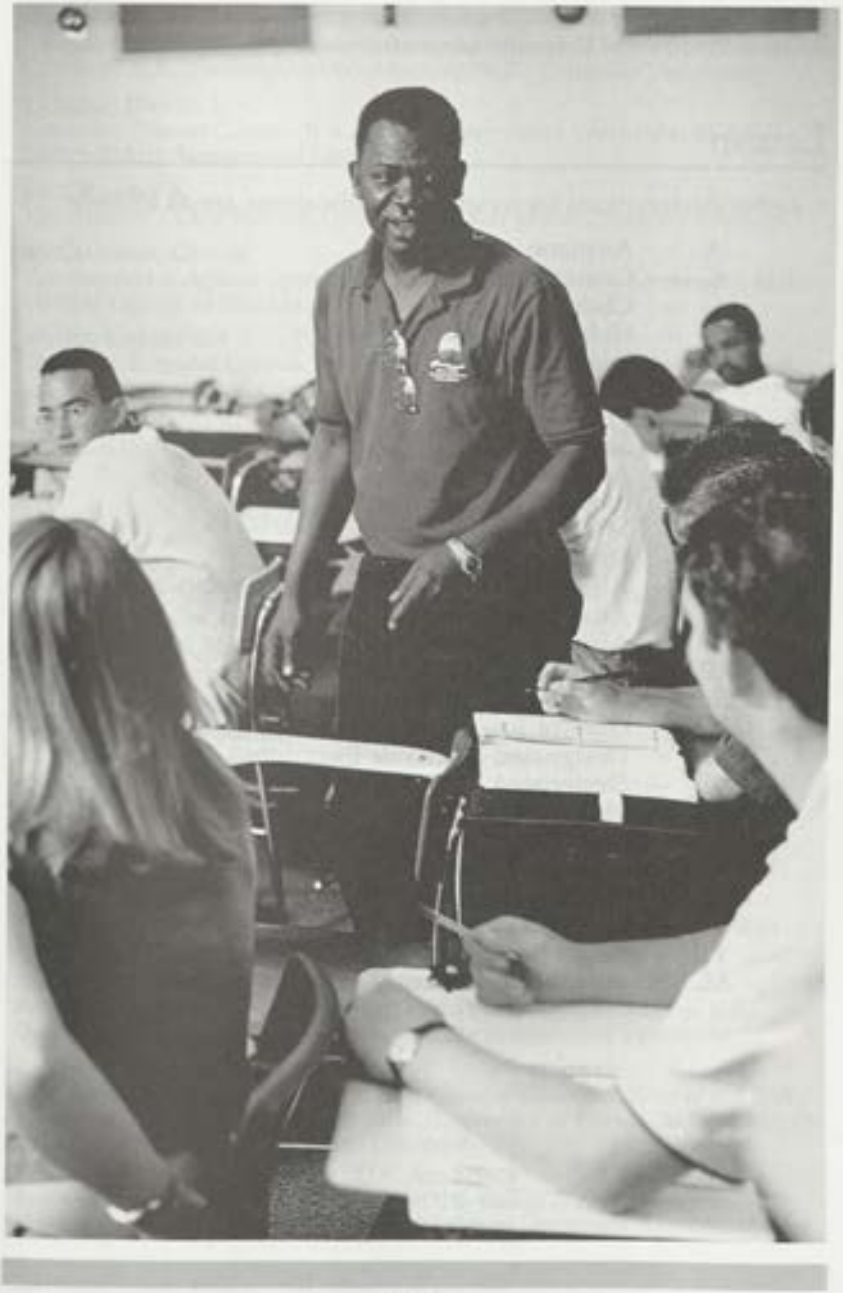
1. For financial aid information:
   Financial Aid Office
   Embry-Riddle Aeronautical University
   600 S. Clyde Morris Blvd.
   Daytona Beach, FL 32114-3900
   Telephone: (800) 943-6279

2. For veterans' educational benefits:
   Veterans Affairs Office
   Embry-Riddle Aeronautical University
   600 S. Clyde Morris Blvd.
   Daytona Beach, FL 32114-3900
   Telephone: (386) 226-6350

3. For student financial services:
   Student Financial Services
   Embry-Riddle Aeronautical University
   600 S. Clyde Morris Blvd.
   Daytona Beach, FL 32114-3900
   Telephone: (386) 226-6285

4. Career Services
   Career Services
   Embry-Riddle Aeronautical University
   600 S. Clyde Morris Blvd.
   Daytona Beach, FL 32114-3900
   Telephone: (386) 226-6054

Faculty and Administration



Faculty and Administration

The administration and faculty of Embry-Riddle are listed below. The numeral one (1) denotes the Daytona Beach Campus; the numeral two (2) denotes the Prescott Campus; the numeral three (3) denotes the Extended Campus. All others are assigned to the University administration.

Legend

Letter designations for aviation qualifications are as follows:

A – Airplane
C – Commercial Pilot
G – Glider
H – Helicopter
I – Instrument
L – Land
P – Private Pilot
S – Seaplane
AD – Aircraft Dispatcher
IA – Inspection Authorization
ME – Multi-Engine
SE – Single-Engine
A&P – Airframe and Powerplant Maintenance Technician
AGI – Advanced Ground Instructor
ATP – Airline Transport Pilot
BGI – Basic Ground Instructor
CFI – Certified Flight Instructor
CTO – Control Tower Operations
DME – Designated Mechanic Examiner
DWE – Designated Written Examiner
HTA – Heavier Than Air
IGI – Instrument Ground Instructor
LTA – Lighter Than Air
SME – Single and Multi-Engine
FCC – Federal Communications Commission
FE – Flight Engineer
AC – Advanced Graduate Credit

Officials of the University

Ebbs, George H.
President and Professor of Strategy, College of Business. B.S., Purdue University; M.B.A., University of Washington; Ph.D., Columbia University.

Carrell, Daniel L. [2]
Chancellor, Prescott Campus. B.A., Northwestern State University; M.A.S., Embry-Riddle Aeronautical University.

Jost, Robert A.
Vice President - Chief Business Officer. B.B.A. and M.B.A., Stetson University.

McClurkan, Guy
Vice President of Affiliate Operations. B.S., Western Kentucky University; M.S., Medical College of Virginia.

Myers, Robert E. [3]
Chancellor, Extended Campus. B.S., M.A., and Ph.D., University of Maryland.

Price, Irwin [1]
Chancellor, Daytona Beach Campus. B.M.E., New York University; M.B.A., San Francisco State College; Ph.D., Boston University Graduate School.

Academic Administration

Bankit, Paul [3]
Professor and Chair, Department of Aeronautics, College of Career Education. B.S., University of Nebraska; M.B.A. and Ph.D., Michigan State University; C-ASMEL-I; CFI-ASMEL; H.

Bloom, Richard [2]
Professor of Psychology and Global Security and Intelligence Studies, Dean, College of Arts and Sciences . B.A., Columbia University; M.A., New School for Social Research; Ph.D., Kent State University.

Brady, Tim [1]
Professor of Safety Science; Dean of the College of Aviation. B.S., Troy State University; M.S., Abilene Christian University; Ph.D., St. Louis University; ATP-MEL; C-SEL.

Brown, James M. [3]
Assistant Dean, College of Career Education. B.S., California State University; M.S., Troy State University; P-ASEL.

Burgess, Scott, Major, U.S. Army. [2]
Professor of Military Science, Army ROTC, College of Arts and Sciences. B.S., Oregon State University; M.S., Embry-Riddle Aeronautical University.

Chadbourne, Bruce D. [1]
Professor of Risk Management; Chair, Department of Economics, Finance and Risk Management, College of Business. B.S.B.A., University of Florida; M.B.A., Stetson University; Ed.D., Florida Atlantic University.

Coman, Michael S., Colonel, U.S. Air Force [1]
Professor of Aerospace Studies; Air Force ROTC, College of Arts and Science. B.S., U.S. Air Force Academy; M.A., Central Michigan University. Command Pilot.

Faculty and Administration

Cone, Milton L. [2]
Associate Professor of Electrical Engineering; Chair, Department of Electrical and Computer Engineering, College of Engineering. B.S.E.E. and M.S.E.E., University of Missouri; Ph.D., Air Force Institute of Technology.

Connolly, Thomas J. [1]
Endowed Chair in Aviation; Professor of Aeronautical Science; Associate Dean, College of Aviation. Ed.D., Nova University; ATP-MEL; CE-500; C-SEL; CFI-ASMEL & IA; AGI; IGI.

Cunningham, James M.
Professor of Humanities and Communications, College of Arts and Sciences; Assistant Vice President for Academic Affairs and Study Abroad Programs. B.A., University of Vermont; M.A.T. and M.A., Stetson University; Ed.D., Florida Atlantic University.

Dickey, Archie [2]
Associate Professor of Biology; Chair, Department of Global Studies, College of Arts and Sciences. B.A., Adams State College; M.S., Northern Arizona University; Ph.D., Arizona State University.

Draut, Arthur W. [2]
Associate Professor and Chair, Department of Aeronautical Science, College of Aviation. B.S., M.S., and Ph.D., The Ohio State University; M.B.A., Auburn University; C-ASMEL-I; CFI-ASEL.

Felton, Richard F. [2]
Professor of Aerospace Engineering, College of Engineering; Dean, College of Engineering. B.S.M.E., West Virginia University; M.S.N.E. and Ph.D., Air Force Institute of Technology; P.E., Colorado.

Fogle, Sarah D. [1]
Professor of Humanities and Communications, College of Arts and Sciences; Dean for Academic Support and Summer Term. B.A. and M.A., University of Florida.

Friend, Mark A. [1]
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