AVIATION AND SPACE STUDIES AT AUBURN UNIVERSITY
A PROSPECTUS

Auburn University Aviation and Space Committee

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Introduction

We have formed an Auburn University Aviation and Space Committee to promote the study of aviation and space flight in order to bridge the interests of traditional departments, promote faculty development through teaching, research and outreach, build enrollments in courses, and promote the national and international image of Auburn University. Support from within Auburn University is essential to create an Institute of Aviation and Space Studies in order to leverage equally essential outside funds. We represent several schools, departments and programs but our efforts are centered in the Department of Aviation Management and Logistics in the College of Business. W. David Lewis (History) and Triant Flouris (Aviation Management) are co-coordinators. Membership in the committee is open and flexible.

Rationale

At the beginning of the 21st Century, long-range thinking is in order for Auburn University to reach a level of greatness that is recognized both in academia, the professional world, and among the general public. Such a strategy need not be narrowly conceived. Auburn should search for centers of attention that will embrace many disciplines and bring them to bear upon a common core of knowledge. This document argues that human flight, in air and space, provides Auburn an appropriate focus to develop an interdisciplinary field of study establishing the potential to compete with the nation's most outstanding universities.

During the first half of the 20th Century the world was increasingly affected by the development of aviation. During the second half, while powered heavier-than-air flight continued to reach faster speeds, higher altitudes, greater destructive capability, and increasing commercial and recreational use, space technology constantly grew in importance. There is virtually no aspect of business or industrial activity that has not been affected in one way or another by space programs and projects. The same can be said of the practice of medicine, the management of natural resources, and the pursuit of science. Military doctrine and tactics have been irrevocably changed by space technology. Space exploration has challenged us to think more deeply about human nature, about why we are here, and whether we may be alone in the universe.

Aviation may or may not be approaching maturity, but the types of aircraft that will be used, the number of people they will carry, the facilities they will require, the safety and security measures that will be necessary to ensure the viability of the industry, and the best ways to integrate flight with other modes of transportation are still vigorously debated and researched. Air routes bind the peoples of the earth more and more tightly together, but the consequences of this situation remain undetermined and problematic. Air passenger travel has expanded so greatly that creative ways to deal with safe and secure management of the system are imperative. Flight safety and security are at the center of attention and new ways to ensure the safe, secure, and efficient growth of air transportation will have to be developed. Struggles between labor and management plague the airline industry, which also faces mounting passenger discontent. Ways must be found to cope with these and other challenges and Auburn University through its
multidisciplinary core of expertise in Aviation and Space can be at the forefront of research and outreach efforts to address this endeavor.

Furthermore, the exploitation of space technology is far from maturity. If the commercialization of space is well underway, the industrialization of space is only beginning and is a major goal in the building of permanent space stations. Low-cost shuttles are being developed and lunar stations are under consideration. Research laboratories in outer space are in the planning stage. Mining the asteroid belt may provide relief from impending shortages of key natural resources as economical techniques of prospecting and extraction are found. The ongoing mapping of Mars is motivated partly by the need for future raw materials. Experiments in producing high-quality pharmaceuticals in space are in progress. Methods of raising food crops in space are being developed. Engineering projects in space may help maximize the promise of solar energy.

The Alabama Aerospace Industry

For more than 50 years, the Aerospace Industry of the State of Alabama has produced the world's most advanced aircraft and spacecraft. From Marshall Space Flight Center and Redstone Arsenal of Huntsville, through Maxwell Air Force Base in Montgomery, the US Army Aviation Center of Fort Rucker, to Teledyne Continental Aircraft Motors of Mobile, the Aerospace Industry is geographically and financially intertwined with Alabama. The State is home to the world's fourth largest aircraft composites manufacturing facility in Tallassee, the builder of the Voyager (round the world record holding aircraft), has major aerospace production plants in Montgomery and Troy and rework facilities in Birmingham and Dothan. More than any other state, Alabama is given credit for putting the men on the moon and maintaining US leadership in the industry through advanced missile, airplane and helicopter design, development, testing and production. Because of the pivotal role of the Alabama Aerospace Industry and its wide distribution of world-class facilities across the state, it has consistently ranked as one of Alabama's top three industries for the past 30 years.

Aviation, Space, and Auburn University

As Alabama's premier institution serving the Aviation and Aerospace Industries, Auburn University has pioneered in all areas of support. More flight crewmembers, airline and aviation executives, and airport managers have started out at Auburn University than any other state school in the Southeast through the Aviation Management Program. The Aerospace History Program has more published aerospace historians than any other academic institution in the country. The Aerospace Engineering Department has produced more Aerospace Engineers than any other school in the state and was recognized for its pioneering research when it claimed Discover Magazine's top award in Aviation and Aerospace technology in 1998. Researchers are further supported by one of the finest aerospace archives outside of the Smithsonian Institution. Students and educators from K - Ph.D. are sparked and recruited by a nationally recognized Extension System which provides regular training sessions, presentations and seminars in the areas of space and flight.

Auburn University is already poised to flourish in a world increasingly affected by, and dependent upon, aviation and space technology. The recent transfer of Aviation Management to the College of Business has opened possibilities of future growth that did not previously exist. The ongoing transformation of the Auburn University Airport is characteristic of what is taking place. Several members of the department are currently involved in funded research projects by the Federal Aviation Administration (FAA) and Department of Transportation (DOT) for work in the areas of Aviation Resource Management and Intermodal Transportation both relating to the safety and efficiency of aviation operations. Auburn University also has a well-established Department of Aerospace Engineering with a long history of cooperation with NASA and other outside agencies. It has numerous departments in sciences and mathematics, all of which teach subjects important to aviation and space exploration. It has one of the largest ROTC programs in the United States,
which has trained generations of students for careers in military aviation in the Army, Navy, and Air Force.

Within the city of Auburn are the headquarters of the University Aviation Association and the Council for Aviation Accreditation. Because of its geographical location in the middle of a two-state area bounded by Atlanta, Birmingham, Columbus, and Montgomery, Auburn-Opelika is well situated to become a hub for the temporary storage of airborne cargo. The proximity of Auburn-Opelika to the headquarters of one of the world’s largest airlines, Delta, is of inestimable benefit to the community, the university, and the Aviation Management program, which is currently forging strong ties with Delta.

The new airport presents an outstanding potential for future development. The larger main runway allows larger private jets to land here and regional airline service is also possible. Plans are under discussion for developing educational facilities at the airport under outside funding. Such facilities could not only be used for pilot training but also for classes in aerospace-related subjects, including aerospace history. In time, the Airport might serve as a logical site for an Auburn University Air and Space Museum to complement the Art Museum that is being built and the Sports Museum that already exist as part of Auburn’s historical foundation. Such a museum could feature exhibits relating to the large number of astronauts who have studied at the university. An Imax theater located near the Airport would be of great cultural benefit to the entire East Alabama-West Georgia area.

A well-known fact nationally and internationally is that Auburn University has an outstanding graduate program in Aviation and Space History. The university has the largest number of published aerospace historians of any institution in the nation other than the National Air and Space Museum (NASM). The Auburn University Library has large and constantly growing collections in aerospace history. The Library’s holdings include the Hampton Aviation Bookstore Collection containing about 6,000 books and journals, many of which are rare, in the history of aeronautics. The Auburn University Archives also possess an extremely large collection of letters, diaries, photographs, scrapbooks, and other materials pertaining to Edward V. (Eddie) Rickenbacker, a pioneering figure in military and commercial aviation about whom W. David Lewis is writing a biography for Johns Hopkins University Press. Auburn also owns several other archival collections that document the history of flight. An attempt is underway with the help of the Alumni Foundation to acquire the Wright Heritage Archives, an extremely valuable collection of papers of the Wright Company, established by Wilbur and Orville Wright in 1909 with the aid of some of the most important American financiers of their time. The same collection also includes records of the Wright-Martin and Curtiss-Wright companies, which figured importantly in the development of American aircraft manufacturing. Acquisition of this would cement the Library’s status as a world-class research institution in aerospace history and technology.

Auburn enjoys a close relationship with the Air War College and the U. S. Air Force Historical Research Agency (AFHRA), both located at Maxwell Air Force Base in Montgomery. AFHRA’s holdings consist of unit histories and broadly-defined special collections that include personal papers of general officers, historical monographs and studies, early materials on military aviation and training, and materials about military aviation in Britain and Germany. Combined with its proximity to Atlanta, Huntsville, Ozark (home of Fort Rucker, the United States Army’s main helicopter training base), and Pensacola (home of the United States Navy’s aviation training base and Museum of Naval Aviation), Auburn has an unrivaled geographical location for aerospace studies.

**Instruction in Aerospace Studies**

There is not a single College, Department, or Program in the University that could not play a significant role in developing courses in aerospace-related subjects. The College of Agriculture could promote instruction relating the growth of food crops in outer space. Opportunities in the College of Business are so manifold that we cannot mention more than a few. Ultimately the
Department of Aviation Management and Logistics may become a Department of Aerospace Management and Logistics. Entrepreneurs and managers of space-based enterprises could be trained at Auburn. The departments of accounting, economics, finance, management, and marketing would have much to contribute. The College of Education could offer courses and workshops to prepare future teachers to use aerospace-related subjects in their classrooms, and take the lead in affiliating with the Alabama Association of Aerospace Teachers. Opportunities in the College of Engineering, in addition to Aerospace Engineering, in Civil, Computer, Electrical, Industrial, and Mechanical Engineering, are numerous. The Civil Engineering Department, for example, could train students in designing aviation and space infrastructures, drainage systems for airports, and airport infrastructures. The College of Liberal and Fine Arts has great potential for offering aerospace-related courses other than the ones the History Department has already developed. Opportunities exist in the English Department, which could offer courses in science fiction and in the literary works of such authors as H. G. Wells, Rudyard Kipling, Ernest K. Gann, Richard Bach, and Olaf Stapledon. The Department of Foreign Languages could offer courses including the works of authors like Verne, St. Exupery, and Zamyatin in their original languages. Political Science (aviation and space law and public policy issues), Psychology (leadership and motivational studies), Philosophy (ethical and philosophical issues relating to space exploration), and Journalism (science writing and coverage of aviation and space-related events) also come immediately to mind. Courses in Speech Communication could help fulfill the dreams of scientists like the late Carl Sagan in studying potential problems that would be involved in communicating with extraterrestrial civilizations. The Art Department could offer instruction in aviation and space-related art, a flourishing field of artistic expression with an enormous following among collectors. Anderson Luster, an alumnus of the Art Department who lives in the Auburn area, has already won distinction in the field and might teach such courses. Architecture and Building Science could offer courses in the planning, design, and building of aviation and space structures. Space exploration is likely in the future to offer opportunities for courses taught by the colleges of Nursing and Veterinary Medicine. The East Alabama Medical Center could work cooperatively with Auburn and UAB in becoming a teaching hospital in aviation and space medicine. The possibilities are endless.
Outreach

One of the key components of focusing university interests in aviation and space is that of outreach, the “extending of services or activities beyond current or usual limits” as defined in a leading dictionary. With education as the impetus and foundation of our initiative on aviation and space studies, educational outreach will address potential opportunities such as:

- Programs devoted to Auburn University’s role in aviation and space.
  - History resources: archives, museum, and visitor’s center.
  - University research programs: aerospace engineering, Space Power Institute.
  - Contributions to the aviation and space industries.

- Using aviation and space studies to help improve literacy in science, mathematics and technology as well as in many other disciplines among K-12 and college students.
  - Utilize Cooperative Extension System.
  - Teacher training workshops, special camp programs.
  - College courses of study for basic awareness.
  - Courses of study for education majors.
  - Potentially a degree in aviation and space education.
  - Certification program in aviation and space education.
  - Work with CAA and UAA.
  - Work with College of Education.
  - Work with College of Science and Mathematics.

- Programs to enhance awareness of potential career opportunities in aviation and space fields.
  - Work with industry to develop short and long-term strategies for attracting young people to technical careers in aviation and space.

- Partnerships with other organizations to improve aviation and space outreach for the state, region, and nation.
  - National Aeronautics and Space Administration (NASA)
  - National Air and Space Museum.
  - Office of Air Force History.
  - University Aviation Association
  - National Coalition for Aviation Education
  - Civil Air Patrol
  - Alabama Aerospace Teachers Association
  - Host outreach support functions
  - Develop web pages and newsletters.
  - Serve clearinghouse functions.
  - Hold joint conferences.

- Fostering leadership in aviation and space education.
  - Participating in leadership forums.
  - Collaborating with leaders in aviation and space communities.

- Addressing needs in business and industry in the state and region.
  - Economic development.
  - Research.
  - Workforce improvement.

As examples of the outreach mentioned above, Professor James R. Hansen is currently projecting a conference at Auburn in 2003 to celebrate the 100th Anniversary of Powered
Heavier-than-Air Flight. Several other members of our committee have played major roles in developing a fruitful relationship with the Alabama Aerospace Teachers Association (AATA). This organization, currently headquartered at Jacksonville State University, has held two of its recent annual meetings at the Auburn University Conference Center demonstrating Auburn University as a focal point in Aviation and Space.

Major in Aerospace Studies

As an outgrowth of pertinent courses in various Colleges, Schools, and Departments, an interdisciplinary major in aerospace studies could be created. Another possibility would be a graduate program leading to Master’s and Ph.D. degrees. Implementing these ideas would take much careful study and the creation of sufficient courses by various colleges and departments to make available the critical mass required. Among the potential functions of the Institute of Aviation and Space Studies would be to oversee these interdisciplinary programs, advise students majoring in them, and recruit new students. The Department of Aviation Management and Logistics is currently evaluating the possibility of entering into a partnership with Embry Riddle University and the Society of Satellite Professionals International (SSPI) through its newly formed Academic Advisory Committee. This committee was established to serve the field of space, which is still expanding and not yet completely well served by the educational programs around the world. To date the SSPI Committee has reviewed the curriculum for a proposed new undergraduate degree in “space operations” and “space physics” and is beginning its review of a proposed new M.S. degree in “space applications.” In the absence of cooperation across disciplines, this endeavor, given its interdisciplinary nature, cannot be realized. Aviation Management will need the help in expertise from Engineering, History, and Science to offer such a curriculum and an institute will be the most appropriate forum to facilitate such an effort.
Purposes of the Committee

Because of the extremely important role the Aerospace Industry plays in the state of Alabama combined with Auburn University's unique position to support this industry, it is proposed that a Center for Aviation and Space Studies be chartered. The overarching purposes of this Center will be to support the Aerospace Industry and taxpayers of Alabama through:

1. Recruitment and training of students from K-Ph.D. as future flight crew members, engineers and scientists possessing skill sets relevant to the Industry;

2. Research facilities for advanced aircraft, helicopter, missile and spacecraft design, development, testing and production and established archives containing relevant historical documentation;

3. Job creation through education of corporate leaders about the benefits of locating in a state with a highly skilled workforce, which has been specifically trained for their industry.

Conclusion

We live in a unique and pivotal era for the aviation and space industries. As a committee and through our proposed institute we are poised to promote the study of aviation and space flight in order to bridge the interests of traditional departments, promote faculty development through instruction, research and outreach, build enrollments in courses, and promote the national and international image of Auburn University. Human flight, in air and space, provides Auburn University an appropriate focus to develop an interdisciplinary field of study in which it has the potential to compete with the nation's elite universities. Through an Institute of Aviation and Space Studies Auburn's mission of teaching, research, and outreach will be served and enhanced in a very important functional area of academic and professional discourse, placing Auburn University in a class of distinction among all others.