Samuel Ginn
College of Engineering

AUBURN UNIVERSITY

Aerospace Engineering

WHAT IS AEROSPACE ENGINEERING?

Aerospace engineers use scientific principles as well as engineering concepts and practices to design, build, test and operate aerospace, aviation and aeronautical systems and vehicles. They are involved with the design, development and production of vehicles for flight both in and beyond the atmosphere. Aerospace engineers apply their knowledge of aerodynamics, propulsion, structures, dynamics, control and performance to a wide variety of challenges encountered with major aerospace systems.

NOTABLE

- 411 undergraduate and 45 graduate students enrolled in fall 2016
- 9 full-time faculty members
- Auburn's curriculum was established in 1942 in part through a decision by the Wright brothers to start a winter flying school near Montgomery
- John Cochran '66, former department head and professor emeritus, John Burkhalter '63, professor emeritus, and Butch Foster '67, the program's second doctoral graduate, are still involved with the department
- Auburn Engineering's contribution to the nation's space program has been cited as one of its most credible efforts, including two astronauts from the department: T.K. Mattingly '58 and Jim Voss '72
- In 2009, Mattingly presented the college with his NASA Ambassador of Exploration Award — a moon rock he brought back from one of his expeditions — which is on display in the dean's office
- Walt Woltosz '69 and Gary Abercrombie '70 developed the space shuttle's rollover maneuver 10 years before the first launch

CURRICULUM

Bachelor of Aerospace Engineering

Designing aerospace components and systems is an integral part of aerospace engineering and is included throughout Auburn's curriculum, beginning with a sophomore course in aerospace fundamentals and culminating in the senior design course sequence.

Auburn's Department of Aerospace Engineering requires students to apply their theoretical knowledge to solve open-ended problems based on a strong background in core areas of aerospace engineering, such as:

- aeroacoustics and aerodynamics
- aerospace structures and materials
- flight dynamics and control
- orbital mechanics and astrodynamics
- aerospace design and vehicle stability
- rocket propulsion

For information about academic programs and minors, visit **www.eng.auburn.edu/programs**

Graduate curriculum

Graduate study in aerospace engineering features a meaningful research project in areas such as aerodynamics, astrodynamics, boundary layer theory, control theory, flight dynamics, orbital mechanics, propulsion, structures or structural dynamics under the guidance and supervision of a senior faculty member

Master of Science (M.S.) — thesis option; minimum of 30 credit hours required, including six credit hours for AERO 7790, Research and Thesis; requires an oral exam that covers a student's research and thesis

Master of Aerospace Engineering (M.A.E) — non-thesis degree; requires a minimum of 33 credit hours of course work and may include three credit hours of AERO 7980, Aerospace Engineering Project; requires a final written report approved by the student's advisory committee and written in a period of one semester; students must pass the Graded Presentation Examination

Doctor of Philosophy (Ph.D.) — 60 credit hours beyond the bachelor's degree; requires 30 credit hours of graded graduate course work (6000 level and above), 18 hours of which must be completed as a graduate student at Auburn; requires 30 additional credit hours of course work that may include non-graded courses, 6000 level courses, a maximum of four credit hours of Research and Thesis from a completed master's degree and the minimum 10 credit hours of AERO 8990, if approved by a student's advisory committee; requires a minimum of two graduate level courses in science and math (6000 level or above)

RESEARCH, LABORATORIES AND CENTERS

The Department of Aerospace Engineering provides opportunities to perform research in areas such as:

- advanced aerospace systems
- experimental aerodynamics and computational fluid dynamics
- non-intrusive flow diagnostics and vortex dynamics
- numerical structural analysis and experimental mechanics
- manned and unmanned aircraft flight dynamics and control
- spacecraft guidance and control
- missile design using genetic algorithms
- spacecraft orbit determination and remote sensing
- solid, liquid and hybrid rocket propulsion systems

The department's instructional and research facilities provide hands-on experience for a practical and comprehensive education in aerospace engineering. Facilities employed in the instructional program include:

- Two large subsonic wind tunnels
- Two supersonic tunnels for Mach numbers 1.5 to 3.5
- Thirty-foot water tunnel for open channel and closed channel experiments
- Composite materials laboratory for component construction

TEAMS AND ORGANIZATIONS

Aerospace engineering students are encouraged to participate in campus organizations, teams and clubs, gaining experience with teamwork and project management, including:

- American Institute of Aeronautics and Astronautics (AIAA)
- Design-Build-Fly team
- NASA Student Launch
- Auburn University Rocket Association (AURA)
- Project Europa
- Sigma Gamma Tau aerospace engineering honor society
- Cupola Engineering Ambassadors
- Engineering Student Council
- National Society of Black Engineers
- Society of Hispanic Engineers
- Society of Women Engineers

For more information, visit
www.eng.auburn.edu/organizations

LIFE AFTER GRADUATION

Aerospace engineering graduates pursue careers in research and design, as well as in government and academia. With expertise in aerodynamics, flight dynamics, propulsion, structures and structural dynamics, Auburn aerospace engineers have been closely connected to many of history's greatest flights and the machines that carried them.

Auburn's aerospace engineering alumni include Gerald Smith '61 and Robert Champion '86, who, among others, contributed to the space shuttle program's design, maneuverability and safety. Charles E. "Buddy" Davis '59, for whom the department's Davis Hall is named, made groundbreaking developments with the Thor rocket, Harpoon missile and KC-10 aircraft aerial refueling platform, which played a vital role in the evolution of U.S. defense systems. Lorenda Ward '90 and '92 is a senior investigator for the National Transportation Safety Board, where she investigates aviation crashes and incidents around the world. Wendell Mead '63 and '66 is a pioneer in the field of ballistic missile defense and aerospace systems engineering. Emily Zieman '02 and '04 is lead for the HELFIRE Legacy Launcher integrated product team at AMRDEC in Huntsville.

SCHOLARSHIPS

The College of Engineering and the Department of Aerospace Engineering provide scholarship opportunities to students at every stage of their academic career. To be eligible for scholarships at Auburn University, all students must apply through the AUSOM system.

For information about engineering scholarships, visit
www.eng.auburn.edu/scholarships

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