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.

AUBURN
GINN ENGINEERING

NOTABLE

- 703 undergraduate and 92 graduate students enrolled in fall 2024
- 17 full-time faculty members
- Auburn's aerospace curriculum was established in 1942 in part through a decision by the Wright brothers to start a winter flying school near Montgomery
- 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 aerospace 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
- Auburn Engineering's Additive Manufacturing program is working in partnership with the Marshall Flight Center in Huntsville

UNDERGRADUATE PROGRAMS

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:

- Aerodynamics
- Aerospace Design
- Aerospace Structures and Materials
- Aircraft Performance
- Flight Dynamics and Control
- Orbital Mechanics and Astrodynamics
- Propulsion

RESEARCH, LABS, AND CENTERS

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

- Aerospace Structures
- Aircraft Design
- Astrodynamics
- Computational Fluid Dynamics
- Experimental Fluid Dynamics
- Flight Simulation
- Mechanics of Materials
- Orbital Mechanics
- Propulsion
- Rocket Science
- Space Mission Design
- Space Technology
- Wind Tunnel Measurements

Facilities employed in the instructional program include:

- Advanced Flow Diagnostics Laboratory
- Advanced Materials and Processing Laboratory
- Advanced Propulsion Research Laboratory
- Aero-Astro Computational and Experimental Laboratory
- Aero-Propulsion Related Systems Modeling, Simulation and Optimization Laboratory
- Aerospace 3D Printing Laboratory
- Aerospace Structures Reliability Laboratory
- Applied Fluids Research Group
- Autonomous Systems and Controls Laboratory
- Composite Materials Laboratory
- Computational Fluid Dynamics Laboratory
- Immersive, Interactive and Intelligent Space Dynamics Laboratory
- Intelligent Systems and Robotics Lab
- Mechanics of Materials Laboratory
- Polymer Mechanics Research Laboratory
- Wind Tunnel Laboratory
- Vehicle Systems, Dynamics and Design Laboratory
- Vortex Dynamics and Basic Fluid Flows Laboratory

GRADUATE PROGRAMS

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** – 30 credit hours required, including six credit hours for AERO 7990 (or 7996 for online students), Research and Thesis; requires an oral exam that covers a student's research and thesis
- **Master of Science (M.S.) non-thesis option** – 30 credit hours required; at least 21 credits must be in aerospace engineering or the AERO category; degree can be earned entirely through the Engineering Online Graduate Program or through on-campus instruction
- **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)

TEAMS & 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)
- Auburn Space Technologies and Robotics Organization (ASTRO)
- Auburn University Rocketry Association (AURA)
- Auburn University Small Satellite Program (AUSSP)
- Design, Build and Fly (DBF) team
- Launch and Propulsion Society
- NASA Student Launch
- Sigma Gamma Tau

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 AUSOM.

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

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, electrical engineering, 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. Nelda Lee '69 is a pioneer of women in aviation and aerospace who created a scholarship in aerospace engineering.

Other notable Auburn aerospace alumni making a difference include Joseph Pelfrey '00, who serves as acting director at NASA's Marshall Space Flight Center in Huntsville; Clay Walker '09 and '11, Director of Test Operations at Relativity Space; Joseph Moore '08, the Component Shop Engines Modernization Leader at GE Aviation in Hamilton, Ohio; and Emily Zieman '02 and '04, who not only gives back to Auburn University as a mentor in our 100+ Women Strong Program, but is Technical Manager at NASA Habitation Systems Development in Huntsville.

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