Undergraduate Programs

Students in the department may major in either aerospace or ocean engineering or may choose to combine the programs of study in a double major program with either major as their primary. Students completing 30 credit hours beyond that required for a single degree may earn two separate degrees. The department also offers an undergraduate minor in naval engineering open to all students in the College of Engineering.

In offering both majors, the department builds on the common interests in both fields related to the design and analysis of vehicles and structures that operate in a fluid. The earth’s atmosphere, its oceans, and the highly rarefied flowfields of space present aircraft, ships, and spacecraft with fluids of very different densities in which they must operate, many of the same basic laws of physics apply to all of them. Aerospace engineering is in itself a combination of the disciplines of aeronautical engineering and astronautical engineering. Ocean engineering emphasizes the older fields of naval architecture and marine engineering at Virginia Tech.

The department’s undergraduate programs of study emphasize propulsion, aero/hydrodynamics, stability and control, vehicle performance, and vehicle structures, which instructional material then leads to a year-long capstone design experience in the senior year. The capstone project is developed by government and industry experts as part of international design competitions in which teams of aerospace and ocean engineering students have won numerous awards for their aircraft, spacecraft, and ship designs.

Program Objectives

The aerospace and ocean engineering undergraduate program seeks to:

• Prepare students for entry-level positions and graduate study in the fields of aerospace engineering or ocean engineering.

• Provide students with a strong background in fundamentals, including theoretical, experimental, and computational aspects of science and engineering, which will facilitate lifelong learning and the ability to pursue advanced study.

• Provide students with a broad education in the aerospace or ocean vehicle field with coverage of the areas of fluid dynamics, propulsion, structures, and vehicle dynamics and control, including an emphasis on design and synthesis in a team environment.

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Accreditation

ABET is the recognized accreditor for college and university programs in applied science, computing, engineering, and technology. Among the most respected accreditation organizations in the U.S., ABET has provided leadership and quality assurance in higher education for over 75 years. The Aerospace and Ocean Engineering Department is unique in offering Bachelor of Science degrees in both aerospace engineering and ocean engineering. Both of these engineering programs are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Engineering by Design

Ignite your voyage with Virginia Tech’s Bachelor of Science Degree in Aerospace Engineering

Program Objectives

For more information, visit our website at http://www.ae.vt.edu or call 540-231-6699.

Engineering by Design

Aerospace Engineering Bachelor of Science Degree Virginia Tech

Program Objectives

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Outstanding Design

Outstanding design requires a comprehensive background in all of the areas of study associated with Aerospace Engineering:

- **Aerodynamics:** Subsonic, supersonic, and computational aerodynamics are all part of the aerospace engineering program at Virginia Tech. Students learn to use state-of-the-art computational and experimental facilities for flows from 10 mph to Mach 10.

- **Structures:** Light yet super-strong, modern aerospace structures employ composite materials and innovative geometries. Aerospace engineering students learn the latest experimental and numerical techniques for structural analysis.

- **Propulsion:** From props to jets to rockets, aerospace engineering students use their background in physics, thermodynamics, and fluid dynamics to understand and analyze the propulsion systems of the future.

- **Flight Mechanics:** Astromechanics, aircraft performance, and stability and control are all needed to understand how to make the designs of tomorrow go faster, further, and higher or deeper into space.

- **Electives:** Other courses include engineering design optimization, automatic flight control, computational aerodynamics, computational structural analysis, and aerospace manufacturing.

Collaborative Learning

Top educators tell us that the best way to learn is to teach your peers in a group environment. Aerospace engineering design courses use the group design process to better simulate the way design is done in the real world as well as to promote the benefits of collaborative learning.

By doing design in groups, aerospace engineering students learn to build on one another’s strengths, to work with others toward a single goal, and to make the compromises needed to optimize a good design into an award winning design.

Dedicated to Excellence in Instruction

The faculty/student ratio on the aerospace engineering program is about 1 to 25, allowing each faculty member to really get to know the students. Aerospace engineering faculty bring a variety of professional backgrounds to the classroom. Diverse and extensive experience in aerospace industry design, NASA Research, flight testing, and many other developing fields greatly enhance the classroom and lab experience with state-of-the-art and up-to-the-minute reality. Many are active members of professional societies involved with the improvement of engineering education, and all are dedicated to excellence in engineering instruction, several having won teaching and research awards.