Program Overview

Aerospace engineering requires a comprehensive background in all of the areas associated with aerospace systems:

- **Aerodynamics**: Subsonic, supersonic, transonic, and computational aerodynamics are all part of the Aerospace Engineering program.

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

- **Flight Mechanics**: Key to making the aerospace systems of tomorrow go faster, further, higher, and deeper into space is understanding astrodynamics, aircraft performance, stability, and control.

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

Who Should be Interested?

- Students with a background in engineering, science, mathematics, or physics.

- Individuals seeking to apply mathematics, physics, or associated scientific principles to the design, development, and operation of aerospace systems.

- Aerospace engineering professionals wanting to advance in their career in the aerospace industry, or in research and development.

- Anyone wanting to enhance their technical, analytical, critical thinking, and research skills within the field of aerospace engineering.

Virginia Tech's Program is Designed for Student Success

- Earn a degree from Virginia Tech's College of Engineering ranked as one of the Top 25 graduate schools by U.S. News and World Report.

- Engage in an exciting curriculum that provides students with the knowledge and tools to enter the diverse field of aerospace engineering.

- Learn from leading aerospace engineering faculty who bring real-world experience from the space and aviation industries.

- Be among the best of the best - Virginia Tech's aerospace engineering graduates are employed with the leading aerospace companies.

- Collaborate with students from all over the world to bring a dynamic exchange to the classroom.

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**Engineering by Design**

Escalate your career with Virginia Tech's Masters and Doctoral Degrees in Aerospace Engineering

"The AOE Department has facilitated my development as a professional through a range of exciting research and teaching opportunities. The SURE@VT group has allowed me to cooperate research that spans multiple engineering disciplines and apply techniques from each to tackle new problems."

--- John Janeski, Ph.D.
Graduate Programs

The Aerospace and Ocean Engineering Department offers Masters and Doctoral programs in aerospace engineering, a Masters program in ocean engineering, and a certificate program in naval engineering. Within aerospace engineering, graduate students may pursue a non-thesis Master of Engineering degree, a Master of Science degree (thesis or non-thesis option), or a Doctor of Philosophy degree. Within ocean engineering, graduate students may pursue a Master of Science degree (thesis or non-thesis option). Students pursuing a doctorate in an ocean engineering related topic may do so as a specialization within the aerospace engineering Ph.D. program. A certificate in naval engineering may be obtained within these degrees.

The department’s unique blend of aerospace engineering and ocean engineering exploits commonalities in the design and analysis of vehicles and structures that operate in fluids. While the properties of the ambient fluid may differ dramatically for ocean, atmospheric, and space vehicles/structures, the dominant physical processes that govern the behavior of these systems are quite similar. Graduate students may leverage the department’s broad faculty and expertise to master tools and methods that span a wide range of application domains.

The aerospace and ocean engineering graduate programs emphasize a broad background in aerodynamics, vehicle energies, and vehicle dynamics and control, with deeper specialization in areas of interest to the student. Doctoral students, for example, must declare a specialization in applied mathematics, applied physics and space engineering, aerodynamics, dynamics and control, ocean engineering, or structures.

Aerospace and ocean engineering graduate alumni have been highly successful in their chosen discipline. Many seek and obtain research and development positions with industry or government research and development laboratories while others pursue academic positions of colleges or universities. The department’s strong academic reputation and the outstanding professional performance of our alumni and alumnae ensure that aerospace and ocean engineering graduates remain in very high demand.

Points of Interest

Number of Active Faculty: 24
Number of Masters and Ph.D. Students: More than 100
Unique Facilities: Stability, Open-Jet, Boundary-Layer, Low Speed, Transonic, Supersonic, and Hypersonic Wind Tunnels, new propulsion laboratory, new Space@VT building, new Kortland Experimental Aerial Systems Laboratory, new Center for Renewable Energy and Aerodynamic Testing (CREATe) Multidisciplinary Research Programs: Collaborative Center for Multidisciplinary Sciences, Naval Engineering Program, Virginia Center for Autonomous Systems

Tracks and Courses

Masters students must complete 30 graduate credit hours, including four core courses listed below. Doctoral students must complete 90 graduate credit hours.

- AOE 4404: Applied Numerical Methods
- AOE 5024: Vehicle Structures
- AOE 5104: Advanced Aero and Hydrodynamics
- AOE 5204: Vehicle Dynamics and Control

Up to 50% of the graded courses on the Plan of Study may be transferred from a graduate program at another institution. A final comprehensive oral exam is required. Specific requirements for each track can be found in the Graduate Study Policies and Procedures Manual.

Admissions Requirements

- A bachelor’s degree, typically in engineering, mathematics, or physics from an accredited institution.
- Applicants should provide evidence that shows genuine promise of success in graduate study (2.5 GPA or better on a 4.0 scale is required).
- Full admission to the Virginia Tech Graduate School.

Program Eligibility

- Age: Applicants must be 21 years old or older.
- GPA: Minimum 3.0 GPA required.
- English: Test of English as a Foreign Language (TOEFL) Scores for international applicants.
- Graduate Record Examination (GRE) Scores.
- Three Letters of Recommendation.
- Statement of Graduate Record Information.
- Statement of Interest and Curriculum Vitae, which can be attached to the online graduate application (www.applyweb.com/apply/vtechg/index.html).

Aerospace and Ocean Engineering

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Virginia Tech
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Blacksburg, VA 24061
Phone: 540-231-6612

For more information, visit our website at www.aeoe.vt.edu or call 540-231-6612.

Accreditation

Southern Association of Colleges and Schools (SACS) Commission on Colleges.

Coastal Engineering

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