Soar to new heights with Virginia Tech’s Master of Science Degree in Aerospace Engineering

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.

Program Overview

Aerospace engineering requires a comprehensive background in all of the areas of study 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.

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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.
- Complete your degree entirely online, affording maximum flexibility.
- Design your course load to fit your individual needs.
- Collaborate with students all over the world to bring a dynamic exchange to the virtual classroom.
- Excellent support for online students from Virginia Tech’s Institute for Distance and Distributed Learning.

“The online M.S. degree in Aerospace Engineering is offered in a convenient, flexible format that accommodated my working full-time and starting a family. The material and expectations were equally as challenging as a face-to-face course, and the staff and faculty were supportive and prompt at answering questions, which made the online experience very interesting. The degree has been a valuable investment in my future that would not have been available to me in a traditional face-to-face format. Even in a virtual environment, the staff and faculty truly made me feel like a Hokie.”

-- Vanessa Aubuchon, M.S.
Program Highlights

Students must complete 30 graduate credit hours, including four core courses, which are offered on a two-year rotation, with one each in the Fall and Spring semesters:

- AOE 4404: Applied Numerical Methods
- AOE 5024: Vehicle Structures
- AOE 5104: Advanced Aero and Hydrodynamics
- AOE 5044: 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. Students are required to complete one of two tracks.

Track A - Master of Science Thesis

- Students must complete 9-12 credits of approved electives.
- Students must complete 6-10 credits of AOE 59941.
- Students must complete a minimum of 12 credits of graded course work numbered 5000 and higher.
- A maximum of 6 credits of AOE 59741 and AOE 59841 is allowed.
- A maximum of 6 credits of approved 4000 level course work is allowed.

Track B - Master of Science Non-Thesis

- Students must complete 18 credits of approved electives.
- Students may complete 3-6 credits of AOE 59041.
- Students must complete a minimum of 12 credits of graded course work numbered 5000 and higher.
- A maximum of 9 credits of AOE 59741 and AOE 59841 is allowed.
- A maximum of 6 credits of approved 4000 level course work is allowed.

Online Courses Featured in the Fall Semester

- AOE 5104: Advanced Aero and Hydrodynamics
- AOE 5304: Vehicle Dynamics and Control
- AOE 5434G: Advanced Introduction to Computational Fluid Dynamics
- AOE 5774: Nonlinear Systems Theory
- AOE 6124: Hypersonic Aerodynamics

Online Courses Featured in the Spring Semester

- AOE 4404: Applied Numerical Methods
- AOE 5034: Mechanical and Structural Vibrations
- AOE 5064: Structural Optimization
- AOE 5114: High Speed Aerodynamics
- AOE 5144: Boundary Layer Theory and Heat Transfer
- AOE 5234: Orbital Mechanics
- AOE 6114: Transonic Aerodynamics
- AOE 6145: Computational Fluid Dynamics
- AOE 6444: Verification and Validation of Scientific Computing
- AOE 6744: Linear Control Theory

Variable Credit Courses

- AOE 5904: Project and Report
- AOE 5974: Independent Study
- AOE 5984: Special Study
- AOE 5994: Research and Thesis

‘Course titles are found in the Graduate Catalog (graduates.vt.edu/graduate_catalog/).

How Do Online Courses Compare to Face-to-Face Courses?

You should expect to do as much work in an online course as you would in a face-to-face course. You may have to do more reading, writing, and independent research than you would in a face-to-face course. In general, you are expected to be self-motivated and to work hard.

Courses are offered using an internet-only delivery method. There will be both synchronous (two-way, live communication between student and professor) and asynchronous (downloadable materials and prerecorded lectures) components. Engagement between the faculty and students is a central thrust of the class to interact with the professor. Each week typically features a one-hour “real time” meeting of the class to interact with the professor. During this session, the professor will present interactive material, answer questions on the lecture material, and review homework assignments.

Program Eligibility

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 of a good academic record. A 3.0 GPA or better on a 4.0 scale is required.
- Full admission to the Virginia Tech Graduate School (www.graduateschool.vt.edu).

Application Documents

- Official transcripts sent to both the Graduate School and to the Aerospace and Ocean Engineering Department.
- Statement of Interest and Curriculum Vitae, which can be attached to the online graduate application (www.applyweb.com/apply/vtechg/index.html).
- Graduate Record Examination (GRE) Scores.
- Three Letters of Recommendation.
- Test of English as a Foreign Language (TOEFL) Scores for international applicants.
- Immigration Information Form for international applicants.

Accreditation

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

For more information, visit our website at www.aoe.vt.edu or call (Toll Free) 866-791-4898.

Graduate Study Policies and Procedures Manual:
www.aoe.vt.edu/graduate/grad-advising/index-grad-advising.html

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