



## HOW DO ONLINE COURSES COMPARE?

Online learning offers a unique opportunity to work at your own pace and fit your life. You should expect to do as much work as you would in a face-to-face course, and you may have to do more reading, writing, and independent research. In general, you are expected to be self-motivated and to work hard.



Courses are generally offered in an asynchronous fashion (downloadable materials and prerecorded lectures) to offer the highest level of flexibility for the working student's schedule; however some courses may also be available in a synchronous mode.

Engagement between the faculty and students is a central thrust of the program. During class sessions, the professor will present interactive material, answer questions on the lecture material, and review homework assignments. In addition, online students are encouraged to schedule regular "real time" meetings with their faculty advisor.

The Virginia Tech College of Engineering's Distance Learning office is focused on student success and provides a source of support for online students.

*"I really enjoyed my time as a student in the Ocean Engineering program... All of my classes were live, so I was able to get nearly the full classroom experience. I could ask questions, hear the teacher, and see the slides as if I were in the class, which I loved!"*

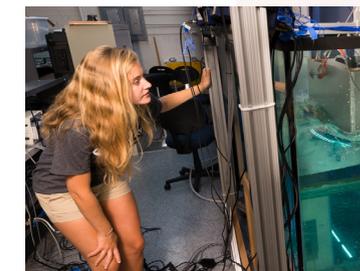
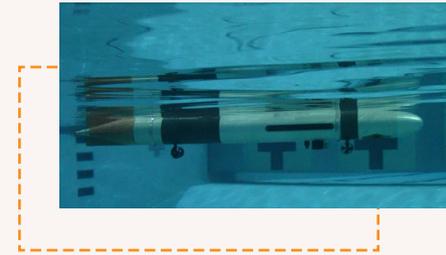
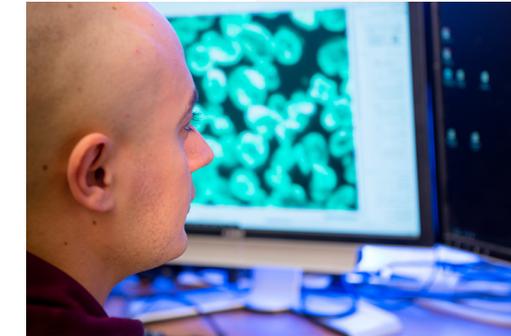
*The most useful part of getting my degree was taking the thesis option. The experience prepared me for writing proposals and reports more than anything I'd done previously. This option provides more preparation for your career than I ever thought possible, and I'm better off having done it." –Lauren Hanyok, M.S.*

## ADMISSION REQUIREMENTS

- A bachelor's degree, typically in engineering, science, mathematics, or closely related field 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 generally required.
- Full admission to the Virginia Tech Graduate School ([www.graduateschool.vt.edu](http://www.graduateschool.vt.edu)).

## APPLICATION DOCUMENTS

- Official transcripts sent to the Graduate School.
- Statement of Interest and Curriculum Vitae, which can be attached to the online graduate application (<https://applyto.graduateschool.vt.edu/pages/login.php>).
- Three Letters of Recommendation.
- GRE General Test (Waived for applicants with significant work experience. Email [gradadvise-g@vt.edu](mailto:gradadvise-g@vt.edu) to see if you qualify).
- Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) Scores for international applicants.
- Immigration Information Form for international applicants.



KEVIN T. CROFTON DEPARTMENT OF  
AEROSPACE AND OCEAN ENGINEERING  
460 OLD TURNER STREET • 215 RANDOLPH HALL  
BLACKSBURG, VA 24061  
PHONE: 540-231-6611 • [WWW.AOE.VT.EDU](http://WWW.AOE.VT.EDU)  
EMAIL: [GRADADVISE-G@VT.EDU](mailto:GRADADVISE-G@VT.EDU)

## COMPLETE YOUR DEGREE ONLINE, AFFORDING MAXIMUM FLEXIBILITY

A number of engineering achievements in the past century shaped the world we live in today: flight, space exploration, computers and the internet. Future engineers expect to tackle complex 21st century issues such as providing energy from fusion, engineering tools for Earth and planetary sciences and securing cyber-physical systems.



Ocean engineers develop, design, and analyze technology that operates in the unpredictable environment on or below the surface. You will design ships that are faster and ensure protection from cyber-physical threats, keeping our waters safe and secure.

- The Kevin T. Crofton Department of Aerospace and Ocean Engineering is ranked as #11 for aerospace and ocean engineering graduate schools by U.S. News and World Report.
- Engage in an exciting and challenging curriculum. While we offer courses on a wide range of traditional ocean engineering subjects, we explore modern-day issues such as cyber-physical systems and distributed control, aero/hydroacoustics and ethics in autonomous systems.
- Virginia Tech is the home of MAESTRO, today's most advanced computer-based method for the analysis and optimization of ships, submarines and offshore structures.
- Learn from leading ocean engineering faculty experts, who bring experience from the U.S. Navy, industry research and design arenas.
- Design your course load to fit your individual needs and work at your own pace.
- Collaborate with students all over the world, which brings a dynamic exchange to the virtual classroom.
- Excellent support for online students from the Virginia Tech College of Engineering's Distance Learning office.

## ARE YOU READY TO TAKE THE NEXT STEP?

Our online M.S. degree is offered in a convenient, flexible format for students who are working full-time. This program is ideal for:

- Ocean engineering professionals who want to advance in their career.
- Anyone interested in maximizing their career potential in a field of growing demand.
- Recent graduates with engineering or science backgrounds.
- Individuals seeking to apply mathematics, physics, or associated scientific principles to the design, development, and operation of ocean related systems.

## PROGRAM HIGHLIGHTS

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

- AOE 4404: Applied Numerical Methods (Spring)
- AOE 5074: Advanced Ship Structural Analysis (Fall)
- AOE 5104: Advanced Aero and Hydrodynamics (Fall)
- AOE 5334: Advanced Ship Dynamics (Spring)

Up to 50% of the graded coursework on the Plan of Study may be transferred from a graduate program at another institution. A final comprehensive oral exam is required.

Students are required to complete one of two tracks, either a Master of Science Thesis, which focuses more on research, or a Master of Science Non-Thesis which is project based. Specific requirements for each track can be found in the Graduate Study Policies and Procedures Manual.

## TYPICAL ONLINE COURSES IN THE FALL SEMESTER

- AOE 4264: Principles of Naval Engineering
- AOE 5074: Advanced Ship Structural Analysis
- AOE 5084 Principles of Submarine and AUV Design
- AOE 5104: Advanced Aero and Hydrodynamics
- AOE 5204: Vehicle Dynamics and Control
- AOE 5315-5316: Naval Ship Design
- AOE 5434G: Adv. Introduction to Computational Fluid Dynamics
- AOE 5774: Nonlinear Systems Theory

## TYPICAL ONLINE COURSES IN THE SPRING SEMESTER

- AOE 4404: Applied Numerical Methods
- AOE 5034: Mechanical and Structural Vibrations
- AOE 5064: Structural Optimization
- AOE 5144: Boundary Layer Theory and Heat Transfer
- AOE 5315-5316: Naval Ship Design
- AOE 5334: Advanced Ship Dynamics
- AOE 5444G: Advanced Dynamics of High-Speed Craft
- 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



\*Course titles are found in the Graduate Catalog at [http://graduateschool.vt.edu/graduate\\_catalog](http://graduateschool.vt.edu/graduate_catalog)