



# AOE Advising and Course Request Guide for Fall 2025

Instructions for Rising  
Sophomores in AOE

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March 2025



# Academic Advising in AOE

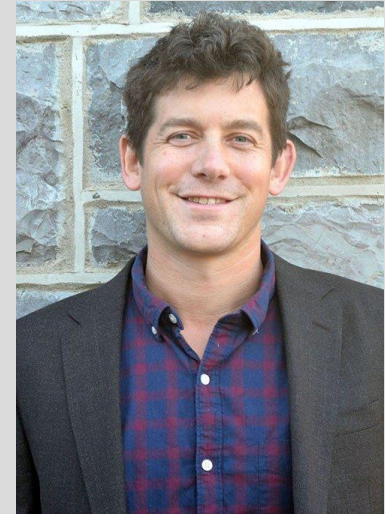


**Emily Metzgar**

Undergraduate Academic Advisor

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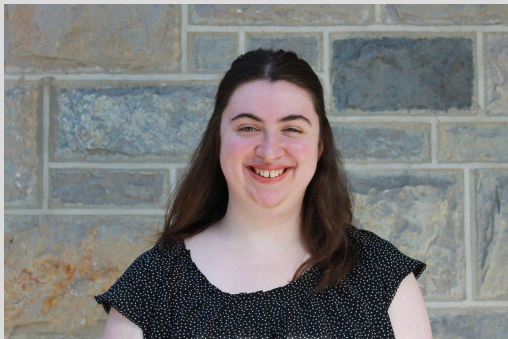


**Brian Kastner**

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AOE Undergraduate Advising Office  
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# AOE Department Administration



**Dr. Ella Atkins**  
Department Head



**Dr. Gary Seidel**  
Assistant Department Head  
for Academic Affairs



COLLEGE OF ENGINEERING  
KEVIN T. CROFTON DEPARTMENT OF  
AEROSPACE AND OCEAN ENGINEERING  
VIRGINIA TECH.

# Curriculum



# Curriculum Contents

1. First-year Courses
2. OE Curriculum/Course Request
3. AE Curriculum/Course Request
4. Pathways
5. Common Substitutions
6. Technical Electives
7. Minors
8. Double Major
9. Accelerated Graduate Program (UG/G)
10. Satisfactory Progress Towards Degree  
(Policy 6305)
11. Academic Planning Resources



# Typical First-Year Schedule for Students Intending to Major in OE or AE

FIRST YEAR		
FALL SEMESTER		CREDITS
CHEM 1035	General Chemistry	3
CHEM 1045	General Chemistry Laboratory	1
ENGL 1105	First-Year Writing	3
MATH 1225	Calculus of a Single Variable	4
ENGE 1215	Foundations of Engineering	2
Pathways 2 and/or 7 <sup>1</sup>		3
<b>Credits</b>		<b>16</b>
SPRING SEMESTER		
ENGL 1106	First-Year Writing	3
MATH 1226	Calculus of a Single Variable	4
PHYS 2305	Foundations of Physics	4
ENGE 1216	Foundations of Engineering	2
Select one of the following programming electives.		3
CS 1044	Introduction to Programming in C	
CS 1064	Introduction to Programming in Python	
CS 1114	Introduction to Software Design	
<b>Credits</b>		<b>16</b>

# What should I do if I still need the programming elective?

- If possible, take the programming elective in the summer. Then, take AOE 2074 in Fall 2025.
- If you do not take the programming elective in the summer, take it in Fall 2025. Then, take AOE 2074 in Spring 2026.



# What should I do if I still need PHYS 2305?

- If possible, take PHYS 2305 in the summer. Then, you can follow the normal sophomore fall schedule.
- If you do not take PHYS 2305 in the summer, take it in Fall 2025.
  - OE Majors: You will not be able to take AOE 2204 until Fall 2026. This will put you on a 5-year academic plan. **Meet with your academic advisor to discuss your plan!**
  - AE Majors: Take AOE 2104 in Spring 2026.
  - You should take ESM 2114/AOE 2014 in SP 2026. You will need to take ESM 2304 in summer 2026 and AOE 2024 in FA 2026.





# What should I do if I still need CHEM 1035, CHEM 1045 and/or ENGL 1106?

- These courses are required for graduation, but are not prerequisites for required courses.
- You should fit these in where you are able to. If you are on a 4-year plan, we suggest taking these courses during a summer session.



# OE Sophomore Year

SECOND YEAR		
FALL SEMESTER		
ESM 2114	Statics & Structures	3
MATH 2114	Introduction to Linear Algebra	3
MATH 2204	Introduction to Multivariable Calculus	3
AOE 2054	Electronics for Aerospace and Ocean Engineers	3
AOE 2074	Computational Methods	2
AOE 2204	Introduction to Ocean Engineering	3
	<b>Credits</b>	<b>17</b>
SPRING SEMESTER		
ESM 2304	Dynamics	3
MATH 2214	Introduction to Differential Equations	3
AOE 2024	Thin-Walled Structures	3
PHYS 2306	Foundations of Physics	4
ECON 2005	Principles of Economics (Pathways 3)	3
	<b>Credits</b>	<b>16</b>

# OE Junior Year

SECOND YEAR		
FALL SEMESTER		
ESM 2114	Statics & Structures	3
MATH 2114	Introduction to Linear Algebra	3
MATH 2204	Introduction to Multivariable Calculus	3
AOE 2054	Electronics for Aerospace and Ocean Engineers	3
AOE 2074	Computational Methods	2
AOE 2204	Introduction to Ocean Engineering	3
	<b>Credits</b>	<b>17</b>
SPRING SEMESTER		
ESM 2304	Dynamics	3
MATH 2214	Introduction to Differential Equations	3
AOE 2024	Thin-Walled Structures	3
PHYS 2306	Foundations of Physics	4
ECON 2005	Principles of Economics (Pathways 3)	3
	<b>Credits</b>	<b>16</b>

# OE Senior Year

FOURTH YEAR		
FALL SEMESTER		
AOE 4205	Experiments for Ocean Vehicle Design	1
AOE 4265	Ocean Vehicle Design	3
STAT 4705	Probability and Statistics for Engineers	3
	Track Technical Elective	3
	Technical Elective	3
	Pathways 6a and/or 7 <sup>1</sup>	3
	<b>Credits</b>	<b>16</b>
SPRING SEMESTER		
AOE 4206	Experiments for Ocean Vehicle Design	1
AOE 4266	Ocean Vehicle Design	3
	Track Technical Elective	3
	Technical Elective	3
	Pathways 2 and/or 7 <sup>1</sup>	3
	Pathways 3 and/or 7 <sup>1</sup>	3
	<b>Credits</b>	<b>16</b>

## Senior Design

- Senior design is a two semester fall/spring sequence
- Access to AOE Studio for Design Innovation (ASDI)

# OE Fall 2025 Course Request

## Typical Fall Sophomore Year

FALL SEMESTER		
ESM 2114	Statics & Structures	3
MATH 2114	Introduction to Linear Algebra	3
MATH 2204	Introduction to Multivariable Calculus	3
AOE 2054	Electronics for Aerospace and Ocean Engineers	3
AOE 2074	Computational Methods	2
AOE 2204	Introduction to Ocean Engineering	3
	<b>Credits</b>	<b>17</b>

### Notes:

- Statics & Structures is getting a new course number (AOE 2014). Request ESM 2114 during course request and you will be switched into AOE 2014 automatically when the course number changes. AOE 2014 will have 2 prerequisites: MATH 1226 & PHYS 2305.
- Options if you are ahead: ECON 2005, elective Pathway, AOE 2024, ESM 2304, MATH 2214, or consider taking fewer credits

# Can I take a summer course to get ahead with the OE sophomore fall schedule?

- Yes, two OE major fall sophomore courses are available over the summer: **MATH 2114** and **MATH 2204**.
- These math courses can typically be taken at VT or at other institutions. Be sure to follow the [proper steps](#) when taking courses elsewhere.





# AE Sophomore Year

SECOND YEAR		
FALL SEMESTER		
ESM 2114	Statics & Structures	3
MATH 2114	Introduction to Linear Algebra	3
MATH 2204	Introduction to Multivariable Calculus	3
AOE 2054	Electronics for Aerospace and Ocean Engineers	3
AOE 2074	Computational Methods	2
AOE 2104	Introduction to Aerospace Engineering and Aircraft Performance	3
	<b>Credits</b>	<b>17</b>
SPRING SEMESTER		
ESM 2304	Dynamics	3
MATH 2214	Introduction to Differential Equations	3
AOE 2024	Thin-Walled Structures	3
PHYS 2306	Foundations of Physics	4
ECON 2005	Principles of Economics (Pathways 3)	3
	<b>Credits</b>	<b>16</b>

# AE Junior Year

THIRD YEAR		
FALL SEMESTER		
MATH 4564	Operational Methods for Engineers	3
AOE 3014	Fluid Dynamics for Aerospace and Ocean Engineers	3
AOE 3034	System Dynamics and Control	3
AOE 3124	Aerospace Structures	3
AOE 3154	Astromechanics	3
	<b>Credits</b>	<b>15</b>
SPRING SEMESTER		
AOE 3114	Aerodynamics & Compressibility	3
AOE 3134 or AOE 3144	Air Vehicle Dynamics or Space Vehicle Dynamics	3
AOE 3164	Aerothermodynamics and Propulsion Systems	3
AOE 3054	Experimental Methods	3
Track Technical Elective		3
	<b>Credits</b>	<b>15</b>

## Vehicle Dynamics

- Select Air Vehicle or Space Vehicle Dynamics
- Choice determines senior design sequence

# AE Senior Year

FOURTH YEAR		
FALL SEMESTER		
AOE 4105	Experiments for Aerospace Design	1
Vehicle Design Choice		3
Select one of the following MATH Electives:		3
MATH 4574	Vector and Complex Analysis for Engineers	
MATH 4404	Applied Numerical Methods	
STAT 4705	Probability and Statistics for Engineers	
Track Technical Elective		3
Technical Elective		3
Pathways 6a and/or 7 <sup>1</sup>		3
<b>Credits</b>		<b>16</b>
SPRING SEMESTER		
AOE 4106	Experiments for Aerospace Design	1
Vehicle Design Choice		3
Track Technical Elective		3
Technical Elective		3
Pathways 2 and/or 7 <sup>1</sup>		3
Pathways 3 and/or 7 <sup>1</sup>		3
<b>Credits</b>		<b>16</b>

## Senior Design

- Senior design is a two semester fall/spring sequence
- Air vehicle or space vehicle focus
- Access to AOE Studio for Design Innovation (ASDI)

# AE Fall 2025 Course Request

## Typical Fall Sophomore Year

FALL SEMESTER		
ESM 2114	Statics & Structures	3
MATH 2114	Introduction to Linear Algebra	3
MATH 2204	Introduction to Multivariable Calculus	3
AOE 2054	Electronics for Aerospace and Ocean Engineers	3
AOE 2074	Computational Methods	2
AOE 2104	Introduction to Aerospace Engineering and Aircraft Performance	3
	<b>Credits</b>	<b>17</b>

### Notes:

- Statics & Structures is getting a new course number (AOE 2014). Request ESM 2114 during course request and you will be switched into AOE 2014 automatically when the course number changes. AOE 2014 will have 2 prerequisites: MATH 1226 & PHYS 2305.
- Options if you are ahead: ECON 2005, elective Pathway, AOE 2024, ESM 2304, MATH 2214, or consider taking fewer credits

# Can I take a summer course to get ahead with the AE sophomore fall schedule?

- Yes, three AE major fall sophomore courses are available over the summer: **AOE 2104**, **MATH 2114** and **MATH 2204**.
- AOE 2104 is only available through VT. It is typically offered in the second half of the summer as an online asynchronous course (pending sufficient enrollment) .
- The math courses can typically be taken at VT or at other institutions. Be sure to follow the [proper steps](#) when taking courses elsewhere.



# Pathways



- **Area 1a:** covered through required AOE curriculum
- **Area 3:** Principles of Economics (ECON 2005) required
- **Remaining Pathways:** fit in where you can; typically no prereqs

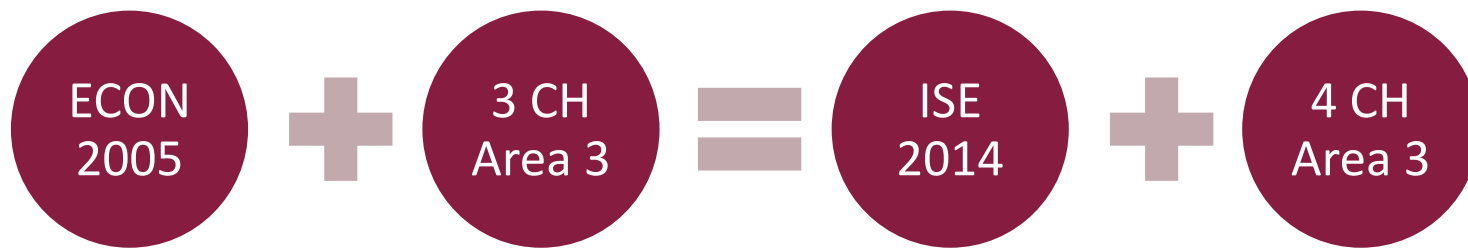


# Common Substitutions

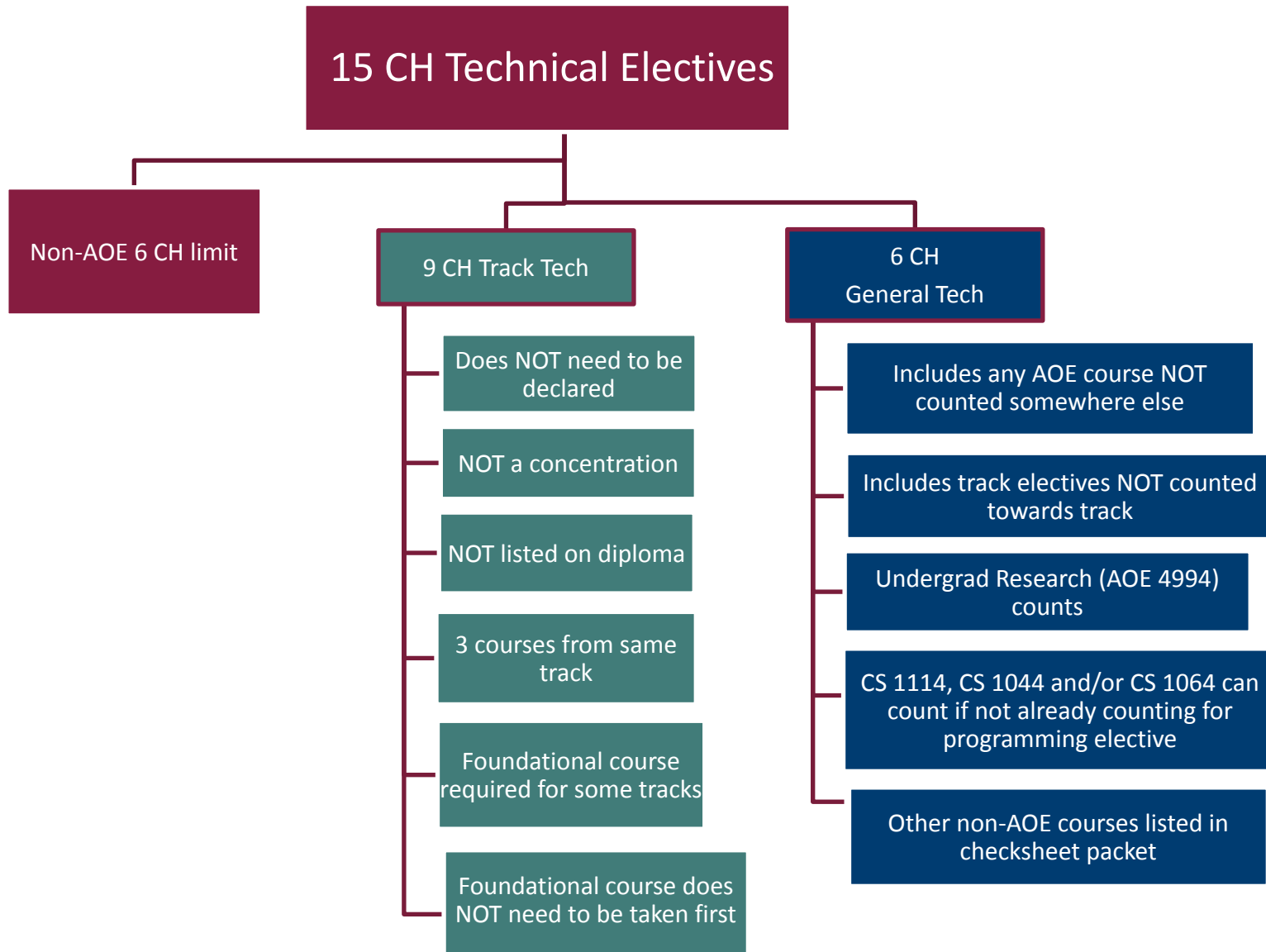


\*ESM 2114 is being switched to the course number AOE 2014

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# Technical Electives



# Technical Tracks



Aero / hydrodynamics



Dynamics, control, and estimation



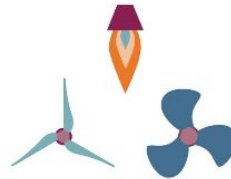
Energy and the environment



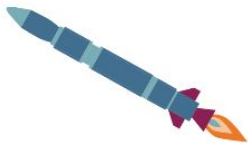
Naval engineering



Foundational option



Propulsion



Space engineering



Structures and materials



Vehicle and system design

## Disciplinary

- Foundational Track
- Aero/Hydrodynamics
- Dynamics, Control & Estimation
- Structures & Materials
- Vehicle & Systems Design

## Applications

- Naval Engineering
- Space Engineering
- Propulsion
- Energy & Environment

# Minors

## Popular Minors

### Math

- 1 extra course for AE major
- 2 extra courses for OE major

### Naval Engineering

- Fits well with Naval Engineering Track

### Green Engineering

- Fits well with Energy and the Environment Track

### Physics and/or Astronomy

- Fits well with Space Engineering Track

### Computer Science

- CS 1114 is programming elective option
- CS 2114 can count as non-AOE general tech elective

### Nuclear Engineering

- NSEG 3145 and NSEG 3146 can count as non-AOE technical electives

**Minors may add significant additional coursework**



# Double Majors & Dual Degrees

## Double Major in AE & OE

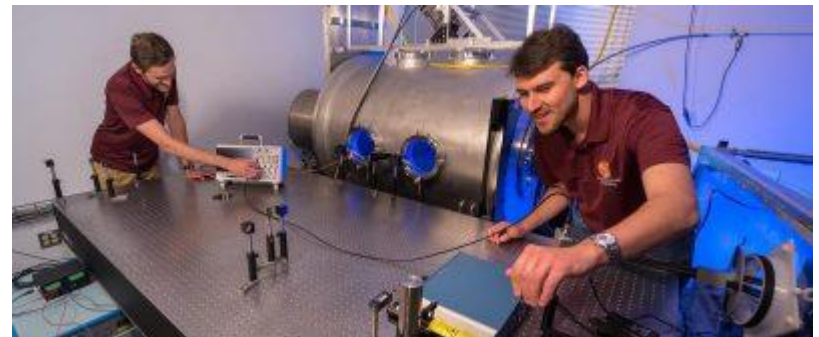
- Complete one senior design sequence
- Minimum 4 extra courses
- High credit load semesters
- Diploma in primary major
- Double major certificate in secondary major

## Dual Degree in AE & OE

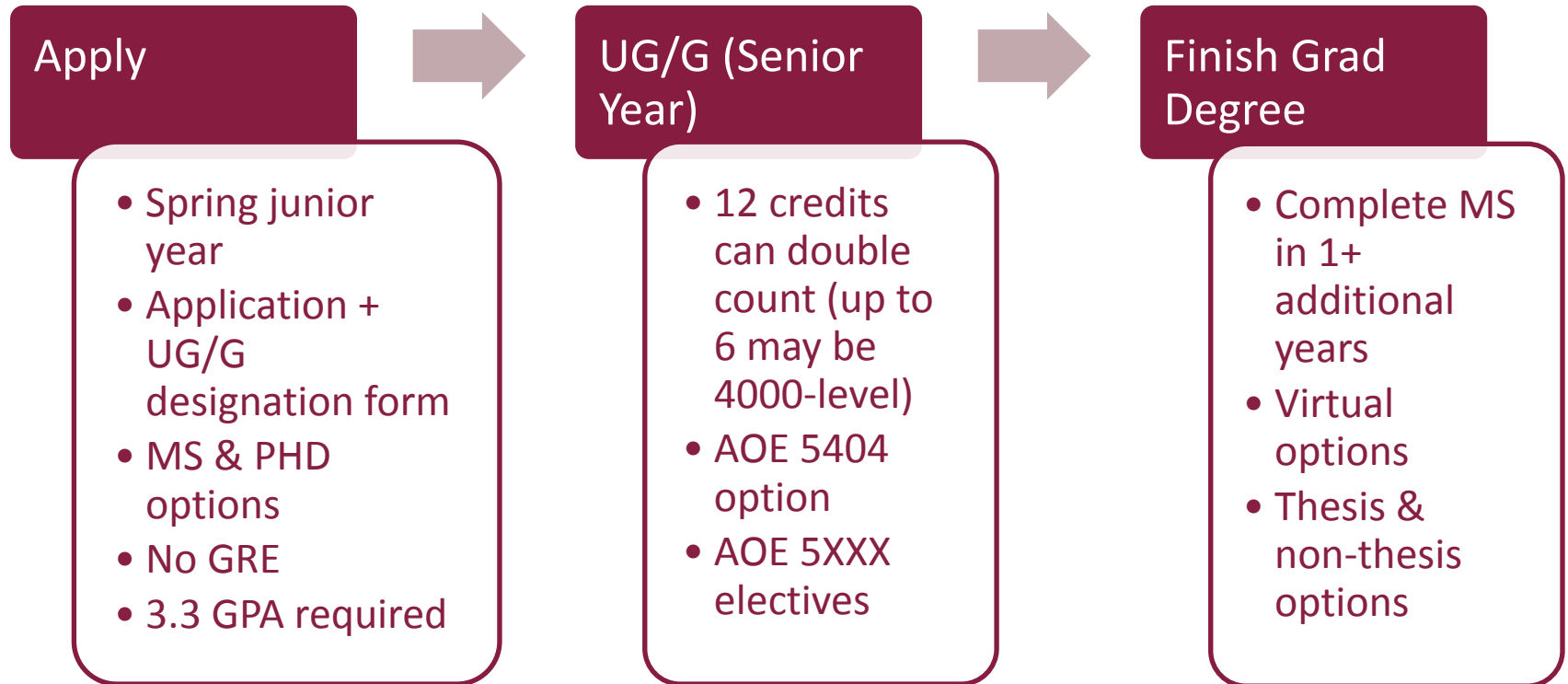
- Diplomas in both majors
- Complete senior design for AE & OE
- 30 extra credits
- Significant extra time required

## 2<sup>nd</sup> Major Outside Department

- Possible, but likely requires significant additional coursework/time



# Accelerated Undergrad/Grad (UG/G) Program



**Grad Program Coordinators:** Rachel Saville ([saville@vt.edu](mailto:saville@vt.edu)) & Audri Cunningham ([audrinc@vt.edu](mailto:audrinc@vt.edu))



# Satisfactory Progress Towards Degree

1. Placed on [Satisfactory Progress Towards Degree \(PTD\)/Policy 6305](#) probation if cumulative and/or in-major (AOE) GPA drops below 2.0.
2. Student on a contract during probation. Must raise cumulative and in-major GPA above 2.0 during probationary period.
3. Failure to raise cumulative and in-major GPA above 2.0 results in removal from the department.

**Department Expectation:** Check your VT email daily! Email is our primary means of communication with students regarding essential information about the AOE Department.



# Academic Planning Resources

- [AOE Undergraduate Curriculum Webpage](#)
- [Virginia Tech Timetable of Classes](#)
- [Undergraduate Course Catalog](#)
- [COE Academic Planning Website](#)
- [COE Course Registration Website](#)
- [GE How to Course Request Video](#)



COLLEGE OF ENGINEERING  
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VIRGINIA TECH.

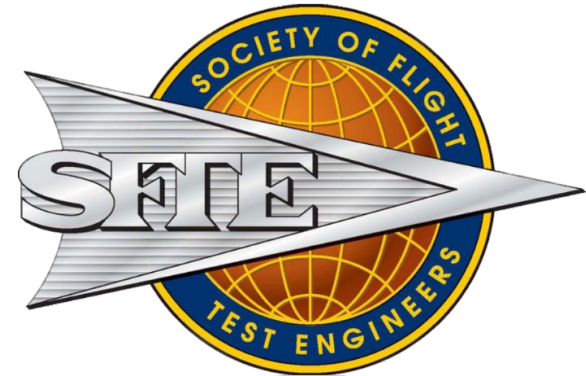
# Extracurricular Activities

# Agenda

1. Student Organizations
2. Design Teams
3. Research
4. Study Abroad
5. Career Advising



# Student Organizations



SOCIETY OF WOMEN IN AVIATION AND SPACE EXPLORATION



**AOE Ambassadors**

# Design Teams



# Undergraduate Research





# Study Abroad – Hamburg, Germany



- Spring semester program
- Hands-on experience with aircraft
- Earn core course & technical elective credits
- Connection with Airbus
- Courses in English
- 4 or 5-year degree plan, depending on specific situation



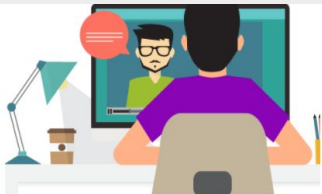


# Career Advising

# Career & Professional Development



- Location: Smith Career Center, 870 Washington St.
- Advising appointments available
- Resume support
- Internship Central
- Handshake
- Federal job search support



## Advising appointments

Offered fall, spring, and summer. Typically 30 or 60 minutes, for a wide array of career-related topics.

[ABOUT APPOINTMENTS](#)

[SCHEDULE NOW](#)



## Mini-appointments

Offered fall and spring. 15-minute mini-appointments for resume reviews, class assignments, quick questions.

[ABOUT MINI-APPOINTMENTS](#)

[SCHEDULE NOW](#)



CAREER AND PROFESSIONAL DEVELOPMENT

# Career Fairs



**Aerospace,  
Defense &  
Intelligence  
Career Fair**

**Engineering  
Expo**

**CAMEO  
CareerFest**

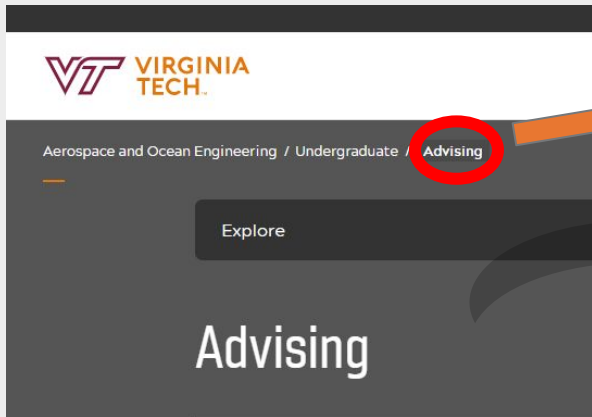
**And more...**

**ENGINEERING EXPO**

**SECI**  
STUDENT ENGINEERS' COUNCIL



# AOE Career Resources



## AOE Resources

- AOE Course Request Guides
- AOE Advising Newsletter
- AOE Undergraduate Curriculum and Checksheets
- Co-ops and Internships
- Satisfactory Progress Towards Degree (PTD)/Policy 6305
- Five-year AE ROTC Plan of Study
- Five-year OE ROTC Plan of Study
- Accelerated Undergraduate/Grad (UG/G) Program
- Tutoring and Academic Support
- AOE Alumni Mentoring Program
- Prerequisite Petition Request Form
- AOE Force-Add Request Form

Check out  
"Career Corner"

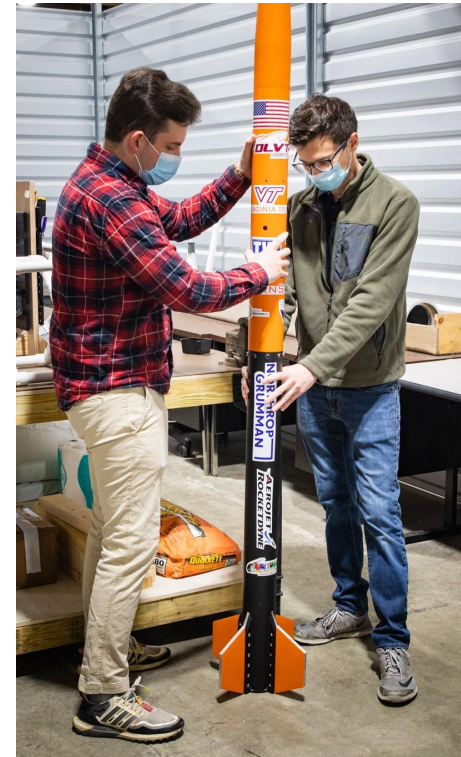
**Internships and co-ops are highly encouraged!**

**Co-ops typically result in a 5-year plan. Do we encourage them anyway?**

**YES!**

# Learn More About AOE

Visit AOE online at: <https://www.aoe.vt.edu>



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KEVIN T. CROFTON DEPARTMENT OF  
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VIRGINIA TECH.

# Still Have Questions?

Contact an AOE advisor!

Emily Metzgar (last names A-G): [emilymetzgar@vt.edu](mailto:emilymetzgar@vt.edu)

Chelsea Nowak (last names H-Ri): [cnowak@vt.edu](mailto:cnowak@vt.edu)

Brian Kastner (last names Ro-Z): [briank4@vt.edu](mailto:briank4@vt.edu)

Schedule an appointment through [Navigate](#).