



AOE Advising and Course Request Guide for Fall 2024

Instructions for Rising
Sophomores in AOE

BRIAN KASTNER
EMILY METZGAR
CHELSEA NOWAK

March 2024



Academic Advising in AOE

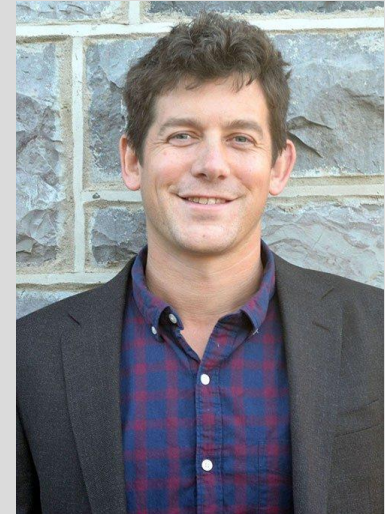


Emily Metzgar

Undergraduate Academic Advisor

Last Names: A-G

Email: emilymetzgar@vt.edu

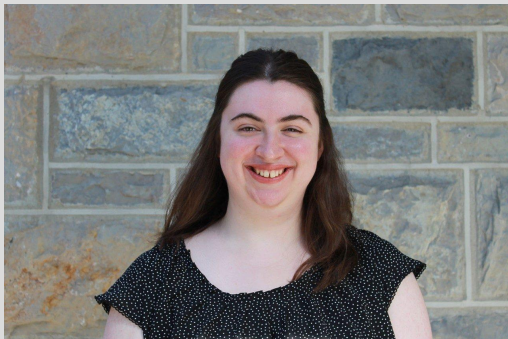


Brian Kastner

Associate Director of
Academic Services

Last Names: Ro-Z

Email: briank4@vt.edu



Chelsea Nowak

Undergraduate Academic Advisor

Last Names: H-Ri

Email: cnowak@vt.edu

AOE Undergraduate Advising Office
220 Gilbert Street, Suite 3300

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

APPROVED
University Registrar

COLLEGE OF ENGINEERING
DEPARTMENT OF AEROSPACE AND OCEAN ENGINEERING
DEGREE: BACHELOR OF SCIENCE IN AEROSPACE AND OCEAN ENGINEERING
MAJOR: AEROSPACE ENGINEERING
FOR STUDENTS ENTERING UNDER UG CATALOG 2023-2024
CREDITS REQUIRED FOR GRADUATION: 127

FALL SEMESTER FIRST YEAR		Credits	SPRING SEMESTER FIRST YEAR		Credits
CHEM 1035 ⁽¹⁾ General Chemistry <i>Pre: Eligible to enroll</i>	3	3	ENGL 1106 ⁽¹⁾ First-Year Writing <i>Pre: ENGL 1105</i>	3	3
CHEM 1045 ⁽¹⁾ General Chemistry Lab <i>Co: CHEM 1035</i>	1	1	MATH 1226 ⁽¹⁾ Calculus of a Single Variable <i>Pre: MATH 1225 (C)</i>	4	4
ENGL 1105 ⁽¹⁾ First-Year Writing	3	3	PHYS 2305 ⁽¹⁾ Foundations of Physics <i>Pre: MATH 1225 or MATH 1226 Co: MATH 1226</i>	4	4
MATH 1225 ⁽¹⁾ Calculus of a Single Variable <i>Pre: Eligible to Enroll</i>	4	4	ENGE 1216 ⁽¹⁾ Foundations of Engineering**	2	2
ENGE 1215 ⁽¹⁾ Foundations of Engineering**	2	2	Programming Elective ⁽¹⁾	3	3
Pathways ⁽²⁾ 2 and/or 7*	3	3			
TOTAL	16	16	TOTAL	16	16
FALL SEMESTER SECOND YEAR		Credits	SPRING SEMESTER SECOND YEAR		Credits
ESM 2114 ⁽³⁾ Statics and Structures <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>	3	3	ESM 2304 ⁽³⁾ Dynamics <i>Pre: (2104 or 2114); (MATH 2204 or MATH 2204H); Co: MATH 2214</i>	3	3
MATH 2114 ⁽³⁾ Introduction to Linear Algebra ~ <i>Pre: MATH 1225 (min grade of B) or MATH 1226</i>	3	3	MATH 2214 ⁽³⁾ Introduction to Differential Equations~ <i>Pre: (1114 or 2114 or 2114H or 2405H), 1226</i>	3	3
MATH 2204 ⁽³⁾ Introduction to Multivariable Calculus~ <i>Pre: MATH 1226</i>	3	3	AOE 2024 ⁽³⁾ Thin-Walled Structures <i>Pre: ESM 2114 or (ESM 2104, ESM 2204), (MATH 2204 or 2204H); Co: MATH 2214</i>	3 ^(F, S)	3 ^(F, S)
AOE 2054 ⁽³⁾ Electronics for Aerospace and Ocean Engineers	3 ^(F)	3 ^(F)	PHYS 2306 ⁽³⁾ Foundations of Physics <i>Pre: MATH 1226, PHYS 2305</i>	4	4
AOE 2074 ⁽³⁾ (ESM 2074) Computational Methods <i>Pre: (ENGE 1114 or ENGE 1216 or ENGE 1414), (CS 1044 or CS 1064 or CS 1114)</i>	2 ^(F, S)	2 ^(F, S)	Pathways 3 ⁽¹⁾ ECON 2005 Principles of Economics~	3	3
AOE 2104 ⁽³⁾ Introduction to Aerospace Engineering and Aircraft Performance <i>Pre: PHYS 2305, Co: ESM 2104 or ESM 2114</i>	3 ^(F, S, SH)	3 ^(F, S, SH)			
TOTAL	17	17	TOTAL	16	16
FALL SEMESTER THIRD YEAR		Credits	SPRING SEMESTER THIRD YEAR		Credits
MATH 4564 ⁽³⁾ Operational Methods for Engineers <i>Pre: (2214 or 2214H) or 2406H or CMDA 2006</i>	3	3	AOE 3114 ⁽⁴⁾ Aerodynamics and Compressibility <i>Pre: 3014, Co: 3164</i>	3 ^(F, S)	3 ^(F, S)
AOE 3014 ⁽³⁾ Fluid Dynamics for Aerospace and Ocean Engineers <i>Pre: (2104 or 2204), ESM 2304, (MATH 2214 or MATH 2214H)</i>	3 ^(F, S)	3 ^(F, S)	AOE 3134 ⁽⁴⁾ Air Vehicle Dynamics <i>Pre: 3034, or</i>	3 ^(F)	3 ^(F)
AOE 3034 ⁽³⁾ System Dynamics and Control <i>Pre: ESM 2304, (MATH 2214 or MATH 2214H)</i>	3 ^(F, S)	3 ^(F, S)	AOE 3144 ⁽⁴⁾ Space Vehicle Dynamics, <i>Pre: 3034, 3154</i>	3 ^(F)	3 ^(F)
AOE 3124 ⁽⁴⁾ Aerospace Structures <i>Pre: 2024 or 3024</i>	3 ^(F, S)	3 ^(F, S)	AOE 3164 ⁽⁴⁾ Aerothermodynamics and Propulsion Systems <i>Pre: 3014, Co: 3114</i>	3 ^(F, S)	3 ^(F, S)
AOE 3154 ⁽⁴⁾ Astromechanics <i>Pre: ESM 2304</i>	3 ^(F, S)	3 ^(F, S)	AOE 3054 ⁽⁴⁾ Experimental Methods <i>Pre: 2024, 2054, 3014, 3034</i>	3	3
TOTAL	15	15	Track Technical Elective	3	3
TOTAL	15	15	TOTAL	15	15
FALL SEMESTER FOURTH YEAR		Credits	SPRING SEMESTER FOURTH YEAR		Credits
AOE 4105 ^(1, 4) Experiments for Aerospace Design <i>Pre: 3054; Co: 4065 or 4165</i>	1 ^(F)	1 ^(F)	AOE 4106 ^(1, 4) Experiments for Aerospace Design <i>Pre: 4105, Co: 4066 or 4166</i>	1 ^(F)	1 ^(F)
Vehicle Design Choice ^(1, 4)	3 ^(F)	3 ^(F)	Vehicle Design Choice ^(1, 4)	3 ^(F)	3 ^(F)
MATH Elective ⁽⁴⁾	3	3	Track Technical Elective	3	3
Track Technical Elective	3	3	Technical Elective	3	3
Technical Elective	3	3	Pathways ⁽²⁾ 2 and/or 7*	3	3
Pathways ⁽²⁾ 6a and/or 7*	3	3	Pathways ⁽²⁾ 3 and/or 7*	3	3
TOTAL	16	16	TOTAL	16	16

* If a Pathways course is taken that does not double-count Pathways 7 with Pathways 2, 3 or 6a, then three more Pathways credits are needed (127 credits total).

1. First-year Courses
2. OE Checksheet/Course Request
3. AE Checksheet/Course Request
4. Pathways
5. Common Substitutions
6. Technical Electives
7. Minors
8. Double Major
9. Accelerated Masters (UG/G)
10. Policy 91

What should I do if I have not completed all of the first-year courses when I enter AOE?

FALL SEMESTER FIRST YEAR		Credits	SPRING SEMESTER FIRST YEAR		Credits
CHEM 1035 ⁽¹⁾ General Chemistry	<i>Pre: Eligible to enroll</i>	3	ENGL 1106 ⁽¹⁾ First-Year Writing	<i>Pre: ENGL 1105</i>	3
CHEM 1045 ⁽¹⁾ General Chemistry Lab	<i>Co: CHEM 1035</i>	1	MATH 1226 ⁽¹⁾ Calculus of a Single Variable	<i>Pre: MATH 1225 (C-)</i>	4
ENGL 1105 ⁽¹⁾ First-Year Writing		3	PHYS 2305 ⁽¹⁾ Foundations of Physics	<i>Pre: MATH 1225 or MATH 1226 Co: MATH 1226</i>	4
MATH 1225 ⁽¹⁾ Calculus of a Single Variable	<i>Pre: Eligible to Enroll</i>	4	ENGE 1216 ⁽¹⁾ Foundations of Engineering~	<i>Pre: ENGE 1215</i>	2
ENGE 1215 ⁽¹⁾ Foundations of Engineering ~		2	Programming Elective ⁽³⁾		3
Pathways ⁽²⁾ 2 and/or 7*		3			
	TOTAL	16		TOTAL	16

- If you are missing courses from the first year (see above), talk to your GE academic advisor this semester to come up with a plan for when you will complete them.
- Consider taking missing courses over the summer.
- Once you switch into AE or OE, make an appointment to talk to your AOE advisor about your plan.



OE Sophomore Year

FALL SEMESTER SECOND YEAR		Credits	SPRING SEMESTER SECOND YEAR		Credits
ESM 2114 ⁽³⁾ Statics and Structures~ <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>	3		ESM 2304 ⁽³⁾ Dynamics <i>Pre: (2104 or 2114), (MATH 2204 or MATH 2204H), Co: MATH 2214</i>	3	
MATH 2114 ⁽³⁾ Introduction to Linear Algebra ~ <i>Pre: MATH 1225 (min grade of B) or MATH 1226</i>	3		MATH 2214 ⁽¹⁾ Introduction to Differential Equations~ <i>Pre: (1114 or 2114 or 2114H or 2405H), 1226</i>	3	
MATH 2204 ⁽³⁾ Introduction to Multivariable Calculus~ <i>Pre: MATH 1226</i>	3		AOE 2024 ⁽³⁾ Thin-Walled Structures <i>Pre: ESM 2114 or (ESM 2104, ESM 2204), (MATH 2204 or 2204H); Co: MATH 2214</i>	3 ^(F, S)	
AOE 2054 ⁽³⁾ Electronics for Aerospace and Ocean Engineers	3 ^(F)		PHYS 2306 ⁽³⁾ Foundations of Physics <i>Pre: MATH 1226, PHYS 2305</i>	4	
AOE 2074 ⁽³⁾ (ESM 2074) Computational Methods <i>Pre: (ENGE 1114 or ENGE 1216 or ENGE 1414), (CS 1044 or CS 1064 or CS 1114)</i>	2 ^(F, S)		Pathways ⁽¹⁾ 3 ECON 2005 Principles of Economics~	3	
AOE 2204 ⁽⁴⁾ Introduction to Ocean Engineering <i>Pre: PHYS 2305; Co: MATH 2204</i>	3 ^(F)				
	TOTAL	17		TOTAL	16



OE Junior Year

FALL SEMESTER THIRD YEAR		Credits	SPRING SEMESTER THIRD YEAR		Credits
MATH 4564 ⁽³⁾ Operational Methods for Engineers <i>Pre: (2214 or 2214H) or 2406H or CMDA 2006</i>	3		GEOS 3034 ⁽⁴⁾ Oceanography	3	
AOE 3014 ⁽³⁾ Fluid Dynamics for Aerospace and Ocean Engineers <i>Pre: (2104 or 2204), ESM 2304, (MATH 2214 or MATH 2214H)</i>	3 ^[F, S]		AOE 3234 ⁽⁴⁾ Ocean Vehicle Dynamics <i>Pre: 3014, 3034, 3214</i>	3 ^[S]	
AOE 3034 ⁽³⁾ System Dynamics and Control <i>Pre: ESM 2304, (MATH 2214 or MATH 2214H)</i>	3 ^[F, S]		AOE 3264 ⁽⁴⁾ Thermodynamics and Marine Propulsion <i>Pre: 2204, 3014</i>	3 ^[S]	
AOE 3214 ⁽⁴⁾ Ocean Wave Mechanics <i>Co: 3014, MATH 4564</i>	3 ^[F]		AOE 3054 ⁽¹⁾ Experimental Methods <i>Pre: 2024, 2054, 3014, 3034</i>	3 ^[F, S]	
AOE 3224 ⁽⁴⁾ Ocean Structures <i>Pre: 2024</i>	3 ^[F]		Track Technical Elective	3	
	TOTAL	15		TOTAL	15



OE Senior Year

FALL SEMESTER FOURTH YEAR		Credits	SPRING SEMESTER FOURTH YEAR		Credits
AOE 4205 ^(1, 4) Experiments for Ocean Vehicle Design <i>Pre: 3054; Co: 4265</i>	1 ^(F)		AOE 4206 ^(1, 4) Experiments for Ocean Vehicle Design <i>Pre: 4205; Co: 4266</i>	1 ^(S)	
AOE 4265 ^(1, 4) Ocean Vehicle Design <i>Pre: 2204, 3214, 3224, 3234, 3264; Co: 4205</i>	3 ^(F)		AOE 4266 ^(1, 4) Ocean Vehicle Design <i>Pre: 4265; Co: 4206</i>	3 ^(S)	
STAT 4705 ⁽⁴⁾ Probability and Statistics for Engineers <i>Pre: MATH 2204 or MATH 2204H nor MATH 2406H</i>	3		Track Technical Elective	3	
Track Technical Elective	3		Technical Elective	3	
Technical Elective	3		Pathways ⁽²⁾ 2 and/or 7*	3	
Pathways ⁽²⁾ 6a and/or 7*	3		Pathways ⁽²⁾ 3 and/or 7*	3	
	TOTAL	16		TOTAL	16

Senior Design

- Senior design is 2 semester fall/spring sequence
- Take STAT 4705
- Access to AOE Studio for Design Innovation (ASDI)



OE Fall 2024 Course Request

Typical Fall Sophomore Year

FALL SEMESTER SECOND YEAR		Credits
ESM 2114 ⁽³⁾ Statics and Structures~ <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>	3	
MATH 2114 ⁽³⁾ Introduction to Linear Algebra ~ <i>Pre: MATH 1225 (min grade of B) or MATH 1226</i>	3	
MATH 2204 ⁽³⁾ Introduction to Multivariable Calculus~ <i>Pre: MATH 1226</i>	3	
AOE 2054 ⁽³⁾ Electronics for Aerospace and Ocean Engineers	3 ^(F)	
AOE 2074 ⁽³⁾ (ESM 2074) Computational Methods <i>Pre: (ENGE 1114 or ENGE 1216 or ENGE 1414), (CS 1044 or CS 1064 or CS 1114)</i>	2 ^(F,S)	
AOE 2204 ⁽⁴⁾ Introduction to Ocean Engineering <i>Pre: PHYS 2305; Co: MATH 2204</i>	3 ^(F)	
TOTAL	17	

Options When Ahead

- ECON 2005 or a Pathway
- Take fewer credits
- Thin-Walled Structures:
AOE 2024
- Dynamics: ESM 2304
- Differential Equations:
MATH 2214

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

FALL SEMESTER SECOND YEAR		Credits	SPRING SEMESTER SECOND YEAR		Credits
ESM 2114 ⁽³⁾ Statics and Structures <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>	3	ESM 2304 ⁽³⁾ Dynamics <i>Pre: (2104 or 2114), (MATH 2204 or MATH 2204H), Co: MATH 2214</i>	3		
MATH 2114 ⁽³⁾ Introduction to Linear Algebra ~ <i>Pre: MATH 1225 (min grade of B) or MATH 1226</i>	3	MATH 2214 ⁽¹⁾ Introduction to Differential Equations~ <i>Pre: (1114 or 2114 or 2114H or 2405H), 1226</i>	3		
MATH 2204 ⁽³⁾ Introduction to Multivariable Calculus~ <i>Pre: MATH 1226</i>	3	AOE 2024 ⁽³⁾ Thin-Walled Structures <i>Pre: ESM 2114 or (ESM 2104, ESM 2204),(MATH 2204 or 2204H); Co: MATH 2214</i>	3 ^[F, S]		
AOE 2054 ⁽³⁾ Electronics for Aerospace and Ocean Engineers	3 ^[F]	PHYS 2306 ⁽³⁾ Foundations of Physics <i>Pre: MATH 1226, PHYS 2305</i>	4		
AOE 2074 ⁽³⁾ (ESM 2074) Computational Methods <i>Pre: (ENGE 1114 or ENGE 1216 or ENGE 1414), (CS 1044 or CS 1064 or CS 1114)</i>	2 ^[F, S]	Pathways 3 ⁽¹⁾ ECON 2005 Principles of Economics~	3		
AOE 2104 ⁽⁴⁾ Introduction to Aerospace Engineering and Aircraft Performance <i>Pre: PHYS 2305, Co: ESM 2104 or ESM 2114</i>	3 ^[F, S, SII]				
TOTAL	17	TOTAL	16		



AE Junior Year

FALL SEMESTER THIRD YEAR		Credits	SPRING SEMESTER THIRD YEAR		Credits
MATH 4564 ⁽³⁾ Operational Methods for Engineers <i>Pre: (2214 or 2214H) or 2406H or CMDA 2006</i>	3	AOE 3114 ⁽⁴⁾ Aerodynamics and Compressibility <i>Pre: 3014, Co:3164</i>	3	[F, S]	
AOE 3014 ⁽³⁾ Fluid Dynamics for Aerospace and Ocean Engineers <i>Pre: (2104 or 2204), ESM 2304, (MATH 2214 or MATH 2214H)</i>	3	AOE 3134 ⁽⁴⁾ Air Vehicle Dynamics <i>Pre: 3034, or</i>	3	[S]	
AOE 3034 ⁽³⁾ System Dynamics and Control <i>Pre: ESM 2304, (MATH 2214 or MATH 2214H)</i>	3	AOE 3144 ⁽⁴⁾ Space Vehicle Dynamics <i>Pre: 3034, 3154</i>	3	[S]	
AOE 3124 ⁽⁴⁾ Aerospace Structures <i>Pre: 2024 or 3024</i>	3	AOE 3164 ⁽⁴⁾ Aerothermodynamics and Propulsion Systems <i>Pre: 3014, Co: 3114</i>	3	[S]	
AOE 3154 ⁽⁴⁾ Astromechanics <i>Pre: ESM 2304</i>	3	AOE 3054 ⁽¹⁾ Experimental Methods <i>Pre: 2024, 2054, 3014, 3034</i>	3	[F, S]	
		Track Technical Elective	3		
	TOTAL	15		TOTAL	15

Air Vehicle & Space Vehicle Options

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



AE Senior Year

FALL SEMESTER FOURTH YEAR		Credits	SPRING SEMESTER FOURTH YEAR		Credits
AOE 4105 ^(1, 4) Experiments for Aerospace Design <i>Pre: 3054; Co: 4065 or 4165</i>	1	^[F]	AOE 4106 ^(1, 4) Experiments for Aerospace Design <i>Pre: 4105, Co: 4066 or 4166</i>	1	^[S]
Vehicle Design Choice ^(1, 4)	3	^[F]	Vehicle Design Choice ^(1, 4)	3	^[S]
MATH Elective ⁽⁴⁾	3		Track Technical Elective	3	
Track Technical Elective	3		Technical Elective	3	
Technical Elective	3		Pathways ⁽²⁾ 2 and/or 7*	3	
Pathways ⁽²⁾ 6a and/or 7*	3		Pathways ⁽²⁾ 3 and/or 7*	3	
TOTAL		16	TOTAL		16

Senior Design

- Senior design is a two semester fall/spring sequence
- Air vehicle or space vehicle focus
- Take Math Elective (3 options)
- Access to AOE Studio for Design Innovation (ASDI)



Fall 2024 Course Request

Typical Fall Sophomore Year

FALL SEMESTER SECOND YEAR		Credits
ESM 2114 ⁽³⁾ Statics and Structures <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>	3	
MATH 2114 ⁽³⁾ Introduction to Linear Algebra ~ <i>Pre: MATH 1225 (min grade of B) or MATH 1226</i>	3	
MATH 2204 ⁽³⁾ Introduction to Multivariable Calculus~ <i>Pre: MATH 1226</i>	3	
AOE 2054 ⁽³⁾ Electronics for Aerospace and Ocean Engineers	3 [F]	
AOE 2074 ⁽³⁾ (ESM 2074) Computational Methods <i>Pre: (ENGE 1114 or ENGE 1216 or ENGE 1414), (CS 1044 or CS 1064 or CS 1114)</i>	2 [F,S]	
AOE 2104 ⁽⁴⁾ Introduction to Aerospace Engineering and Aircraft Performance <i>Pre: PHYS 2305, Co: ESM 2104 or ESM 2114</i>	3 [F, S, SS]	
TOTAL	17	

Options When Ahead

- ECON 2005 or a Pathway
- Take fewer credits
- Thin-Walled Structures:
AOE 2024
- Dynamics: ESM 2304
- Differential Equations:
MATH 2214

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.
- The math courses can typically be taken at VT or at other institutions. Be sure to follow the [proper steps](#) when taking courses elsewhere.

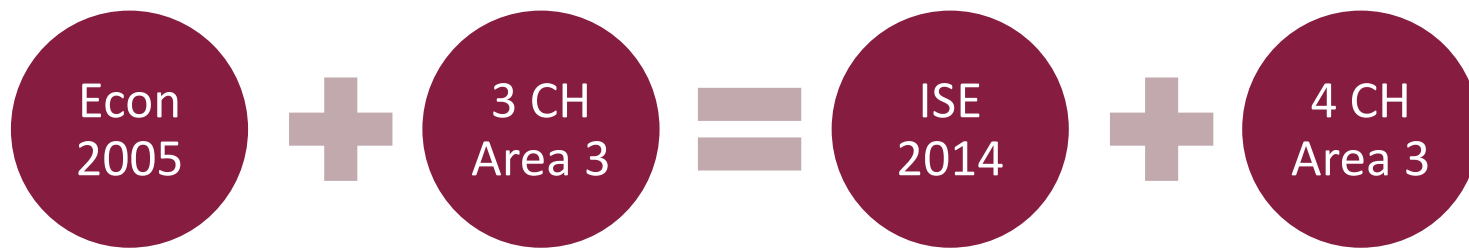


Pathways

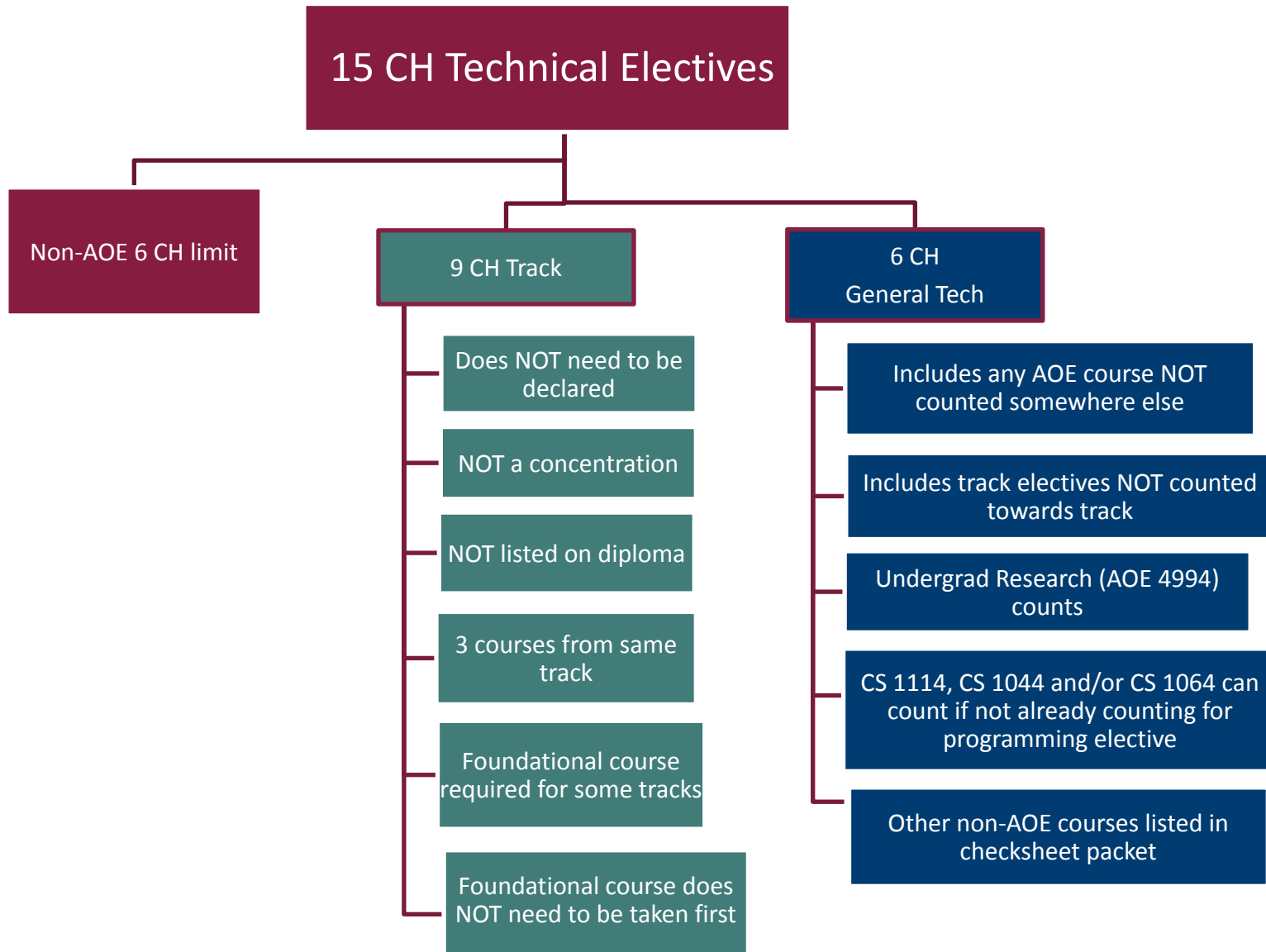


- **Area 1a:** covered through required AOE curriculum
- **Area 3:** Principles of Economics (ECON 2005) required
- **Remaining Pathways:** fit in where you can; typically no prereqs

Common Substitutions



Technical Electives



Technical Tracks

TABLE of AOE UG Courses in TRACKS
(See Track Descriptions for Specific Conditions/Requirements)

	Tracks	Structures & Materials	Aero/Hydro Dynamics	Dynamics, Control, and Estimation	Vehicle & System Design	Naval Engineering	Space Engineering	Propulsion	Energy and the Environment
Foundational Track	Foundational Courses	AOE 4224 Energy Methods for Structures	AOE 3044: Boundary Layer & Heat Transfer	AOE 4804 State-Space Control	AOE 4804 (ESM 4804) Engineering Design Optimization	AOE 4264 Principles of Naval Engineering			
	Track Courses	AOE 4054 (EM 4444) Stability of Structures	AOE 4804 Fluid Flows in Nature	AOE 2034** Air Vehicle Dynamic	AOE 3254 Avionics Systems	AOE 4244 Naval and Marine Engineering Systems Design	AOE 2664 (ECE 2164) Exploration of Space Environment	AOE 4174 (ME 4174) Spacecraft Propulsion	AOE 4864 Fluid Flow in Nature
		AOE 4024 (EM 4734) Intro to the Finite Element Method	AOE 4224 Applied Computational Aerodynamics	AOE 2144** Dynamic	AOE 3804 Sp Topics in Aircraft Systems (JWV)	AOE 4274 Intermediate Ship Structural Analysis	AOE 4174 (ME 4174) Spacecraft Propulsion Systems	AOE 4234 (ME 4234) Aerospace Propulsion Systems	AOE 4474 Propellers & Turbines
		AOE 4274 Intermediate Ship Structural Analysis	AOE 4224 Configuration Aerodynamic	AOE 3234** Ocean Vehicle Dynamic	AOE 4224 Configuration Aerodynamic	AOE 4244 Dynamic of High Speed Marine Craft	AOE 4454 Spacecraft PNT & Orbit Determination	AOE 4474 Propellers & Turbines	AOE 4624 Foundations of Aero/Hydroacoustic
		AOE 5224 Vehicle Structures*	AOE 4434 Introduction to Computational Fluid Dynamics	AOE 4244 Dynamic of High Speed Marine Craft	AOE 4244 Naval and Marine Engineering Systems Design	AOE 4474 Propellers & Turbines	AOE 4604 Booster Design, Fabrication, and Operation	AOE 4604 Booster Design, Fabrication, and Operation	AOE 4634 Wind Turbine Tech & Aerodynamics
		AOE 5324 Vehicle Structural Dynamics*	AOE 4474 Propellers & Turbines	AOE 4464 Spacecraft PNT & Orbit Determination*	AOE 4264 Principles of Naval Engineering	AOE 5874 Advance Ship Structural Analysis*	AOE 4654 (ECE 4154) Intro to Space Weather	AOE 4824 Sp Topics in Propulsion	AOE 4824 Sp Topics in Energy & Environment
		AOE 5274 Advance of Ship Structural Analysis*	AOE 4624 Foundations of Aero/Hydroacoustic	AOE 4084 Sp Topics in DOE	AOE 4604 Booster Design, Fabrication, and Operation	AOE 5247 Advance Ship Dynamic	AOE 4824 Special Topics in Space Engineering	AOE 5235* Vehicle Propulsion	ECE 4364 Alternate Energy Systems
		ESM 3054 (ME 3054) Mechanical Behavior of Material	AOE 5204* Advanced Aero and Hydrodynamic	AOE 5204* Vehicle Dynamics & Control	AOE 4824 Sp Topics in Propulsion	ECE 4164 Global Navigation Satellite	AOE 5235* Vehicle Propulsion	AOE 5244 * Boundary Layer Theory & Heat Transfer	ENGR 3124 Intro to Green Engineering
		AOE 4824 Advanced Mechanical Behavior of Material	AOE 5224* High Speed Aerodynamics	AOE 5234* Advanced Ship Dynamic	ECE 5014 Analytic of Air Transportation Systems	ECE 4364 Air Energy Systems	AOE 5274* Introduction to Plasma Science	ME 2134 Fundamentals of Thermodynamics	ESM 4194 (ME 4194) Sustainable Energy Solution for a Global Society
		ESM 4844 Mechanics of Composite Material	AOE 5244 * Boundary Layer Theory & Heat Transfer	AOE 5244* Linear Systems Theory	ME 4644 Intro to Rapid Prototyping	ME 3234 Fundamentals of Thermodynamic	AOE 5234* Orbital Mechanics	ME 4234 Internal Combustion Engine	ME 2234 Fundamentals of Thermodynamics
		ME 4624 Finite Element Practice in Mechanical Design	ME 3234 Fundamentals of Thermodynamics	AOE 5254* Applied Linear Systems	ME 3104 ME Theory & Leadership		ECE 3018 Intro to Space Systems & Technologies		
		ME 2034 Elements of Material Engineering		AOE 5264* Applied Linear Control			ECE 3154 Space Systems Design and Validation		
		ME 3104 (AOE 3104) Materials & Manufacturing for Aero & Ocean Engineers		AOE 5274* Nonlinear Systems Theory			ECE 4164 Intro to GPS		
				ECE 4405 Control Systems			ECE 4194 Eng Principles of Remote Sensing		

Disciplinary

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

Applications

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

Tracks	Structures & Materials	Aero/Hydro Dynamics	Dynamics, Control, and Estimation	Vehicle & System Design	Naval Engineering	Space Engineering	Propulsion	Energy and the Environment
Foundational Courses / Track	AOE 4324 Energy Methods for Structures	AOE 3044: Boundary Layer & Heat Transfer	AOE 4004 State-Space Control	AOE 4084 (ESM 4084) Engineering Design Optimization	AOE 4264 Principles of Naval Engineering			
Track Courses	AOE 4054 (ESM 4444) Stability of Structures	AOE 4064 Fluid Flows in Nature	AOE 3134** Air Vehicle Dynamics	AOE 3354 Avionics Systems	AOE 4244 Naval and Marine Engineering Systems Design	AOE 2664 (ECE 2164) Exploration of Space Environment	AOE 4174 (ME 4174) Spacecraft Propulsion	AOE 4064 Fluid Flows in Nature
	AOE 4024 (ESM 4734) Intro to the Finite Element Method	AOE 4114 Applied Computational Aerodynamics	AOE 3144** Space Vehicle Dynamics	AOE 3804 Spl Topics in Aircraft Systems (HAW)	AOE 4274 Intermediate Ship Structural Analysis	AOE 4174 (ME 4174) Spacecraft Propulsion	AOE 4234 (ME 4234) Aerospace Propulsion Systems	AOE 4474 Propellers & Turbines
	AOE 4274 Intermediate Ship Structural Analysis	AOE 4124 Configuration Aerodynamics	AOE 3234** Ocean Vehicle Dynamics	AOE 4124 Configuration Aerodynamics	AOE 4344 Dynamics of High Speed Marine Craft	AOE 4454 Spacecraft PNT & Orbit Determination	AOE 4474 Propellers & Turbines	AOE 4624 Foundations of Aero/Hydroacoustics
	AOE 5024 Vehicle Structures*	AOE 4434 Introduction to Computational Fluid Dynamics	AOE 4344 Dynamics of High Speed Marine Craft	AOE 4244 Naval and Marine Engineering Systems Design	AOE 4474 Propellers & Turbines	AOE 4604 Booster Design, Fabrication, and Operation	AOE 4604 Booster Design, Fabrication, and Operation	AOE 4634 Wind Turbine Tech & Aerodynamics
	AOE 5034 Vehicle Structural Dynamics*	AOE 4474 Propellers & Turbines	AOE 4454 Spacecraft PNT & Orbit Determination	AOE 4264 Principles of Naval Engineering	AOE 5074 Advanced Ship Structural Analysis*	AOE 4654 (ECE 4154) Intro to Space Weather	AOE 4814 Sp Topics in Propulsion	AOE 4824 Sp Topics in Energy & Environment
	AOE 5074 Advanced Ship Structural Analysis*	AOE 4624 Foundations of Aero/hydroacoustics	AOE 4804 Sp Topics in DCE	AOE 4604 Booster Design, Fabrication, and Operation	AOE 5334* Advanced Ship Dynamics	AOE 4864 Special Topics in Space Engineering	AOE 5135* Vehicle Propulsion	ECE 4364 Alternate Energy Systems
	ESM 3054 (MSE 3054) Mechanical Behavior of Materials	AOE 5104* Advanced Aero and Hydrodynamics	AOE 5204* Vehicle Dynamics & Control	AOE 4814 Sp Topics in Propulsion	ECE 4164 Global Navigation Satellite	AOE 5135* Vehicle Propulsion	AOE 5144 * Boundary Layer Theory & Heat Transfer	ENGR 3124 Intro to Green Engineering

Tracks	Structures & Materials	Aero/Hydro Dynamics	Dynamics, Control, and Estimation	Vehicle & System Design	Naval Engineering	Space Engineering	Propulsion	Energy and the Environment
Track Courses (cont'd.)	ESM 4024 Advanced Mechanical Behavior of Materials	AOE 5114* High Speed Aerodynamics	AOE 5334* Advanced Ship Dynamics	CEE 5614 Analysis of Air Transportation Systems	ECE 4364 Alt Energy Systems	AOE 5174* Introduction to Plasma Science	ME 3134 Fundamentals of Thermodynamics	ESM 4194 (ME 4194) Sustainable Energy Solution for a Global Society
	ESM 4044 Mechanics of Composite Materials	AOE 5144 * Boundary Layer Theory & Heat Transfer	AOE 5744* Linear Systems Theory	ME 4644 Intro to Rapid Prototyping	ME 3134 Fundamentals of Thermodynamics	AOE 5234* Orbital Mechanics	ME 4204 Internal Combustion Engines	ME 3134 Fundamentals of Thermodynamics
	ME 4624 Finite Element Practice in Mechanical Design	ME 3134 Fundamentals of Thermodynamics	AOE 5754* Applied Linear Systems	MGT 3304 Mgt Theory & Leadership		ECE 3104 Intro to Space Systems & Technologies		
	MSE 2034 Elements of Materials Engineering		AOE 5764* Applied Linear Control			ECE 3154 Space Systems Design and Validation		
	MSE 3094 (AOE 3094) Materials & Manufacturing for Aero & Ocean Engineers		AOE 5774* Nonlinear Systems Theory			ECE 4164 Intro to GPS		
			ECE 4405 Control Systems			ECE 4194 Eng Principles of Remote Sensing		
			ECE 4406 Control Systems			PHYS 3655 Intro to Astrophysics		
			ECE 4624 Digital Signal Processing & Filter Design			PHYS 3656 Intro to Astrophysics		
			ESM 4114					

Minors

Minors may add significant additional coursework



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

- Popular, but adds many extra credits
- More feasible with 5-year plan

Double Majors & Dual Degrees

Double Major in AE & OE

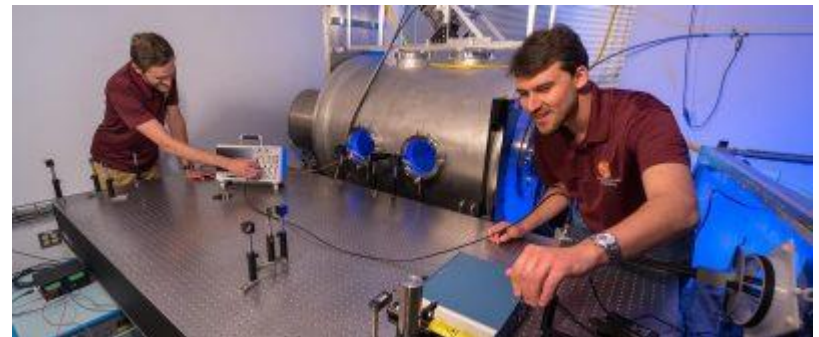
- Complete one senior design sequence
- Minimum 4 extra courses
- High credit load semesters
- Diploma in primary major
- Double major certificate in secondary major

Dual Degree in AE & OE

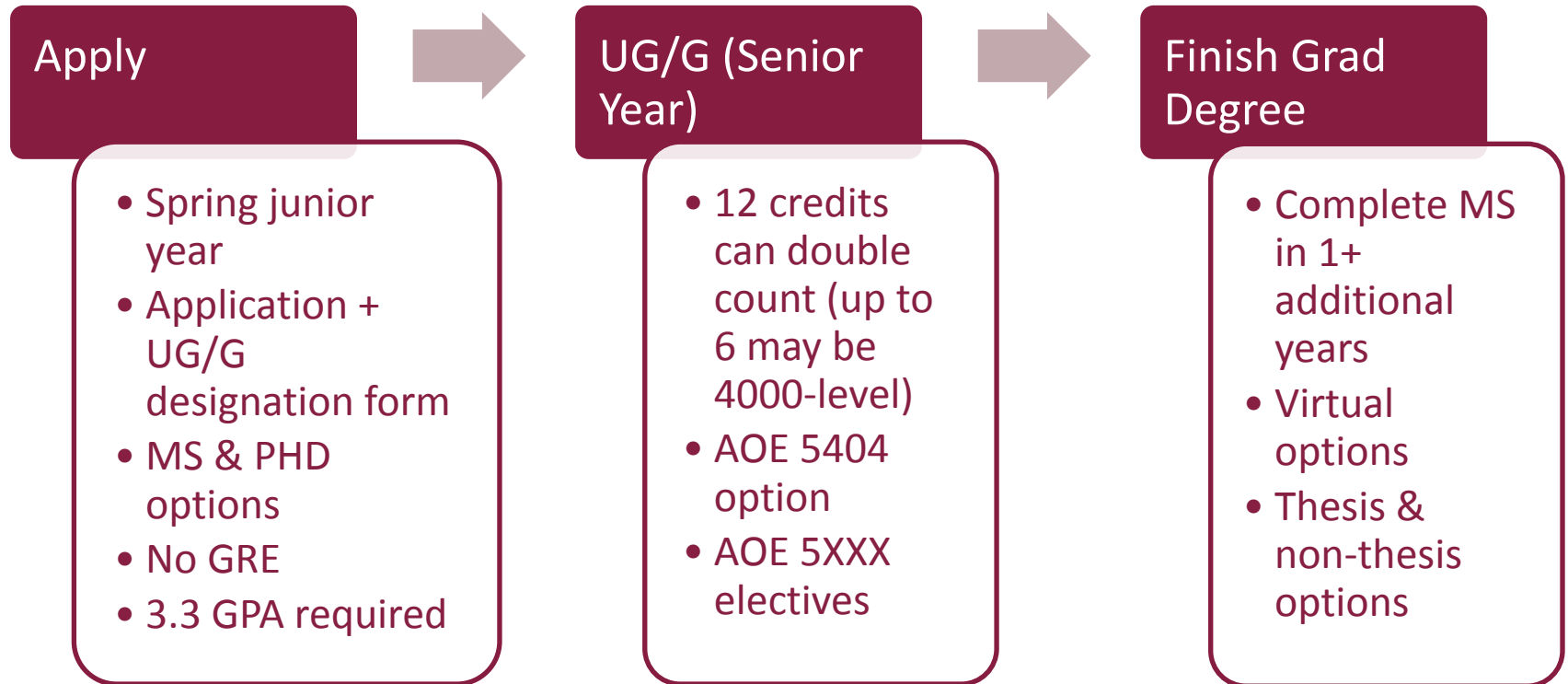
- Diplomas in both majors
- Complete senior design for AE & OE
- 30 extra credits
- Significant extra time required

2nd 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) & Audri Cunningham (audrinc@vt.edu)

Policy 91

1. Placed on [Policy 91](#) 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 suspension 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.



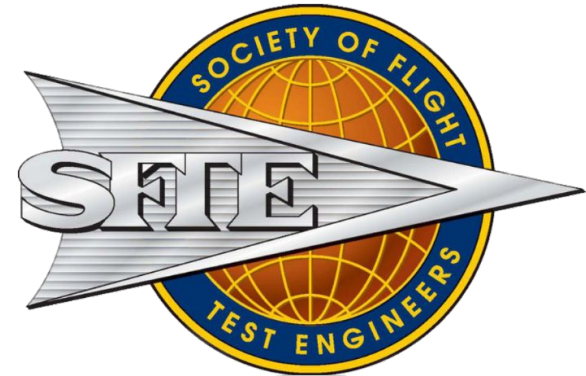
Extracurricular Activities

Agenda

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



Student Organizations

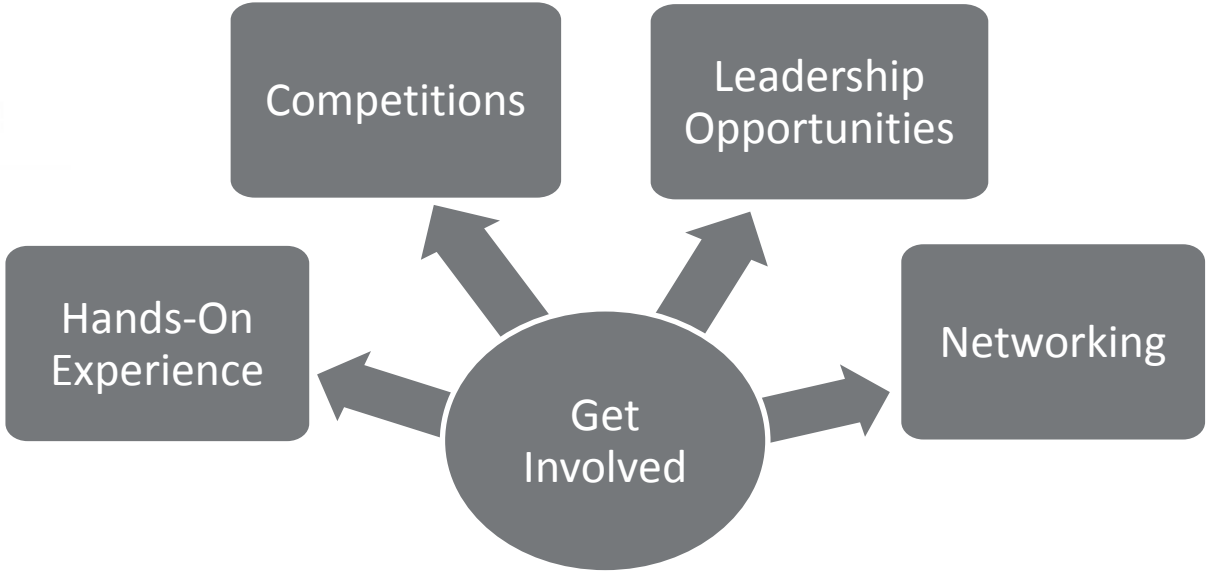


SOCIETY OF WOMEN IN AVIATION AND SPACE EXPLORATION



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

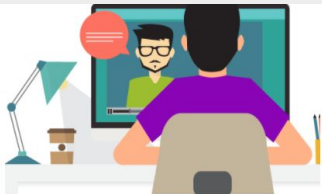


Career Advising

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**

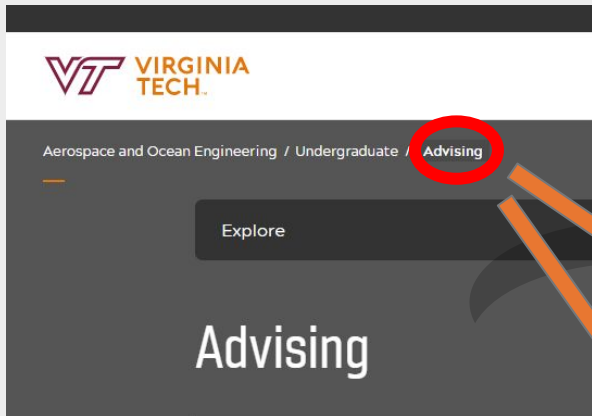
**CAMEO
CareerFest**

And more...

ENGINEERING EXPO

SECI
STUDENT ENGINEERS' COUNCIL

AOE Career Resources



Internships and co-ops are highly encouraged!

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

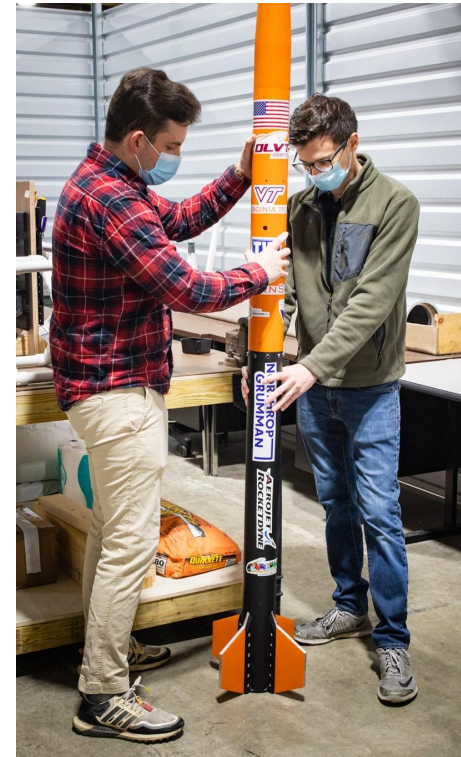
YES!

AOE Resources

- AOE Course Request Guides
- AOE Advising Newsletter
- AOE Undergraduate Curriculum and Checksheets
- Policy 91
- AOE Technical Electives Guide
- **Co-ops and Internships**
- 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 Form
- AOE Force-Add Request Form

Learn More About AOE

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



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

Still Have Questions?

Contact an AOE advisor!

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

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

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

Schedule an appointment through [Navigate](#).