Aerospace and Ocean Engineering
Class of 2019
Information Session

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We are here to help you in every way possible to achieve your goal of earning a Bachelor of Science degree in Aerospace and/or Ocean Engineering
AOE Dept Head, Dr. Eric Paterson

A Message From the Department Head

I am pleased to introduce to you my distinguished colleagues, the faculty and staff of Aerospace and Ocean Engineering. There are currently 19 full-time faculty members, with graduate and undergraduate engineering degrees from 28 different universities in 7 different countries. Many work in both aerospace and ocean fields, but some specialize in one or the other. There are more than a dozen administrative and technical staff who support the research and education mission of the department, and more than a dozen research faculty who conduct research and in some cases participate in the department’s teaching mission.

Our faculty numbers include four Professors who have been elected as Fellows of their professional engineering societies, four who have been honored by Virginia Tech with prestigious named professorships, and four junior faculty who have been honored by national agencies with highly competitive young investigator awards. These faculty members are responsible for educating one of the larger classes of Aerospace Engineering B.S. graduates in the nation, as well as a significant number of Ocean Engineering B.S. graduates. The department has awarded 100 or more B.S. degrees per year during the past several years, with graduates going to industry, government, graduate school, and professional school. The department’s faculty are active in externally funded research, with more than $6.5 million in annual research expenditures. Research projects play a significant role in the education of graduate students, and we award some 30 M.S. degrees and 10 Ph.D. degrees annually.
Agenda

• Welcome
• Information Packets
• AOE Policies
• Academic Advising
• Academic Plan of Study
  – AE or OE Degree
  – Double Majors & Minors
• Co-Ops & Internships, Career Services
• Final Advice
Declaring an Engineering Major or Minor

The College of Engineering offers 14 degree-granting engineering majors and 7 minors and accepts applications to declare an engineering major and/or minor three times per year (end of spring, end of summer, and end of fall). The specific dates can be located on the right side bar.

Students wishing to change out of engineering should review the Out of Engineering website for the steps and procedures necessary for their college of interest.

| General Engineering Students to a Degree-Granting Engineering Majors |

Requirements and Policies

The steps below provide a guide for General Engineering students wishing to declare one of the 14 degree-granting engineering majors:

Step 1: Complete the change of major requirements and review the application policies.

1. Requirements and Policies: End of Spring 2016 and after

Step 2: Review your unofficial transcript on Hokie Spa to verify completion of all required coursework.

Step 3: Review the application availability (on the right side bar).

Step 4: Submit the College of Engineering Major/Minor Application during one of the three application dates.

Application Dates

Spring 2016

- May 15 Application Opens
- May 20 Application Closes

Summer 2016

- Aug 10 Application Opens
- Aug 15 Application Closes

http://www.enge.vt.edu/undergraduate/undergraduate-changing-majors.html
Major Checksheets

- Checksheets:
  - Select the year closest to your projected graduation date.

- Checksheets show:
  - Courses required for graduation
  - Required courses that fulfill the CLE areas
  - When certain courses will likely be taken
Information Packets

• You now have a copy of the **Class of 2019 Information Packet**
  – Read it, Save it, Use it!
  – Bring it with you when you visit your advisor

• If you become a member of a later Class, you will need to get a copy of the **Class of 20xx Information Packet**

• These information packets are all on the AOE website at
Aerospace and Ocean Engineering / Programs / Undergraduate Programs

Undergraduate Advising

As the Undergraduate Academic Advisor for the Department of Aerospace and Ocean Engineering, I look forward to working with our students during their time at Virginia Tech. As a student at Virginia Tech, you have the opportunity to learn from some of the best minds in the related fields of aerospace and ocean engineering.

My primary goal is to serve as a resource to help you maximize your opportunity. One of my tasks is to help you develop your individual curriculum plan. I will strive to match your interests and goals to the various curriculum offerings and their related requirements. If you are a transfer student, I will be glad to help you work through the requirements related to your transfer. In addition to working with you on general curriculum issues, I serve as your contact for course withdrawals, course substitution requests and more. My desire is to see you succeed at Virginia Tech. More...

Information Packets

The links provided below give you access to information on AOE.
Some AOE Policies

- **E-Mail Listservs:** We maintain listservs for sophomores, juniors, and seniors
  - Pay attention to the emails
  - Going to your PID!

- **In-Major GPA Rule:** You must maintain a 2.0 or better GPA in your AOE courses
**Advisors**

- You will be assigned a **faculty advisor from among the AOE faculty**
- Please make an appointment to meet your faculty advisor as soon as possible
- If you want to change advisors for any reason, contact Dr. Canfield.
- AOE also has dedicated Career and Curriculum Advisors: Ms. Rall-Smith, Ms. Kapania
- Their office is in Randolph 224-A

  Drop in during office hours, or make an appointment to discuss concerns about your academic progress
AOE UG Advising

Rachel Hall-Smith
Madhu Kapania
Office: Rand 224-A
Phone: 231–6699
E-mail: rahall@vt.edu, mkapania@vt.edu
Website: http://www.aoe.vt.edu/saffairs/advising
Office Hours 8:30 to 5:00
Advising on Academic Issues

General Schedule Issues:

• Schedule Courses; to stay on Track
• ROTC; Five year plan
• Co-ops
• Internships
• Study abroad

Course Transfer Issues:

• If take course elsewhere; Check the equivalency database at VT’s site
• Fill in the TR form and give it to Dean’s office
• Send the transcripts to Registrar’s office once course is complete
• Minimum tr grade is C and only the hours will count, not the GPA
• If you have send in the hours but don’t see in your transcripts, see me as the course might require the substitution.

Force-adds:

• If the class is full or the system is not seeing the prerequisites
Course Withdrawal:
- Up to 3 courses;
- Does not count towards GPA
- Download the form from the Dean’s site and get my signatures on it.

Undergraduate Research Form:
- AOE 2994, 4994, 4974 are the undergraduate courses for the research.
- Need to fill in the form so it shows in your transcripts

Plan for Improvement (For GPA below 2.0)
- Need to have the GPA of 2.0 and above (even for In-major)
- Plan of courses to improve the GPA

Email Lists (Listservs)
- Listservs for Sophomores, Juniors, Seniors and Undergraduates
- For departmental notifications
- Co-ops, internships, scholarship opportunities
- Read the emails
Tools For Course Scheduling

Plan of Study

• Pathways Planner (HokieSpa)
• Web Resources: http://www.enge.vt.edu/Undergraduate/plansofstudy.html

Degree Audit Reporting System (DARS)

• On HokieSpa, it is highly recommended that you RUN A “what if” DARS for the major you desire to enter http://www.registrar.vt.edu/academic_records/dars/index.html to MAKE SURE you understand what requirements you have yet to fulfill to earn your degree.

• Unofficial Transcripts: HokieSpa
For internships or co-ops
Things to keep in mind...

- Full time status during fall & spring semesters is 12 hours, maximum credit hours is 19.

- Full time status during summer sessions (I & II) is 5 hours per session, maximum credit hours is 9.

- Be sure to check for any required co-requisites, pre-requisites, and/or major restrictions. Click on CRN# for comments and restrictions on the timetable of classes.

- Some classes are only offered the semester listed on the checksheet.

- There can be multiple sections of a class; some sections might be restricted while others are not. If a class you want is restricted please check other CRN numbers to see if any sections are not restricted.
# Aerospace Engr (AE) Checksheet

<table>
<thead>
<tr>
<th>College of Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Aerospace and Ocean Engineering</td>
</tr>
<tr>
<td>Bachelor of Science in Aerospace and Ocean Engineering, Major: Aerospace Engineering</td>
</tr>
<tr>
<td>For students graduating in calendar year 2018</td>
</tr>
<tr>
<td>132 credits required for graduation</td>
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</table>

## Freshman Fall Semester 2014

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1035 General Chemistry (C–)</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1045 General Chemistry Lab Co: CHEM 1035</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 1105 First-Year Writing</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1225 Calculus of a Single Variable (C–) Pre: Math Ready</td>
<td>4</td>
</tr>
<tr>
<td>ENGE 1215 Foundations of Engineering (C–) Co: MATH 1225</td>
<td>2</td>
</tr>
<tr>
<td>CLE (Area 2, 3, or 7)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

## Freshman Spring Semester 2015

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 1106 First-Year Writing Pre: ENGL 1105</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1226 Calculus of a Single Variable Pre: MATH 1225</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 2305 Found of Physics I w/lab (C–) Pre: MATH 1225; Co: MATH 1226</td>
<td>4</td>
</tr>
<tr>
<td>ENGE 1216 Foundations of Engineering (C–) Pre: ENGE 1215</td>
<td>2</td>
</tr>
<tr>
<td>CLE (Area 2, 3, or 7)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

## Sophomore Fall Semester 2015

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM 2104 Statics Co: MATH 2204 or 2204H or 2224 or 2224H</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2114 Introduction to Linear Algebra Pre: MATH 1226 or a grade of at least B in VT MATH 1225</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2204 Multivariable Calculus Pre: MATH 1226</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 2306 Foundations of Physics I w/lab Pre: MATH 1226, PHYS 2305</td>
<td>4</td>
</tr>
<tr>
<td>AOE 2074 Computational Methods Pre: ENGE 1216 or 1114 or 1434</td>
<td>2 [F, S]</td>
</tr>
<tr>
<td>AOE 2104 Intro to AE Pre: (ENGE 1216 or 1114), PHYS 2305, Co: 2074</td>
<td>2 [F, S]</td>
</tr>
<tr>
<td>CLE (Area 6)</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
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</tbody>
</table>

## Sophomore Spring Semester 2016

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESM 2204 Mechanics of Deformable Bodies Pre: ESM 2104, (MATH 2204 or 2204H or 2224 or 2224H)</td>
<td>3</td>
</tr>
<tr>
<td>ESM 2304 Dynamics, Co: MATH 2214; Pre: ESM 2104, (MATH 2204 or 2204H or 2224 or 2224H)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2214 Differential Equations Pre: MATH 1226, MATH 2114</td>
<td>3</td>
</tr>
<tr>
<td>AOE 3094 (MSE 3094) Materials for Aero &amp; Ocean Eng Pre: CHEM 1035; Co: ESM 2204, PHYS 2305</td>
<td>3 [S, SII]</td>
</tr>
<tr>
<td>AOE 3104 Aircraft Performance Pre: 2104, ESM 2104; Co: 2074, ESM 2304</td>
<td>3 [S, SII]</td>
</tr>
<tr>
<td>CLE (Area 3, ECON 2005)</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>
# Ocean Engr (OE) Checksheet

**College of Engineering**  
**Department of Aerospace and Ocean Engineering**  
**Bachelor of Science in Ocean and Ocean Engineering, Major: Ocean Engineering**  
**For Students Graduating in Calendar Year 2018**  
**133 Credits Required for Graduation**

### Freshman Fall Semester 2014

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 1035</td>
<td>General Chemistry (C–)</td>
<td>3</td>
<td>ENGL 1106</td>
<td>First-Year Writing</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 1045</td>
<td>General Chemistry Lab Co: CHEM 1035</td>
<td>1</td>
<td>MATH 1226</td>
<td>Calculus of a Single Variable</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1105</td>
<td>First-Year Writing</td>
<td>3</td>
<td>PHYS 2305</td>
<td>Found of Physics I w/lab (C–)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1225</td>
<td>Calculus of a Single Variable (C–)</td>
<td>4</td>
<td>ENGE 1215</td>
<td>Foundations of Engineering (C–)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pre: Math Ready</td>
<td></td>
<td></td>
<td>Pre: MATH 1225; Co: MATH 1226</td>
<td></td>
</tr>
<tr>
<td>ENGE 1215</td>
<td>Foundations of Engineering (C–)</td>
<td>2</td>
<td>ENGE 1216</td>
<td>Foundations of Engineering (C–)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Co: MATH 1225</td>
<td></td>
<td></td>
<td>Pre: ENGE 1215</td>
<td></td>
</tr>
<tr>
<td>CLE (Area 2, 3, or 7)</td>
<td></td>
<td>3</td>
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**Total: 16**

### Freshman Spring Semester 2015

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<th>Course Code</th>
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<tr>
<td>ENGL 1106</td>
<td>First-Year Writing</td>
<td>3</td>
<td>MATH 1226</td>
<td>Calculus of a Single Variable</td>
<td>4</td>
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<tr>
<td></td>
<td>Pre: ENGL 1105</td>
<td></td>
<td>PHYS 2305</td>
<td>Found of Physics I w/lab (C–)</td>
<td>4</td>
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<tr>
<td>MATH 1226</td>
<td>Calculus of a Single Variable</td>
<td>4</td>
<td>ENGE 1215</td>
<td>Foundations of Engineering (C–)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Pre: MATH 1225; Co: MATH 1226</td>
<td></td>
<td></td>
<td>Pre: ENGE 1215</td>
<td></td>
</tr>
<tr>
<td>ENGE 1216</td>
<td>Foundations of Engineering (C–)</td>
<td>2</td>
<td>CLE (Area 2, 3, or 7)</td>
<td></td>
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</table>

**Total: 16**

### Sophomore Fall Semester 2015

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<tbody>
<tr>
<td>ESM 2104</td>
<td>Statics Co: MATH 2204 or 2204H or 2224 or 2224H</td>
<td>3</td>
<td>ESM 2204</td>
<td>Mechanics of Deformable Bodies Pre: ESM 2104, (MATH 2204 or 2204H or 2224 or 2224H)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2114</td>
<td>Introduction to Linear Algebra Pre: MATH 1226 or a grade of at least B in VT MATH 1225</td>
<td>3</td>
<td>ESM 2304</td>
<td>Dynamics, Co: MATH 2214; Pre: ESM 2104, (MATH 2204 or 2204H or 2224 or 2224H)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 2204</td>
<td>Multivariable Calculus Pre: MATH 1226</td>
<td>3</td>
<td>MATH 2214</td>
<td>Differential Equations Pre: MATH 1226, MATH 2114</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 2306</td>
<td>Foundations of Physics I w/lab Pre: MATH 1226, PHYS 2305</td>
<td>4</td>
<td>AOE 3094</td>
<td>(MSE 3094) Materials for Aero &amp; Ocean Eng Pre: CHEM 1035; Co: ESM 2204, PHYS 2305</td>
<td>3[^5,^6]</td>
</tr>
<tr>
<td>AOE 2074</td>
<td>Computational Methods Pre: ENGE 1216 or 1114 or 1434</td>
<td>2[^,^5,^6]</td>
<td>AOE 3204</td>
<td>Naval Architecture, Co: 2074, ESM 2304; Pre: 2204, ESM 2104, MATH 2204 or 2204H or 2224 or 2224H</td>
<td>3[^5,^6]</td>
</tr>
<tr>
<td>AOE 2204</td>
<td>Intro to OE Pre: (ENGE 1216 or 1114), PHYS 2305; Co: 2074</td>
<td>2[^,^5]</td>
<td>CLE (Area 3, ECON 2005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AOE 2214</td>
<td>Intro to Phys Ocean for OE Pre: (ENGE 1216 or 1114), PHYS 2305</td>
<td>1[^,^5]</td>
<td></td>
<td></td>
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</table>

**Total: 18**
### Junior/Senior (AE)

#### Junior Fall Semester 2016
- **MATH 4564 Operational Methods**
  - Pre: MATH 2214 or 2214H or 2406H or CMDA 2006H
  - **3 credits**
- **ME 3134 Fundamentals of Thermodynamics**
  - Pre: MATH 2214
  - **3 credits**
- **AOE 3014 Aero/Hydrodynamics**
  - Pre: 3104 or 3204, ESM 2304
  - **3 credits**
- **AOE 3024 Thin-Walled Structures**
  - Pre: ESM 2104, ESM 2204
  - **3 credits**
- **AOE 3034 Vehicle Vibration & Control**
  - Pre: ESM 2304, MATH 2214
  - **3 credits**
- **AOE 4134 Astromechnics, Pre: ESM 2304**
  - **3 credits**

**TOTAL 18 credits**

#### Junior Spring Semester 2017
- **MATH Elective**
  - Choice of: MATH 4574, MATH 4404, or STAT 4705
  - **3 credits**
- **AOE 3054 AOE Experimental Methods**
  - Pre: 3014, 3024, and 3034
  - **3 credits**
- **AOE 3114 Compressible Aerodynamics**
  - Pre: 3014, ME 3134
  - **3 credits**
- **AOE 3124 Aerospace Structures**
  - Pre: 3024
  - **3 credits**
- **Choose one:**
  - AOE 3134 Stability and Control, Pre: 3034
  - AOE 4140 Spacecraft Dyn & Controls, Pre: 3034, 4134
  - **3 credits**
- **Technical Elective**
  - **3 credits**

**TOTAL 18 credits**

#### Senior Fall Semester 2017
- **AOE 3044 Boundary Layer Theory**
  - Pre: 3014, MATH 4564, ME 3134
  - **3 credits**
- **AOE 4065 Aircraft Design Pre: 3054, 3114, 3124, 3134, or**
  - **3 credits**
- **AOE 4165 Spacecraft Design Pre: 3054, 3114, 3124, 4140**
  - **3 credits**
- **AOE 4154 Aero Engr Lab Pre: 3054, 3114, 3124, (3134 or 4140)**
  - **1 credit**
- **AOE 4234 (ME 4234) Aerospace Propulsion Systems**
  - Pre: 3114, ME 3134
  - **3 credits**
- **Technical Elective**
  - **3 credits**
- **CLE (Area 2, 3, or 7)**
  - **3 credits**

**TOTAL 16 credits**

#### Senior Spring Semester 2018
- **AOE 4066 Aircraft Design, Pre:**
  - 3054, 3114, 3124, 3134, 4065; or
  - **3 credits**
- **AOE 4166 Spacecraft Design**
  - Pre: 3054, 3114, 3124, 4140, 4165
  - **3 credits**
- **Technical Elective**
  - **3 credits**
- **CLE (Area 2, 3, or 7)**
  - **3 credits**

**TOTAL 12 credits**
### Junior/Senior (OE)

<table>
<thead>
<tr>
<th>JUNIOR FALL SEMESTER 2016</th>
<th>Credits</th>
<th>JUNIOR SPRING SEMESTER 2017</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MATH 4564 Operational Methods</strong>&lt;br&gt;Pre: MATH 2214 or 2214H or 2406H or CMDA 2006H</td>
<td>3</td>
<td><strong>STAT 4705 Probability &amp; Stat for Engr</strong>&lt;br&gt;Pre: MATH 2204 or 2204H or 2224</td>
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</tr>
<tr>
<td><strong>ME 3134 Fundamentals of Thermodynamics</strong>&lt;br&gt;Pre: MATH 2214</td>
<td>3</td>
<td><strong>AOE 3054 AOE Experimental Methods</strong>&lt;br&gt;Pre: 3014, 3024, and 3034</td>
<td>3</td>
</tr>
<tr>
<td><strong>AOE 3014 Aero/Hydrodynamics</strong>&lt;br&gt;Pre: 3104 or 3204, ESM 2304</td>
<td>3</td>
<td><strong>AOE 3224 Ocean Structures</strong>&lt;br&gt;Pre: 3024</td>
<td>3</td>
</tr>
<tr>
<td><strong>AOE 3024 Thin-Walled Structures</strong>&lt;br&gt;Pre: ESM 2104, ESM 2204</td>
<td>3</td>
<td><strong>AOE 3264 Resistance &amp; Propulsion of Ships</strong>&lt;br&gt;Pre: 3014, 3204</td>
<td>3</td>
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<tr>
<td><strong>AOE 3034 Vehicle Vibration &amp; Control</strong>&lt;br&gt;Pre: ESM 2304, MATH 2214</td>
<td>3</td>
<td><strong>AOE 4214 Ocean Wave Mechanics</strong>&lt;br&gt;Pre: 3014, MATH 4564</td>
<td>3</td>
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<tr>
<td><strong>Technical Elective</strong></td>
<td>3</td>
<td><strong>AOE 4244 (MSE 4244) Marine Engineering</strong>&lt;br&gt;Pre: 3204, (ME 3134 or 3124)</td>
<td>3</td>
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<tr>
<td><strong>TOTAL 18</strong></td>
<td></td>
<td><strong>TOTAL 18</strong></td>
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<table>
<thead>
<tr>
<th>SENIOR FALL SEMESTER 2017</th>
<th>Credits</th>
<th>SENIOR SPRING SEMESTER 2018</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AOE 3044 Boundary Layer Theory</strong>&lt;br&gt;Pre: 3014, MATH 4564, ME 3134</td>
<td>3</td>
<td><strong>AOE 4266 Ship Design</strong>&lt;br&gt;Pre: 4265</td>
<td>3</td>
</tr>
<tr>
<td><strong>AOE 4265 Ship Design</strong>&lt;br&gt;Pre: 3054, 3224, 3264, 4214, 4244; Co: 4334</td>
<td>3</td>
<td><strong>Technical Elective</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>AOE 4254 Ocean Engr Lab</strong>&lt;br&gt;Pre: 3054, 3264</td>
<td>1</td>
<td><strong>CLE (Area 2, 3, or 7)</strong></td>
<td>6</td>
</tr>
<tr>
<td><strong>AOE 4334 Ship Dynamics</strong>&lt;br&gt;Pre: 3014, 3034, 4214; MATH 4564</td>
<td>3</td>
<td><strong>Elective</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>Technical Elective</strong></td>
<td>3</td>
<td><strong>CLE (Area 6)</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL 14</strong></td>
<td></td>
<td><strong>TOTAL 15</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Sophomore Year
### (AE/OE and OE/AE Double Majors)

| FALL | | SPRING |
|------|----------------------------------------------------------|
| AOE 2074 | **COMP METHODS** | AOE 3094 | AOE MATERIALS |
| AOE 2104/2204 | **INTRO AERO/OCEAN ENGR** | AOE 3104 | **AIRCRAFT PERFORMANCE** |
| ESM 2104 | **STATICS** | AOE 3204 | **NAVAL ARCHITECTURE** |
| MATH 2224 | **MULTI VAR CALC** | ESM 2204 | **MECH DEFORM BODIES** |
| PHYS 2306 | **PHYSICS II** | ESM 2304 | **DYNAMICS** |
| MATH 2114 | **LINEAR ALEGBRA** | MATH 2214 | **DIFFERENTIAL EQUATIONS** |
| **17/18** | | **18** |

* [SATISFACTORY PROGRESS] Students must have passed AOE 3104 / 3204 after attempting 68 credit hours.
Double Majors and Two Degrees

- Many AOE students choose to earn a double major in the “other” curriculum in the department
  - Double major can require as little as two extra credits
  - Programs of study for double majors are provided
  - Double major receives a diploma in the primary program
  - Double major certificate is issued to recognize the second major
  - Both majors are indicated on the transcript
  - A graduate desiring two diplomas (called “two degrees”) must take a minimum of thirty extra credits
  - Generally advisable to pursue a master’s degree rather than “two degrees”

- Some students pursue second major outside department
  - Rare, typically involves significant additional coursework
  - AOE students have graduated with second majors in Math, Physics, English, Philosophy, Chemistry and other engineering
  - Generally better to pursue master’s degree rather than second major
Minors

• Minors often require significant additional coursework beyond the 133 credits necessary to graduate and are not generally available in engineering majors
• Except a Math minor requires little additional study beyond required AE, OE math credits
  – Typically possible by judicious selection of one technical elective
  – Contact the Math Department for a list of minor requirements and for the forms needed to sign up for the minor
• Naval Engineering
Curriculum for a Liberal Education, and Electives

• The CLE requirements are well-established
  – See Info Packet for details and recommendations.

• ECON 2005 is required for graduation and may be taken as one of the two Area 3 requirements in the University Curriculum for a Liberal Education
  – If you choose to satisfy Area 3 requirements with courses not including ECON 2005, ISE 2014 may also be used to satisfy this requirement but this requires additional credits.

• MATH ELECTIVE:
  – AE students must take either Math 4574 or Math/AOE 4404 or Statistics 4705 on an A/F basis
  – OE students must take Statistics 4705

• TECHNICAL ELECTIVES: requires 9 credits of technical electives, all of which must be taken on an A/F basis
  – Details are in Info Packet
  – Prior approval is required for courses not on the approved list
Pass/Fail and Electives

• For AOE majors all required AOE courses and all math, science and technical electives must be taken on an A/F basis
• The university requires that all CLE courses must also be taken for A/F credit
• Only “free” electives and courses offered only P/F may be taken P/F
• Acceptable technical and math electives are listed in your packets
• Substitutions may be made with the prior approval of your advisor in some cases
Electives

Superscripted annotation [F,S,SI,SII] in Credits column indicates that a course is known to be offered in terms other than when shown. Course offerings are subject to change and the availability of sufficient resources. Students should confirm course offerings in advance with their department. Core courses common to all AOE majors are listed in black. **Major courses are listed in blue.** AE primary majors with an OE secondary major may substitute 2104 for 2204, and 4065-4066 or 4165-4166 for 4265-4266 in their secondary OE major.

### Curriculum for Liberal Education (CLE)

Consult the CLE Alphabetical Listing at: [http://www.cle.prov.vt.edu/guides/alpha.html](http://www.cle.prov.vt.edu/guides/alpha.html), CLE courses need to be completed prior to graduation. If a CLE course is double-counted to satisfy two different CLE areas, a free elective(s) must be taken to maintain a minimum of 133 credits.

| CLE Area 1: Writing and Discourse (6 hrs) | ENGL 1105 | (3) | ENGL 1106 | (3) |
| CLE Area 2: Ideas, Cultural Traditions, Values Electives (6 hrs) | | | | |
| CLE Area 3: Society & Human Behavior electives (6 hrs) | ECON 2005 | (3) |
| CLE Area 4: Scientific Reasoning and Discovery (8 hrs) | CHEM 1035/1045 | (4) | PHYS 2305 | (4) |
| CLE Area 5: Quantitative and Symbolic Reasoning (8 hrs) | MATH 1225 | (4) | MATH 1226 | (4) |
| CLE Area 6: Creativity & Aesthetic Experience elective (1 hr) | | | | |
| CLE Area 7: Global Issues Elective (3 hrs) | | | | |

**Technical Electives:** The AOE department requires 9 credits of technical electives, of which 6 credits must be AOE 3000-level or higher courses. The remaining 3 may be selected from the attached approved list of computer programming courses and other 3000-level or higher technical courses.
Senior Design

• In senior year, you are required to take AOE 4x65 and AOE 4x66, a two-course sequence in which you complete a group design project
  – AE students take either 4065-66, Aircraft Design, or 4165-66, Spacecraft Design
  – OE students take 4265-66, Ship Design

• AE students must make a junior-year decision:
  – Spacecraft Design requires AOE 4134 (Fall) and 4140 (Spring)
  – Aircraft Design requires AOE 3134 (Spring)
Scholarships, Co-ops and Internships

• Many AOE undergraduates participate

• Your first step is to visit Career Services http://www.career.vt.edu/
Time To Graduate

- AOE curricula lead to graduation in four years (five years for Co-op students)
- Required junior and senior level AOE courses are only offered once per year, making it difficult to “stretch” the program over a longer period
- Some students enter the department later than normal or with fewer credits than normal and there are others who need to accommodate special programs such as ROTC or sports participation
- We will work with you to develop the needed schedule of coursework within the restrictions imposed by course teaching schedules, curricular and accreditation requirements, and elective availability
- If you drop a course that is a prerequisite course, that drop could extend your program by a full year
Sample Curriculum Problem:
Cost of Dropping AOE 3014 in Junior Fall

**Given:** You are a junior in AE. In the fall semester you decide to drop AOE 3014, Aero/Hydro. Furthermore, you do not speak with your advisor about this decision. Determine the consequences of this action, particularly the cost.

**Facts:** AOE 3014 Aero/Hydro is a prerequisite for the following AOE courses: 3054, 3264, 3114, 4214, 4334. AOE 3054, 3114, 3264 and 4214 are in the Junior Spring Semester. AOE 3054 and 3114 are prerequisites senior AE classes. AOE 3054, 3264 and 4214 are prerequisites for senior OE classes. All of these courses are only offered once per year.

**Consequence:** You cannot take AOE 3054, 3114, 3264 or 4214 in Spring. You must wait until next Fall and take AOE 3014. You can then take AOE 3054, etc. the following Spring, in what would have been your last semester. However, since these courses are prerequisites for senior courses, you would not yet have taken all your senior courses.

The end result of this chain of events is that you will need another entire year to obtain your B.S. degree. The $ cost therefore is the cost of tuition, room and board for an additional year. In addition, there is the opportunity cost of another year of not earning the $50,000-$60,000 per year that AOE graduates typically earn after graduation.

**Lesson:** *Speak with your advisor and/or with Ms. Kapania before dropping any courses.*
Extracurricular Activities

• AIAA (American Institute of Aeronautics and Astronautics) is aerospace engineering professional society
  – Our student branch is among the largest and most active in AIAA
  – Activities include regular meetings, a regional paper competition and design competitions

• SNAME (Society of Naval Architects and Marine Engineers) is professional society for Ocean Engineers
  – Our student branch is very active and successful in SNAME national programs and design competitions
  – Members hold regular meetings and travel to the SNAME national meeting

• ΣΓΤ (Sigma Gamma Tau) is the national Aerospace honor society
  – Each semester the chapter selects the top AE and OE juniors and seniors for membership
# AOE Ambassadors

![Sign-up Page](image)

## Meetings
Click 'Add' to create a new meeting, or click a meeting title to modify or copy it.

<table>
<thead>
<tr>
<th>Meeting Title</th>
<th>Organizer</th>
<th>Location</th>
<th>Category</th>
<th>Date</th>
<th>Time</th>
<th>Status</th>
<th>Remove</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Majors Fair</td>
<td>Madhu Kapania</td>
<td>Squires Commonwealth Ballroom</td>
<td></td>
<td>Wed, 9/10/14</td>
<td>10:00 AM - 3:00 PM</td>
<td>Closed</td>
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More Extracurricular Activities

• Design-Build-Fly
• Human-Powered Submarine
• Autonomous Underwater Vehicle
• Sounding Rocket Project
• Take charge of your career now.

• Take responsibility for your curriculum
  – Read and know the info in your packet
  – Meet your advisor
  – Seek advice from us!

• Get involved
  – Student chapters
  – Student vehicle projects

• We are here to help you succeed, but you have to do the work