Required Courses for Aerospace Science and Engineering Degree – 2019-20
This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org

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For advising hours, please visit:
http://mae.ucdavis.edu/undergraduate-advising/

Note: Curriculum and course offerings are subject to change. You must fulfill the degree requirements stated in the catalog of the year you graduate or the year immediately prior.

Communication, Writing and General Education Requirements

Lower Division Composition (4 units)
Select ONE of the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
<th>Qtr Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>UWP 1, 1Y or 1V</td>
<td>Introduction to Academic Literacies</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>Satisfactory score on math placement exam</td>
</tr>
<tr>
<td>ENL 3</td>
<td>Introduction to Literature</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21A or 21AH</td>
</tr>
<tr>
<td>COM 1</td>
<td>Major Works-Ancient World</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21B or 21BH</td>
</tr>
<tr>
<td>COM 2</td>
<td>Major Works-Med. &amp; Early Mod. World</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>COM 3</td>
<td>Major Works-Modern World</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>COM 4</td>
<td>Major Works-Contemporary World</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>NAS 5</td>
<td>Intro to Native American Studies</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
</tbody>
</table>

Upper Division Composition (0 or 4 units)
Select ONE of the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Units</th>
<th>Qtr Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>UWP 101</td>
<td>Advanced Composition</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21A or 21AH</td>
</tr>
<tr>
<td>UWP 102E</td>
<td>Writing in the Disciplines: Engineering</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21B or 21BH</td>
</tr>
<tr>
<td>UWP 104A</td>
<td>Writing in the Professions: Business Writing</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>UWP 104E</td>
<td>Writing in the Professions: Science</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>UWP 104T</td>
<td>Writing in the Professions: Technical Writing</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
</tbody>
</table>

Alternatively, you may satisfy the upper division English requirement by passing the Upper Division Composition Exam.

Note: CMN 3V and CMN 3Y do not satisfy the communication requirement.

Communication (4 units)
Select ONE of the following courses:

<table>
<thead>
<tr>
<th>Course</th>
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<th>Units</th>
<th>Qtr Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMN 1</td>
<td>Intro. to Public Speaking</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21A or 21AH</td>
</tr>
<tr>
<td>CMN 3</td>
<td>Group Communication</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21B or 21BH</td>
</tr>
<tr>
<td>ENG 3</td>
<td>Intro to Engineering Design</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
</tbody>
</table>

General Education Requirement
This requirement will vary depending on the year you entered UC Davis. Please refer to your specific GE requirement.

Lower and upper division composition courses require a grade of C- or better to fulfill the requirement.

Lower Division Mathematics, Physical Sciences, and Engineering Requirements

Mathematics and Physical Science (47 units)

<table>
<thead>
<tr>
<th>Course Number</th>
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<th>Units</th>
<th>Qtr Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 21A</td>
<td>Calculus</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>Satisfactory score on math placement exam</td>
</tr>
<tr>
<td>MAT 21B</td>
<td>Calculus</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21A or 21AH</td>
</tr>
<tr>
<td>MAT 21C</td>
<td>Calculus</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21B or 21BH</td>
</tr>
<tr>
<td>MAT 21D</td>
<td>Vector Analysis</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH</td>
</tr>
<tr>
<td>MAT 22A</td>
<td>Linear Algebra</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C or 21CH, ENG 6, EME 5, ECH 60 or MAT 22AL†</td>
</tr>
<tr>
<td>MAT 22B</td>
<td>Differential Equations</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 22A</td>
</tr>
<tr>
<td>PHY 9A (L)</td>
<td>Classical Physics</td>
<td>5</td>
<td>F W S SSI/II</td>
<td>PHY 9A, MAT 21C, MAT 21D†</td>
</tr>
<tr>
<td>PHY 9B (L)</td>
<td>Classical Physics</td>
<td>5</td>
<td>F W S SSI/II</td>
<td>PHY 9B, MAT 21D, MAT 22A†</td>
</tr>
<tr>
<td>CHE 2A or 2AH (L)</td>
<td>General Chemistry</td>
<td>5</td>
<td>F W S SSI/II</td>
<td>Qualifying score on Chemistry Placement Exam</td>
</tr>
<tr>
<td>CHE 2B or 2BH (L)</td>
<td>General Chemistry</td>
<td>5</td>
<td>F W S SSI/II</td>
<td>C- or better in CHE 2A or 2AH</td>
</tr>
</tbody>
</table>

Engineering (19 units)

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Description</th>
<th>Units</th>
<th>Qtr Offered</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 4 (L)</td>
<td>Engineering Graphics in Design</td>
<td>3</td>
<td>F W</td>
<td></td>
</tr>
<tr>
<td>ENG 6 or EME 5</td>
<td>Engr Prob Solving / Engr Applic.</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>ENG 6: C- or better in MAT 21A &amp; MAT 21B† or EME 5: MAT 21A†</td>
</tr>
<tr>
<td>ENG 17</td>
<td>Circuits I</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better recommended in: MAT 21C</td>
</tr>
<tr>
<td>ENG 35</td>
<td>Statics</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in PHY 9A and MAT 21D†</td>
</tr>
<tr>
<td>ENG 45 or 45Y (L)</td>
<td>Properties of Materials</td>
<td>4</td>
<td>F W S SSI/II</td>
<td>C- or better in: MAT 21C and CHE 2A, PHY 9A</td>
</tr>
</tbody>
</table>

†may be taken concurrently  ^^ ENG 6 recommended for Aerospace program  (L) Course has a lab component  ± not offered during 2019-2020 school year

YOU ARE RESPONSIBLE FOR ENSURING THAT ALL REQUIREMENTS FOR GRADUATION ARE COMPLETE
Upper Division Technical Elective - Select ONE of the following courses (4 units):

- ENG 100 (L) Electronic Circuits and Systems 3 F W S SSII ENG 17 (C- or better recommended)
- ENG 102 Dynamics 4 F W S SSI C- or better in: ENG 35 and MAT 22B
- ENG 103 Fluid Mechanics 4 F W S SSI C- or better in: ENG 35, MAT 22B and PHY 9B
- ENG 104 Mechanics of Materials 4 F W S SSI C- or better in: ENG 35 and MAT 22B
- ENG 105 Thermodynamics 4 F W S SSI C- or better in: MAT 22B and PHY 9B
- ENG 190 Professional Responsibilities 3 W S Upper division standing
- EME 106 Thermo-Fluid Dynamics 4 F W S C- or better in: ENG 103 and 105
- EME 108 (L) Measurement Systems 4 F W S C- or better in: ENG 100 and 102; ENG 104 recommended
- EME 109 (L) Experimental Methods for Thermal Fluids 4 F W S SSI C- or better in: EME 106
- EME 165 Fundamentals of Heat Transfer 4 F S SSI C- or better in: ENG 6 or EME 5 or EME 20, ENG 103 and ENG 105
- EME 172 Automatic Control of Eng. Systems 4 F W S SSI C- or better in: ENG 100 and ENG 102
- EAE 127 Applied Aircraft Aerodynamics 4 F C- or better in: EME 106
- EAE 129 Stability & Control of Aerospace Vehicles 4 W C- or better in: ENG 102
- EAE 133 Finite Element Methods in Structure 4 F C- or better in: ENG 104
- EAE 135 Aerospace Structures 4 W C- or better in: ENG 104; EAE 126 or 127 recommended
- EAE 138 Aircraft Propulsion 4 W C- or better in: ENG 106

(L) Course has a lab component

* ENG 180 recommended for students who want to take EAE 126

Applied Mathematics - Select ONE of the following courses (4 units):

- ENG 180 * Engineering Analysis 4 F C- or better in: ENG 6 or EME 5 or ECS 30 & MAT 21D & 22B
- MAT 128C Numerical Analysis in Differential Equations 4 S MAT 22A, 22B; ENG 6 or EME 5 or ECS 32A or ECS 30
- EME 115 Intro to Numerical Analysis 4 F C- or better in: ENG 6 or EME 5 or ECS 30 & MAT 21A-22B & PHY 9A-9C

* ENG 180 recommended for students who want to take EAE 126

Senior Design Experience - (8 units)

- EAE 130A/B Aircraft Performance and Design 4/4 (W/S) C- or better in: EAE 127 and EAE 129

† may be taken concurrently

Astronautics Elective - Select ONE of the following courses (4 units):

- EAE 140 Rocket Propulsion 4 F C- or better in: EME 106
- EAE 141 Space Systems Design 4 S C- or better in: ENG 102 and EME 106
- EAE 142 Orbital Mechanics 4 W C- or better in: ENG 102
- EAE 143A Space Vehicle Design 4 W C- or better in: ENG 102, ENG 103 and ENG 105

Aeronautics Elective - Select ONE of the following courses (4 units):

- EAE 140 ** Rocket Propulsion 4 F C- or better in: EME 106
- EAE 141 ** Space Systems Design 4 S C- or better in: ENG 102 and EME 106
- EAE 142 ** Orbital Mechanics 4 W C- or better in: ENG 102
- EAE 143A ** Space Vehicle Design 4 W C- or better in: ENG 102, ENG 103 and ENG 105
- EAE 126 Theoretical/Computational Aerodynamics 4 S C- or better in: EAE 127 and ENG 180* or MAT 128C or EME 115
- EME 139 (L) Stability of Flexible Dynamic Systems 4 S C- or better in: ENG 102 and ENG 103

(L) Course has a lab component

* ENG 180 recommended for students who want to take EAE 126
** If not used to satisfy other requirements.

Upper Division Technical Elective - Select ONE of the following courses (4 units):

- EAE 140 ** Rocket Propulsion 4 F C- or better in: EME 106
- EAE 141 ** Space Systems Design 4 S C- or better in: ENG 102 and EME 106
- EAE 142 ** Orbital Mechanics 4 W C- or better in: ENG 102
- EAE 143A ** Space Vehicle Design 4 W C- or better in: ENG 102, ENG 103 and ENG 105
- EAE 126 ** Theoretical/Computational Aerodynamics 4 S C- or better in: EAE 127 and ENG 180* or MAT 128C or EME 115
- EME 139 (L) Stability of Flexible Dynamic Systems 4 S C- or better in: ENG 102 and ENG 103
- Any Upper Division Engineering course (including courses above**) except BIM 110L, ENG 160, ECS 188 or any 197T course. 192 (internship) or 199 (research) may be used for this requirement. 192 and 199 units are only granted with prior approval.

(L) Course has a lab component

* ENG 180 recommended for students who want to take EAE 126
** If not used to satisfy other requirements.

Total Units for Aerospace Science and Engineering Degree – 164 (Does not include units for GE requirement)