

# 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>

## Undergraduate Advisors:

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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:

<input type="checkbox"/>	UWP 1, 1Y or 1V	Introduction to Academic Literacies
<input type="checkbox"/>	ENL 3	Introduction to Literature
<input type="checkbox"/>	COM 1	Major Works-Ancient World
<input type="checkbox"/>	COM 2	Major Works-Med. & Early Mod. World
<input type="checkbox"/>	COM 3	Major Works-Modern World
<input type="checkbox"/>	COM 4	Major Works-Contemporary World
<input type="checkbox"/>	NAS 5	Intro. to Native American Studies

### Upper Division Composition (0 or 4 units)

Select ONE of the following courses:

<input type="checkbox"/>	UWP 101	Advanced Composition
<input type="checkbox"/>	UWP 102E	Writing in the Disciplines: Engineering
<input type="checkbox"/>	UWP 104A	Writing in the Professions: Business Writing
<input type="checkbox"/>	UWP 104E	Writing in the Professions: Science
<input type="checkbox"/>	UWP 104T	Writing in the Professions: Technical Writing

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

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

### Communication (4 units)

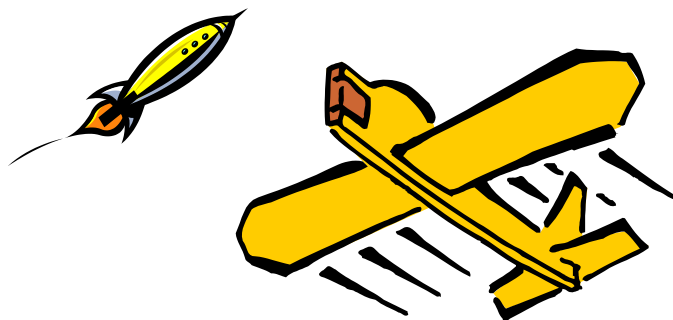
Select ONE of the following courses:

<input type="checkbox"/>	CMN 1	Intro. to Public Speaking
<input type="checkbox"/>	CMN 3	Group Communication
<input type="checkbox"/>	ENG 3	Intro to Engineering Design

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

### General Education Requirement

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



## Lower Division Mathematics, Physical Sciences, and Engineering Requirements

### Mathematics and Physical Science (47 units)

Course Number	Description	Units	Qtr Offered	Prerequisites
<input type="checkbox"/> MAT 21A	Calculus	4	F W S SSI/II	Satisfactory score on math placement exam
<input type="checkbox"/> MAT 21B	Calculus	4	F W S SSI/II	C- or better in: MAT 21A or 21AH
<input type="checkbox"/> MAT 21C	Calculus	4	F W S SSI/II	C- or better in: MAT 21B or 21BH
<input type="checkbox"/> MAT 21D	Vector Analysis	4	F W S SSI/II	C- or better in: MAT 21C or 21CH
<input type="checkbox"/> MAT 22A	Linear Algebra	3	F W S SSI/II	C- or better in: MAT 21C or 21CH. ENG 6, EME 5, ECH 60 or MAT 22AL <sup>†</sup>
<input type="checkbox"/> MAT 22B	Differential Equations	3	F W S SSI/II	C- or better in: MAT 22A
<input type="checkbox"/> PHY 9A (L)	Classical Physics	5	F W S SSI	MAT 21B
<input type="checkbox"/> PHY 9B (L)	Classical Physics	5	F W S SSI	PHY 9A, MAT 21C, MAT 21D <sup>†</sup>
<input type="checkbox"/> PHY 9C (L)	Classical Physics	5	W S SSI	PHY 9B, MAT 21D, MAT 22A <sup>†</sup>
<input type="checkbox"/> CHE 2A or 2AH (L)	General Chemistry	5	F W S SSI	Qualifying score on Chemistry Placement Exam
<input type="checkbox"/> CHE 2B or 2BH (L)	General Chemistry	5	W S SSI	C- or better in CHE 2A or 2AH

### Engineering (19 units)

<input type="checkbox"/>	ENG 4 (L)	Engineering Graphics in Design	3	F W	
<input type="checkbox"/>	ENG 6 <sup>^^</sup> or EME 5 <sup>±</sup> (L)	Engr Prob Solving / Engr Applic.	4	F W S SSI	ENG 6: C- or better in MAT 21A & MAT 21B <sup>†</sup> or EME 5: MAT 21A <sup>†</sup>
<input type="checkbox"/>	ENG 17	Circuits I	4	F W S SSI	C- or better recommended in: MAT 21C
<input type="checkbox"/>	ENG 35	Statics	4	F W S SSI	C- or better in PHY 9A and MAT 21D <sup>†</sup>
<input type="checkbox"/>	ENG 45 or 45Y (L)	Properties of Materials	4	F W S	C- or better in: MAT 21C and CHE 2A, PHY 9A

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

**YOU ARE RESPONSIBLE FOR ENSURING THAT ALL REQUIREMENTS FOR GRADUATION ARE COMPLETE**

# Aerospace Science and Engineering – 2019-20

## Upper Division Engineering, Applied Mathematics and Elective Requirements

### Engineering core requirements (62 units)

Course Number	Description	Units	Qtr Offered	Prerequisites
ENG 100 (L)	Electronic Circuits and Systems	3	F W S SSII	ENG 17 (C- or better <i>recommended</i> )
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 <i>recommended</i>
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 SSII	C- or better in: ENG 6 or EME 5 or ECS 30, ENG 103 and ENG 105
EME 172	Automatic Control of Eng. Systems	4	F W S SSII	C- or better in: ENG 100 and ENG 102
EAE 127	Applied Aircraft Aerodynamics	4	F	C- or better in: EME106
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 <i>recommended</i>
EAE 138	Aircraft Propulsion	4	W	C- or better in: EME 106

(L) Course has a lab component

### 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 <sup>†</sup>
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<sup>†</sup> may be taken concurrently

### 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

### 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: ENG 103, ENG 105 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: ENG 103, ENG 105 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. <sup>o</sup>Tentative offering

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