

# Required Courses for Mechanical 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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<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 S SSI	MAT 21B
<input type="checkbox"/>	PHY 9B (L)	Classical Physics	5 F W 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 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 (23 units)

<input type="checkbox"/>	ENG 4 (L)	Engineering Graphics in Design	3 F W	
<input type="checkbox"/>	ENG 6 or EME 5 (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
<input type="checkbox"/>	EME 50 (L)	Manufacturing Processes	4 F W SSI	C- or better in: ENG 4 and PHY 9A

<sup>†</sup>may be taken concurrently (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**

# Mechanical Engineering – 2019-20

## Upper Division Engineering, Design, Applied Mathematics and Elective Requirements

### Engineering core requirements (46 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 150A	Mechanical Design	4	F S	C- or better in: ENG 45 or 45Y, 104 and EME 50 <sup>†</sup>
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 Engineering Systems	4	F W S SSII	C- or better in: ENG 100 and ENG 102

### Senior Design Experience - Select ONE of the following courses (8 units)

EME 185A/B (L)	Mechanical Systems Design Project	4/4	(W/S)	C- or better in: EME 50, EME 150A and EME 165 <sup>†</sup> ; ENG 3, CMN 1 or 3 <i>recommended</i> ; Upper Division Composition <i>recommended</i>
EAE 130A/B	Aircraft Performance and Design	4/4	(W/S)	C- or better in: EAE 127 and EAE 129 <sup>†</sup>

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

ECH 140	Math Methods in Biochem and Chem Eng	4	F SSI	MAT 22B; ENG 6 or ECH 60
ECI 114	Probabilistic Systems Analysis	4	W S SSII	C- or better in: MAT 21C
ECS 130 ±	Scientific Computation	4		MAT 22A; ENG 6 or ECS 32A or ECS 36A or ECS 10 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
EME 151 ±	Statistical Methods in Design & Manufacturing	4		C- or better in: EME 150A
ENG 180	Engineering Analysis	4	F	C- or better in: ENG 6 or EME 5 or ECS 30 & MAT 21D & 22B
MAT 118A	Partial Differential Equations: Elem Methods	4	F	MAT 21D, MAT 22A, MAT 22B
MAT 128A	Numerical Analysis	4	F SSII	MAT 21C; ENG 6 or EME 5 or ECS 32A or ECS 30
MAT 128B	Numerical Analysis in Solution of Equations	4	W	MAT 22A; ENG 6 or EME 5 or ECS 32A or ECS 30
STA 130A	Brief Math Statistics	4	F SSI	C- or better in: MAT 21C, STA 13 or STA 13Y or STA 32 or STA 100
STA 131A	Introduction to Probability Theory	4	F S	C- or better in: MAT 21C and MAT 22A or MAT 27A; MAT 21D strongly recommended

### System Dynamics / Mechanical Design Elective - Select ONE of the following courses (4 units):

EME 121 (L)	Engineering Applications of Dynamics	4	S	C- or better in: ENG 6 or EME 5 or ECS 30 & ENG 102
EME 139 (L)	Stability of Flexible Dynamic Systems	4	S	C- or better in: ENG 102 and ENG 103
EME 150B	Mechanical Design	4	W S	C- or better in EME 150A
EME 154 (L)	Mechatronics	4	W S	C- or better in: ENG 100 and 102 and EME 50
EME 171 (L)	Simulation & Design of Mechatronic Systems	4	F W	C- or better in: ENG 100 and ENG 102
ENG 122	Intro to Mechanical Vibrations	4	W	C- or better in: ENG 6 or EME 5 or ECS 30 & ENG 102; MATLAB programming

### Restricted Electives - Select TWO of the following courses (8 units):

EAE 126 <sup>∞</sup>	Theoretical/Computational Aerodynamics	4	S	C- or better in: ENG 103, ENG 105 and ENG 180 or MAT 128C or EME 115
EAE 129	Stability & Control of Aerospace Vehicles	4	W	C- or better in ENG 102
EAE 130A/B**	Aircraft Performance & Design	4/4	W S	C- or better in: EAE 127 and EAE 129 <sup>†</sup>
EAE 135 <sup>∞</sup>	Aerospace Structures	4	W	C- or better in: ENG 104; EAE 126 or EAE 127 <i>recommended</i>
EAE 138	Aircraft Propulsion	4	W	C- or better in EME 106
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 <sup>∞</sup>	Space Vehicle Design	4	W	C- or better in: ENG 102, ENG 103 and ENG 105
EME 121** (L)	Engineering Applications of Dynamics	4	S	C- or better in: ENG 6 or EME 5 or ECS 30 & ENG 102
EME 134 (L)	Vehicle Stability	4	S	C- or better in ENG 102
EME 139** (L)	Stability of Flexible Dynamic Systems	4	S	
EME 150B**	Mechanical Design	4	W S	C- or better in EME 150A
EME 151** ±	Statistical Methods in Design & Manufacturing	4		C- or better in EME 150A
EME 152	Computer-Aided Mechanism Design	4	F	C- or better in: ENG 6 or EME 5 or ECS 30 & ENG 102
EME 154** (L)	Mechatronics	4	S	C- or better in: ENG 100 and 102 and EME 50
EME 161 ±	Combustion and the Environment	4	W	C- or better in EME 106
EME 163 (L) ±	Internal Combustion Engines	4		C- or better in: EME 106 and EME 50
EME 164 ±	Introduction to HVAC	4		C- or better in EME 106 and 165
EME 171** (L)	Simulation & Design of Mechatronic Systems	4	F W	C- or better in: ENG 100 and ENG 102
EMS 180	Materials in Engineering Design	4	F S	C- or better in ENG 45
EMS 182 (L)	Failure Analysis	4	F	C- or better in ENG 45; EMS 174 ( <i>recommended</i> )
ENG 122**	Intro to Mechanical Vibrations	4	W	C- or better in: ENG 6 or EME 5 or ECS 30 & ENG 102; MATLAB programming
ENG 188	Science & Technology of Sustainable Power Gen	4	S	PHY 9C

\*\* If not used to satisfy other requirements <sup>†</sup> may be taken concurrently ± not offered during 2019-20 AY (L) Course has a lab component <sup>∞</sup> allowed 2019-20 AY only

**Total units for Mechanical Engineering Degree: 152 (Does not include units for GE requirement)**

12/2/19