

# Required Courses for Mechanical Engineering Degree – 2016-17

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	Expository Writing
<input type="checkbox"/>	ENL 3	Introduction to Literature
<input type="checkbox"/>	COM 1	Books of West Civ/ Ancient World
<input type="checkbox"/>	COM 2	Books of West Civ/MidAge-Enlight.
<input type="checkbox"/>	COM 3	Books of West Civ/Modern Crisis
<input type="checkbox"/>	COM 4	Books of Contemporary World
<input type="checkbox"/>	NAS 5	Intro to Native American Lit.

### 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

### General Education Requirement

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



### 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*

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

### Mathematics and Physical Science (51 units)

Course Number	Description	Units	Qtr Offered	Prerequisites
<input type="checkbox"/>	MAT 21A	Calculus	4 F W S SSI	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 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"/>	PHY 9D	Modern Physics	4 F S SSI	PHY 9C, MAT 22A (MAT 22B <sup>†</sup> recommended)
<input type="checkbox"/>	CHE 2A or 2AH (L)	General Chemistry	5 F W SSI	Satisfactory score on diagnostics exam or prep path
<input type="checkbox"/>	CHE 2B or 2BH (L)	General Chemistry	5 W S SSI	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 S SSI/II	C- or better recommended in: MAT 22A, MAT 22B <sup>†</sup> and PHY 9C
<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 SSI	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 2016-2017 school year

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

# Mechanical Engineering – 2016-17

## 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	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	SSII 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	SSI 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 150A and EME 165 <sup>†</sup> ; 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	MAT 22B; ENG 6
ECI 114	Probabilistic Systems Analysis	4	W S	SSII C- or better in: MAT 21C
ECS 130	Scientific Computation	4	S <sup>∞</sup>	MAT 22A; ECS 30 or ENG 6
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	W	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 in Differential Equations	4	F	MAT 21C, C programming
MAT 128B	Numerical Analysis in Differential Equations	4	W	MAT 21C, MAT 22A; C programming
STA 130A	Brief Math Statistics	4	F	MAT 16B
STA 131A	Introduction to Probability Theory	4	F S	MAT 21C, MAT 22A

### 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	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	F	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 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 138	Aircraft Propulsion	4	W	C- or better in: EME 106
EAE 140 ±	Rocket Propulsion	4		C- or better in: EME 106
EAE 141	Space Systems Design	4	F	C- or better in: ENG 102 and EME 106
EAE 142	Orbital Mechanics	4	S	SSII C- or better in: ENG 102
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	C- or better in: ENG 102 and ENG 103
EME 150B**	Mechanical Design	4	W S	C- or better in: EME 150A
EME 151**	Statistical Methods in Design & Manufacturing	4	W	C- or better in: EME 150A
EME 152±	Computer-Aided Mechanism Design	4		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	F	C- or better in: EME 106 and EME 50
EME 164	Introduction to HVAC	4	W	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	S	C- or better in: ENG 45
EMS 182 (L)	Failure Analysis	4	W <sup>∞</sup>	C- or better in: ENG 45; EMS 174 ( <i>recommended</i> )
ENG 122**	Intro to Mechanical Vibrations	4	F	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

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

_____	Any Upper Division Engineering course (including courses above**) except BIM 110L, ENG 160, 191, 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.
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### Other Technical Elective Requirement - Select ONE of the following courses (3 units):

_____	Any Upper Division Engineering course (including courses above**) except BIM 110L, ENG 160, 191, ECS 188 or any 197T course.
_____	Any course from this Technical Elective List: <a href="http://mae.ucdavis.edu/ugte.php">http://mae.ucdavis.edu/ugte.php</a> .

\*\* If not used to satisfy other requirements † may be taken concurrently ± not offered during 2016-2017 school year (L) Course has a lab component ∞ Tentative offering

**Total units for Mechanical Engineering Degree: 163** (Does not include units for GE requirement)