UCDAVIS
MECHANICAL AND AEROSPACE ENGINEERING

Mechanical and Aerospace Engineering Major Requirements

NOTE: Mechanical Engineering **AND** Aerospace Science and Engineering majors are required to complete **all** courses listed on this page prior to graduation. You may also reference the UC Davis catalog.

University Requirements (required by all UC Davis students)
American History & Institutions – Click here for more information
Writing Requirements
Entry Level Writing (ELWR) – Click here for more information
Lower/Upper Division Writing – Click here for more information Upper Div Writing Options: UWP 101, 102E, 104A, 104E, 104T

General Education – Topical Breadth (52 units needed)	
	Courses Covered by EMEC/EASE major
Arts/Humanities (AH): 12 – 20 units	NONE
Science & Engineering (SE): 12 – 20 units	MAT/PHY/CHE
Social Science (SS): 12 – 20 units	ENG 003 ENG 190 ENG 188 (if selected)

General Education – Core Literacy *(can be completed with some GE courses used for topical breadth as well as some major requirements)*	
Writing Experience (WE) – 6 units	EME 108 EME 150A (EMEC only)
Oral Literacy (OL) / Add'l (WE) – 3 units	ENG 003/CMN 001
Visual Literacy (VL) – 3 units	ENG 004
American Cultr, Gov, Hist (ACGH) – 3 units	NONE
Domestic Diversity (DD) – 3 units	NONE
World Cultures (WC) – 3 units	NONE
Quantitative Literacy – at least 3 units	MAT
Scientific Literacy – at least 3 units	PHY/CHE

Communication Requirement
ENG 003: Intro to Engineering Design **OR** CMN 001: Intro. to Public Speaking

† may be taken concurrently

STUDENTS ARE RESPONSIBLE FOR ENSURING THAT ALL REQUIREMENTS FOR GRADUATION ARE COMPLETE.

Lower Division Engineering Core Requirements – Mathematics/Physical Science (47 units)	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
MAT 021A - Calculus (4)	Satisfactory score on math placement exam.
MAT 021B - Calculus (4)	MAT 21A/AH OR MAT 17A (B or Better)
MAT 021C - Calculus (4)	MAT 21B/BH
MAT 021D - Vector Analysis (4)	MAT 21C/CH
MAT 022A - Linear Algebra (3)	MAT 21C/CH, ENG 6, EME 5, ECH 60/MAT 22A†
MAT 022B - Differential Equations (3)	MAT 22A
CHE 002A - General Chemistry (5)	Qualifying score on Chemistry Placement Exam.
CHE 002B - General Chemistry (5)	C- or better in CHE 2A/AH
PHY 009A *(lab)* - Classical Physics (5)	MAT 21B
PHY 009B *(lab)* - Classical Physics (5)	PHY 9A, MAT 21C, MAT 21D†
PHY 009C *(lab)* - Classical Physics (5)	PHY 9B, MAT 21D, MAT 22A†

Lower Division Engineering Core Requirements – (19 units)	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
ENG 004 *(lab)* - Engineering Graphics in Design (3)	NONE
ENG 006/EME 5± *(lab)* - *Engr Prob Solving / Engr Appl. (4)*	MAT 21A & MAT 21B† / EME 5: MAT 21A†
ENG 017/V - Circuits I (4)	MAT 21C
ENG 035 - Statics (4)	PHY 009A; MAT 021D *(can be concurrent)*
ENG 45/Y *(lab)* (4)- Properties of Materials	MAT 21C and CHE 2B, PHY 9A/9HA
Upper Division Engineering Core Requirements – (42 units)	
ENG 100 *(lab)* - Electronic Circuits & Systems (3)	ENG 17 *(C- or better recommended)*
ENG 102 - Dynamics (4)	ENG 35 and MAT 22B
ENG 103 - Fluid Mechanics (4)	ENG 35, MAT 22B and PHY 9B
ENG 104 - Mechanics of Materials (4)	ENG 35 & MAT 22B
ENG 105 - Thermodynamics (4)	MAT 22B & PHY 9B
ENG 190 - Professional Responsibilities (3)	Upper Division Standing
EME 106 - Thermo-Fluid Dynamics (4)	ENG 103 & 105
EME 108 *(lab)* - Measurement Systems (4)	ENG 100 & 102; ENG 104 *recommended*
EME 109 *(lab)* – Exper. Methods Therm Fluids (4)	EME 106
EME 165 – Fund. of Heat Transfer (4)	ENG 6/EME 5/ECS 30, ENG 103 & 105
EME 172 - Automatic Control of Eng. Systems (4)	ENG 100 & ENG 102

UCDAVIS
MECHANICAL AND AEROSPACE ENGINEERING

2024-25AY Mechanical and Aerospace Engineering Major Requirements

NOTE: The major requirements below must be completed with the CORE requirements listed on Page 1.

This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org

Aerospace Science and Engineering Majors ONLY

Aerospace Science and Engineering Core Requirements	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
EAE 129 - Stability & Control of Aerospace Vehicles (4) *(Winter ONLY)*	ENG 102
EAE 133 - Finite Element Methods in Structure (4) *(Fall ONLY)*	ENG 104
EAE 135 - Aerospace Structures (4) *(Winter ONLY)*	ENG 104; EAE 126 or 127 recommended
EAE 138 - Aircraft Propulsion (4) *(Winter ONLY)*	EME 106
Aerodynamics Elective, choose one*:	
EAE 126* - Theoretical/Computational Aerodynamics (4) *(Spring Only)*	ENG 103, ENG 105 and ENG 180* or MAT 128C or EME 115
EAE 127 - Applied Aircraft Aerodynamics (4) *(Fall ONLY)*	EME106
Applied Mathematics Elective, choose one*:	
ENG 180 - Engineering Analysis (4) *(Fall ONLY)*	ENG 6/EME 5/ECS 30 & MAT 21D & 22B
EME 115 - Intro to Numerical Analysis (4)	ENG 6/EME 5/ECS 30 & MAT 21A-22B & PHY 9A-9C
ECS 130 - Scientific Computation (4)	(ECS 030/ENG 006/ECS 032A/ECS 010/ECS 036A); (MAT 022A/MAT 027A/MAT 067)
MAT 128A - Numerical Analysis (4)	MAT 021C; (ECS 032A/ENG 006/ EME 005/ECS 030)
MAT 128C - Numerical Analysis in Differential Equat (4)	MAT 22A, 22B; ENG 6/EME 5/ECS 32A/ECS 30

Astronautics Elective*, choose one:	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
EAE 140* - Rocket Propulsion (4)	EME 106
EAE 142* - Orbital Mechanics (4)	ENG 102
Aeronautics Elective*, choose one:	
EAE 140* - Rocket Propulsion (4)	EME 106
EAE 142* - Orbital Mechanics (4)	ENG 102
EAE 143A* - Space Vehicle Design (4)	EAE 140 AND EAE 142
EAE 126*- Theoretical/Computational Aerodynamics (4) (Spring only)	ENG 103, ENG 105 and ENG 180* or MAT 128C or EME 115
EME 139* *(lab)* - Stability of Flexible Dynamic Systems (4) (Spring only)	ENG 102 and ENG 103
Upper Division Technical elective – (4 units needed)	
Any Upper Division Engineering course in the College of Engineering that has not been used to satisfy other major requirements, except BIM 110L, ENG 160, ECS 188 or any 197T course. If you are doing research with a faculty, you may use 4units of a 199 course.	

Senior Design Capstone, choose one series:	
(8 units total, completed in Winter and Spring of final year)	
Series	Pre-requisites
EAE 130A/B - Aircraft Performance and Design	EAE 126/127 and EAE 129[†]
EAE 143A/B – Space Vehicle and Mission Design	EAE 140 AND EAE 142

STUDENTS ARE RESPONSIBLE FOR ENSURING THAT ALL REQUIREMENTS FOR GRADUATION ARE COMPLETE.

EASE Major Total Unit Count: 160-164
(not including GE Requirements)

UCDAVIS
MECHANICAL AND AEROSPACE ENGINEERING

2024-25AY Mechanical and Aerospace Engineering Major Requirements

NOTE: The major requirements below must be completed with the CORE requirements listed on Page 1 of this

This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org

Mechanical Engineering Majors ONLY

Mechanical Engineering Core Requirements	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
EME 050 *(lab)* – Manufacturing Processes (4)	ENG 4 and PHY 9A
EME 150A – Mechanical Design (4)	ENG 45/Y, 104 and EME 50†
Applied Mathematics Elective, choose one:	
ECH 140 – Math Methods. Bio/Chem ENG (4)	MAT 22B; ENG 6/ECH 60
ECI 114 – Probability Systems Analysis	MAT 21C
ECS 130 - Scientific Computation (4)	MAT 22A; ENG 6/ECS 32A/36A/10/30
EME 115 - Intro to Numerical Analysis (4)	ENG 6/EME 5/ECS 30 & MAT 21A-22B & PHY 9A-9C
ENG 180 - Engineering Analysis (4) *(Fall ONLY)*	ENG 6/EME 5/ECS 30 & MAT 21D & 22B
MAT 118A – Partial Diff Equations (4)	MAT 21D, MAT 22A, MAT 22B
MAT 128A - Numerical Analysis (4)	MAT 021C; (ECS 032A/ENG 006/ EME 005/ECS 030)
MAT 128B – Numerical Analysis – Eq of Sol (4)	MAT 22A; ENG 6/EME 5/ECS 32A /30
STA 130A – Brief Math Statistics (4)	MAT 21C, STA 13/13Y /32/100
STA 131A - Intro to Probability Theory (4)	MAT 21C and MAT 22A/27A; MAT 21D strongly recommended
System Dynamics Elective, choose one*:	
EME 121* *(lab)* - Eng Appl of Dynamics (4)	ENG 6/ EME 5/ ECS 30 & ENG 102
EME 139* *(lab)* – Stab of Flexible Dyn Sys (4)	ENG 102 and ENG 103
EME 150B* – Mechanical Design (4)	EME 150A
EME 154* *(lab)* – Mechatronics (4)	ENG 100 and 102 and EME 50
EME 171* *(lab)* – Sim & Des Mech Sys (4)	ENG 100 and ENG 102
ENG 122* – Intro to Mech Vibrations (4)	ENG 6/EME 5/ECS 30 & ENG 102; *MATLAB programming*

† may be taken concurrently
**If not used to satisfy other requirements*

STUDENTS ARE RESPONSIBLE FOR ENSURING THAT ALL REQUIREMENTS FOR GRADUATION ARE COMPLETE.

EMEC Major Total Unit Count: 152 (not including GE Requirements)

Restricted Electives* (8 units) – Choose (2) courses from the following:	
Course (units)	Pre-requisites *(C- or better needed in most instances)*
EME 121*– Engineering App of Dyn (4)	ENG 6/ EME 5/ECS 30 & ENG 102
EME 134 *(lab)* - Vehicle Stability (4)	ENG 102
EME 139* *(lab)* – Stab of Flexible Dyn Sys (4)	ENG 102 and ENG 103
EME 150B* – Mechanical Design (4)	EME 150A
EME 154* *(lab)* – Mechatronics (4)	ENG 100 and 102 and EME 50
EME 161 - Combustion & the Envir (4)	EME 106
EME 163 *(lab)* - Internal Combustion Engines (4)	EME 106 and EME 050
EME 164 - Intro to HVAC (4)	EME 106 and EME 165
EME 171* *(lab)* - Sim & Dsgn of Mech Sys (4)	ENG 100 and ENG 102
EMS 180 - Materials Engin Design (4)	ENG 045
EMS 182 *(lab)* – Failure Analysis (4)	ENG 45; EMS174 (recommended)
ENG 122* – Intro to Mech Variat (4)	ENG 6/EME 5/ECS 30 & ENG 102; *MATLAB programming*
ENG 188 – Sci & Tech, Sustain Pwr (4)	PHY 009C

Senior Design Capstone, choose one series: *(8 units total, completed in Winter and Spring of final year)*	
Series	Pre-requisites
EME 185A/B - Mechanical Systems Design Project	EME 50, EME 150A and EME 165†; ENG 3, CMN 1 & *Upper Division Composition recommended*
EAE 130A/B - Aircraft Performance and Design	EAE 126/127 and EAE 129†
EAE 143A/B – Space Vehicle and Mission Design	EAE 140 AND EAE 142

UCDAVIS
MECHANICAL AND
AEROSPACE ENGINEERING

A Quick Guide for Course Balance/Selection

The Aerospace Science and Engineering Major, and the Mechanical Engineering Major are heavy in both academic load and scheduling. Please review the following to help prepare you for a successful academic quarter.

First Year Students:

- Most MAT, PHY, CHE courses have lab components. Understand that each component will have additional requirements, such as reports/quizzes/tests. Balancing **(3) STEM** courses and **(1) General Education course** for a given quarter is encouraged.
- If, after the review of the course syllabi, you feel the load is a bit heavy, you may elect to push your General Education course to a different quarter (please make all major changes in your schedule are completed during week 1 of the quarter).

Second Year Students:

- ENG 017 (Circuits) and ENG 045 (Materials) have been identified as heavy load courses by our students. While students may take both in the same quarter, we do not advise this.
- By the end of the second year, all lower division MAT, PHY, CHE and ENG core should be completed. If not, your graduation timeline may be extended.

Third Year Students:

- ENG 100 (Circuits), Eng 102 (Dynamics), ENG 105 (Thermodynamics) and EME 106 (Thermo-Fluid Dynamics) have been identified as heavy load courses by our students. Please keep this in mind when planning your quarter.
- Begin preparation for your Senior Design Capstone (Additional information about the senior design capstone can be found here)
    - ***All Aerospace Science and Engineering Students***:
        - ENG 102 should be done by Fall quarter of your JR Year.

Fourth Year Students+:

- Identify any remaining General Education courses needed for graduation by Fall quarter. Speak with the Engineering Undergraduate Office (EUO) for assistance (Express Advising).
    - ***All Aerospace Science and Engineering Students:***
        - 16+ units **per quarter** is standard for the 4th year. Please plan accordingly as courses are often offered (1) time per year in a specific quarter (MAE Course Schedule).
- Check all emails, set all reminders, **DO NOT MISS YOUR PASS TIME FOR ENROLLMENT.**
    - *"But I need to graduate!" is not a reason for the department to adjust its enrollment policies.*