

## **MECHANICAL ENGINEERING TECHNICAL ELECTIVES**

Mechanical Engineering majors are required to complete four (4) Technical Electives.  
**At least one (1) of these electives must be a MAE course.**

*-Not all courses are offered each year/quarter.*

*-All prerequisites are enforced.*

### **FLUIDS AND THERMAL ENGINEERING**

MAE 104	Aerodynamics
MAE 110B	Thermodynamic Systems
MAE 113	Fundamentals of Propulsion
MAE 118	Intro to Energy Systems
MAE 119	Intro to Renewable Energy: Solar & Wind
MAE 120	Intro to Nuclear Energy
MAE 180A	Spacecraft Guidance I
MAE 181	Space Mission Analysis and Design
MAE 210A	Fluid Mechanics I
MAE 211	Intro to Combustion
MAE 212	Introductory Compressible Flow
MAE 220A	Physics of Gases

### **ENVIRONMENTAL ENGINEERING**

MAE 118	Intro to Energy Systems
MAE 119	Intro to Renewable Energy: Solar & Wind
MAE 120	Intro to Nuclear Energy
MAE 122	Flow and Transport in the Environment
MAE 123	Intro to Transport in Porous Media
MAE 124	Environmental Challenges: Science and Solutions
CHEM 171/172	Environmental Chemistry

### **DESIGN**

MAE 131B	Solid Mechanics II
MAE 131C	Solid Mechanics III
MAE 133	Finite Element Methods in Mechanical and Aerospace Engineering
MAE 144	Embedded Control & Robotics
MAE 154	Product Design and Entrepreneurship
MAE 232A/B	Finite Element Methods in Solid Mechanics I & II
MAE 291	Design and Mechanics Problems in Computer Technology
MAE 292	Computer Aided Analysis and Design

### **DYNAMIC SYSTEMS AND CONTROL**

MAE 142	Dynamics and Control of Aerospace Vehicles
MAE 144	Embedded Control & Robotics
MAE 145	Robotic Planning & Estimation
MAE 149	Sensor Networks

MAE 180A	Spacecraft Guidance
MAE 181	Space Mission Analysis and Design
ECE 172A	Robotics and Machine Intelligence
MAE 280A	Linear Systems Theory
MAE 281A	Nonlinear Systems
MAE 283A	Parametric Identification: Theory and Methods

### **MECHANICS AND MATERIALS ENGINEERING**

MAE 131B	Fundamentals of Solid Mechanics II
MAE 131C	Solid Mechanics III
MAE 133	Finite Element Methods in Mechanical and Aerospace Engineering
MAE 166	Nanomaterials
MAE 231A	Foundations of Solid Mechanics

### **STRUCTURAL ENGINEERING**

SE 103	Conceptual Structural Design
SE 120	Engineering Graphics and Computer Aided Structural Design
SE 130A/B	Structural Analysis
SE 142	Design of Composite Structures
SE 181	Geotechnical Engineering

### **OTHER**

COGS 152	Cognitive Foundations of Mathematics
ECE 120	Solar System Physics
PSYC 161	Engineering Psychology
MATH 102	Applied Linear Algebra
MATH 109	Mathematical Reasoning
MATH 120A	Elements of Complex Analysis
MATH 175	Numerical Partial Differential Equations
MATH 187	Introduction to Cryptography
MGT 164	Business and Org Leadership
MGT 172	Business Project Management

*(Only one MGT course can be used for TE credit)*

-Only students with an overall GPA of 3.5 and an A- or better in all prerequisite courses are encouraged to take graduate-level classes to fulfill their TE requirement. Students must obtain consent from both the instructor and the MAE Student Affairs Office to take graduate level courses.

-Two quarters of MAE 199 (Independent Study) can be used for **one** TE under certain circumstances. Please see our website, [mae.ucsd.edu](http://mae.ucsd.edu), for more details.