

## **MECHANICAL ENGINEERING TECHNICAL ELECTIVES**

- Mech. Eng. majors following the Fall 2017 catalog must complete **three** TEs.
- Mech. Eng. majors following a pre-Fall 2017 catalog must complete **four** TEs.

**At least one of your electives must be an MAE course.**

- Not all courses are offered each year/quarter.
- All prerequisites are enforced.

### **FLUIDS AND THERMAL ENGINEERING**

|          |  |
|----------|--|
| MAE 101D | Intermediate Heat Transfer                     |
| MAE 104  | Aerodynamics                                   |
| MAE 110  | Thermodynamic Systems ( <i>formerly 110B</i> ) |
| 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 ( <i>only counts for TE if MAE 160 was taken</i> ) |
| MAE 131C   | Solid Mechanics III   |
| MAE 133    | Finite Element Methods in Mechanical and Aerospace Engineering        |
| MAE 144    | Embedded Control & Robotics ( <i>formerly 143C</i> )                  |
| 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 ( <i>formerly 143C</i> ) |
| 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 | Solid Mechanics II ( <i>only counts for TE if MAE 160 was taken</i> )                |
| MAE 131C | Solid Mechanics III  |
| MAE 133  | Finite Element Methods in Mechanical and Aerospace Engineering                       |
| MAE 160  | Mechanical Behavior of Materials ( <i>only counts for TE if MAE 131B was taken</i> ) |
| 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 ( <i>Only one MGT course can be used for TE credit</i> )  |
| MGT 172   | Business Project Management ( <i>Only one MGT course can be used for TE credit</i> )  |
| MAE 199   | Independent Study. Two quarters of MAE 199 can be used for <b><u>one</u></b> TE under certain circumstances. See our website, <a href="http://mae.ucsd.edu">mae.ucsd.edu</a> , for details. |

**Global TIES:** One quarter of ENG 100D **and** two consecutive quarters of ENG 100L can be used for **one** TE.

-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.

*All TEs must be taken for a letter grade. No P/NP grades allowed except in MAE 199.*

*If you enroll in a course on this list and it is not shown on your degree audit, please notify an MAE undergraduate advisor.*

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For information about receiving TE credit for courses not on this list, please contact an MAE undergraduate advisor:  
Mae-ugrad@eng.ucsd.edu