## Materials Engineering - Fall 2011 Curriculum Model

<table>
<thead>
<tr>
<th>FRESHMAN</th>
<th>FALL</th>
<th>SPRING</th>
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<tbody>
<tr>
<td>CHEM 1030/1031: Fund. of Chemistry I / Lab.</td>
<td>4</td>
<td>PHYS 1600: Engineering Physics I</td>
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<tr>
<td>MATH 1610: Calculus I</td>
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<td>MATH 1620: Calculus II</td>
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<tr>
<td>COMP 1200 Intro. to Computing for Engineers and Scientists</td>
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<td>ENGR 1110: Intro. to Engineering</td>
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<tr>
<td>ENGL 1100: English Composition I</td>
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<td>ENGL 1120: English Composition II</td>
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<tr>
<td>Core History 1</td>
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<td>Core History 2</td>
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<tr>
<td>ENGR 1100: Engineering Orientation</td>
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<th>SOPHOMORE</th>
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<tbody>
<tr>
<td>MATH 2630: Calculus III</td>
<td>4</td>
<td>MATH 2650: Linear Differential Equations</td>
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<td>CHEM 1040/1041: Fund. Of Chemistry II / Lab.</td>
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<td>STAT 3010: Statistics for Engineers &amp; Scientists</td>
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<td>ECON 2020: Principles of Microeconomics</td>
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<td>PHYS 1610: Engineering Physics II</td>
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<td>PHIL 1020: Intro. to Ethics</td>
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<td>MATL 2100: Intro. to Materials Science (M)</td>
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<th>JUNIOR</th>
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<tbody>
<tr>
<td>MATL 3100: Engineering Materials – Metals (M)</td>
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<td>MATL 3200: Engineering Materials – Polymers (M)</td>
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<tr>
<td>MATL 3101: Metallography Lab. (M)</td>
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<td>MATL 3201: Polymer and Composite Materials Lab. (M)</td>
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<td>MATL 5200: Crystallography (M)</td>
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<td>MATL 3300: Engineering Materials – Ceramics (M)</td>
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<td>MATL 5201: X-Ray Lab. (M)</td>
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<td>Technical Elective I*</td>
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<td><strong>Core Social Science</strong></td>
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<td><strong>Core Fine Arts</strong></td>
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<tr>
<td>MATH 2660: Topics in Linear Algebra</td>
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<tr>
<td>MATL 4500: Materials Properties and Selection (M)</td>
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<td>MATL 4980: Senior Design Project (M)</td>
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<tr>
<td>MATL 5100: Thermodynamics of Materials Systems (M)</td>
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<td>MATL 5300: Phase Transformations in Materials Processing (M)</td>
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<td>MATL 5400: Physics of Solids (M)</td>
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<td>MATL 5500: Numerical Simulation of Materials Processing (M)</td>
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<td>Technical Elective II*</td>
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<td>Technical Elective III*</td>
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<td><strong>Core Literature</strong></td>
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* If HIST 1010/1020 is not taken for the Core History, then Core Social Science elective must be one of the following courses: ANTH 1000, GEOG 1010, PSYC 2010, SOCY 1000, UNIV 2720
* Technical electives are chosen from a list of coordinated cross-disciplinary sequences. Sequences other than those specified must be approved by the materials engineering curriculum committee.
Approved Materials Engineering Cross-Disciplinary Sequences

**Aerospace Structures I**
- TE I: AERO 3610: Aerospace Structures I (2)
- TE II: AERO 4620: Aerospace Structures II (3)
- TE III: AERO 5630: Aerospace Applications of Composite Materials (4)

**Aerospace Structures II**
- TE I: CIVL 3610: Structural Analysis (4)
- TE II: AERO 4620: Aerospace Structures II (3)
- TE III: AERO 4640: Aerospace Structures III (2)

**Aerospace Structures III**
- TE I: AERO 3610: Aerospace Structures I (2)
- TE II: AERO 3110: Aerodynamics I (3)
- TE III: AERO 3120: Aerodynamics II (3)
- TE IV: AERO 3970: Matlab Applications (1)

**Microelectronic Devices and Fabrication**
Replace ELEC 3810: Fundamentals of Electrical Engineering (3)
with ELEC 2110: Electrical Circuit Analysis (3)
- TE I: ELEC 2200: Digital Logical Circuits (3)
- TE II: ELEC 2210: Digital Electronics (3)
- TE III: ELEC 5730: Microelectronic Fabrication (3)
  or ELEC 5760: Solid State Sensors (3)

**Electronic Control Systems**
Replace ELEC 3810: Fundamentals of Electrical Engineering (3)
with ELEC 2110: Electrical Circuit Analysis (3)
- TE I: ELEC 2120: Linear Systems & Signal Analysis (3)
- TE II: ELEC 3500: Control Systems (3)
- TE III: ELEC 3800: Random Signals and Systems (3)

**Geotechnical Engineering**
- TE I: CIVL 3810: Civil Engineering Materials (4)
- TE II: CIVL 3310: Geotechnical Engineering I (4)
- TE III: CIVL 4310: Geotechnical Engineering II (3)

**Geology**
- TE I: GEOL 2010: Mineralogy and Optical Crystallography (5)
- TE II: GEOL 2050: Igneous and Metamorphic Petrology (4)
- TE III: GEOL 3400: Structural Geology (4)
  or GEOL 4010: Sedimentary Petrology (3)
  or GEOL 4260: Introduction to Geochemistry (3)

**Engineering Economics**
Replace STAT 3010: Statistics for Engineers & Scientists
  with STAT 3600: Probability and Statistics I (3)
- TE I: INSY 3600: Engineering Economy (3)
- TE II: INSY 3400: Stochastic Operations Research (3)
- TE III: INSY 5600: Industrial and Production Economies (3)
Statistics
Replace STAT 3010 Statistics for Engineers & Scientists
with STAT 3600: Probability and Statistics I (3)
TE I: INSY 3400: Stochastic Operations Research (3)
TE II: STAT 3610: Probability and Statistics II (3)
TE III: INSY 4330: Statistical Quality Design and Control (3)
or MATH 5670: Probability and Stochastic Processes (3)

Manufacturing I
TE I: INSY 3020: Introduction to Safety & Ergonomics (3)
TE II: INSY 3800: Manufacturing Processes (3)
TE III: INSY 5500: Informational Technology for Operations (3)

Manufacturing II
TE I: INSY 3600: Engineering Economy (3)
TE II: INSY 3800: Manufacturing Processes (3)
or INSY 3410: Deterministic Operations Research (3)
TE III: INSY 5600: Manufacturing and Production Economics (3)
or INSY 5830: Vehicle Technology and Trends (3)

Polymer and Fiber Engineering – Polymers
TE I: PFEN 3200: Polymer Processing (4)
TE II: PFEN 4100: Polymer Characterization (3)
TE III: PFEN 4200: Polymers from Renewable Resources (2)

Polymer and Fiber Engineering – Fiber/Composites
TE I: PFEN 4400: Mechanics of Flexible Structures (3)
TE II: PFEN 4500: Fiber Reinforced Materials (3)
TE III: PFEN 4970: Introduction of Protective Materials (3)

Chemical Engineering
Replace ENGR 2200: Thermo/Heat Trans/Fluids (3) with ENGR 2010: Thermodynamics (3)
TE I: CHEN 2100: Principles of Chemical Engineering (4)
TE II: CHEN 2610: Transport I (3)
TE III: AGRN 5400: Bioenergy and the Environment (3)

Biology I
TE I: CHEM 2030: Survey of Organic Chemistry (3)
TE II: BCHE/CHEN 5180: Biochemistry I (3)
TE III: BCHE/CHEN 5190: Biochemistry II (3)

Biology II
TE I: CHEM 2070/2071: Organic Chemistry / Lab (4)
TE II: BIOL 3000: Genetics (4)
TE III: BIOL 4100: Cell Biology (3)