# ISyE Engineering Electives Page One - Sorted by Pre-Requisites (Effective Fall 2013)

**Important Notes:**
1. Take 2 courses from Page One.
2. Course offering change - to have a course evaluated, see your advisor.
3. All Special Topics courses (4801/4803/4823, etc.) MUST be approved by your advisor. No SEMINARS may be used.
4. You must meet the pre-requisite requirements.
5. Some departments may only allow you to register during Phase II.

### Section 1: Engineering Electives: You DO NOT have Chemistry nor any other Non-IE Curriculum

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credit</th>
<th>Pre-reqs</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>CEE 3000</td>
<td>Civil Engr Systems</td>
<td>3</td>
<td>MATH 1501</td>
<td>Occasional summer availability</td>
</tr>
<tr>
<td>CEE 4100</td>
<td>Construction Engr &amp; Mgt</td>
<td>3</td>
<td>None</td>
<td>Occasional summer availability</td>
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<tr>
<td>ChBE/ME 4763</td>
<td>Pulping and Chemical Recovery</td>
<td>3</td>
<td>No pre-reqs but CHEM 1310 is helpful, min. 2.8 GPA</td>
<td>ME or CHBE class is acceptable</td>
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<tr>
<td>ChBE/ME 4764</td>
<td>Bleaching and Papermaking</td>
<td>3</td>
<td>No pre-reqs but CHEM 1310 is helpful, min. 2.8 GPA</td>
<td>ME or CHBE class is acceptable</td>
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<td>ChBE 4803</td>
<td>Biofuels, Bleaching and Paper making</td>
<td>3</td>
<td>None</td>
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<tr>
<td>COE 2001</td>
<td>Statics</td>
<td>2</td>
<td>MATH 1502 &amp; PHYS 2211</td>
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<tr>
<td>CS/PSYC 3750</td>
<td>User Interface Design</td>
<td>3</td>
<td>None</td>
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<tr>
<td>CX 4010</td>
<td>Computational Problem Solving for Sci &amp; Engr.</td>
<td>3</td>
<td>None</td>
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<td>CX 4240</td>
<td>Computing for Data Analysis</td>
<td>3</td>
<td>CS 1371 or CS 1301</td>
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<tr>
<td>CX 4242</td>
<td>Data and Visual Analytics</td>
<td>3</td>
<td>MATH: 2605 or 2401 or 24X1, AND ISYE 2027 AND CS 1371 or CS 1301</td>
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<tr>
<td>ECE 2020</td>
<td>Digital System Design</td>
<td>3</td>
<td>CS 1371 or CS 1301</td>
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<td>ECE 3710</td>
<td>Circuits and Electronics</td>
<td>2</td>
<td>PHYS 2212</td>
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<tr>
<td>MSE 4020</td>
<td>Design with Materials I</td>
<td>1</td>
<td>None</td>
<td>Must have Senior hours</td>
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<tr>
<td>NRE 3301</td>
<td>Radiation Physics</td>
<td>3</td>
<td>MATH 1502 &amp; PHYS 2211</td>
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### Section 2: Engineering Electives: You DO have Chemistry but no other Non-IE Curriculum

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<tr>
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<th>Pre-reqs</th>
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<tr>
<td>CEE 2300</td>
<td>Environmental Engineering Principles</td>
<td>3</td>
<td>CHEM 1310, MATH 1502, PHYS 2211</td>
<td>Occasional summer availability</td>
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<tr>
<td>ChBE 2100</td>
<td>Chemical Process Principles</td>
<td>3</td>
<td>CHEM 1310 &amp; MATH 1502</td>
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<tr>
<td>MSE 2001</td>
<td>Principles &amp; Applications of Engineering Materials</td>
<td>3</td>
<td>CHEM 1310</td>
<td>Occasional summer availability</td>
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### Section 3: Engineering Electives: You NEED Chemistry AND other Non-IE Curriculum

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<th>Pre-reqs</th>
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<tbody>
<tr>
<td>BMED 2210</td>
<td>Conservation Principles in BME</td>
<td>3</td>
<td>CHEM 1310, BMED 1300, PHYS 2211</td>
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<td>BMED 3100</td>
<td>Systems Physiology</td>
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<td>CHEM 1315</td>
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<tr>
<td>ME 3720</td>
<td>Introduction to Fluid and Thermal Engineering</td>
<td>3</td>
<td>CHEM 1310, PHYS 2211, MATH2403</td>
<td>Occasional Summer Availability</td>
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<tr>
<td>PTFE 2200</td>
<td>Structure and Properties of Fibers and Polymers</td>
<td>3</td>
<td>CHEM 1315</td>
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<td>Course</td>
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<td>Credit</td>
<td>Pre-reqs</td>
<td>Notes</td>
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<tr>
<td>AE 2020</td>
<td>Low-Speed Aerodynamics</td>
<td>3</td>
<td>AE 1350, MATH 2401, &amp; PHYS 2211</td>
<td>Occasional summer availability</td>
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<tr>
<td>AE 2220</td>
<td>Dynamics</td>
<td>3</td>
<td>MATH 2403 &amp; COE 2001</td>
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<td>AE 3450</td>
<td>Thermodynamics &amp; Comp Flow</td>
<td>3</td>
<td>MATH 2403, PHYS 2212</td>
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<tr>
<td>CEE 2040</td>
<td>Dynamics</td>
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<td>COE 2001</td>
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<td>CEE 3010</td>
<td>Geomatics</td>
<td>3</td>
<td>AE/CEE/ME 1770</td>
<td>Occasional summer availability</td>
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<td>CEE 4300</td>
<td>Environmental Engineering Systems</td>
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<td>CEE 2300</td>
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<td>CEE 4600</td>
<td>Transportation Planning &amp; Design</td>
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<td>AE/CEE/ME 1770</td>
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<td>ChBE 2110</td>
<td>Chemical Engineering Therodynamics I</td>
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<td>ChBE 2100 &amp; BIOL 1510</td>
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<td>COE 3001</td>
<td>Deformable Bodies</td>
<td>3</td>
<td>MATH 2403 &amp; COE 2001</td>
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<tr>
<td>CS 2110</td>
<td>Computer Organization and Programming</td>
<td>4</td>
<td>CS 1331</td>
<td>Only counts as EE for those who are not using this course for a minor</td>
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<td>ECE 2026</td>
<td>Introduction to Signal Processing</td>
<td>3</td>
<td>MATH 1502 &amp; CS 1371 or CS 1372</td>
<td>Used to be ECE 2025 (4 credits hours)</td>
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<td>Circuit Analysis</td>
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<td>ECE 3090</td>
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<td>Instrumentation and Electronic Lab</td>
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<td>ECE 4606</td>
<td>Wireless Communication</td>
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<td>ECE 2025, ECE 3040/3710, ISYE/MATH 3770/ISYE 2027</td>
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<td>ECE 4823</td>
<td>Game Theory and Multiagent Systems</td>
<td>3</td>
<td>COE 2001/ME 2211/AE2120</td>
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<tr>
<td>ME 2202</td>
<td>Dynamics of Rigid Bodies</td>
<td>3</td>
<td>COE 2001/ME 2211/AE 2120</td>
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<td>MSE 3015</td>
<td>Elc, Optical&amp;Magnet Properties</td>
<td>3</td>
<td>PHYS 2212 &amp; MSE 2001</td>
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<td>Yarn and Fabric Formation</td>
<td>3</td>
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<td>Thermal &amp; Transport Props</td>
<td>3</td>
<td>PHYS 2212 &amp; MSE 2001</td>
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<td>System Dynamics &amp; Control</td>
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<td>MATH 2403, ME 2202/AE 2220, ME 2016, ECE 2040</td>
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<tr>
<td>CS 4641</td>
<td>Machine Learning</td>
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<td>CS 1331</td>
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<td>Credit</td>
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<td>AE 2801</td>
<td>Special Topics w/ COE 2001*</td>
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<td>AE 3310</td>
<td>Introduction to Aerospace Vehicle Performance</td>
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<td>AE 4701</td>
<td>Wind Engineering</td>
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<td>AE 4370</td>
<td>Life Cycle Cost, Schrage</td>
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<td>ARCH 6271</td>
<td>Healthcare Design of the Future</td>
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<td>Mathematical Models in Biology</td>
<td>3</td>
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<td>Math 2403</td>
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<td>Intro to Biomechanics</td>
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<td>COE 2001, MATH 2403</td>
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<td>Problems-Biomed Engr II</td>
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<td>BMED 1300</td>
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<td>BME 4803</td>
<td>Global Health Engineering</td>
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<td>Writing proposal, APPROVE</td>
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<td>BMED/MSE 4751</td>
<td>Introduction to Biomaterials</td>
<td>3</td>
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<tr>
<td>CEE 4225</td>
<td>Coastal Engineering</td>
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<td>CEE 4330</td>
<td>Air Pollution Control Eng</td>
<td>3</td>
<td>Has NTU syllabus APPROVE</td>
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<td>CEE 4803</td>
<td>Freight Transportation Systems and Airport Plan</td>
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<td>CEE 4803</td>
<td>Transportation Policy &amp; Analysis</td>
<td>3</td>
<td>syllabus?</td>
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<td>ChBE/MSE 4751</td>
<td>Intro to Biomaterials</td>
<td>3</td>
<td>MSE 2001</td>
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<tr>
<td>COE 3002</td>
<td>Intro to Microelec &amp; Nano Revolution</td>
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<td>CP 4310</td>
<td>Urban Transportation</td>
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<td>CP 4510</td>
<td>Introduction to Geographic Information Systems</td>
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<td>CS 2801</td>
<td>Digital Design Lab for CS</td>
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<td>CS 2110</td>
<td>Lab centric, APPROVE</td>
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<tr>
<td>ECE 2803</td>
<td>Grand Achievements and Grand Challenges</td>
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<td>ECE 2811</td>
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<td>ECE 3811</td>
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<tr>
<td>ECE 3812</td>
<td>Vertically-Integrated Projects (VIP) program</td>
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<td>VIP and ISyE approval</td>
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<td>ECE 4811</td>
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<td>ECE 2031</td>
<td>Digital Design laboratory</td>
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<td>ECE/MSE 4755</td>
<td>Substrate Fabrication</td>
<td>3</td>
<td>CHEM 1310 and PHYS 2112</td>
<td>Lab, multi, APPROVE</td>
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<td>ECE 2893/ME 2803</td>
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<td>Bioinspired Design</td>
<td>3</td>
<td>Multi-disciplinary, APPROVE</td>
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<td>ISYE 4803</td>
<td>System Modeling with SysML</td>
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<td>Multidisciplinary, project, APPROVE</td>
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<td>ISYE 4803</td>
<td>Model Based Systems Engineering</td>
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<td>ME 2110</td>
<td>Creative Design &amp; Decision Making</td>
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<td>ME 1770, AE 2120/COE 200</td>
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<td>ME 2813 - GLE</td>
<td>Engineering &amp; International Development</td>
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**Important Notes:**
- If you take 2 courses from page one, you can take the 3rd course from this list.

Engineering Electives Page II (Effective Fall 2013)
### Engineering Electives Page II (Effective Fall 2013)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
<th>Notes</th>
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<tr>
<td>ME 3057</td>
<td>Experimental Methodology</td>
<td>3</td>
<td>ME 3015, COE 3001, ME 3340, 3322, 3345, ISYE 3770</td>
<td>syllabus?</td>
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<td>ME 4803</td>
<td>Energy Systems Engineering</td>
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<td>Project, APPROVE</td>
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<td>AE, CEE, ChBE, ME, MSE, PTFE 4793</td>
<td>Composite Mtl Pros</td>
<td>3</td>
<td>CHEM 1310 and PHYS 2112</td>
<td>Project centric, APPROVE</td>
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<td>MSE 2021</td>
<td>Characterization of Materials</td>
<td>3, 3, 4</td>
<td>MSE 2001</td>
<td>Lab centric, APPROVE (Used to be MSE 2020)</td>
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<td>MSE 2803</td>
<td>Lab for Fundamental Concepts of Mtls</td>
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<td>MSE 3801</td>
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<td>MSE 3803</td>
<td>Optics and Soft Materials</td>
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<td>MSE 2001</td>
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<td>Materials Entrepreneurship</td>
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<td>MSE 4803</td>
<td>Soft Nano Materials</td>
<td>3</td>
<td>MSE 2001</td>
<td>Project and Lab, APPROVE</td>
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<td>MSE 4803/ 8803</td>
<td>Fundamentals of Nanomaterials &amp; Energy</td>
<td>3</td>
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<td>PHYS 4803</td>
<td>Nanoscale Physical Properties and Characterization</td>
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<td>PHYS 2021</td>
<td>Solar Systems</td>
<td>3</td>
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<td>Introduction to Fiber Enterprise</td>
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<td>PTFE 4043</td>
<td>Safety &amp; Ethics</td>
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<td>ONLY allowable if taking with COE 2001</td>
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<td>PTFE 4801</td>
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<td>CP 4020</td>
<td>Introduction to Urban Regional Planning</td>
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