### Mathematics and Science Requirements

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/AP Approval</th>
<th>Units</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mathematics (32 units minimum)</td>
<td></td>
<td></td>
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<tr>
<td>MATH</td>
<td>41</td>
<td>Single Variable Calculus</td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>MATH</td>
<td>42</td>
<td>Single Variable Calculus</td>
<td></td>
<td>5</td>
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<tr>
<td>MATH</td>
<td>51</td>
<td>Multi-Variable Calculus (req'd)</td>
<td></td>
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<tr>
<td>MATH</td>
<td>53</td>
<td>ODE with Linear Algebra (req'd)</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MS&amp;E</td>
<td>120</td>
<td>Probabilistic Analysis (req'd)</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MS&amp;E</td>
<td>121</td>
<td>Intro to Stochastic Modeling (req'd)</td>
<td></td>
<td>4</td>
<td></td>
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<tr>
<td>STAT</td>
<td>110 or 200</td>
<td>(req'd)</td>
<td></td>
<td>5</td>
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</tr>
</tbody>
</table>

**Mathematics Unit Total (32 units minimum)**

**Science (11 units minimum; see Note 1)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</table>

**Science Unit Total (11 units minimum)**

**Mathematics and Science Unit Total (45 units minimum)**

### Technology in Society Requirement (1 course req'd; see Note 2)

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
</table>

**Technology in Society Requirement Unit Total (1 unit minimum)**

### NOTES

* This form is available as an Excel file at http://ughb.stanford.edu/; you must use a program sheet from a year you were enrolled at Stanford. The printed form must be signed by the advisor and, if required, by the departmental representative. Changes must be initialed in ink by the advisor/dept.
* Read all emails from the Office of Student Affairs; this is the SoE's only method of conveying key information to Eng.
* All courses listed on this form must be taken for a letter grade if offered by the instructor.
* Minimum Combined Grade Point Average for all courses in Engineering Fundamentals and Engineering Depth is 2.0.
* Transfer and AP credits in Math, Science, Fundamentals, & TIS must be approved by the SoE Dean's office. Transfer credits in Engineering Depth must be approved by the Department. Transfer credit information and petitions are available at http://ughb.stanford.edu.
* All courses listed on this form must only be included under one category. Delete courses not taken.

1. Eleven units of science required; must include PHYS 41/43, or PHYS 21/22/23/24, or CHEM 31X/33, or CHEM 31B/33.

*Follow all requirements as stated for the year of the program sheet used.*
Management Science and Engineering Program Sheet (continued)

Engineering Fundamentals and Engineering Depth

<table>
<thead>
<tr>
<th>Dept</th>
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<th>Units</th>
<th>Grade</th>
</tr>
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<tbody>
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<td>✓</td>
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</tbody>
</table>

**Engineering Fundamentals (3 courses required)**

- CS 106A Programming Methodology (req'd) 5
- ENGR 25 or 40 or 80 (req'd)
- ENGR Fundamental Elective required (see Note 3)

**Engineering Fundamentals Unit Total**

**Engineering Depth (7 courses required; no course may be listed more than once; no double-counting)**

- CS 103, 106B/X, or CME 108 (req'd)
- ENGR 60 Engineering Economy (req'd) 3
- MS&E 108 Senior Project (req'd) 5
- MS&E 111 Intro to Optimization (req'd) 4
- MS&E 130 or 134 (req'd) 4
- MS&E 142 or 260 (req'd) 4
- MS&E 180 Organizations (req'd) 4

**Engineering Depth Concentration (7-8 courses required; see note 4)**

**Circle one concentration:** F&DE OR OTE POM T&P

**Engineering Unit Total**

**Program Totals**

- Mathematics and Science (45 units minimum)
- Engineering Fundamentals and Engineering Depth (between 60 and 72 units)

**Program Approvals**

- Advisor/Student Services
  - Advisor Name: 
  - Signature: 
  - Date: 

- Departmental
  - Printed Name: 
  - Signature: 
  - Date: 

- School of Engineering (signature not required prior to graduation)
  - Printed Name: 
  - Signature: 
  - Date: 

**NOTES (continued from page 1)**

(3) For a list of approved ENGR Fundamentals, see UGHB, Chapter 3, Fig. 3-4 at http://ughb.stanford.edu/

(4) The "Writing in the Major" requirement will normally be fulfilled through a course taken in the concentration or for the Technology in Society requirement.