# Mathematics and Science Requirement

## Mathematics (26 units minimum)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/AP Approval by SoE</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>41</td>
<td>Calculus (see note 1)</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MATH</td>
<td>42</td>
<td>Calculus</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>103</td>
<td>Mathematical Foundations of Computing</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>109</td>
<td>Introduction to Probability for Computer Scientists</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Plus two electives (see note 2)

<table>
<thead>
<tr>
<th>Mathematics Unit Total (26 units minimum)</th>
<th></th>
</tr>
</thead>
</table>

## Science (11 units minimum)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/AP Approval by SoE</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>41</td>
<td>Mechanics (or PHYS 21 or 61)</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>PHYS</td>
<td>43</td>
<td>Electricity and Magnetism (or PHYS 23 or 63)</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elective (see note 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Science Unit Total (11 units minimum) | 4 |

## Technology in Society Requirement

(1 course required; see UGHB Figure 3-3 for approved list; see note 8)

## Engineering Fundamentals (13 units minimum)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/AP Approval by SoE</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>106</td>
<td>Programming Abstractions (B or X)</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>ENGR</td>
<td>40</td>
<td>Introductory Electronics (40A and 40M also allowed; see note 4)</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

| Engineering Fundamentals Total (13 units minimum) | 9 |

### Notes

* All courses listed on this form must be taken for a letter grade (if offered) and can be included under only one category.
* This printed form must be signed by the departmental representative. Changes must be petitioned (see UGHB pg 27-29) and initialed in ink.
* Minimum Grade Point Average (GPA) for all courses in Engineering Funds and CS Core, Depth, and Senior Project (combined) is 2.0.
* Transfer and AP credits in Math, Science, Fundamentals, & TIS must be approved by the SoE Dean's Office. Transfer credits in Computer Science Core, Depth and Senior Project must be approved by the Computer Science undergraduate program office.
* Courses must be taken for the number of units on the Program Sheet. CS103, 106B/X, 107, 109, 110, and 161 must be taken for 5 units.
  1. Math 19, 20 and 21 may be taken instead of Math 41 and 42 as long as at least 26 math units are taken.
  2. The Mathematics electives list consists of: Math 51, 104, 108, 109, 110, 113; CS 157, 205A; Phil 151; CME 100, 102, 104. Completion of Math 52 & 53 will (together) count as one Math elective. Restrictions: CS 157 + Phil 151 may not be used in combination to satisfy the Math electives requirement. Students who have taken both Math 51 and 52 may not count CME 100 as an elective.
  3. Any course of 3 or more units from the SoE Science List (Fig. 3-2 in the UGHB), PSYCH 30 or 55, or AP Chemistry may be used.
  4. Students who take ENGR 40A or 40M for fewer than 5 units are required to take 1-2 additional units of ENGR Fundamentals (13 units minimum), or 1-2 additional units of Depth (27 units minimum for track and elective courses).
CS HCI Track Program Sheet (continued)

Human-Computer Interaction Track Core, Depth and Senior Project (43 units minimum)

Be advised: no course may be listed twice on the sheet. No double-counting.

Human-Computer Interaction Track Core, Depth and Senior Project (43 units minimum)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/Deviation Approval by Dept</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>107 or 107E</td>
<td>Computer Organization and Systems</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>110</td>
<td>Principles of Computer Systems</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>161</td>
<td>Design and Analysis of Algorithms</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Core (15 units minimum)

Depth; Track and Electives (25 units and seven courses minimum) see note 5

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/Deviation Approval by Dept</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>147</td>
<td>Introduction to HCI Design (Track Requirement A)</td>
<td>✓ if Transfer</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>247</td>
<td>HCI Design Studio (Track Requirement A)</td>
<td>✓ if Transfer</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
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<tr>
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<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>148</td>
<td>HCI Design in CS (Track Requirement B, see note 6)</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>194</td>
<td>HCI Design in CS (Track Requirement B, see note 6)</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
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<tr>
<td>CS</td>
<td>210A</td>
<td>HCI Design in CS (Track Requirement B, see note 6)</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>210B</td>
<td>Interdisciplinary HCI (Track Requirement C, see note 7)</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>294</td>
<td>Interdisciplinary HCI (Track Requirement C, see note 7)</td>
<td>✓ if Transfer</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>At least 3 units of 191, 191W, 194, 194H, 194W, 210B, 294 or 294W (see note 9)</td>
<td>Optional Elective</td>
<td>✓ if Transfer</td>
<td>3</td>
<td></td>
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</tbody>
</table>

Senior Project (1 course required)

<table>
<thead>
<tr>
<th>Dept</th>
<th>Course</th>
<th>Title</th>
<th>Transfer/Deviation Approval by Dept</th>
<th>Unit</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>At least 3 units of 191, 191W, 194, 194H, 194W, 210B, 294 or 294W (see note 9)</td>
<td>Optional Elective</td>
<td>✓ if Transfer</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Computer Science Core, Depth, Track, and Senior Project Total (43 units minimum)

Example HCI depth course plans

Design thinking: CS 147, 247, 448B, 142, 194H, ME 101, 115A;

Front-end dev.: CS 147, 247, 142, 448B, 194H, 148, 221;

User experience: CS 147, 247, 194H, 210A, 376, COMM 121, MS&E 125;

Product management: CS 147, 247, 194H, 210A, 142, COMM 169, 140;

Digital art: CS 147, 247, 148, 448B, 142, ARTSTUDI 160, 168;

Research frontiers: CS 147, 247, 376, 448B, ME 216M, COMM 124, 166, PSYCH 252

Program Approvals

Departmental

Printed Name: ___________________________ Date: ___________________________

Signature: ___________________________

School of Engineering (No action required-office use only)

Printed Name: ___________________________ Date: ___________________________

Signature: ___________________________

NOTES (continued from page 1)

(5) Some HCI project courses are limited enrollment. Be careful not to create a degree plan that depends on a limited-enrollment course.

(6) Track Requirement B: Any three of CS 142, 148, 194H, 210A, 376, any 377A/B/C/... 'Topics in HCI' of three or more units, 448B; ME 216M

(7) Track Requirement C: At least two additional courses selected from the Track Requirement B list, the General CS Electives list (see note 8), or the following: any d.school class of three or more units, any class of three or more units at hci.stanford.edu under the 'courses' link; Communication (COMM 121, 124/224, 140/240, 166, 169/269, 172/272, 182, 324); Art Studio (ARTSTUDI 160, 162, 163, 164, 165, 168, 264, 266, 267); Sym Sys (SYMSYS 245); Psychology (30, 45, 55, 70, 75, 110, 131, 154); Empirical Methods (MS&E 125, PSYCH 252, 254, 110, STATS 203, EDUC 191X, HUMBIO 82A); ME design (ME 101, 115A, 203, 210, 216A); Learning Design+Tech (Educ 281X, 239X, 338X, 342); MS&E (MS&E 185, 331); Computer music (Music 220A/B/C, 250A)


(9) WIM requirement: take CS 181W as a Technology in Society course or take the Senior Project course (191W, 194W, 210B or 294W only).