**Engineering @ SEAS**

Engineers **solve** real-world problems by applying math and science for **analysis** and **design**.

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**Bioengineering**

At the intersection of life and physical sciences, biomedical engineers apply principles of engineering to understand and model living systems and design novel therapies to improve human health.

*Degrees offered: Engineering Sciences SB (Bioengineering track); Biomedical Engineering AB*

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**Environmental Science and Engineering**

To understand, predict, and respond to natural and human-induced environmental change, environmental scientists and engineers provide technical solutions and advance innovations in environmental measurements, modeling, and control.

*Degrees offered: Engineering Sciences SB (Environmental Science and Engineering track); Environmental Science and Engineering AB*

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**Mechanical Engineering**

Mechanical engineering uses the principles of physics and materials science for the analysis and design of mechanical and thermal systems.

*Degrees offered: Mechanical Engineering SB; Engineering Sciences AB (Mechanical and Materials Science and Engineering Track)*

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**Undergraduate Engineering Stats** *(as of Spring 2019)*

<table>
<thead>
<tr>
<th></th>
<th>BE/BME</th>
<th>EE</th>
<th>ESE</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td># Concentrators</td>
<td>87</td>
<td>54</td>
<td>36</td>
<td>80</td>
</tr>
<tr>
<td>% SB (vs. AB)</td>
<td>55%</td>
<td>89%</td>
<td>64%</td>
<td>94%</td>
</tr>
<tr>
<td>Median Class Size</td>
<td>21</td>
<td>18</td>
<td>21</td>
<td>28</td>
</tr>
</tbody>
</table>

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**Where have our recent graduates gone?**

A few examples of where recent alumni are currently:

- **Work Full Time**: 69%
- **Graduate School**: 20%
- **Service / Travel / Other**: 11%

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**You’re invited to learn more!**

**Talk to our engineering advisors:**

- **Electrical & Mechanical Engineering:**
  - Chris Lombardo
    - lombardo@seas.harvard.edu
    - Pierce 207B

- **Bioengineering / Biomedical Engineering:**
  - Linsey Moyer
    - lmoyer@seas.harvard.edu
    - Pierce 206C

- **Environmental Science & Engineering:**
  - Patrick Ulrich
    - pulrich@seas.harvard.edu
    - Pierce 117

**Learn more on the web:** [www.seas.harvard.edu/engineering](http://www.seas.harvard.edu/engineering)
Frequently asked questions

What’s the difference between Bachelor of Arts (A.B.) and Bachelor of Science (S.B.)?
- AB: 14-16 courses, more flexible requirements, can do research thesis, can do joint concentration
- SB: 20 courses, engineering design courses, including individual capstone design project in E500 (this is a required thesis), ABET-accredited (for professional licensure)

How can I get involved in research?
- Term-time: SEAS labs welcome undergraduates to work on research projects during the term
- Can do research for credit by taking ES 91r.
- During summer: Students regularly join SEAS labs with funding through PRISE, HCRP, HUCE

What kinds of internships can I do?
- Research internships are available through SEAS and national labs. See above.
- Industry internships are available and can be found by attending SEAS career fairs or talking to
  the SEAS Experiential Learning Director, Keith Karasek (karasek@seas.harvard.edu)

Where do I start?
- Start taking math (according to placement) and science in your first year
- Talk to a concentration advisor (ADUS) in any of our fields to chat about your options
- Take one of our introductory courses (see below)
- Joint a SEAS club (HCES, EWB, HURC, etc…)

Full FAQ @ www.seas.harvard.edu/programs/engineering/engineering-faqs

Common course sequences for the first two years

<table>
<thead>
<tr>
<th>General Guidelines</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math Science or Gateway Engineering</td>
<td>Foundational Math Science or Gateway Engineering</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Foundational Math (if needed) Engineering</td>
<td>Foundational Math (if needed) Engineering</td>
</tr>
</tbody>
</table>

Tips for all students:
- **First year**: At least two courses toward the concentration should be taken each term
- **Sophomore year**: Generally, three courses toward the concentration should be taken each term
- Foundational math, physics, science, and gateway courses generally count toward any of the engineering concentrations
- Students have the flexibility to switch between programs through sophomore year
- **Foundational Math**: Students should start math fall of their first year according to their placement (i.e., start at Math Ma, 1a, 1b, or 21a) and continue each semester until completion of the 21a/b series, which is required of all students. SB students starting in Math 1b and beyond will need to take additional advanced math courses beyond foundational math.
- **Physics**: Students should complete the physics series by spring of sophomore year. Typical sequences are:
  - Spring first year (PS 12a or Physics 15a) then fall sophomore year (Physics 12b or Physics 15b)
  - Fall sophomore year (Physics 15a or AP 50a) then spring sophomore year (Physics 15b or AP 50b)
- **Life Science/Chemistry/other Science**: Students should take the appropriate course relevant to their discipline (see chart below).

**Bio/biomedical engineering**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
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<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math LS 5a/LPS A</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Found. Math (if needed) Physics</td>
</tr>
</tbody>
</table>

Tips for Bio/BME students:
- Most Bio/BME students take E53 in sophomore fall, though some take the course in fall of first year
- While not strictly required for the SB program, many premed SB students take LS 1b (beyond concentration requirements)

**Electrical engineering**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math CS 50</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Found. Math (if needed) Physics</td>
</tr>
</tbody>
</table>

Tips for EE students:
- First-year students who place out of Math 1b can take E55 in their first fall semester
- First-year students who take CS10 in fall or have programming experience can take CS141 in spring
- Strongly recommended to start physics in first year to be able to take E5152 (co-req Physics b) in sophomore year

**Environmental science and engineering**

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<th>Spring</th>
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<tr>
<td>First Year</td>
<td>Foundational Math LS 5a/LPS A</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Found. Math (if needed) Physics</td>
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</table>

Tips for ESE students:
- Most ESE students take E56 in spring of first year
- Students are highly encouraged to consider PS11 in spring of first year

**Mechanical engineering**

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<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math E51 or CS 50</td>
</tr>
<tr>
<td>Sophomore</td>
<td>Found. Math (if needed) Physics</td>
</tr>
</tbody>
</table>

Tips for MechE students:
- MechE students should complete E51 by sophomore fall
- Almost all MechE students take E520 in sophomore spring