Undergraduate Engineering Stats (as of Spring 2023)

<table>
<thead>
<tr>
<th>BE/BME</th>
<th>EE</th>
<th>ESE</th>
<th>ME</th>
</tr>
</thead>
<tbody>
<tr>
<td># Concentrators</td>
<td>104</td>
<td>43</td>
<td>35</td>
</tr>
<tr>
<td>% SB (vs. AB)</td>
<td>43%</td>
<td>79%</td>
<td>54%</td>
</tr>
</tbody>
</table>

Where have our recent graduates gone?

A few examples of where recent alumni are currently:

- Raytheon
- Medtronic
- Boston Children’s Hospital
- Jacobs
- Boeing
- Amazon
- Intuitive Surgical
- JPMorgan
- McKinsey & Company
- Wayfair
- LEK
- UAS

You’re invited to learn more!

Talk to our engineering advisors:

- Bioengineering/Biomedical Engineering:
  Linsey Moyer
  lmoyer@seas.harvard.edu

- Electrical Engineering:
  Chris Lombardo
  clombardo@seas.harvard.edu

- Environmental Science & Engineering:
  Bryan Yoon
  byoon@seas.harvard.edu

- Mechanical Engineering:
  Seymur Hasanov
  shasanov@seas.harvard.edu

Learn more on the web: www.seas.harvard.edu
Foundational Math
SB: 20 courses, engineering design courses, including individual capstone design project in ES100

Researchers
What's the difference between Bachelor of Arts (A.B.) and Bachelor of Science (S.B.)?

Many students participate in research at other universities through NSF REU programs

Students take ES 120 in sophomore spring

Where do I start?

While not strictly required for the SB program, many
Math (if needed)
Physics b) in sophomore year

Math
Intracavity
according to their placement (i.e., start at Math
First year:
Fall
Term
Life Science/Chemistry/other Science
Take one of our introductory courses (see below)

Year
During summer: Students regularly join SEAS labs with funding through PRISE, HCRP, HUCE

Strongly recommended to start physics in first year to be
Physics is a co
Math (if needed)

Students are highly encouraged to consider PS11 in spring of
Compressed Air Assisted Bicycle

What problem do you want to solve?

Senior theses in the Class of 2023:
Compressed Air Assisted Bicycle
(ME SB)
Microscale Metasurface Intracavity Holographic Display
(EE SB)
Optimizing the Automatic Release of Water for Lawn Irrigation with Household Rainwater Harvesting
(ESE SB)
Engineering a Biomimetic Adventitia to Model Fibrosis in a Tissue-Engineered Blood Vessel
(BioE SB)

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 ES100

• 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 91
  • Can find a SEAS lab by attending the SEAS Research Labs event in Nov. and/or March.
  • 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 (kkarasek@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)
  • Join a SEAS club (HCES, EWB, HURC, etc.)

Gateway Courses
Designed for first-years and sophomores

Electrical
ES 50 (Spr)
Mechanical
ES 51 (Fall,Spr)
Environmental
ESE 6 (Spr)
Bio/biomedical
ES 53 (Fall)

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</td>
<td>Foundational Math</td>
</tr>
<tr>
<td>Science or Gateway Engineering</td>
<td>Science or Gateway Engineering</td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore | Foundational Math (if needed) | Foundational Math (if needed) |
| Engineering | Engineering |

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 (PS 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).

<table>
<thead>
<tr>
<th>Bio/biomedical engineering</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math (LS 1a/LPS A)</td>
<td>Foundational Math (LS 1b)</td>
</tr>
<tr>
<td>Physics</td>
<td>Physics</td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore | Found. Math (if needed) | Found. Math (if needed) |
| Engineering course | Engineering course |

Tips for Bio/BME/ME students:

• Most Bio/BME students take ES 53 in sophomore fall, though some take the course in fall of first year.
• Physics is a co-req for ES 53. It is highly recommended to start physics in the first year.
• While not strictly required for the SB program, many premed SB students take LS 1b (beyond concentration requirements), but it need not be taken in the first year.

<table>
<thead>
<tr>
<th>Electrical engineering</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math</td>
<td>Foundational Math</td>
</tr>
<tr>
<td>CS 50</td>
<td>CS 50</td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore | Found. Math (if needed) | Found. Math (if needed) |
| Physics | Engineering course |

Tips for EE students:

• First-year students who place out of Math 1b can take ES 155 in their first fall semester.
• First-year students who take CS50 in fall or have programming experience can take CS141 in spring.
• Strongly recommended to start physics in first year to be able to take ES152 (co-req Physics B) in sophomore year.

<table>
<thead>
<tr>
<th>Environmental science and engineering</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math (LS 1a/LPS A)</td>
<td>Foundational Math (ESE 6)</td>
</tr>
<tr>
<td>Consider: P5 11</td>
<td>Consider: P5 11</td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore | Found. Math (if needed) | Found. Math (if needed) |
| Physics | PS 11 or Engineering course |

Tips for ESE students:

• Most ESE students take ESE 6 in spring of first year
• Students are highly encouraged to consider P511 in spring of first year.

<table>
<thead>
<tr>
<th>Mechanical engineering</th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Foundational Math</td>
<td>Foundational Math</td>
</tr>
<tr>
<td>ES 51, AM 10, or CS 50</td>
<td>ES 51 (if needed) or ES 50</td>
<td></td>
</tr>
</tbody>
</table>

| Sophomore | Found. Math (if needed) | Found. Math (if needed) |
| Physics | Physics |

Tips for MechE students:

• MechE students should complete ES 51 by sophomore fall.
• Almost all MechE students take ES 120 in sophomore spring.