Requirements: 14 courses for primary; 11 courses for joint-allied; 5 courses for secondary; everyone attends 5 dept tutorials

Students entering the concentration in before Spring 2021 may choose to follow the NEW foundational courses requirements below OR the former requirements that lack a data analysis course. Students are encouraged to discuss with their advisor the pros and cons of following the new requirements. All students entering the concentration during or after Fall 2021 will be expected to follow the requirements below.

EPS courses for Primary
- A minimum of six EPS courses with at least one course at the 50- or 100-level sampling all three sub-disciplines: Atmosphere(s) & Oceans; Earth History & Geobiology; and Geology, Geophysics & Planetary Science. Ordinarily, courses taken to fulfill chemistry, math or physics will not count toward fulfilling a breadth category.
- Of these six, two should be foundational courses. One of these can be from EPS-ESE 6, EPS 10 or GENED 1018, 1085, 1094, 1098, 1137, 1158 or 1167 (ordinarily taken no later than the first semester of the junior year) and the other course or both of the courses from 50-level EPS courses.
- Four additional courses in EPS, at least three of which must be numbered 99 or above. Examples: Acceptable: EPS 52, 99, 109, 134; Unacceptable: EPS 52, 56, 99, 109—instead either 52 or 56 would have to be moved to "other related courses" where it would still count for concentration credit, just no longer in the "four courses" requirement.

EPS courses for Joint-Allied
A minimum of five EPS courses, two of which should be foundational courses. One of these can be from EPS-ESE 6, EPS 10 or GENED 1018, 1085, 1094, 1098, 1137, 1158 or 1167 (ordinarily taken no later than the first semester of the junior year) and the other course or both of the courses from 50-level EPS courses. Two additional EPS courses, at least one of which must be at 100-level or above. The last course must be EPS 99 Senior Thesis Tutorial or its equivalent.

Foundational courses for Primary & Joint-Allied new in 2021
- 1 course in Physics
  One mechanics course is required (Physics 12a, 15a, 16, or 19). Physical Sciences 2 & 3 allowable by petition. Strongly encourage students who take the physics 15 series to complete all three courses.

- 1 course in Chemistry
  Physical Sciences 11 is required. More advanced chemistry students who do not need to take PS-11 can take Chemistry 17, 20, or 60 instead. If a student has taken Physical Sciences 1 before declaring EPS, it can be used in place of Physical Sciences 11. Physical Sciences 1 and Physical Sciences 11 cannot both be taken for credit.

- 1 additional course in higher Physics or Chemistry. Students with a focus in Physics can take Physics 12b, 15b, or 15c. Chemistry focused students can take Chemistry 17, 20, 40, or 60. Students who elect a 2nd advanced Physics or Chemistry course (e.g., the full Physics 15 sequence, or who need a full year of Chem for pre-med) will automatically be allowed to count that 7th course toward the concentration as an EPS-related course.

- 2 courses in Math
  Through or above Math 21a & 21b or 22a & 22b or 23a & 23b or Applied Math 22a & 22b.
• 1 course in data analysis, statistics, and computation
EPS 100 or 102. Applied Math 111 or 120. Computer science 109a. Statistics 109, 110, or 111. No other course is allowed except by petition. Students are strongly recommended to take one of these courses.

**Chart of Foundational courses:**

<table>
<thead>
<tr>
<th>Math (2)</th>
<th>Physics (1)</th>
<th>Chemistry (1)</th>
<th>Physics/Chemistry (1)</th>
<th>Stat/Comp/Data (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 21ab</td>
<td>PHYS 12a</td>
<td>PHYSCI 11</td>
<td>CHEM 17, 20, 40, 60</td>
<td>EPS 100, 102</td>
</tr>
<tr>
<td>Math 23ab</td>
<td>PHYS 15a</td>
<td>PHYS 12b, 15b, 15c</td>
<td>APMTH 111, 120</td>
<td></td>
</tr>
<tr>
<td>Math 25ab</td>
<td>PHYS 16</td>
<td>CHEM (17 or 20) &amp; 60</td>
<td>CS 109a</td>
<td></td>
</tr>
<tr>
<td>APMTH 22ab</td>
<td>PHYS 19</td>
<td>STAT 109, 110, 111</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chemistry-focused students can satisfy chemistry requirements with CHEM (17 or 20) & 60.

**Courses for Secondary**

Five EPS courses, two of which should be foundational courses. One of these can be from EPS-ESE 6, EPS 10 or GENED 1018, 1085, 1094, 1098, 1137, 1158 or 1167 (ordinarily taken no later than the first semester of the junior year) and the other course or both of the courses from 50-level EPS courses.

**For All Concentrators**

• All courses must be taken for a grade, and C-minus is normally the minimum acceptable grade.

**Thematic Plan of Study:** Primary and Joint-Allied students should discuss and develop individual thematic plans of study together with their concentration adviser. This ensures that the upper-level courses in EPS and related fields provide a coherent focus. The following lists may help focus these discussions, but students have the option to suggest and develop their own themes outside these boundaries:

- **Focus on Energy and Climate:** EPS 109, 112, 130, 131, 132, 133, 134, 135, 139, 162.
- **Focus on Environmental Geoscience:** EPS 101, 109, 110, 112, 130, 131, 135, 160, 161, 162, 164, 168, 169, 189.
- **Focus on Geobiology:** EPS 53, 56, 110, 150, 174, 182, 187, 189.
- **Focus on Geochemistry:** EPS 53, 110, 112, 130, 133, 135, 139, 141, 142, 145, 146, 187, 189.
- **Focus on Geology:** EPS 52, 55, 56, 109, 110, 112, 139, 142, 145, 146, 171, 174, 189.
- **Focus on Planetary Sciences:** EPS 52, 110, 112, 120, 142, 145, 146, 189.
- **Focus on Solid Earth Geophysics:** EPS 52, 55, 120, 142, 146, 162, 165.
- **For preparation for advanced work in any sub-discipline:** EPS 100, 102, 112.

**Advanced Placement:** May allow students to complete higher-level courses, but a minimum of two physics, two chemistry, and two math courses must be completed to satisfy concentration requirements.

**Department Tutorial:** EPS hosts six department tutorials each year during which EPS faculty speak informally about their research. EPS concentrators are required to attend a minimum of five tutorials prior to graduation. Tutorial dates for 2021 at 5:00 pm EST: October 7, November 4, December 2, February 3, March 3, and April 7.

**Senior Thesis:** Required for joint concentrators, and optional for primary and secondary concentrators. For primary concentrators, a thesis is required for departmental (English) honors. Students interested in doing a thesis should begin discussions with potential thesis advisors no later than the end of their junior year. (The summer prior to their senior year is usually spent conducting thesis research.) Students must complete at least one term of EPS 99 which must be taken for a letter grade. A mid-year poster presentation and a final oral presentation of the thesis is required.
Courses Required for Admission to Most Medical Schools

- General or inorganic chemistry with lab (one year)
- Organic chemistry with lab (one year)
- General physics with lab (one year)
- Biology with lab (one year)
- English (one year)

Taken from: https://ocs.fas.harvard.edu/premedical-health-careers-advising

Harvard Courses That Satisfy Most Medical School Admissions Requirements

GENERAL OR INORGANIC CHEMISTRY WITH LAB (ONE YEAR):
Two of the following courses. Preferably both should contain labs.
• Life Sciences 1a OR Life & Physical Sciences A OR Life Sciences 50a
• Physical Sciences 10 or Physical Sciences 1 or Physical Sciences 11 EPS credit
• Advanced inorganic, or physical chemistry. For example, Chemistry 40, Chemistry 60, or Chemistry 160 EPS credit

ORGANIC CHEMISTRY WITH LAB (ONE YEAR):
• Chem 17 & 27 OR Chem 20 & 30 OR ChemS 17 & Chem 27 OR Chem S-20ab (Harvard Summer School) EPS credit

BIOLOGY WITH LAB (ONE YEAR): Case by case for EPS credit
Two of the following courses. Preferably both should contain labs. Most medical schools recommend that these courses cover the cellular and molecular aspects as well as the structure and function of living organisms.
• Life Sciences 1b • Life Sciences 2 • Life Sciences 50a/b • MCB 60 • MCB 68 • OEB 10 • HEB 1420

BIOCHEMISTRY (ONE SEMESTER) : Case by case for EPS credit
Options for students who need to meet a biochemistry requirement include the following:
Most medical schools who require biochemistry will accept a combination of Chem 17 and Chem 27 EPS credit as fully meeting both the organic and biochemistry requirements OR • MCB 63 OR • MCB 65 OR • BCMP 234 OR • BIOS 5-10 (Harvard Summer School) OR • Advanced courses such as Chemistry 170 or 171.

PHYSICS WITH LAB (ONE YEAR):
• Physical Sciences 2 & 3* OR • Physical Sciences 12a & 12b OR • Physics 15a OR Physicals 16 & Physics 50b OR • Applied Physics 50a & 50b EPS credit OR • Phys-S1a & 1b (Harvard Summer School)
*by petition

MATHEMATICS (ONE SEMESTER OF CALCULUS AND ONE SEMESTER OF STATISTICS)
• Math Ma & Mb OR • Math 1a or Math 1b OR • Math 19a OR • Math 18 OR • Math21a or 21b OR • Life Sciences 50b OR • Any more advanced Math or Applied Math course
PLUS • Any statistics course (e.g. Stats Dept courses or Psychology 1900 or OEB 153 or Math 19b).

ENGLISH (ONE YEAR):
• One semester of the English requirement is met with Expos. Students who take two semesters of Expos have met the full requirement of two semesters of English. For many schools, the second semester can be met with English or Literature courses or with many of the Aesthetic and Interpretive Understanding and Culture and Belief courses.