

General Requirements:

14 courses for primary/double concentration

11 courses for joint-allied concentration

5 courses for secondary field

All concentrators attend 5 department tutorials

EPS Primary/Double Concentration Requirements:

- A minimum of 6 EPS courses, with at least 1 course at the 50- or 100-level, sampling all three sub-disciplines: *Climate, Atmosphere, and Oceans; Geobiology, Geochemistry, and Earth History; and Geology, Geophysics, and Planetary Science*. Ordinarily, courses taken to fulfill chemistry, mathematics, or physics requirements will not count toward fulfilling a breadth category.
- Of these 6 EPS courses, 2 should be foundational courses. 1 of these can be from EPS/ESE 6, EPS 10, or GENED 1018, 1085, 1098, 1158, 1167, or 1184 (ordinarily taken no later than first semester of junior year) and the other course or both of the courses from 50-level EPS offerings.
- 4 additional courses in EPS, at least 3 of which must be numbered 99 or above. Examples: EPS 52, 99, 109, 134 would be an acceptable grouping, but EPS 52, 56, 99, 109 would be unacceptable (either 52 or 56 would have to be moved to the "Related Courses" section, where it could still count for concentration credit).

EPS Joint-Allied Concentration Requirements:

- A minimum of 5 EPS courses, 2 of which should be foundational courses. 1 of these can be from EPS/ESE 6, EPS 10, or GENED 1018, 1085, 1098, 1158, 1167, or 1184 (ordinarily taken no later than first semester of junior year) and the other course or both of the courses from 50-level EPS offerings. 2 additional EPS courses, at least 1 of which must be numbered 99 or above. The last course must be EPS 99: Senior Thesis Tutorial or its equivalent (depending on which concentration is primary).

Foundational Courses for Primary, Double, and Joint-Allied Concentrations:

- **1 course in Physics**
 - 1 mechanics course is required (Physical Sciences 12a, Physics 15a, Physics 16, or Physics 19). Physical Sciences 2 and 3 are allowable by petition. Students who take Physics 15a are strongly encouraged to complete the rest of the series (Physics 15b and 15c).
- **1 course in Chemistry**
 - Physical Sciences 11 is required. More advanced chemistry students who do not need to take Physical Sciences 11 can take Chem 17, 20, or 40 instead. If a student took Physical Sciences 1 before declaring an EPS concentration, it can be used in place of Physical Sciences 11. Physical Sciences 1 and Physical Sciences 11 cannot both be taken for credit.
- **1 course in Higher-Level Physics or Chemistry**
 - Students with a focus in Physics can take Physical Sciences 12b, Physics 15b, or Physics 15c.
 - Students with a focus in Chemistry can take Chem 17, 20, or 40.
 - Students who elect to take a second higher-level Physics or Chemistry course (completing the entire Physics 15 series or pre-med requirements) will automatically be allowed to count the last class toward the concentration as a Related Course.
- **2 courses in Mathematics**
 - Math 21a and 21b, Math 22a and 22b, or Applied Math 22a.
- **1 course in Data Analysis, Statistics, and Computation**
 - EPS 102, Applied Math 111 or 120, Computer Science 109a, or Statistics 109a, 110, or 111. No other course is allowed, except by petition, and students are strongly encouraged to take one of the courses listed above.

Foundational Courses Chart:

Physics (1)	Chemistry (1)	Higher-Level Physics/Chemistry (1)	Mathematics (2)	Data Analysis, Statistics, and Computation (1)
Physical Sciences 12a Physics 15a Physics 16 Physics 19	Physical Sciences 11	<u>Physics</u> Physical Sciences 12b Physics 15b Physics 15c <u>Chemistry</u> Chem 17, 20, 40	Math 21a and 21b Math 22a and 22b Applied Math 22a	EPS 102 Applied Math 111 or 120 Computer Science 109a Statistics 109a, 110, or 111

EPS Secondary Field Requirements:

- 5 EPS courses, 2 of which should be foundational courses. 1 of these can be from EPS/ESE 6, EPS 10, or GENED 1018, 1085, 1098, 1158, 1167, or 1184 (ordinarily taken no later than first semester of junior year) and the other course or both of the courses from 50-level EPS offerings.

For All Concentrators:

- All courses must be taken for a grade, and C- is normally the minimum acceptable grade.
- In most cases, a course needs to be petitioned to count for EPS-related credit.

Thematic Plan of Study:

Primary, double, and joint-allied concentrators should develop individual thematic plans of study together with their faculty advisor. This ensures that the upper-level EPS courses provide a coherent focus. The following lists may help center these discussions, but students have the option to suggest and develop their own themes outside of these boundaries:

- Focus on Atmosphere and Ocean:* 6, 50, 53, 101, 112, 131, 133, 134, 135, 138, 139, 161, 162, 164, 168, 169
- Focus on Energy and Climate:* 109, 112, 131, 133, 134, 139, 162
- Focus on Environmental Geoscience:* 101, 109, 110, 112, 133, 160, 161, 162, 164, 168, 169
- Focus on Geobiology:* 53, 56, 110, 150, 174, 182, 187
- Focus on Geochemistry:* 53, 110, 112, 133, 139, 141, 145, 146, 187
- Focus on Geology:* 52, 54, 55, 56, 109, 110, 112, 139, 145, 146, 171, 174
- Focus on Planetary Sciences:* 52, 110, 112, 120, 160
- Focus on Solid Earth Geophysics:* 52, 55, 120, 146, 162, 165

Advanced Placement:

Advanced Placement may allow students to complete higher-level courses instead of our traditional foundational requirements, but a minimum of 1 physics, 1 chemistry, 1 higher-level physics or chemistry, 2 mathematics, and 1 statistics course must be completed in order to satisfy concentration requirements.

Department Tutorials:

EPS hosts 6 department tutorials each year, during which EPS faculty speak informally about their research. EPS concentrators are required to attend a minimum of 5 tutorials prior to graduation.

Senior Thesis:

The senior thesis is required for joint concentrators, and optional for primary/double concentrators and secondary fielders. 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 junior year. The summer before senior year is usually spent conducting thesis research. Students must complete at least 1 term of EPS 99 for a letter grade. A mid-year poster presentation and a final oral presentation are required.

Harvard Courses That Satisfy Most Medical School Admissions Requirements

GENERAL OR INORGANIC CHEMISTRY WITH LAB (ONE YEAR):

- 2 of the following courses, preferably both with labs:
 - Life Sciences 1a, Life and Physical Sciences A, or Life Sciences 50a
 - Physical Sciences 1, Physical Sciences 10, or Physical Sciences 11
 - Chemistry 40 or Chemistry 160

ORGANIC CHEMISTRY WITH LAB (ONE YEAR):

- Chemistry 17 and Chemistry 27
- Chemistry 20 and Chemistry 30
- Chemistry S-17 and Chemistry S-27
- Chemistry S-20a and Chemistry S-20b

BIOLOGY WITH LAB (ONE YEAR):

- 2 of the following courses, preferably both with labs:
 - Life Sciences 1b, Life Sciences 2, or Life Sciences 50a and 50b
 - MCB 60 or MCB 68
 - OEB 10
 - HEB 1420
- Most medical schools recommend that these courses cover the cellular and molecular aspects as well as the structure and function of living organisms

BIOCHEMISTRY (ONE SEMESTER):

- Options for students who need to meet a biochemistry requirement include the following:
 - Chemistry 17 and Chemistry 27
 - MCB 63 or MCB 65
 - BCMP 234
 - BIOS S-10
 - Chemistry 170 or Chemistry 171
- Most medical schools who require biochemistry will accept a combination of Chemistry 17 and Chemistry 27 as satisfying both the organic and biochemistry requirements

GENERAL PHYSICS WITH LAB (ONE YEAR):

- Physical Sciences 2 and Physical Sciences 3 or Physical Sciences 12a and Physical Sciences 12b
- Physics 15a, Physics 16 and Physics 50b, or Physics S-1a and Physics S-1b
- Applied Physics 50a and Applied Physics 50b

MATHEMATICS (ONE SEMESTER OF CALCULUS AND ONE SEMESTER OF STATISTICS):

- Math Ma and Math Mb
- Math 1a, Math 1b, Math 18, Math 19a, Math 21a, or Math 21b
- Life Sciences 50b
- Any advanced Math or Applied Math course
- Any Statistics course (including PSY 1900, 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 requirement can be satisfied with English or Literature courses, or with many of the Aesthetic and Interpretive Understanding and Culture and Belief courses