FIELDS OF CONCENTRATION

Academic Year 2021-2022
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**LANGUAGE CITATIONS**

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CONCENTRATIONS
African and African American Studies

Professor Glenda Carpio, Director of Undergraduate Studies

The Department of African and African American Studies brings together scholars and scholarship from many disciplines to explore the histories, societies, and cultures of African and African-descended people. The field of African and African American studies is not only interdisciplinary but also comparative and cross-cultural. Africans and people of African descent have developed cultural forms that have profoundly shaped the fine arts and popular culture in the Americas and all around the planet. Comparative and cross-cultural studies of Africa and its diaspora contribute enormously to our understanding of race and ethnicity, and ideas about race are among the central objects of study in the field of African and African American Studies. In addressing the ethical, social, and political consequences of racial thinking, the African and African American Studies faculty raise questions relevant to the experiences of all peoples.

The Department offers two distinct courses of study: the African track and the African American track. African track concentrators come to the program with a variety of interests (e.g., the environment, public health, music, ethnic relations, religion, politics, economic development, and literature). Components of the African track include study in the African Languages Program, required courses, electives, and the option of study abroad. The Department offers seminars and lecture courses on a variety of Africa-related topics. Concentrators in the African track are encouraged to take courses in a variety of departments, including History of Art and Architecture, Music, Economics, Government, History, Anthropology, Social Studies, Romance Languages and Literatures, and the Comparative Study of Religion. Courses in the Divinity School, the Graduate School of Education, and Kennedy School of Government may also be available for concentration credit.

The African American track attracts students with an equally wide range of interests. There are many reasons students pursue African American Studies. First, African American music, literature, and visual arts are significant cultural achievements worthy of study in their own right. Second, African Americans have played a crucial role in the history of the United States, participating in the American Revolution, the Civil War, Reconstruction, women’s suffrage, and the New Deal; and they led the struggle for equality in the second half of the twentieth century. Third, because American political life remains encumbered by racism and its historical legacy, a proper historical, sociological, and economic understanding of race relations continues to be essential for those who seek to make or evaluate public policy. Fourth, some of the social relations that have developed in countries such as the United States, Cuba, Jamaica, Haiti, and Brazil provide important examples of ethno-racial conflict, and through the study of them, it is possible to gain insight into what remains a problem across the globe.

Exploring African and African American cultures requires us to explore aspects of the many other cultures and peoples that have created the mosaic of the modern world. Thus, diaspora studies are integral to each track. In many parts of the Caribbean and Latin America, for example, religions and performance arts are influenced by traditional African belief systems and practices. The cultures of the African Atlantic diaspora have also developed in interactions with other peoples: the many Native American cultures; the Dutch, English, French, German, Irish, Italian, Polish, Portuguese, Russian, Scandinavian, Scottish, Spanish, and other European groups that came with colonists and immigrants; and the traditions that have come with immigrants from East and South Asia.
Students who graduate with a concentration in African and African American Studies go on to pursue advanced degrees in fields such as history, literature, political science, and sociology. They also go on to work in a wide variety of careers in education, business, medicine, entertainment, law, public policy, and the arts and sciences.

**REQUIREMENTS**

**African Studies Track**

**Basic Requirements: 12 courses (48 credits)**

1. **Required Courses:**
   a. **AFRAMER 11: Introduction to African Studies.** Students should take this course by the end of their junior year. (Students who transfer into the concentration after their sophomore year will be permitted to substitute for AFRAMER 11 a course in African Studies they have already taken, but only if they can demonstrate to the Director of Undergraduate Studies that they have established a basic familiarity with the material covered in AFRAMER 11.)
   b. **AFRAMER 10: Introduction to African American Studies.** Students should take this course by the end of their junior year. (Students who transfer into the concentration after their sophomore year will be permitted to substitute for AFRAMER 10 a course in African and African American Studies they have already taken, but only if they can demonstrate to the Director of Undergraduate Studies that they have established a basic familiarity with the materials covered in AFRAMER 10.)
   c. Two courses of an African language. The language requirement is met by attaining a level of competence equivalent to two courses of African language study. Students who can show evidence at the beginning of their concentration that they have a level of competence equivalent to two courses of African language study will be required to substitute other courses offered in the department. Language courses taken outside of Harvard may be substituted upon approval by the Director of the African Language Program and the Director of Undergraduate Studies.
   d. A course in pre-20th century African history. (Students must select from a pre-approved list of courses available on the Department's website or petition the Director of Undergraduate Studies for a substitution.) A course in African history. (Students must select from a pre-approved list of courses available on the Department's website or petition the Director of Undergraduate Studies for a substitution.)
   e. Five courses in African Studies, with at least one in the social sciences and one in the humanities. (These courses need not be given in the department.) In selecting these three courses, students should declare a focus. Some students will declare a disciplinary focus or more general focus in the humanities or social sciences; others will choose an area focus or thematic, methodological, or comparative focus (e.g., comparative literary or historical analysis, comparative economic and political development). These are not the only possibilities, but students are required to make a coherent case for the course of electives they choose.

2. **Tutorials:**
   a. **Sophomore Tutorial: AFRAMER 97: Race, Class, and Colonialism in Africa and the Americas.** (Restricted to concentrators and others by permission of instructor.)
b. **Junior Tutorial**: AFRAMER 98A, an individual course tutorial that focuses on an African Studies topic.

3. **Other information**:
   a. **Pass/fail**: No course used for the concentration may be taken pass/fail, with the exception of AFRAMER 99.
   b. **Teaching**: Concentrators may be eligible to obtain certification to teach in middle or secondary schools in Massachusetts and states with which Massachusetts has reciprocity. See information about the Undergraduate Teacher Education Program (UTEP) at [https://utep.gse.harvard.edu/](https://utep.gse.harvard.edu/).
   c. Students can take AFRAMER 11 and AFRAMER 97 in succeeding terms starting in their freshman or sophomore year, and then proceed to do individual tutorials in the junior year. Nevertheless, the tutorial program is designed to allow great flexibility; students who declare late may take AFRAMER 97 concurrently with AFRAMER 11, for example. Concentrators may be permitted to substitute for AFRAMER 11, if they declare late.
   d. **Study Abroad**: Students are encouraged to explore the options available for study in Africa, either during the regular academic year or the summer. It is recommended that students study abroad in the spring term of their junior year. In either case, they must get approval of their plan of study from the department's Director of Undergraduate Studies.

### Requirements for Honors Eligibility: 12-14 courses (48-56 credits)

1. **Required courses**: Same as **Basic Requirements**.
2. **Tutorials**:
   a. Same as **Basic Requirements**.
   b. **Senior year**: One year of AFRAMER 99: Senior Thesis Workshop required.
3. **Thesis**: Required for eligibility for high and highest honors. A student who has not written a thesis but has attained a GPA of at least 3.9 in twelve concentration courses may be recommended for honors (but not high or highest honors).
4. **Other information**: Same as **Basic Requirements**.

### Requirements for Joint Concentration: 8 courses (32 credits), including thesis

1. **Required courses**:
   b. A course in African history. (Students must select from a pre-approved list of courses available on the Department's website or petition the Director of Undergraduate Studies for a substitution.)
   c. Two courses of an African language. Students who intend to conduct thesis research in Africa are encouraged to continue African language instruction beyond the first year.
2. **Tutorials**:
   a. **Sophomore Tutorial**: AFRAMER 97: Race, Class, and Colonialism in Africa and the Americas. (Restricted to concentrators and others by permission of instructor.)
   b. **Junior Tutorial**: AFRAMER 98A or junior tutorial equivalent in primary concentration if African and African American Studies is the allied concentration.
   c. **Senior year**: One year of AFRAMER 99 required, if African and African American Studies is the primary concentration. If African and African American Studies is
the allied concentration, the student should register for the thesis tutorial in the primary concentration.

3. **Thesis:** Required. Thesis must be related to both fields. Both departments will participate in evaluating the thesis.

4. **Other information:** Same as **Basic Requirements**.

**Concentration requirements for the Joint Concentration in History and African and African American Studies (African Studies track): 14 courses (56 credits)**

1. Study of an African language (2 courses).
2. AFRAMER 11.
3. **Sophomore Tutorial:** HIST 97 and AFRAMER 97. (Restricted to concentrators and others by permission of instructor.)
4. AFRAMER 98A.
5. One History research seminar focused on Africa and resulting in a 20-page research paper based on primary sources.
6. **Senior thesis tutorial:** HIST 99 or AFRAMER 99 (full year).
7. 5 courses in History and African and African American Studies which must include:
   a. One U.S. or European history course.
   b. One pre-modern history course.
   c. Three courses in African/African American history (one must be a modern African history course).
8. **Also note the following information:**
   a. Two types of courses count automatically toward African and African American Studies/History joint concentration requirements:
      i. Courses listed in the course catalog’s "History" section and historical courses in the catalog’s "African and African American Studies" section, as determined in consultation with the History Director of Undergraduate Studies.
      ii. Courses taught in the General Education and/or Freshman Seminar programs by members of the History or African and African American Studies department faculty. Students wishing to count such courses toward their concentration requirements should consult the Undergraduate Office, as they may need to file a petition requiring approval by the Director of Undergraduate Studies. Students may also apply to do an independent study, or HIST 91R, with a member of the department; HIST 91R can be used to fulfill one of the elective course requirements.
   b. The joint concentration also regularly accepts credit from Study Abroad toward concentration requirements. With the exception of certain Freshman Seminars taught by History or African and African American Studies faculty (see above), courses taken on pass/fail basis may not be counted for concentration credit.

**African American Studies Track**

**Basic Requirements: 12 courses (48 credits)**

1. **Required courses:**
   a. AFRAMER 10: Introduction to African American Studies. Students should take this course by the end of their junior year. (Students who transfer into the concentration after their sophomore year will be permitted to substitute for
AFRAMER 10, a course in African and African American studies they have already taken, but only if they can demonstrate to the Director of Undergraduate Studies that they have established a basic familiarity with the materials covered in AFRAMER 10.

b. AFRAMER 11: Introduction to African Studies. Students should take this course by the end of their junior year. (Students who transfer into the concentration after their sophomore year will be permitted to substitute for AFRAMER 11 a course in African studies they have already taken, but only if they can demonstrate to the Director of Undergraduate Studies that they have established a basic familiarity with the material covered in AFRAMER 11.)

c. A course in 18th or 19th century African American history that engages substantially with the history of slavery. (Students must select from a pre-approved list of courses available on the department's website or petition the Director of Undergraduate Studies for a substitution.

d. Seven additional courses in African American or diaspora studies, at least one of which must be in the humanities and one in the social sciences. (These courses need not be given in the department.) Some students will declare a disciplinary focus or a more general focus in humanities or social sciences; others will choose an area of focus in African American or Afro-Caribbean cultures; still others will elect a thematic, methodological, or comparative focus (e.g., comparative ethnic studies, comparative literary analysis, urban studies). These are not the only possibilities, but students should be prepared to make a coherent case for the course of electives they select.

2. Tutorials:
   a. Sophomore Tutorial: AFRAMER 97: Race, Class, and Colonialism in Africa and the Americas. (Restricted to concentrators and others by permission of the instructor.)
   b. Junior Tutorial: AFRAMER 98, an individual course tutorial that focuses on an African American studies topic.

3. Other information:
   a. Pass/fail: No course used for the concentration may be taken pass/fail, with the exception of AFRAMER 99.
   b. Teaching: Concentrators may be eligible to obtain certification to teach in middle or secondary schools in Massachusetts and states with which Massachusetts has reciprocity. See information about the Undergraduate Teacher Education Program (UTEP) at https://utep.gse.harvard.edu.
   c. Students can take AFRAMER 10 and AFRAMER 97 in succeeding terms starting in their freshman or sophomore year, and then proceed to do individual tutorials in the junior year. Nevertheless, the tutorial program is designed to allow great flexibility; students who declare late may take AFRAMER 97 concurrently with AFRAMER 10, for example. Concentrators may be permitted to substitute for AFRAMER 10, if they declare late.

Requirements for Honors Eligibility: 12-14 courses (48-56 credits)

1. Required courses: Same as Basic Requirements.
2. Tutorials:
   a. Same as Basic Requirements.
   b. Senior year: One year of AFRAMER 99: Senior Thesis Workshop required.
3. **Thesis**: Required for eligibility for high and highest honors. A student who has not written a thesis but has attained a GPA of at least 3.9 in twelve concentration courses may be recommended for honors (but not high or highest honors).

4. **Other information**: Same as **Basic Requirements**.

**Requirements for Joint Concentration (honors only): 8 courses (32 credits), including thesis**

1. **Required courses**:
   - a. AFRAMER 10: Introduction to African American Studies.
   - b. A course in 18th or 19th century African American history that engages substantially with the history of slavery. (Students must select from a pre-approved list of courses available on the department's website or petition the Director of Undergraduate Studies for a substitution.)
   - c. Two courses in African American or diaspora studies, one in the humanities and one in the social sciences.

2. **Tutorials**:
   - a. **Sophomore Tutorial**: AFRAMER 97: Race, Class, and Colonialism in Africa and the Americas. (Restricted to concentrators and others by permission of the instructor.)
   - b. **Junior Tutorial**: AFRAMER 98 or junior tutorial equivalent in primary concentration if African and African American Studies is the allied concentration.
   - c. **Senior year**: One year of AFRAMER 99 required, if African and African American Studies is the primary concentration. If African and African American Studies is the allied concentration, the student should register for the thesis tutorial in the primary concentration.

3. **Thesis**: Required. Thesis must be related to both fields. Both departments will participate in evaluating the thesis.

4. **Other information**:
   - a. **Pass/fail**: No course used for the concentration may be taken pass/fail, with the exception of AFRAMER 99.
   - b. Students can take AFRAMER 10 and 97 in succeeding terms starting in their freshman or sophomore year, and then proceed to do individual tutorials in the junior year. Nevertheless, the tutorial program is designed to allow great flexibility: students who declare late may take AFRAMER 97 concurrently with AFRAMER 10, for example. Concentrators may be permitted to substitute for AFRAMER 10, if they declare late.

**Concentration requirements for the Joint Concentration in History and African and African American Studies (African American Studies track): 14 courses (56 credits)**

1. AFRAMER 10: Introduction to African American Studies.
2. Two courses in African American Studies: one in humanities, one in social sciences.
3. One course in African American pre-20th century history (if not available, consult Director of Undergraduate Studies).
4. **Sophomore Tutorials**: HIST 97 and AFRAMER 97.
5. One History research seminar (ideally focused on African American History) and resulting in a research paper of at least 20 pages based on primary sources.
6. AFRAMER 98.
7. **Senior Thesis Tutorial**: HIST 99 or AFRAMER 99 (full year).
8. 4 courses in History and African and African American Studies. These must include:
   a. One pre-modern History course.
   b. Three African/African American history courses, of which one must be a modern African history course.

9. Please also note the following information:
   a. Two types of courses count automatically toward African and African American Studies/History concentration requirements:
      i. Courses listed in the course catalog's "History" section and historical courses in the catalog's "African and African American Studies" section, as determined in consultation with the History Director of Undergraduate Studies.
      ii. Courses taught in the General Education and/or Freshman Seminar programs by members of the History or African and African American Studies department faculty. Students wishing to count such courses toward their concentration requirements should consult the Undergraduate Office, as they may need to file a petition requiring approval by the Director of Undergraduate Studies. Students may also apply to do an independent study, or HIST 91R with a member of the department; HIST 91R can be used to fulfill one of the elective course requirements.
      iii. The joint concentration also regularly accepts credit from Study Abroad toward concentration requirements. With the exception of certain Freshman Seminars taught by History or African and African American Studies faculty (see above), courses taken on pass/fail basis may not be counted for concentration credit.

ADVISING
Beginning in the sophomore year, concentrators will work directly with their individual advisers and with the Director of Undergraduate Studies to create a plan of study that meets their academic interests. The department requires that students develop a focus as part of their declaration of the concentration. This plan of study will take cognizance of disciplinary requirements and the option of study abroad, yet it will be flexible enough to accommodate students in pursuit of their own specific intellectual interests. At the end of the sophomore year, students are asked to submit a 1-2 page Concentration Focus Statement describing the main area(s) of study they wish to explore. The Director of Undergraduate Studies will meet with students, if they request, in order to assist them in the formulation of the statement of concentration focus.

For up-to-date information on advising in African and African American Studies, please see the Advising Programs Office website (https://advising.college.harvard.edu/concentrations).

RESOURCES
The Franklin D. and Wendy F. Raines Library, in the Department of African and African American Studies, is located on the second floor of the Barker Center and contains a non-circulating collection of important books, academic and popular periodicals, and offprints, as well as an extensive audio and video collection. Past undergraduate theses are also available. An important resource for African Studies concentrators is the Committee on African Studies, which offers summer travel grants to assist Harvard juniors with senior honors thesis research. Please see their website for more information (http://africa.harvard.edu). They can also guide students to resources for teaching, research, and advisory work on Africa in a number of
departments, centers, and institutes at Harvard. Harvard’s Office of International Education has approved study abroad in eleven African countries (https://oie.fas.harvard.edu/home). To plan their term in Africa, students should meet with the Director of the Office of International Programs.

HOW TO FIND OUT MORE
Students should consult the departmental website (http://aaas.fas.harvard.edu/), which includes information about concentration rules, the senior thesis, model programs, faculty interests, and departmental resources. Additional information is available from the Director of Undergraduate Studies Glenda Carpio (carpio@fas.harvard.edu) or the Graduate and Undergraduate Studies Coordinator Faton Limani at faton_limani@fas.harvard.edu, or 617-384-7767. The department is located on the second floor of the Barker Center, 12 Quincy Street.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Anthropology

Prof. Jason Ur, Director of Undergraduate Studies
Dr. Zoe Eddy, Assistant Director of Undergraduate Studies
Ligia Alfonzo, Undergraduate Program Coordinator

Anthropology brings global, comparative, and holistic views to the study of the human condition, exploring the enormous range of similarities and differences across time and space. It includes the study of how human behavior has evolved as well as how language, culture, and society have shaped and continue to shape the human experience.

The concentration in Anthropology aims to cultivate a critical understanding of this wide-ranging experience. To study the human condition is to confront the familiarity of the seemingly strange, and to interrogate the strangeness of that which seems familiar. What does this mean? At the very least, it means stepping back and seeing ourselves the way others might see us – a shift in perspective that is foundational to human empathy and humility. Anthropology also invites deeper analysis of behaviors that we might think we fully understand but that have histories and complexities that only reveal themselves to careful investigation. This is why we do long term field research in local languages to understand social life in all its richness and depth. And finally, making the familiar strange demands an ethical and political accounting. It means not accepting the world as given. This might well be the heart of the discipline, its moral optimism: the conviction that things can be different and better – and that knowledge about the world should be oriented towards greater empathy, solidarity, and equality. Through an insistence on the importance of context, anthropologists wrestle with the totality of intersections between human practices and behaviors, beliefs, culture, place, politics, identities, and more. Some develop this awareness of cultural and social context into an engaged participation in the contemporary world through politics, work in the public sector, global health policy, journalism, cultural heritage work, the law, advertising, or business. For others, the study of anthropology provides a foundation for graduate studies in anthropology or related fields.

At Harvard, the Anthropology Department is divided into two programs: Archaeology and Social Anthropology.

Archaeology investigates the past human condition primarily through the identification, recovery, and analysis of the material remains of ancient peoples in the field and in the laboratory. Goals of archaeology include understanding such developments as the origins of modern humans, the beginnings and spread of agriculture, and the rise and elaboration of complex societies, as well as the roles that archaeologically documented pasts play in the modern world.

Social Anthropology examines the social and cultural diversity of contemporary human experience, practice, and knowledge. Based on various research methods including ethnography, social anthropology provides a critical perspective for better understanding everyday life in a globalized world, and the political, economic, and cultural interconnections within and among the societies of the world.

All students are strongly encouraged to take the opportunity to study and/or carry out research abroad and gain a basic knowledge of both subfields (Archaeology and Social Anthropology). Beyond this, most students focus their studies within one of the two programs, meeting the concentration requirements set forward by the particular program concerned. Some
students may choose to pursue a combined focus on both approaches, meeting reduced concentration requirements for both Social Anthropology and Archaeology.

Senior theses are generally supervised within a program, and the tutorials concentrate on problems of research within the subfields of each program. Anthropology concentrators may, however, take tutorials for credit in both programs if they so choose. Field and laboratory research are encouraged, although not required.

While specialization in either Social Anthropology or Archaeology is the most common pattern of study, the Anthropology department also encourages interdisciplinary work across programs or between Anthropology and other disciplines. The Anthropology department allows students to arrange joint concentrations with other Faculty of Arts and Sciences (FAS) departments when appropriate and possible. Such concentrations are restricted to honors candidates and culminate in an interdisciplinary senior thesis. A joint concentration involves an individualized, coherent plan of study approved by both of the departments involved. Harry Lewis, Gordon McKay Professor of Computer Science, best described the joint concentration: “A joint concentration is meant to be a program that integrates two fields and aims towards a research thesis bridging the areas. In other words, a joint concentration in X and Y is meant for people who have an interest in the intersection of X and Y, not just in both X and Y independently.” The number of required Anthropology courses and basic program requirements may be reduced when declaring a joint concentration.

**REQUIREMENTS**

**Archaeology Track**

**Basic Requirements:** 10 courses (40 credits), including 2 tutorials

1. **Required courses:**
   a. One course in archaeological method and theory. Ordinarily met with GENED 1105 (fall term) or ANTHRO 1010 (prior to 2019).
   b. Five additional Archaeology courses, any level.
   c. One Social Anthropology course.
   d. One course related to human evolution. This course must be approved by the Director of Undergraduate Studies (DUS) or Assistant Director of Undergraduate Studies (ADUS).

2. **Tutorials:**

3. **Thesis:** None.
4. **General Examination:** None.
5. **Other information:**
   a. **Pass/fail:** Two courses may be taken pass/fail and counted toward the concentration. All Anthropology tutorials are letter-graded.
   b. **Languages:** The department itself has no language requirement. However, the importance of modern languages for research in all branches of Anthropology cannot be too highly stressed. Concentrators who expect to do work in Anthropology beyond the AB degree are most strongly urged to develop their language skills as undergraduates.
   c. **Statistics/Archaeological Science:** Concentrators in combined Archaeology and Social Anthropology are encouraged to take courses in statistics, archaeological science and/or computer science (including Geographic Information Systems
[GIS]). Competence in handling quantitative data is extremely important in anthropological research, and such competence is best obtained through formal training in statistics and scientific methods.

d. **Study and Research Abroad:** Concentrators in Archaeology are encouraged to investigate the possibilities for studying and/or carrying out research abroad during the summer or during the academic year. If a student has received Harvard degree credit for courses taken in a Harvard-approved overseas studies program, that student may petition the DUS or ADUS for permission to count these courses toward the requirements of the Archaeology concentration. Ordinarily, up to two courses per semester may be counted for concentration credit.

e. **Field Experience:** Concentrators are required to participate in a field experience. While this is not a course requirement, it may be completed by having an experience, training, or internship, including museum internships, for which there is not credit given.

**Requirements for Honors Eligibility (Thesis Track): 12 courses (48 credits)**

1. **Required courses:**
   a. One course in archaeological method and theory. Ordinarily met with GENED 1105 (fall term) or ANTHRO 1010 (prior to 2019).
   b. Four additional Archaeology courses, any level.
   c. Graduate-level research seminar (2000-level).
   d. One Social Anthropology course.
   e. One course related to human evolution. This course must be approved by the DUS or ADUS.

2. **Tutorials:**
   a. Sophomore year: Same as Basic Requirements.
   b. Junior year: In addition to ANTHRO 98A (fall term), Archaeology honors candidates are strongly encouraged to enroll in ANTHRO 98B, an individual Junior tutorial, normally taken spring term, in which they carry out study and research directly related to the preparation of the senior thesis. Assignments may include a focused literature review, a grant proposal for summer research funding, etc.
   c. Senior year: ANTHRO 99 (a year-long 8-credit course: letter-graded during the fall term and SAT/UNSAT during the spring term), culminating in the submission of a senior thesis and related poster, followed by an oral presentation of and examination on the thesis.

3. **Thesis:** Required, with oral examination.
4. **General Examination:** None.
5. **Other information:** Same as Basic Requirements. Honors candidates usually carry out research for their senior theses during the summer between their junior and senior years.

**NON-THESIS TRACK**

Graduating seniors in Archaeology who are not thesis candidates and have taken a 2000-level course may be considered for a non-thesis honors recommendation of honors (but not high or highest honors), provided that their concentration grade point averages calculated at the end of
their next to last semester are among the highest twenty-five percent of non-thesis candidates in their graduating class.

**Social Anthropology Track**

**Basic Requirements: 10 courses (40 credits), including 2 tutorials**

1. **Required courses:**
   a. ANTHRO 1610: Ethnographic Research Methods (fall term).
   b. Four Social Anthropology courses, any level.
   c. Two courses in Anthropology, of which at least one must be an Archaeology course (any level).
   d. One related course: One additional course in Anthropology or in any social sciences field or advanced foreign language. Students may substitute a relevant course in humanities or science fields with approval from the DUS or ADUS.

2. **Tutorials:**
   b. Junior year: ANTHRO 98A, Junior tutorial in Anthropology (fall term).

3. **Thesis:** None.

4. **General Examination:** None.

5. **Other information:**
   a. **Pass/fail:** One course may be taken pass/fail and counted for concentration credit. This will ordinarily be in the related course category. All Anthropology tutorials are letter-graded.
   b. **Language:** No (but strongly encouraged).
   c. **Study Abroad:** Concentrators are strongly encouraged to participate in study abroad or internship programs. If a student has received Harvard degree credit for courses taken in a Harvard-approved overseas studies program, that student may petition the DUS or ADUS for permission to count up to two courses per semester toward the requirements of the concentration.

**Requirements for Honors Eligibility (Thesis Track): 12 courses (48 credits)**

1. **Required courses:** Same as **Basic Requirements**.

2. **Tutorials:**
   a. Sophomore and junior years: Same as **Basic Requirements**.
   b. Junior year: In addition to ANTHRO 98A (fall term), Social Anthropology honors candidates are strongly encouraged to enroll in ANTHRO 98B, an individual Junior tutorial, normally taken spring term, in which they carry out study and research related to the preparation of the senior thesis.
   c. Senior year: ANTHRO 99 (a year-long 8-credit course: letter-graded during the fall term and SAT/UNSAT during the spring term), culminating in the submission of a senior thesis and an oral examination on that thesis.

3. **Thesis:** Required, with oral examination.

4. **General Examination:** None.

5. **Other information:** Same as **Basic Requirements**. Honors candidates usually carry out research for their senior theses during the summer between their junior and senior years.

**NON-THESIS TRACK**
All graduating seniors in Social Anthropology who are not thesis candidates may be considered for a non-thesis honors recommendation of honors (but not high or highest honors), provided that their concentration grade point averages calculated at the end of their next to last semester are among the highest twenty-five percent of non-thesis candidates in their graduating class.

Combining Archaeology and Social Anthropology

Basic Requirements: 10 courses (40 credits), including 3 tutorials

1. **Required courses:**
   a. One course in archaeological method and theory. Ordinarily met with GENED 1105 (fall term) or ANTHRO 1010 (prior to 2019).
   b. ANTHRO 1610: Ethnographic Research Methods (fall term).
   c. One course in Archaeology.
   d. One course in Social Anthropology.
   e. One course in Archaeology or Social Anthropology.
   f. One course in Archaeology or Social Anthropology. Graduate research seminar (2000-level) encouraged, but not required.
   g. One related course: One additional course in Anthropology or a related discipline, Human Evolutionary Biology, or human evolution. This course must be approved by the DUS or ADUS.

2. **Tutorials:**
   a. Sophomore year: Both Archaeology and Social Anthropology Sophomore Tutorials (ANTHRO 97X and ANTHRO 97Z, two courses, spring term).
   b. Junior year: ANTHRO 98A: Junior tutorial in Anthropology (fall term)

3. **Thesis:** Not required.

4. **General Examination:** None.

5. **Other information:**
   a. **Pass/fail:** Same as Basic Requirements for each program.
   b. **Languages:** Same as Basic Requirements for each program.
   c. **Statistics/Archaeological Science:** Concentrators in combined Archaeology and Social Anthropology are encouraged to take courses in statistics, archaeological science and/or computer science (including GIS). Competence in handling quantitative data is extremely important in anthropological research, and such competence is best obtained through formal training in statistics and scientific methods.
   d. **Study Abroad:** Study abroad is encouraged. Consult the DUS or ADUS.

Requirements for Honors Eligibility (Thesis Track): 12 courses (48 credits)

1. **Required courses:** Same as Basic Requirements.

2. **Tutorials:**
   a. Sophomore and Junior years: Same as Basic Requirements.
   b. ANTHRO 99: Senior Tutorial (a year-long 8-credit course: letter-graded during the fall term and SAT/UNSAT during the spring term), culminating in the submission of a senior thesis and an oral examination on that thesis.

3. **Thesis:** Required, with oral examination.

4. **General Examination:** None.

5. **Other information:** Same as Basic Requirements. Prospective honors candidates are strongly encouraged to enroll in ANTHRO 98B (spring term). Honors candidates usually
carry out research for their senior theses during the summer between their junior and senior years.

NON-THESIS TRACK

All graduating seniors in combined Archaeology and Social Anthropology who are not thesis candidates may be considered for a non-thesis honors recommendation of honors (but not high or highest honors), provided that their concentration grade point averages calculated at the end of their next to last semester are among the highest twenty-five percent of non-thesis candidates in their graduating class.

Joint Concentrations

The programs in Archaeology and Social Anthropology of the Department of Anthropology both encourage a joint concentration with any other department that permits a joint concentration. A joint concentration is meant to be a program that integrates two fields and aims towards a research thesis bridging the areas. The Anthropology part of the joint concentration can serve as either the primary or allied field. Consult the DUS or ADUS and the concentration adviser in the allied field for details.

Concentration Requirements for the Joint Concentration in Archaeology and another field outside of Anthropology: 6 courses (24 credits)

For the Archaeology portion of the joint concentration, there is a six-course requirement.

1. **Required courses:**
   a. One course in archaeological method and theory. Ordinarily met with GENED 1105 (fall term) or ANTHRO 1010 (prior to 2019).
   b. ANTHRO 97X: Sophomore Tutorial in Archaeology (spring term).
   c. ANTHRO 98A: Junior Tutorial in Anthropology (fall term).
   d. Three additional Archaeology courses, any level.
   e. One additional Archaeology course: ordinarily a research seminar (2000-level) expected.

1. Because a joint concentration is an honors concentration, if Archaeology is the primary field, the following courses are also required: ANTHRO 99: Senior Tutorial (a year-long 8-credit course: letter-graded during the fall term and SAT/UNSAT during the spring term), culminating in the submission of a senior thesis and an oral examination on that thesis.

2. **Other information:** Prospective honors candidates are strongly encouraged to enroll in ANTHRO 98B (spring term). Honors candidates usually carry out research for their senior theses during the summer between their junior and senior years.

3. **Field Experience:** Archaeology joint-concentrators are encouraged to participate in a field experience, but this will depend on the nature of the joint concentration. While this is not a course requirement, field experience may be completed by having an experience, training, or internship, including museum internships, for which there is not credit given.

Concentration Requirements for the Joint Concentration in Social Anthropology and another field outside of Anthropology: 6 courses (24 credits)

The Social Anthropology portion of the joint concentration consists of a six-course requirement.
1. **Required courses:**
   a. ANTHRO 1610: Ethnographic Research Methods (fall term).
   b. ANTHRO 97A: Sophomore Tutorial (spring term).
   c. ANTHRO 98A: Junior Tutorial (fall term).
   d. Two Social Anthropology courses, any level.
   e. One additional course in Anthropology.

2. Because a joint concentration is an honors concentration, if Social Anthropology is the primary field, the following courses are also required:
   a. One Social Anthropology course, any level.
   b. One additional course in Anthropology.
   c. ANTHRO 99: Senior Tutorial (a year-long 8-credit course).

3. **Other information:** Prospective honors candidates are strongly encouraged to enroll in ANTHRO 98B (spring term). Honors candidates usually carry out research for their senior theses during the summer between their junior and senior years.

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**Concentration Requirements for the Joint Concentration in Human Evolutionary Biology (HEB) and Anthropology (Archaeology or Social Anthropology track, or both): 16 courses (64 credits)**

1. Five Anthropology courses (in Social Anthropology or Archaeology or a mix of both), including: one of either ANTHRO 1610 or GENED 1105 (or ANTHRO 1010 prior to 2019), and highly recommended ANTHRO 98B: Junior Tutorial.
2. Sophomore Tutorials: HEB 97 and ANTHRO 97X or 97Z.
5. Five additional courses:
   a. LS 1B.
   b. LS 1A, LPS A, or HEB course (depending on whether HEB is the primary or allied concentration).
   c. One course in human evolution.
   d. One course in anatomy/physiology or human/primate behavior.
   e. One HEB course.

*Please also note the following information:*

A signed form is required from the DUS or ADUS in both departments.

If a student’s primary field is expected to be Anthropology, special permission is needed to enroll in HEB 97 during sophomore year.

**Concentration requirements for the Joint Concentration in History and Anthropology (Archaeology or Social Anthropology track, or both): 14 courses (56 credits)**

1. Four Anthropology courses (in Social Anthropology or Archaeology or a mix of both), including one of either ANTHRO 1610 or GENED 1105 (or ANTHRO 1010 prior to 2019).
2. Sophomore Tutorials: HIST 97 and ANTHRO 97X or 97Z.
5. Four additional History courses:
   a. One Western history course.
   b. One pre-modern history course.
   c. One non-Western history course.
   d. Another course in History.

Please also note the following information:

Two types of courses count automatically toward Anthropology/History joint concentration requirements:

1. Courses listed in the course catalog's "History" section and historical courses in the catalog's "Anthropology" section, as determined in consultation with the History DUS.
2. Courses taught in the General Education and/or Freshman Seminar programs by members of the History or Anthropology department faculty. Students wishing to count such courses toward their concentration requirements should consult the Undergraduate Office, as they may need to file a petition requiring approval by the Director of Undergraduate Studies. Students may also apply to do an independent study, or HIST 91R, with a member of the History department; HIST 91R can be used to fulfill one of the elective course requirements.

The joint concentration also regularly accepts credit from Study Abroad toward concentration requirements. With the exception of certain Freshman Seminars taught by History or Anthropology faculty (see above), courses taken on pass/fail basis may not be counted for concentration credit.

ADVISING

Advising in the Department of Anthropology is carried out by the Director of Undergraduate Studies (DUS), the Assistant Director of Undergraduate Studies (ADUS), faculty, senior graduate students, and the Undergraduate Program Coordinator. The DUS has overall responsibility for the academic progress of undergraduates and, along with the ADUS, is available by appointment for advice on academic and administrative matters. The Undergraduate Program Coordinator also provides information on departmental and College requirements and on administrative matters, particularly to Social Anthropology students. Starting in the junior year and depending on their interests, undergraduates often begin to work more closely with individual faculty members, senior graduate students (especially in Social Anthropology), and members of the staff of the Peabody Museum (especially in Archaeology) within the tutorial system. Choice of a faculty adviser depends largely upon the academic and research interests of the student.

For up-to-date information on advising in Anthropology, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES

Peabody Museum of Archaeology and Ethnology

Founded in 1866, the Peabody Museum is among the oldest archaeological and ethnographic museums in the world with one of the finest collections of human cultural history found anywhere.
Alfred P. Tozzer Memorial Library
Founded in 1866, Tozzer Library is the oldest library in the United States devoted to Anthropology and contains more than 250,000 volumes, with a special emphasis on materials relating to the indigenous peoples of the Americas.

Archaeological Research Labs
The Mesoamerican Lab focuses on Mesoamerican archaeology, ethnology, epigraphy, and iconography. The Zooarchaeology Lab focuses on the research and analysis of animal remains that form archaeological sites. The Joint Use Lab provides facilities and equipment for materials analysis in Archaeology and related disciplines.

Additional Resources
Anthropology’s tradition of cross-cultural understanding and multidisciplinary approach to the study of the human condition has fostered strong links to many other disciplines and research centers across Harvard University. Social anthropologists can be found in the Center for Middle Eastern Studies, the Asia Center, the Harvard-Yenching Institute, the Fairbank Center for East Asian Research, the Reischauer Institute of Japanese Studies, the South Asia Institute, the David Rockefeller Center for Latin American Studies, the Davis Center for Russian and Eurasian Studies, and the Faculties of Medicine, Public Health, and Education, as well as in other departments of the Faculty of Arts and Sciences (FAS). There are archaeologists in the departments of Near Eastern Languages and Civilizations, Classics, and History of Art and Architecture, as well as a Standing Committee on Archaeology that includes individuals from across FAS who are practicing archaeologists or for whom use of the results of archaeological study are integral to their teaching and research. From time to time, distinguished visiting scholars hold teaching appointments in the department. Harvard students have access to an exceptionally large number of professional anthropologists.

FIELDWORK
Fieldwork may be taken for credit through an approved university. Institute of Field Research archaeological field schools are pre-approved by the Department of Anthropology. Although concentrators will register directly with the other university, they must first obtain permission from the Department of Anthropology at Harvard and apply for credit through the Office of International Education (https://oie.fas.harvard.edu/). Upon completion of this work and receipt of the official transcript, the department will make a recommendation to the Office of International Education regarding the amount of concentration credit to be granted toward the AB degree.

HOW TO FIND OUT MORE
The department's website address is www.anthropology.fas.harvard.edu. The undergraduate office is Room 103B, Tozzer Anthropology Building, 21 Divinity Avenue (617-495-3814). The Undergraduate Program Coordinator may be reached at anthrouc@fas.harvard.edu. The Director for Undergraduate Studies is Dr. Rowan K. Flad, Peabody Museum 57G, 11 Divinity Avenue (617-495-1966), rflad@fas.harvard.edu. The Assistant Director of Undergraduate Studies is Dr. Zoe Eddy, Tozzer Anthropology Building, Room 207, 21 Divinity Avenue (zeddy@fas.harvard.edu).
## ENROLLMENT STATISTICS

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Applied Mathematics

Professor Steven Gortler, Co-Director of Undergraduate Studies
Dr. Sarah Iams, Co-Director of Undergraduate Studies
Dr. Margo Levine, Co-Director of Undergraduate Studies

Mathematical modeling is ubiquitous throughout the physical, biological, social, engineering, and management sciences. Mathematical scientists who identify themselves primarily as applied mathematicians develop, implement, and study mathematical, statistical, and computational techniques broadly applicable in various fields. In addition, they bring mathematical modeling skills to bear on particular scientific problems, using judicious approximations to obtain insights and predictions when the underlying phenomena are thought to be relatively simple and well understood, or creating conceptual frameworks for quantitative reasoning and measurement when the underlying phenomena are complicated and less well understood.

In their methodological role, applied mathematicians may function temporarily as mathematicians, statisticians, or computer scientists; in their phenomenological role, they may function temporarily as physicists, chemists, biologists, economists, engineers, and the like. In both roles, they must possess relevant knowledge, technical mastery, and educated taste; clearly, this necessitates specialization. Avowed practitioners of mathematically oriented segments of other disciplines equally may function temporarily as applied mathematicians.

The range of activities carried on under the aegis of the principal professional organization in the field, the Society for Industrial and Applied Mathematics (SIAM), can serve as an operational definition of the scope of the discipline. Various SIAM publications are readily accessible to Harvard students, and student memberships are available. Ideally, over time, an applied mathematician demonstrates substantive involvement with both the mathematical and scientific aspects of their dual roles. In the long run, their contributions must be evaluated based on both methodological and phenomenological impact. Inside academia, their activities are usually carried out in collaboration with students or colleagues; outside academia, applied mathematicians often serve as parts of a multidisciplinary team tackling complex problems under time and resource constraints. In either context, a premium is placed on having an outstanding ability to communicate with fellow technical professionals.

Applied mathematics is inherently interdisciplinary, in motivation and in operation. This vision informs the design of the concentration. The Applied Mathematics concentration consists of a broad undergraduate education in the mathematical sciences, both in those subjects that have proved vital to an understanding of problems arising in other disciplines, and in some specific area where mathematical methods have been substantively applied. For concentrators, a core learning objective is building and demonstrating foundational knowledge in computation, probability, discrete, and continuous mathematics through the successful completion of the foundation and breadth courses. In addition, through their coursework, concentrators should gain facility and comfort in using approximation to simplify problems and gain insight. They should learn to communicate effectively with fellow technical professionals, and should be prepared, by their senior year, to tackle mathematical modeling problems in their area of application, at the level of a senior thesis. Additionally, students can expect to be able to attain employment or, with appropriate planning, gain admission to graduate study in applied mathematics.
The concentration requirements are flexible but structured and demanding. Individual academic programs should be arranged in consultation with an adviser and will be approved by the adviser and by the co-Director of Undergraduate Studies. The concentration is overseen by an interdepartmental Committee on Undergraduate Studies in Applied Mathematics and administered by the School of Engineering and Applied Sciences (SEAS).

Students select the concentration because they enjoy mathematical coursework and are especially interested in the use of mathematics to solve real-world problems. Some want a deeper involvement with an area of application than may be provided within a mathematics, statistics, or computer science concentration. Others want a more mathematically oriented approach to an area of application than that which is normally provided within the corresponding concentration; mathematical economics is a prime example. Yet others want a special program not otherwise available, usually involving an area of application in which mathematical modeling is less common. Applied mathematics programs will typically involve a broader range of study within the mathematical sciences and a narrower range of study within the area of application than alternate programs offered by neighboring concentrations. With a little forethought, it is ordinarily straightforward to change the chosen area of application or to transfer between this concentration and neighboring ones until the end of the sophomore year, and often beyond.

Some concentrators go on to graduate work or to employment in their area of application, or in applied mathematics. Others go on to professional schools in law, medicine, or business. Students interested in entering a PhD program should plan to take more technical electives than the minimum required for concentration and should plan their program carefully with their adviser and with a co-Director of Undergraduate Studies.

REQUIREMENTS
Concentration Requirements: 14-15 courses (56-60 credits)

Prospective concentrators are encouraged to make early contact with concentration representatives. Students wishing to enter the concentration should review the concentration requirements, meet with a co-Director of Undergraduate Studies to discuss their proposed program, and then submit a program of study at: http://studyplan.seas.harvard.edu/. Students should be aware that interdisciplinary and interdepartmental programs will usually be more demanding than conventional programs in an established discipline. Prerequisite or co-requisite courses not included in the program of study may be needed to provide background or perspective.

In addition to the courses listed specifically below, more advanced courses may be approved by petition in the context of a particular program of study. In certain areas of application, undergraduates routinely take courses designated as primarily for graduate students. Recommendations or restrictions on course selection may flow from the choice of a particular area of application.

Total course requirements may be reduced from fifteen to no less than twelve, and the balance of foundation and breadth courses are dependent on placement in Math courses. Such placement is granted based on an appropriate Advanced Placement examination, the Harvard Mathematics Placement Test, or an equivalent college-level course taken elsewhere, provided this bypass is validated by successful completion (honor grades) of more advanced courses. Students seeking placement based on college-level work done elsewhere must submit a petition to am-advising@seas.harvard.edu, supplemented by suitable supporting materials. Transfer students from other colleges will have their programs considered on a case-by-case basis in response to a petition documenting their previous preparation.
1. **Required courses:**
   a. **Foundation:** 2-5 courses (see note i.1-3 below) in calculus and linear algebra:
      i. MATH MA or MATH 1A.
      ii. MATH 1B.
      iii. APMTH 22B, MATH 21A, or MATH 22B.
      iv. APMTH 22A, MATH 21B, or MATH 22A.
   b. **Breadth:** 5-7 courses (see note i.1-3 below) from the following categories.
      Students must take courses from at least five out of the eight categories listed below. Of those, students must take at least one course in Computation and one course in Probability and Statistics. In addition, students must take a course drawn from at least one “continuous” category (Differential Equations or Analysis) and one drawn from at least one “discrete” category (Algebra, Optimization, or Discrete Mathematics). Students must show evidence of satisfying prerequisites for a course to count towards the concentration.
      i. **Computation:**
         1. First course: APMTH 10 and/or COMPSCI 50.
      ii. **Probability and Statistics:**
          1. First course: either STAT 110 or MATH 154, but not both.
          2. Additional courses: STAT 111, STAT 121, STAT 139.
      iii. **Differential Equations:** APMTH 105, APMTH 108, APMTH 202; MATH 110.
      iv. **Analysis:** APMTH 104, APMTH 201, APMTH 202; MATH 112, MATH 113, MATH 114, MATH 115, MATH 118R.
      v. **Algebra:**
         1. Linear Algebra: APMTH 120, MATH 121.
         2. Abstract Algebra: APMTH 106; MATH 122, MATH 123.
      vi. **Optimization:** APMTH 121, MATH 116.
      vii. **Discrete Mathematics:** APMTH 107; MATH 152, MATH 155R; COMPSCI 120, COMPSCI 121, COMPSCI 124.
      viii. **Modeling and Approved Electives:** APMTH 50, APMTH 91R, APMTH 115; ECON 985; or an approved advanced technical elective from outside of the student’s application area.
   c. **Application:** Five courses from an area of application in which mathematics has been substantively applied, selected to provide a coherent and cumulative introduction to mathematically oriented aspects of the field.
   d. **Notes:**
      i. The number of required courses depends on the starting Math course (see Requirements above).
         1. Students starting in Math MA or 1A: 15 courses.
            a. Math MA (5 Foundation, 5 Breadth, 5 Application).
            b. Math 1A (4 Foundation, 6 Breadth, 5 Application).
         2. Students starting in Math 1B or higher: 14 courses.
            a. Math 1B (3 Foundation, 6 Breadth, 5 Application).
            b. Math 21A or higher (2 Foundation, 7 Breadth, 5 Application).
            c. Note: Students starting in APMTH 22A, or MATH 21A may take MATH 101 in their first or sophomore year as a third Foundation course; these students are then required to take only six courses in the Breadth category. Students
may count APMTH 50 only if it is taken before APMTH 115.

3. Students may take MATH 25AB, MATH 55AB in place of APMTH 22AB, MATH 21AB, MATH 22AB. In terms of preparing for future Applied Mathematics coursework, these courses are appropriate for students who have previously taken multivariable calculus and linear algebra at the level of MATH 21AB.

ii. Honors: Recommendations for honors are based on the grade point average of the final plan of study, the rigor of the overall record, and the satisfaction of the honors requirement. The honors requirement is automatically satisfied with a B- or higher grade in APMTH 115 and satisfactory grades in the APMTH 115 prerequisites. The second option is a modeling project, undertaken in APMTH 91R, in which a mathematical analysis of a problem is undertaken. Papers describing the project must be turned in to the concentration for evaluation by the end of the semester in which the APMTH 91R is completed.

iii. Recommendations for high or highest honors depend on the grade average in the courses included in the final plan of study, the rigor of the overall record, and the completion and evaluation of a senior thesis.

2. Thesis: Optional (see note ii.).
3. General Examination: None.
4. Other information:
   a. Pass/fail: All courses counted for concentration credit must be letter-graded.
   b. Program of Study: Students entering the concentration must file an Applied Mathematics program of study at https://studyplan.seas.harvard.edu. The program must be reviewed with the student’s adviser and updated as necessary each term thereafter before the deadline. Programs of study are initially approved by the adviser and are subsequently approved by the Director or Associate Director of Undergraduate Studies.
   c. Joint Concentration: Applied Mathematics may not be combined with any other field of concentration because of its intrinsically interdisciplinary nature; study of an area of application is already an essential part of the program.

ADVISING

The co-Directors of Undergraduate Studies, Professor Steven Gortler, am-advising@seas.harvard.edu; Dr. Sarah Iams, am-advising@seas.harvard.edu; and Dr. Margo Levine, am-advising@seas.harvard.edu, are responsible for student advising in Applied Mathematics. Subsequently, an adviser is assigned to each student. Special arrangements are made for students whose area of application is mathematical economics, in cooperation with the Economics Department. If an adviser becomes unavailable, the student is reassigned to a new adviser. Students may seek further advice from a co-Director of Undergraduate Studies at any time.

For up-to-date information on advising in Applied Mathematics, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

ENROLLMENT STATISTICS

Number of Concentrators as of December

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*Applied Mathematics does not participate in joint concentrations.
Art, Film, and Visual Studies

Matt Saunders, Director of Undergraduate Studies

The concentration in Art, Film, and Visual Studies (AFVS) cultivates skills in the practice and the critical study of the visual arts. It includes photography, filmmaking, animation, video art, painting, drawing, printmaking and sculpture, as well as film and visual studies, critical theory, and the study of the built environment. The department has a strong commitment to fostering dialogue among makers, critics, and theorists. The teaching combines the intensity of studio-based work with the broad intellectual aims of a liberal arts college.

Within AFVS, there are three different areas of focus: 1) studio arts; 2) film/video making; and 3) film and visual studies. Each have slightly different requirements. In studio arts and film/video, concentrators work toward a level of accomplishment in a chosen area of artistic production while also exploring a variety of other practices. In film and visual studies, concentrators pursue interdisciplinary approaches to the theory and history of images, space, art, and media. In all areas, AFVS concentrators work closely with faculty, mostly in studios and small seminars, to gain understanding through both study and practice.

Students who would like to concentrate in AFVS need to have taken at least one AFVS course in their proposed area of focus or be in the process of taking one in their sophomore year, at the time of concentration declaration. In addition, students who would like to concentrate in AFVS are asked to have an advising conversation with a member of the department before the College’s concentration declaration deadline. Please e-mail Professor Matt Saunders, Director of Undergraduate Studies (DUS) at msaunders@fas.harvard.edu or Paula Soares, Manager of Academic Programs at soares@fas.harvard.edu for more information.

Upon graduation, concentrators in AFVS enter a wide variety of fields. Some pursue careers as artists or filmmakers while others go into media and communications. Among the graduate schools to which AFVS concentrators are admitted are schools of architecture, animation, art, film, and photography, as well graduate schools of arts and sciences, medicine, and business.

REQUIREMENTS
Concentration Requirements: 12 courses (48 credits)

Studio Arts and Film/Video Track

1. *Introductory Studios/Film or Video Production Courses:* At least two courses should be completed by the end of the sophomore year related to the student's area of focus. Introductory courses are typically numbered with two digits.
2. *Intermediate Studios/Film or Video Production Courses:* At least two courses should be completed by the end of the junior year related to the student's area of focus. Intermediate courses are typically numbered with three digits.
   a. *Note:* A film/video thesis will be allowed only if it represents the 5th and 6th courses in the medium of the thesis.
3. *Historical and Theoretical Courses:* At least two courses are required. These are seminar and lecture courses offered in AFVS that explore the history and theory of the moving image, contemporary art, the built environment, and critical studies. Appropriate courses offered in other departments can count toward the history and theory requirements with prior AFVS department approval.
4. *AFVS 97: Sophomore Tutorial:* Required of all AFVS concentrators during their first full term in the concentration, ordinarily sophomore spring.
5. **Electives within the concentration:** Five additional courses in AFVS, two of which may be AFVS 99, the senior thesis or senior project tutorial. AFVS 99 is considered an elective and is not a required course.
   a. Note: Students may petition to have an appropriate triple-digit course count as a second introductory course, at the discretion of the DUS.

**Film and Visual Studies Track**

1. **Introductory Courses:** Two courses comprising AFVS 70: The Art of Film and one other double-digit seminar or lecture course in film and visual studies offered within the department. Students may petition to count an appropriate triple-digit course towards this requirement, per the discretion of the DUS.
2. **AFVS 97: Sophomore Tutorial:** Required of all AFVS concentrators during their first full term in the concentration, ordinarily sophomore spring.
3. **AFVS 98R: Junior Tutorial:** Research-based writing workshop.
4. **Advanced Film and Visual Studies Seminars:** At least three advanced, three-digit seminars in film and visual studies.
5. **Electives:** Three courses directly related to film and visual studies, including an AFVS film production or studio course of the student’s choosing. Offerings under this heading will include both film and visual studies classes offered in AFVS by regular and visiting faculty as well as pertinent film studies classes offered in departments outside of AFVS with prior departmental approval.
6. **Senior Thesis or Senior Project:** Students who write a thesis or senior project essay will enroll in AFVS 99, which constitutes two courses. Students are strongly encouraged to write a thesis or senior project essay, though it is not required. Students who choose not to write a thesis will instead take two additional advanced film and visual studies courses (these choices are subject to the approval of the Director of Undergraduate Studies). AFVS 99 is considered an elective and is not a required course.
   a. Note: Students should consult with the Director of Undergraduate Studies or the Manager of Academic Programs to discuss which courses in other departments may count toward AFVS film and visual studies requirements.

**Information for All Areas**

1. **Tutorials and Supervised Study:**
   a. **AFVS 97: Sophomore Tutorial:** Required of all AFVS concentrators during their first full term in the concentration, ordinarily sophomore spring.
   b. **AFVS 99: Tutorial - senior year.** Senior Projects/Theses. AFVS 99 is presumed to be a year-long 8-credit course but may be divided if necessary. A thesis or senior project is not required. (For further information please see item d., below).
   c. **AFVS 91R: Special Projects:** In very rare instances, AFVS 91R is open to advanced students who wish to carry out a special project under supervision. Professional specialization is not the aim of this course. It is intended for specially qualified students who wish to extend work begun in a regular department course. Students wishing to enroll in AFVS 91R must find a member of the faculty to advise the project and submit an application to the Director of Undergraduate Studies.
      i. Note: All tutorials and special projects courses in AFVS are letter-graded only. Application forms for all AFVS tutorials are available in the department office or from the department's website at [https://afvs.fas.harvard.edu](https://afvs.fas.harvard.edu).
   d. **Thesis:** Qualified students may only undertake a thesis upon approval by the AFVS Honors Board. A filmmaking thesis must represent the third year of work in
film production. A thesis in video must represent the third year of work in film and/or video production. All theses should be preceded by a related critical or historical course. Students who want to do a thesis should plan their sophomore and junior year courses accordingly. No concentrator in Art, Film, and Visual Studies is required to do a thesis or senior project to be recommended for honors.

It is also possible to enroll in an AFVS 99 tutorial without doing a thesis. Like a thesis, these senior projects are undertaken with a tutorial adviser but do not undergo some of the rigors associated with the thesis (including thesis reviews, reader evaluations, and the requirement of a finished body of work). A final body of work may or may not result from an AFVS 99 senior project. For further information on the differences between an AFVS 99 tutorial with thesis and an AFVS 99 tutorial without thesis, please consult with the Director of Undergraduate Studies or the department’s website at https://afvs.fas.harvard.edu.

2. **General Examination:** None.

3. **Other Information:**
   a. **Related courses for concentration credit:** Ordinarily, no more than two courses taken outside Art, Film, and Visual Studies or History of Art and Architecture may be counted. It is strongly recommended that studio concentrators with little background in the history of art take introductory courses in History of Art and Architecture as soon as possible.
      i. Concentrators in all areas of the department who wish to receive concentration credit for any non-AFVS course (in the Faculty of Arts and Sciences, at one of Harvard’s graduate schools, at MIT, at the Harvard Summer School, or while studying out of residence) must submit a course requirement substitution form, available on the AFVS website at https://afvs.fas.harvard.edu, even if the course is cross-listed. If the course is not cross-listed a syllabus must accompany the petition. Syllabi are not required to accompany cross-listed course petitions.
      ii. Courses in History of Art and Architecture, theater design, and some courses in the field of cultural studies may be counted for concentration credit, subject to the approval of the Director of Undergraduate Studies when the Plan of Study is filed.
   b. **Joint Concentrations:** Students who are interested in pursuing a joint concentration in Art, Film, and Visual Studies and another concentration must meet with the Director of Undergraduate Studies to discuss this potential course of study.
   c. **Pass/fail:** Courses counting for concentration credit may not be taken pass/fail or SAT/UNS, except that one Freshman Seminar may be counted for elective concentration credit if taught by a department faculty member and consistent with AFVS department offerings, and if the student has received a positive evaluation.
   d. **Work done out of residence:** A student wishing to count work done out of residence toward concentration requirements must have the plan for such work approved by the Director of Undergraduate Studies and the Office of International Education prior to undertaking it. No credit will be given for work done out of residence until this work, when completed, is evaluated by the faculty of the department. Ordinarily, no more than three courses taken out of residence will be counted for concentration credit. For information on programs recommended by the faculty of the department, please visit the Office of International Education website at https://oie.fas.harvard.edu.
   e. **Honors:** Ordinarily, no student whose overall grade point average in the concentration falls below B will be recommended for honors. No concentrator in
Art, Film, and Visual Studies is required to do a thesis to be eligible for an honors recommendation from the department.

**ADVISING**

Departmental academic advising is provided by the Director of Undergraduate Studies, who will meet individually with concentrators to discuss course selection. Information and advice are also available throughout the year in the Carpenter Center from Paula Soares, Manager of Academic Programs, who is available on a walk-in basis during most regular office hours. Each new concentrator is assigned a faculty adviser and is required to meet with the adviser at least once at the start of each term to review their Plan of Study. Students are reminded that they are each responsible for the fulfillment of concentration requirements and should regularly check on the current status of their progress.

For up-to-date information on advising in Art, Film, and Visual Studies, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

**RESOURCES**

Aside from providing the space in which the Department of Art, Film, and Visual Studies holds many of its classes, the Carpenter Center for the Visual Arts, designed by world-renowned architect Le Corbusier, is an important landmark in the recent history of architecture and is the setting in which Harvard evidences its concern for contemporary expression in the visual arts. During the academic year, exhibitions, performances, events, film screenings, and lectures are offered. In addition, the Harvard Film Archive, housed in the Carpenter Center, mounts an ongoing program of film screenings.

The Carpenter Center contains studio classrooms for the practice of the studio arts. The department also holds classes in Sever Hall, where most of the film, video, and animation studio courses are conducted. Studios at 6–8 Linden Street are used by practicing artists and photographers, including members of the faculty and senior concentrators doing thesis work, when applicable.

Art, Film, and Visual Studies concentrators benefit from the unusually rich University collections of Harvard’s museums: The Harvard Art Museum, The Museum of Natural History, and the Harvard Semitic Museum, containing Western, Asian, and ethnographic art. Harvard’s library holdings in art and archaeology include more than 250,000 books and more than 1,500,000 photographs and slides.

The Museum of Fine Arts is one of Boston’s great cultural resources. Other resources are the ICA Boston, the MIT List Visual Arts Center, and the commercial and non-profit galleries of the greater Boston area.

**HOW TO FIND OUT MORE**

Further information about the concentration may be obtained from the Director of Undergraduate Studies, Matt Saunders (msaunders@fas.harvard.edu) or the Manager of Academic Programs, Paula Soares (soares@fas.harvard.edu, 617-496-4469). The department has an extensive website providing a range of information on the faculty, courses, the Carpenter Center lecture series as well as exhibition schedule. This site is available at [https://afvs.fas.harvard.edu](https://afvs.fas.harvard.edu).
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Astrophysics

Professor Karin Öberg, Director of Undergraduate Studies

The concentration in Astrophysics builds the foundation from which students may consider some of the deepest questions of the physical universe. What was the state and composition of the Universe at the moment of the Big Bang? What is the nature of the force that currently dominates the expansion of the Universe? How do space and time behave in the vicinity of the black hole? How do galaxies form, and how do stars and planets form within those galaxies? Are there habitable worlds other than our own?

The science of astrophysics involves the study of matter and radiation in the universe as understood through the laws of physics. Astronomical phenomena exhibit an extreme range of physical conditions, from superfluid neutrons in neutron stars, high-temperature nuclear reactions in supernovae, and strong gravitational fields near black holes, to the unique state of the universe during its earliest phases. Theoretical attempts to describe these and more familiar phenomena (such as stars and galaxies) have achieved a useful understanding in many cases. However, our overall knowledge of the universe is still woefully incomplete, and our contemporary physical knowledge is often stretched to its limits in attempting to understand physical conditions that cannot be reproduced in terrestrial laboratories.

The concentration in Astrophysics introduces students to a broad range of phenomena through a program of both observational and theoretical courses. This program builds from a foundation of modern physics to a general account of the known contents of the universe. ASTRON 16: Stellar and Planet Astronomy and ASTRON 17: Galactic and Extragalactic Astronomy provide a complete introductory survey to the major fields of astrophysics. The research tutorial, ASTRON 98, places students in close contact with the wide range of research activities at the Harvard-Smithsonian Center for Astrophysics. Undergraduates are strongly encouraged to pursue research projects (conducted under the mentorship of members of the faculty), which culminate in their junior papers and optional senior theses. Since the emphasis of astrophysics is on the explanation of phenomena in the universe in terms of physical theory, the initial stages of a concentration in Astrophysics closely resemble those of the Physics concentration, and the courses offered by the Department of Astronomy are readily accessible to any student with a good physics background. Our concentration offers avenues similar to Physics for future employment and research opportunities.

Astrophysics offers joint concentrations with other departments. In general, such concentrations involve meeting requirements for honors candidates in both fields. Joint concentrations combining Astrophysics with either Physics or with Earth and Planetary Sciences are particularly encouraged, although various other combinations are certainly possible. Students interested in joint concentrations are encouraged to contact the Director of Undergraduate studies, Professor Karin Öberg, at 617-496-9062 or koberg@cfa.harvard.edu.

REQUIREMENTS

Concentration Requirements: 12 courses (48 credits)

1. Required courses:
   a. ASTRON 16 and ASTRON 17 (2 courses; see 7.a. below).
   b. PHYSICS 15A, PHYSICS 15Band PHYSICS 15C (3 courses; see 7.b. below).
   c. MATH 21A and MATH 21B, or MATH 23A and MATH 23B, or MATH 25A and MATH 25B, or APMTH 21A and APMTH 21B (2 courses; see 7.c. below).
d. ASTRON 98: Research Tutorial, generally taken in the spring semester of the junior year (1 course).

e. Two additional courses in astronomy (2 courses; see 7.d. below).

f. Two additional courses in astronomy or related fields to complete the requirement of 12 courses (2 courses; see 7.e. below).

2. **Tutorial**: Required, see 1.d. above.

3. **Honors Eligibility**: Students who wish to be considered for honors must satisfy requirements 1.e. and 1.f. by completing ASTRON 99 and/or courses at the 100-level or above. None of the courses satisfying 1.e. or 1.f. may be taken pass/fail. Courses that meet this requirement include:
   a. ASTRON 99, a year-long 8-credit course leading to the senior thesis. The Department of Astronomy is located within the Harvard-Smithsonian Center for Astrophysics, one of the world’s largest astrophysical research institutes. The Center for Astrophysics offers significant undergraduate research opportunities, which students are encouraged to pursue through the senior thesis.
   b. Any 100-level or 200-level course in astronomy.
   c. PHYSICS 143A, PHYSICS 143B, PHYSICS 151, PHYSICS 153, or PHYSICS 181.
   d. E-PSCI 141, E-PSCI 142, OR E-PSCI 160.
   e. APMTH 104, APMTH 105, APMTH 111, or APMTH 115.

4. **Thesis**: Optional. See item 3 above.

5. **Joint concentrations**: Joint concentrations are permitted to enable students to pursue study at the interface of Astrophysics and another field such as Physics or Earth and Planetary Sciences. Students must meet with the Director of Undergraduate Studies to develop the Plan of Study.

6. **General Examination**: None.

7. **Other information**:
   a. ASTRON 16 and ASTRON 17: Together, these two courses provide a complete introductory survey of astrophysics using single-variable calculus and freshman mechanics. These courses are not sequential and thus may be taken in either order.
   b. **Physics**: PHYSCI 12A and PHYSCI 12B may be substituted for PHYSICS 15A and PHYSICS 15B provided students follow with Physics 15C. Qualified students may replace PHYSICS 15A with PHYSICS 16, to be followed by PHYSICS 15B and 15C.
   c. **Math**: MATH MA, MATH MB, MATH 1A, and MATH 1B normally do not count toward concentration credit.
   d. Students may count one course out of ASTRON 2, ASTRON 5, a Freshman Seminar in Astronomy, or a course offered in the Science of the Physical Universe category of the Program in General Education that focuses on astronomy for concentration credit, provided the course is completed prior to enrolling in other courses offered by the Department of Astronomy.
   e. **Related fields**: Includes all departmental courses offered in Physics, Earth and Planetary Sciences, Mathematics, and Applied Mathematics that count towards the respective concentration requirements. Appropriate courses in Applied Physics, Computer Science, Chemistry, Engineering Sciences, Mathematics, and Statistics may be counted for concentration credit with permission from the Director of Undergraduate Studies.
   f. **Graduate Study**: Students considering graduate study should contact the Director of Undergraduate Studies to prepare a study plan to meet this goal.
   g. **Pass/fail**: At most one of the courses counted for concentration credit may be taken pass/fail.
ADVISING
Upon joining the concentration, students are assigned a faculty adviser; students continue with the same adviser throughout their three years, unless there is a particular reason for making a change. Students meet with their adviser at least once per term and at other times as needed.

For up-to-date information on advising in Astrophysics, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
The Department of Astronomy is located within the Harvard-Smithsonian Center for Astrophysics, which also contains the Smithsonian Astrophysical Observatory and Harvard College Observatory, at 60 Garden Street and 160 Concord Avenue, Cambridge. The Center for Astrophysics has a large staff of scientists and is among the largest institutions devoted to astronomy and astrophysics in the world. A very broad range of astrophysical research is conducted by the many scientists at the Center, in its divisions of Atomic and Molecular Physics; High-Energy Astrophysics; Optical and Infrared Astronomy; Radio and Geoastronomy; Theoretical Astrophysics; and Solar, Stellar, and Planetary Sciences. Scientists in these divisions encourage students to participate in their research. Full-time summer and part-time academic year employment are often available for Harvard undergraduates at the Center. Please contact the Director of Undergraduate Studies for more information.

Through the Center for Astrophysics, students may make use of a wide range of observational, experimental, and theoretical facilities. These include two 6.5-meter Magellan Telescopes in Chile; the Multiple-Mirror Telescope and the 1.5-m and 1.2-m reflecting telescopes of the Whipple Observatory on Mount Hopkins, Arizona; and the Submillimeter Array on Mauna Kea in Hawaii. In addition, students may participate in the analysis of data from a number of national and international observatories, including X-ray data from the Chandra X-ray Observatory, ultraviolet and optical data from the Hubble Space Telescope, solar data from SOHO, radio data from the Very Large Array and the VLBI network, and infrared data from the Spitzer Space Telescope.

HOW TO FIND OUT MORE
The Director of Undergraduate Studies for the concentration is Professor Karin Öberg. Her Observatory office is 60 Garden Street, MS-16, Center for Astrophysics, Perkins 346 (617-496-9062); her email address is koberg@cfa.harvard.edu. A map showing the location of the Observatory complex can be found at the Center for Astrophysics website at https://www.cfa.harvard.edu. The Astronomy department office is located at the same address in room P-243 (617-495-3753). Online information about the Astronomy department is available at the department's website at https://www.cfa.harvard.edu. If you are interested in study abroad, please contact the Director of Undergraduate Studies.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Biomedical Engineering

Professor Demba Ba, Director of Undergraduate Studies
Dr. Linsey Moyer, Associate Director of Undergraduate Studies

Biomedical Engineering lies at the intersection of the physical and life sciences, incorporating principles from physics and chemistry to understand the operation of living systems. As in other engineering fields, the approach is highly quantitative: mathematical analysis and modeling are used to capture the function of systems from subcellular to organism scales. An education in Biomedical Engineering, and engineering more broadly, enables students to translate abstract hypotheses and scientific knowledge into working systems (e.g., prosthetic devices, imaging systems, and biopharmaceuticals). This enables one to both test the understanding of basic principles and to further this knowledge, and it places this understanding in the broader context of societal needs.

In recognition of the pivotal importance of the life sciences and the technologies they inspire in our society, Harvard is committed to broadly educating engineers who will become leaders in the developing field of Biomedical Engineering. The objectives of this concentration include providing students a solid foundation in engineering, particularly as applied to the life sciences, within the setting of a liberal arts education. The concentration is flexibly structured for a diversity of educational and professional objectives. It enables the acquisition of a broad range of skills and attitudes drawn from the humanities, social sciences and sciences, in addition to engineering, which enhance engineering knowledge and which will contribute to future leadership and technical success.

The overarching intellectual goal of Biomedical Engineering is to apply quantitative engineering analysis to understand the operation of living systems and design novel systems to satisfy unmet needs in medicine and industry. Specific objectives for students undertaking the A.B. in Biomedical Engineering are:

- Utilize mathematical analysis and modeling to capture the function of systems from subcellular to organism scales.
- Understand and apply the fundamental engineering disciplines (thermodynamics, fluid mechanics, kinetics); sciences (physics, biology, chemistry); and mathematics (statistics, differential equations) to solve biomedical problems.
- Translate scientific knowledge into working systems (e.g., prosthetic devices, imaging systems, and biopharmaceuticals).
- Gain depth of knowledge in chemical, biological, materials, and engineering science aspects of bioengineering.

The AB degree consists of 14 courses (56 credits). This degree prepares students for the practice of biomedical engineering and for graduate study in engineering and medicine, and it is excellent preparation for careers in other professions (business, law, etc.), as it provides an ideal framework for a well-rounded technical and scientific education. The curriculum is highly structured, with advanced courses building on the knowledge acquired in math, science, and introductory engineering science courses. Concentrators are encouraged to complete the common prerequisite course sequence in their first two years at Harvard. This includes Math (MATH 21A and 21B, 22A and 22B, 23A and 23B) or Applied Mathematics (APMTH 21A and 21B, or 22A and 22B), Life Sciences and Chemistry (LS 1A and 1B), Physics (APPHY 50A and 50B; PHYSICS 15A and 15B or 16 and 15B, or PHYSSCI 2 and 3 or 12A and 12B), and Engineering Sciences (ENG-SCI 53). Students are cautioned that it is more important to derive
a solid understanding of these basic subjects than to complete them quickly without thorough knowledge; this material is extensively used in many subsequent courses. The Sophomore Forum provides an opportunity for students to become familiar with the range of engineering disciplines, to find research opportunities within the school, and to make industrial contacts in an informal setting.

The technologies that engineers create are changing at an amazing rate, but the fundamental tools of engineering that enable these advances remain more constant. The Biomedical Engineering curriculum emphasizes a solid background in the chemical and biological aspects of the biomedical engineering field, with ample opportunities to learn about state-of-the-art technologies. In particular, students will take courses in systems modeling (ENG-SCI 53 and BE 110) to better understand and mathematically model non-linear, complex biological systems; thermodynamics (ENG-SCI 181, ENG-SCI 112, or MCB 199) to appreciate the basic driving forces underlying biological and chemical systems; the fundamental processes of heat and mass transport (ENG-SCI 123) that often control the rates of system changes; and molecular to tissue level engineering of biological systems (BE 121, 125 or ENG-SCI 221). Through this coursework students also gain experience in the engineering design process, the engineering activity that requires creative synthesis as well as analysis.

REQUIREMENTS
Concentration Requirements: 14 courses (56 credits)

1. Required courses:
   a. Mathematics: APMTH 21A and APMTH 21B; APMTH 22A and 22B; MATH 21A and 21B; MATH 22A and 22B; or MATH 23A and 23B.
   b. Physics: APPHY 50A and 50B; PHYSCI 2 and 3 or 12A and 12B; or PHYSICS 15A and 15B, or 16 and 15B.
   c. Statistics: APMTH 101 or STAT 111.
   e. Cell Biology and Genetics: LPS A or LS 1A, and LS 1B. Students who take LPS A should consult with the Director of Undergraduate studies to get advice on advanced class selection.
   f. Engineering Sciences (five courses): ENG-SCI 53; BE 110; ENG-SCI 123; one of the following: ENG-SCI 181, ENG-SCI 112, or MCB 199; one of the following: BE 121, BE 125, BE 128, BE 129, BE 130, BE 131, BE 191, or ENG-SCI 221.
   g. Approved Elective (one course): BE 121, BE 125, BE 128, BE 129, BE 130, BE 131, BE 191, ENG-SCI 120, ENG-SCI 221, ENG-SCI 228, CHEM 27, 30 or 160; COMPSCI 50; MCB 60, 80 or OEB 53, or 100- or 200-level engineering courses by prior approval. ENG-SCI 91R cannot count as an elective.

3. Thesis: required for recommendations of high honors and highest honors, and for joint concentrators.
4. General Examination: None.
5. Other information:
   a. By prior petition and approval, other advanced undergraduate or graduate courses, as well as courses at MIT, can be used to satisfy general requirements and specialization requirements and electives. Petitions will only be considered for courses that possess technical content at a level similar to other upper-level engineering courses at School of Engineering and Applied Sciences (SEAS).
   b. Pass/fail and SAT/UNSAT: All courses for concentration credit must be letter-graded.
   c. Plan of Study: Concentrators are required to file an approved departmental Plan of Study and to keep their plan up-to-date in subsequent years. Plan of Study
forms may be obtained from the Office of Academic Programs (Science and Engineering Complex at 150 Western Avenue, 1.101) or from the School of Engineering and Applied Sciences (SEAS) website at https://www.seas.harvard.edu/bioengineering/undergraduate-program/concentration-information/concentration-requirements.

d. **Independent Project**: Students are required to have a substantial research experience in order to deepen their understanding of at least one aspect of the biomedical engineering field, and to develop hands-on experience in the scientific method and/or technology development. This typically would be fulfilled through a summer project resulting in a significant written report; alternatively, ENG-SCI 91R or ENG-SCI 100HF may be used to fulfill this requirement.

e. **Joint Concentrations**: Biomedical Engineering participates in joint concentrations. The requirements for joint concentrators are the same as for sole concentrators; in addition, a joint concentrator is required to write an interdisciplinary thesis that combines the two fields. This thesis is required regardless of whether Biomedical Engineering is the primary or allied concentration.

f. Any exceptions to these policies must be approved via written petition.

**ADVISING**

Students interested in concentrating in Biomedical Engineering should discuss their plans with the Director of Undergraduate Studies, Professor Demba Ba, demba@seas.harvard.edu, (617) 496-1228; or the Associate Director of Undergraduate Studies, Dr. Linsey Moyer, lmoyer@seas.harvard.edu, (617) 496-2840; or the Academic Programs Administrator, Sarah Colgan, scolgan@seas.harvard.edu.

Each undergraduate who elects to concentrate in Biomedical Engineering is assigned a faculty adviser. If students do not request a change in adviser, they have the same adviser until they graduate. Each student is reassigned to another faculty member while the student's original faculty adviser is on leave. It is expected that students will discuss their Plans of Study and progress with their Director or Associate Director of Undergraduate Studies at the beginning of each term. Students may also seek advice from their faculty adviser, the Director or Associate Director of Undergraduate Studies, or the Academic Programs Administrator at any time.

**HOW TO FIND OUT MORE**

Further information is available from the Academic Programs Administrator in the School of Engineering and Applied Sciences Office of Academic Programs, Science and Engineering Complex at 150 Western Avenue, 1.101 (617-495-2833).

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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Chemical and Physical Biology

Professor Adam Cohen, Co-Head Tutor
Professor Rachelle Gaudet, Co-Head Tutor

The Chemical and Physical Biology (CPB) concentration provides students with a broad foundation in the physical and life sciences. This concentration is designed for students interested in applying quantitative tools, physical concepts, and chemical principles to the study of biology.

Remarkable progress in the last four decades has revealed the atomic structure of proteins, enzymes, and genes; the nature of the genetic code; and how genes can be turned on or off in response to the demands of the environment. As our understanding of fundamental biological processes has increased, so has our appreciation that the focus on information transfer through nucleic acids provides an inadequate basis for understanding living systems. The activities of proteins are regulated by post-translational modifications—chemical changes in protein structure—and are affected by small signaling molecules. Dissecting metabolic pathways and reconstructing cellular networks requires supplementing the traditional arsenal of molecular, genetic, biochemical, and cell biological techniques with advances in chemical and physical methods that make it possible to characterize the state of a biological system under a given set of conditions. Chemical and physical biology provides a link between classical approaches to studying biology and the chemical tools and physical methods required to understand dynamic changes in complex biological systems.

Students who are interested in understanding living systems in detail will require considerable proficiency in mathematics and physics as well as a broad background in both chemistry and biology. In its emphasis on quantitative, physical, and chemical tools, this concentration represents a significant departure from traditional undergraduate programs of study in the biological and life sciences. Our goal is to provide the next generation of life scientists with the background needed to make new advances in the quantitative understanding of living systems. The CPB concentration is intended primarily for students considering careers in research.

All students are required to participate in a non-credit tutorial program. Tutorials for students in both Chemical and Physical Biology and Molecular and Cellular Biology are offered by the Board of Tutors in Biochemical Sciences, which was established in 1926. Tutors hold a PhD and/or a MD degree and meet with their students, singly or in small groups, about twice a month to discuss topics tailored largely to individual interests and needs. Tutorial sessions typically consist of readings selected from the primary literature or relevant texts. Mentoring on career choices, the research experience, and other academic issues is a logical extension of the tutorial.

All students are required to obtain a minimum of one term of laboratory research experience. This requirement may be fulfilled through a project lab course, a term of laboratory research (CPB 91), or research for a senior thesis (CPB 99A and B).

A thesis based on laboratory research is required to be eligible for honors in the Chemical and Physical Biology concentration. Students are encouraged to begin thesis research in a laboratory no later than the start of their junior year.
REQUIREMENTS

Basic Requirements: 16 courses (64 credits)

1. **Required courses:**
   
a. *Life Sciences (2 courses):* LS 1A (or LPS A) and LS 1B, or equivalent.

b. *Biology (2 courses):* MCB 60 and one additional course selected from MCB 63, MCB 64, MCB 65, MCB 68, or MCB 80.

c. *Chemistry (2 courses):* One course in general or inorganic chemistry (chosen from PHYSCI 1, 10 or 11; CHEM 40 or 160; or a suitable equivalent) and one course in physical chemistry (chosen from CHEM 60, MCB 65 or 199, CHEM 161, or a suitable equivalent).

d. *Organic Chemistry (2 courses):* CHEM 20 and 30, or CHEM 17 and 27, or equivalent.

e. *Mathematics (2 courses):* MATH 19A and 19B, or 21A and 21B, or APMTH 22A and 22B.

f. *Physics (2 courses):* One course in mechanics (chosen from PHYSICS 16 or 15A, PHYSCI 2 or 12A, or APPHY 50A), and one course in electricity and magnetism (chosen from PHYSICS 15B, PHYSCI 3 or 12B, or APPHY 50B). Students who do not take at least one course at the level of PHYSICS 15 or 16 or PHYSCI 12 must take a computational course as one of the upper-level courses (see item 1.g., below) chosen from APMTH 10, COMPSCI 50 or 109; APMTH 111, 115 or 126; MCB 111, 112, 131, or 199; or other computational class approved by the Head Tutor.

g. Three upper-level courses in the natural sciences, engineering, and/or mathematics. Courses that meet this requirement include any 100-level chemistry, molecular and cellular biology, or physics course. Students are encouraged to consult concentration advisers when selecting upper-level courses.

h. Students who do not write a thesis based on laboratory research (see item 3 under *Requirements for Honors Eligibility*) must take one upper-level project lab course (such as LS 100 or CHEM 100R) or enroll in one term of CPB 91.

2. **Tutorial:** The tutorial program is an important component of the concentration. It provides a mechanism for students to engage in mentorship relationships with the Molecular and Cellular Biology (MCB) faculty and members of the Board of Tutors in Biochemical Sciences. The goals are to: (1) provide opportunities for discussions about science and its role in the larger community; (2) provide students with the foundation to apply their education and the scientific method to life outside of the classroom and Harvard; and (3) advise and inform students on curricular and pre-professional choices. The tutorial is a non-credit program that spans the whole length of time the student is part of the concentration. A handout that describes the history, goals, and format of the tutorial program is available online at


Requirements for Honors Eligibility: 16 courses (64 credits)

1. **Required Courses:** Same as *Basic Requirements.*

2. **Tutorial:** Same as *Basic Requirements.*

3. **Thesis:** A thesis based on independent laboratory research is required for honors eligibility. Students should therefore enroll in two terms of CPB 99, one of which counts towards the upper-level course requirement (see item 1.g., above).
ADVISING
Professors Adam Cohen and Rachelle Gaudet, and concentration advisers Dr. Dominic Mao and Dr. Monique Brewster are available to concentrators and pre-concentrators to provide guidance on course selection, laboratory research, and the fulfillment of concentration requirements.

RESOURCES
A tutorial reference library is housed in the CPB Undergraduate Office at 7 Divinity Avenue (95 Sherman Fairchild building), which contains books and hard copies of past senior theses (thesis titles from 2011-present can be viewed at https://www.mcb.harvard.edu/undergraduate/molecular-and-cellular-biology-mcb/research-and-thesis/?course-button=pastthesisandprizewinners). Four rooms in the upper level of the undergraduate office are used by concentrators for tutorial meetings and as study spaces.

HOW TO FIND OUT MORE
The Co-Head Tutors for the Chemical and Physical Biology concentration are Professors Adam Cohen and Rachelle Gaudet, and the Concentration Advisers are Dr. Dominic Mao (dominicmao@fas.harvard.edu or 617-496-1206) and Dr. Monique Brewster (mbrewster@g.harvard.edu or 617-496-6136)

Visit https://www.mcb.harvard.edu/undergraduate/chemical-and-physical-biology/ or contact the concentration advisers for more information.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Chemistry

Dr. Gregg Tucci, Director of Undergraduate Studies

Chemistry is the science of the structure, properties, and reactions of matter. It is both a basic science, fundamental to an understanding of the world we live in, and a practical science with an enormous number and variety of important applications. Knowledge of chemistry is fundamental to an understanding of biology and biochemistry and of certain aspects of geology, astronomy, physics, and engineering.

The most important motivation for a concentration in Chemistry is an intrinsic interest in the subject. Career opportunities in chemistry include the areas of basic research, applied research and development, biotechnology, chemical analysis, manufacturing, and marketing. In addition, a degree in chemistry can be an excellent background for careers in many related fields, including law, medicine, business, environmental science, and other areas of science. Because of the diversity of interests of prospective Chemistry concentrators, the Department of Chemistry and Chemical Biology has designed a very flexible program of requirements, which allows each student to select an area of emphasis. Courses in organic, physical, and inorganic chemistry, as well as courses in chemical biology and biochemistry, are offered. A few of these courses include required laboratory work, and special laboratory courses are available to advanced students in each area. In addition, concentrators may elect to pursue an individual research project with one of the research groups of the department. Each research group consists of advanced undergraduates, graduate students, postdoctoral fellows, and a faculty member. In order to introduce students to chemical research and current topics of faculty interest, the department offers a non-credit sophomore tutorial, a series of lectures by faculty members on their current research, in the spring term. Concentrators can enroll in the junior tutorial, CHEM 98R, in which the student joins a research group under the supervision of a faculty member. Often this work is continued throughout the senior year as CHEM 99. Here, the student becomes associated with current research in a particular area either by reading and studying recommended advanced material in that area or by undertaking an individual research project. Such projects often result in publications.

All of the courses in the department are open to properly prepared undergraduates and most upper-level courses do have some undergraduates. The more advanced courses are designed to be related closely to active areas of research in chemistry. Current research activity is further stressed in the numerous seminars and colloquia in organic, physical, biophysical, and inorganic chemistry as well as in chemical biology, materials, energy, and climate. Some seminars are held jointly with other departments at Harvard as well as at MIT. Most research groups have meetings and informal seminars at which topics of interest are discussed.

In addition to a balanced program of at least eight courses (32 credits) in chemistry, concentrators are able to take courses in physics, biology, biochemistry, engineering, computer science, and mathematics as part of their concentration requirements. Because of the sequence of prerequisites for chemistry courses, the department strongly recommends some work in mathematics as well as chemistry in the first year. Freshmen contemplating this program are urged to consult the Director of Undergraduate Studies of the Chemistry concentration while planning their work for the first year.

Students graduating with a degree in Chemistry will gain skills in a range of areas, from reading scientific papers, to conducting experiments safety and ethically, to learning how to identify and propose solutions to problems that are novel and important. Because research is a foundation
for the study of chemistry, we believe that all students in the concentration should participate in an authentic research experience by the end of their senior year.

**REQUIREMENTS**

**Basic Requirements: 12-14 courses (48-56 credits)**

1. **Required courses:** Twelve to fourteen courses required, including at least eight courses in chemistry (see item 5.a.):
   
   a. **General chemistry (two courses):** Chosen from LPS A, LS 1A, PHYSCI 1, PHYSCI 10, and PHYSCI 11 or satisfactory placement out of the requirement.
   
   b. **Inorganic chemistry (one course):** CHEM 40, or equivalent.
   
   c. **Organic chemistry (two courses):** CHEM 20 and 30, or CHEM 17 and 27, or equivalent.
   
   d. **Physical chemistry (two courses):** Chosen from CHEM 160 or equivalent; and CHEM 60, 161, 163, or equivalent.
   
   e. **Advanced laboratory (one course):** CHEM 100R, 135, 145 or 165. Laboratory work performed in CHEM 91R, 98R, or 99R may not be counted in fulfillment of the advanced laboratory requirement.
   
   f. **Chemistry with a strong biological orientation (one course):** LS 1A, LPS A or CHEM 27 or 170, or MCB 60, 63, 64, 65 or equivalent. (LS 1A and LPS A may count for both this requirement and 1.a. above; CHEM 27 may count for this requirement and 1.c. above.)
   
   g. **Mathematics (at least one course):** MATH 21A or equivalent. (e.g., MATH 19A, APMTH .21A, MATH 22A, MATH 23A, etc.). MATH 21B is strongly recommended.
   
   h. **Physics (at least two courses):** PHYSCI 2, 3 or 12A, 12B; APPHY 50A, 50B; or the 15A (16), 15B, 15C sequence. PHYSICS 15A and 15B alone do not constitute a complete overview of general physics.
   
   i. Additional courses as needed to meet the total of twelve in chemistry or in related fields (13 courses needed if the student places into MATH 1B; 14 courses needed if the student must take MATH 1A.)

2. **Tutorial:**
   
   a. **Sophomore year:** CHEM 91R, optional, for approved students only. A few very well-prepared sophomores or first year students who are accepted for laboratory research work may register for CHEM 91R, graded SAT/UNSAT only.
   
   b. **Junior year:** CHEM 98R, optional, for approved students only. Graded SAT/UNSAT only. Each term of CHEM 98R involves individual reading and research projects under the direction of a member of the staff. Junior concentrators are advised to consult with their advisers and to inquire at the office of the Director of Undergraduate Studies concerning the tutorial program. Students enrolling in CHEM 98R must register the name of their research mentor at the office of the Director of Undergraduate Studies before registering for CHEM 98R.

3. **General Examination:** None.

4. **Thesis:** Not required.

5. **Other information:**
   
   a. Related fields, in the present context, include departmental courses in Physics and Mathematics, Applied Physics and Applied Mathematics, and upper-level departmental courses in Biology, Biochemistry, and Earth and Planetary Sciences that carry a chemistry prerequisite. Chemistry courses include many Biochemistry courses.
   
   b. **Pass/fail:** Two courses counted for concentration credit may be taken pass/fail. This does not include SAT/UNSAT grades given in CHEM 91R, 98R, or 99R.
Requirements for Honors Eligibility: 14-16 courses (56-64 credits)

1. **Required courses:** 14 courses required, including at least eight courses in chemistry (see item 5.a. above).
   A. Same as **Basic Requirements.**
   B. Two additional courses in chemistry or biochemistry, or at a suitable advanced level in a related field. Courses that meet this requirement include:
      a. MCB 60, 63, 64, 65.
      b. Other courses significantly related to chemistry may also be accepted on petition to the department.
      d. APMTH 104.
      e. MATH 19B, MATH 21B.
      f. LS 1B, LS 50A, LS 50B.
   C. Total program must include at least four courses in Chemistry numbered 100 or higher. Please consult with office of the Director of Undergraduate Studies for a complete list of courses offered by other departments (e.g., MCB 176, MCB 178, EPS 133, ENG-SCI 135, ENG-SCI 164) that can be used to satisfy this requirement.

2. **Tutorials:**
   A. **Sophomore year:** Same as **Basic Requirements.**
   B. **Junior year:** Same as **Basic Requirements.**
   C. **Senior year:** CHEM 99R, optional, for honors candidates only. Graded SAT/UNSAT only. CHEM 99R involves individual reading and research projects under the direction of a faculty member. Students enrolling in CHEM 99R must register the name of their research mentor at the office of the Director of Undergraduate Studies by the course enrollment deadline.

3. **General Examination:** None.
4. **Thesis:** Optional. Students enrolled in CHEM 99R have the option of writing a thesis.
5. **Other information:** Same as **Basic Requirements.**

**ADVISING**
The Director of Undergraduate Studies serves as faculty adviser for all concentrators until they join research groups, usually through the CHEM 98R tutorial, or otherwise establish a working relationship with another faculty member who agrees to serve as co-faculty adviser. Either the Director of Undergraduate Studies or another faculty adviser may release the advising hold or advise on concentration matters. Students interested in concentrating in Chemistry should discuss their plans of study with the Director of Undergraduate Studies. For up-to-date information on advising in Chemistry, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

**HOW TO FIND OUT MORE**
Further information is available at the office of the Director of Undergraduate Studies in Chemistry, Dr. Gregg Tucci, Science Center 114 (617-496-4668), tucci@fas.harvard.edu.

**ENROLLMENT STATISTICS**
**Number of Concentrators as of December**

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Chemistry and Physics

Professor Howard Georgi, Co-Head Tutor/Director of Undergraduate Studies
Dr. David Morin, Co-Head Tutor/Director of Undergraduate Studies

Physics and Chemistry are intellectual neighbors, sharing a large and somewhat arbitrary boundary. Scientists in this exciting boundary area study many of the same systems. They use many of the same experimental and theoretical tools. The concentration in Chemistry and Physics is supervised by a committee comprised of members of the Departments of Physics and of Chemistry and Chemical Biology and is administered through the office of the Director of Undergraduate Studies in the Physics Department. As the name suggests, the concentration has been established to serve students wishing to explore this boundary who need to develop a strong foundation in both physics and chemistry. Because of the need to cover a wide range of material in considerable depth, only an honors-eligible program is available in this concentration.

The requirements of the Chemistry and Physics concentration are designed to provide a solid foundation for further study in either or both of these two closely related sciences. Concentrators have gone on to graduate work and careers in chemistry, physics, and other quantitative fields. The concentration is also often chosen by students whose career goals lie in medicine. In addition, the intellectual disciplines involved provide a suitable background for careers in many different professions.

Because the requirements of the concentration lie between those of Chemistry and Physics, it is possible that a given set of courses could satisfy the requirements of one of those concentrations as well as those of the concentration in Chemistry and Physics. By the same token, a transfer to or from one of these concentrations, even as late as the junior year, normally causes little difficulty.

The concentration is structured to assure that all concentrators are introduced to the core subjects of chemistry (organic, inorganic, and physical); physics (mechanics, electromagnetism, waves, and quantum theory); and mathematics. Beyond this core, students take additional courses in chemistry, physics, or related sciences, according to their personal interests and objectives.

Tutorial or individual study and research are optional and may be undertaken within the framework of PHYSICS 90R or 91R, or CHEM 91R, 98R, or 99R.

REQUIREMENTS
Concentration Requirements: 13 courses (52 credits)

1. Required courses:
   a. General Chemistry: LS 1A and PHYSCI 1, or PHYSCI 10 and 11, or satisfactory placement out of the requirement.
   b. Inorganic Chemistry: CHEM 40 or 158, or equivalent.
   c. Organic Chemistry: CHEM 20 and 30, or CHEM 17 and 27. CHEM 20 and 30 are strongly recommended, but CHEM 17 and 27 may be a preferred alternative, particularly for students preparing for medical school.
d. *Physical Chemistry or Statistical Mechanics*: CHEM 60 or one of CHEM 161, PHYSICS 181, or ENG-SCI 181. One of the statistical mechanics courses is strongly recommended.

e. *Mechanics, Electromagnetism, and Waves*: PHYSICS 15A (or PHYSICS 16 or 19), 15B, and 15C. Students may also take PHYSCI 12A and 12B or APPHY 50A and 50B in place of PHYSICS 15A and 15B. These students should contact the Director or Co-Director of Undergraduate Studies, who will work with them to develop a coherent program.

f. *Quantum Mechanics*: PHYSICS 143A or CHEM 160.

g. *Mathematics*: Two courses at the level of MATH or APMTH 21A, 21B, or above. While not required, taking one or more additional Mathematics courses is strongly recommended. Students should consider especially APMTH 104 or MATH 113; APMTH 105 or MATH 110; APMTH 115; STAT 110. Students planning to go into research should consider taking a course in Computer Science and/or numerical analysis.

h. Additional courses from the list below, to complete the requirement of 13 courses. It is strongly recommended that one course be a laboratory course. In all cases, the student must take at least four Physics courses and four Chemistry courses.

   i. A course of independent research from the following: CHEM 91R, 98R, 99R, or PHYSICS 90R.
   ii. Any 100- or 200-level Chemistry course.
   iii. Any 100- or 200-level Physics or Applied Physics course.
   iv. Any 100- or 200-level Math or Applied Math course.
   v. Any intermediate- or advanced-level course in a science, engineering sciences, or computer science with significant direct application to chemistry or physics. These courses should be approved in advance by the Director or Co-Director of Undergraduate Studies. (No approval is needed for the “related” or “counting as physics” courses listed in the requirements for the Physics concentration.) To fulfill particular needs, a concentrator, with the adviser’s consent, may petition the committee to use other intermediate- or advanced-level science courses for this requirement.
   vi. One course from MATH 1A and 1B, LS 1A, and PHYSCI 1 may count toward the requirement of 13 courses.

2. *Tutorials*: Optional. Admission to tutorials requires prior approval by the Director of Undergraduate Studies of the Department of Chemistry and Chemical Biology.

   a. *Junior year*: CHEM 98R.
   b. *Senior year*: CHEM 99R.


4. *General Examination*: None.

5. *Other Information*:

   a. Satisfactory grades (C- or better) are required in PHYSICS 15A, 15B, and 15C (or higher-level substitutions).
   b. *Pass/fail*: Two courses counted for concentration may be taken pass/fail, but not PHYSICS 15A, 15B, 15C, 16, or 19.
   c. *Substitutions*: Students can substitute a more advanced course for one or more of the required elementary courses on the same topics, provided they have the
written permission of the Director or Co-Director of Undergraduate Studies. However, the total number of concentration courses taken during the student’s college career (including study abroad or transfer credits) must be at least 13. Students who substitute more advanced courses for PHYSICS 15B and/or 15C must complete the lab component of these courses, on a pass/fail basis. See the Co-Director of Undergraduate Studies for further information.

d. Teaching: Students who are interested in receiving eligibility for the certification needed to teach both physics and chemistry in public schools are invited to look at Degree in Physics with Teacher Certification in both Physics and Chemistry under the Physics concentration at https://www.physics.harvard.edu/files/physics/files/spsbook20-21.pdf. Completing the Chemistry and Physics concentration with eligibility for teacher certification in both physics and chemistry requires taking the UTEP program, in addition to the required courses listed in items 1.a–h.

e. Individual Study and Research courses: PHYSICS 90R/91R and CHEM 91R/98R/99R are optional.

f. Applied Physics and Engineering Science courses listed in the requirements for the Physics concentration as “counting as physics” for Physics concentrators are also counted as physics courses in the Chemistry and Physics concentration.

ADVISING

Students interested in concentrating in Chemistry and Physics should discuss their Plans of Study with the Co-Director of Undergraduate Studies, David Morin. When Plans of Study are approved, each undergraduate who elects to concentrate in the field is assigned a faculty adviser from either the Physics or Chemistry department. If students do not request a change in adviser, they have the same adviser until they graduate. It is expected that students will discuss their programs and review their progress with faculty advisers at the beginning of each term. Students are told to seek advice at any time and can see their advisers at regularly scheduled office hours or by making an appointment. Students may also seek advice from the Director or Co-Director of Undergraduate Studies at any time.

For up-to-date information on advising in Chemistry and Physics, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES

The resources and facilities available to this concentration are essentially those of the Chemistry and Physics departments combined. Hence the descriptions of those concentrations should be consulted for further information.

HOW TO FIND OUT MORE

The pamphlet, The SPS Guide to Physics and Related Fields, available from the Co-Director of Undergraduate Studies in Lyman 238, provides useful information about the opportunities for the study of Physics and physics-related areas at Harvard. Much of this information is also relevant to the concentration in Chemistry and Physics.

Advice and personal consultation concerning the concentration can be obtained from the Director of Undergraduate Studies: Professor Howard Georgi, Jefferson 456, georgi@physics.harvard.edu, 617-496-8293; and the Co-Director of Undergraduate Studies, Dr. David Morin, Lyman Laboratory 238, morin@physics.harvard.edu, 617-495-3257. For office hours, check the website at http://www.people.fas.harvard.edu/~hgeorgi/. Students should also seek advice from the Director of Undergraduate Studies in Chemistry: Dr. Gregg Tucci, tucci@fas.harvard.edu.
Official acceptance into the concentration program is made only through the office of the Co-Director of Undergraduate Studies, David Morin, who must approve the Plan of Study.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Classics

Professor Jared Hudson, Director of Undergraduate Studies

Classics as an intellectual discipline embraces the study of ancient Greece and Rome, two civilizations whose legacy has played a major role in shaping our modern world. The Greeks and Romans produced literature and philosophy of enduring power and impact; they created art and architecture of unsurpassed grace and beauty; they made discoveries in science and math that anticipate principles and theorems re-discovered in the Renaissance; they grappled with problems of economics and governance that still challenge us today. In short, the Greco-Roman world provides the modern student with a laboratory of the human condition. Hence, the Department of the Classics encourages its students to explore the whole range of Greco-Roman civilization from the Bronze Age through Byzantium and medieval Europe to Modern Greece.

To study Classics at Harvard, no prior knowledge of an ancient language is required. Students may either start Greek and/or Latin from scratch, or build upon prior knowledge by taking more advanced courses. Two concentration options are offered within the department: Classical Languages and Literatures, for students wishing to emphasize the study of Greek and Latin literature in the original languages; and Classical Civilizations, for those primarily interested in exploring Greco-Roman culture through an archaeological, historical, or philosophical lens. Classics is essentially inter-disciplinary, combining the study of language, linguistics, and literature; archaeology, art, and architecture; history; philosophy, science, and medicine; and myth and religion. Hence, in addition to its dedicated Joint Concentration in Ancient History (Greek and Roman), which is offered in conjunction with History, the department welcomes joint concentrators combining Classics with a large number of allied fields.

As well as requirements in Greek and/or Latin, all concentrators take at least one of the department’s foundational courses in Greek culture & civilization and Roman culture & civilization (CLS-STDY 97A and 97B); in the junior year they choose one of a suite of small-group tutorials in advanced research methods (CLASSIC 98); and in their senior year, all Classics concentrators have the option of writing a thesis under faculty supervision (CLASSIC 99, mandatory for joint concentrators). Beyond these requirements, students have a wide range of courses to choose from, including courses in translation. Furthermore, courses from related departments are regularly cross-listed with Classics, so that students can craft the concentration to accommodate their individual interests.

Classics concentrators have at their disposal the resources of the Herbert Weir Smyth Classical Library, and they are encouraged to conduct primary research on ancient artifacts, coins, manuscripts, and papyri in the unparalleled collections of Houghton Library and the Harvard Art Museums. During the summer, students are given the chance to complement their experience in the classroom by undertaking an internship at one of Harvard’s classical institutes in Washington, D.C. (the Center for Hellenic Studies and Dumbarton Oaks); participating in an archaeological dig; learning to speak Latin in Rome or to speak Greek in Athens; taking summer courses in Italy or Greece; or traveling to Europe (or elsewhere) to learn one of the modern languages that are fundamental for classical scholarship—typically French, German, or Italian.

By mastering Greek and/or Latin and acquiring the skills necessary to analyze and interpret the remains of Greek and Roman culture, students learn to make sense of material that is both dauntingly complex and disconcertingly fragmentary. The effort of trying to understand the thoughts and actions of people who are separated from us by a gulf of two millennia teaches our students to test their assumptions in every human situation. The challenge of finding out about
an aspect of Greco-Roman civilization for which no substantial evidence appears to survive
develops resourcefulness and flexibility—research skills that can be transferred to any walk of
life. Concentrators in Classics learn to think rigorously and to express themselves precisely in
both speech and writing. They go on to excel in fields as varied as business, diplomacy,
education, finance, journalism, law, and medicine. In short, training in Classics is applicable to
everything.

REQUIREMENTS
Classical Languages and Literatures Track
Basic requirements: 12 courses (48 credits)

1. Two courses providing a broad introduction to Classical civilization, normally CLS-STDY 97A and 97B.
2. Six courses in Greek and/or Latin, at least two of which must be numbered 100 or above
   (H and K are considered 100-level), and at least one of which must be selected from the
   following list: GREEK 112A, GREEK 112B, LATIN 112A, LATIN 112B (or equivalent in
   the case of Byzantine/Modern Greek and Medieval Latin). Note: Introductory language
courses are intended to be taken sequentially. Students may not earn concentration
credit for completion of a course sequentially prior to one in which they have already
earned a passing grade.
3. One semester of CLASSIC 98, a small-group tutorial, is required of all concentrators in
   the junior year. The tutorial emphasizes the development of research skills through a
   close examination of a topic in Greek and Roman literature and/or Greco-Roman
civilization.
4. Three additional courses from among those listed under Classics in the course search in
courses.my.harvard.edu, including cross-listed courses and either HUMAN 10A or
   HUMAN 10B. Other courses may be counted with approval of the Director of
   Undergraduate Studies.
5. Note: Two courses counted for concentration may be taken pass/fail or, in the case of
   approved Freshman Seminars, SAT/UNSAT. CLASSIC 98 must be taken for a letter
   grade.
6. Honors: Students wishing to be considered for honors must fulfill the basic requirements
   as specified above, as well as the following:
   a. Either: A senior thesis, together with two semesters of the senior tutorial,
      CLASSIC 99. The thesis must be submitted to the department office on or before
      the Friday before the spring recess. The length of the thesis should be decided
      upon by the student and the thesis adviser but should not ordinarily exceed 60
      pages of text.
   b. Or: Two additional courses in Greek or Latin, both of which must normally be
      letter-graded with a grade of A- or better:
      i. Candidates for high honors: Two of the following courses: LATIN H, K;
         GREEK H, K.
      ii. Candidates for highest honors: Both LATIN K and GREEK K.
      iii. Candidates for honors: Any 100-level course in Greek or Latin, plus one
          of the following courses: LATIN H, K; GREEK H, K.

Note: if a student pursues both routes to honors, the Department's honors recommendation
shall be based upon the higher result in the eligible category.
Joint concentration: Classical Languages and Literatures and Allied Field
Basic requirements: 7 letter-graded courses (28 credits) in Classics

1. CLS-STDY 97A or 97B.
2. CLASSIC 98.
3. Four courses in Greek and/or Latin, at least two of which must be at the 100 level or above (H and K are considered 100-level), and at least one of which must be selected from the following list: GREEK 112A, GREEK 112B, LATIN 112A, LATIN 112B (or equivalent in the case of Byzantine/Modern Greek and Medieval Latin). Note: Introductory language courses are intended to be taken sequentially. Students may not earn concentration credit for completion of a course sequentially prior to one in which they have already earned a passing grade.
4. One additional course from among those listed under Classics in the course search in courses.my.harvard.edu, including cross-listed courses and either HUMAN 10A or HUMAN 10B. Other courses may be counted with approval of the Director of Undergraduate Studies.
5. Additional coursework as required by the allied field.

6. Honors: Thesis required. Two semesters of either CLASSIC 99 or the equivalent in the allied field, as appropriate.

Classical Civilizations Track
Basic requirements: 12 courses (48 credits)

1. Two courses providing a broad introduction to Classical civilization, normally CLS-STDY 97A and 97B.
2. Four courses in Greek and/or Latin. Note: Introductory language courses are intended to be taken sequentially. Students may not earn concentration credit for completion of a course sequentially prior to one in which they have already earned a passing grade.
3. One semester of CLASSIC 98, a small-group tutorial, is required of all concentrators in the junior year. The tutorial emphasizes the development of research skills through a close examination of a topic in Greek and Roman literature and/or Greco-Roman civilization.
4. CLS-STDY 112 Regional Study, a multi-disciplinary and problem-based in-depth survey of a region of the ancient Mediterranean world, to be taken at any stage in the concentration, provided that both 97A and 97B have been completed or the second of these is being taken concurrently.
5. Four additional courses from among those listed under Classics in the course search in courses.my.harvard.edu, including cross-listed courses and either HUMAN 10A or HUMAN 10B. Other courses may be counted with approval of the Director of Undergraduate Studies.
6. Note: Two courses counted for concentration may be taken pass/fail or, in the case of approved Freshman Seminars, SAT/UNSAT. CLASSIC 98 must be taken for a letter grade.
7. Honors: In addition to the basic requirements set out above, all concentrators in Classical Civilizations who wish to be considered for honors must write a senior thesis by completing two semesters of the senior tutorial, CLASSIC 99. The thesis must be submitted to the department office on or before the Friday before the spring recess. The length of the thesis should be decided upon by the student and the thesis adviser but should not ordinarily exceed 60 pages of text.
Joint concentration: Classical Civilizations and Allied Field
Basic requirements: 7 letter-graded courses (28 credits) in Classics

1. CLS-STDY 97A or 97B.
2. CLASSIC 98.
3. Two courses in Greek and/or Latin. Note: Introductory language courses are intended to be taken sequentially. Students may not earn concentration credit for completion of a course sequentially prior to one in which they have already earned a passing grade.
4. CLS-STDY 112 Regional Study, a multi-disciplinary and problem-based in-depth survey of a region of the ancient Mediterranean world, to be taken at any stage in the concentration, provided either 97A or 97B has been completed or is being taken concurrently.
5. Two additional courses from among those listed under Classics in the course search in courses.my.harvard.edu, including cross-listed courses and either HUMAN 10A or HUMAN 10B. Other courses may be counted with approval of the Director of Undergraduate Studies.
6. Additional coursework as required by the allied field.
7. Honors: Thesis required. Two semesters of either CLASSIC 99 or the equivalent in the allied field, as appropriate.

Joint Concentration in Ancient History (Greek and Roman)
Basic requirements: 14 courses (56 credits)

1. Classical Language Courses (4 courses): Four courses of study of one or two classical languages.
2. Additional Coursework (8 courses):
   a. HIST 97.
   b. CLS-STDY 97A or 97B
   c. HIST 97 is offered in the spring term only; if combining with CLS-STDY 97B (on Rome), also offered in the spring, students may choose either to take both during their sophomore spring, or to take one in the sophomore spring and the other in the junior spring.
   d. CLASSIC 98. Must be completed by the end of the junior spring, in preparation for the senior thesis.
   e. CLS-STDY 112.
   f. One non-Western History course.
   g. One modern History course.
   h. Two additional electives within Ancient History.
   i. Additional note: One of the four history courses should be a seminar that results in a research paper of at least 20 pages and involving primary source research and that is completed before the end of the junior year.
4. Please also note the following information:
   a. Students who complete the thesis will be eligible for honors; the department in which the student chooses to take the senior tutorial will be responsible for making the final determination of honors.
   b. Two types of courses count toward Ancient History (Greek and Roman) concentration requirements:
      i. Courses listed in the course catalog's "History" section and "Classics" section, including cross-listed courses.
      ii. Courses taught in the General Education and/or Freshman Seminar programs by full members of the History or Classics Department faculty.
Students wishing to count such courses toward their concentration requirements should request approval from the relevant Director of Undergraduate Studies. Students may also apply to do an independent study, HIST 91R or CLASSIC 93R, with a member of the relevant Department; HIST 91R/CLASSIC 93R can be used to fulfill one of the elective course requirements.

ADVISING
At the beginning of each semester, concentrators meet with the Director of Undergraduate Studies to discuss their Plans of Study and their progress through the concentration. In addition, junior and senior members of the department are available throughout the year to offer advice on particular academic matters as the need arises.

For up-to-date information on advising in Classics, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

RESOURCES
The Smyth Classical Library, on the top floor of Widener Library, is open to all concentrators in the department. It contains an extensive and up-to-date collection of Greek and Latin authors, principal commentaries, works of reference, corpora of inscriptions, and major books on classical archaeology, history, literature, and philosophy. The library is locked at all times because there is no regular attendant. Key-card access will be granted to any concentrator upon request. Items from the McDaniel collection of antiquities illustrating Greek and Roman life, together with an extensive collection of ancient coins, are housed in the Harvard Art Museums. The antiquities are available for study by qualified students.

HOW TO FIND OUT MORE
For further information about the concentration, contact the Director of Undergraduate Studies, Professor Jared M. Hudson (classicsDUS@fas.harvard.edu, 617-495-9625).

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Comparative Literature

Dr. Sandra Naddaff, Director of Undergraduate Studies

The undergraduate program in Comparative Literature prepares students to play an active and creative role in today’s globalized world by exploring literature and culture across languages and national borders. Working in more than one language, our students investigate the interconnections among literatures, cultures, and media to explore the human experience in a comparative and interdisciplinary context.

The flexible nature of the concentration allows students to develop a program of study both within and beyond the humanities based on their particular languages and interests. Some students craft a curriculum in literature and the arts, linking the study of literature with film, music, theater, digital media, or creative writing. Others design a program that connects literary study to contemporary concerns and disciplines beyond the humanities, focusing their work on the relationship between literature and medicine, or literature and law, or literature and ethics, for example. Still other students find in the study of Comparative Literature a place for the comparative study of multiple literatures, world literature, and translation, or the examination of aesthetics, philosophy, and literary and cultural theory. Our concentrators work across many languages—Hindi, French, Spanish, English, Chinese, Hebrew, Italian, Latin, Arabic, Swahili—to name but a few. We welcome work in any foreign language in which a student has an interest. In cases where a student does not have the necessary linguistic competence to undertake literary study, we are happy to help make arrangements towards fluency.

In consultation with the Director of Undergraduate Studies (DUS) and the student’s academic adviser, undergraduate concentrators develop an individually tailored and carefully structured program of study that brings together their particular interests and languages and allows them to take courses in a variety of departments across the Humanities. Central to each student’s curriculum is the tutorial program. The one-semester sophomore tutorial seminar introduces students to various disciplinary methodologies and forms of literary and cultural analysis. Junior tutorial offers students the rare opportunity to design their own reading course in which they work one on one with a tutor and ultimately develop their junior essay project. Students may, however, opt out of junior tutorial in order to take additional courses in a non-English language or in Comparative Literature. (See #2 in Tutorials below.) Senior tutorial is again an individual course of study largely devoted to the research and writing of the senior thesis, which is required of all students. All tutorials are reading and writing intensive, and form the core around which a student develops a larger program of study. For more information about students’ junior essays and senior thesis projects, please see the “Undergraduate Concentration” link on our website, www.complit.fas.harvard.edu.

Students with degrees in Comparative Literature develop habits of mind that serve them well in any number of professional endeavors. The ability to write well, to read critically, to argue analytically, and to speak eloquently, translates fluently to a variety of fields. Our graduates include doctors, lawyers, literary scholars, cultural critics, investment bankers, actors, novelists, consultants, and journalists among many others. For a fuller list of our alumni, please consult the “Lit alumni” link on our website, www.complit.fas.harvard.edu.

In order to help students determine whether they can meet their academic and intellectual goals in our department, we ask interested students to apply to the concentration during the fall of the sophomore year, although later applications will also be considered whenever possible. Application includes submitting a brief statement of interest and essay, as well as a conversation with two members of the department.
REQUIREMENTS

Concentration Requirements: 14 courses (56 credits)

1. Required Courses:
   A. Comparative Literature 97; Comparative Literature 98a and 98b or tutorial alternative. See 2B below; Comparative Literature 99a and 99b (see item 2, Tutorials).
   B. Three courses from among the courses listed under Comparative Literature in the course search in courses.my.harvard.edu, including those courses cross-listed under Comparative Literature. Each of these courses must be passed with a grade of B– or above.
   C. Three courses in one or more non-English literatures, each passed with a grade of B– or above. Note: A student may petition the DUS to take one non-English course at the advanced language level for concentration credit in this category.
   D. Three courses drawn from a variety of related departments. These may include, but are not limited to, additional courses in Comparative Literature; English literature; non-English or classical literatures or folklore and mythology (including additional courses in the literature chosen under 1c above); Philosophy; AFVS; studies of Women, Gender, and Sexuality; Linguistics. Students should consult the DUS to determine whether a specific course will count for concentration credit in this category.

2. Tutorials:
   A. Sophomore year: Comparative Literature 97. A grade of B- or above is required.
   B. Junior year: Comparative Literature 98a and 98b. Graded SAT/UNS. A grade of SAT in both semesters is required in order to continue on to Comparative Literature 99a and 99b. Alternatively, Junior concentrators in Comparative Literature can petition to substitute one or two courses in place of the junior tutorial. These courses must be from the Comparative Literature departmental listings or courses that support non-English language learning at any level. Students must petition the DUS by the end of the second semester of sophomore year.
   C. Senior year: Comparative Literature 99a and 99b (the writing of the senior thesis). Graded SAT/UNS. In order for a student to receive a grade of SAT for the first semester of senior tutorial, one chapter of the thesis must be submitted by the end of the semester in which the thesis work is begun.

3. A junior essay of 20-25 pages (5,000-6,250 words) is required of all students enrolled in the junior year tutorial. Students who do not enroll in junior tutorial must, in consultation with the DUS, make arrangements to complete a junior essay.

4. A senior thesis of 45-70 pages (11,250-17,500 words) is required of all concentrators in the senior year.

5. General Examination: A 75-minute oral examination at the end of the senior year. This exam will include a thesis defense, as well as an intellectual autobiography. The examination committee will consist of three members and will ideally include the student’s junior tutor and one reader of the senior thesis.

6. Study Abroad: Comparative Literature encourages study abroad for one semester of the junior year. Students who study abroad take only one term of junior tutorial, although they must still complete the junior essay and 14 total concentration courses.

JOINT CONCENTRATION

It is possible to pursue a joint concentration with Comparative Literature as either a primary or allied field. Please make an appointment with the DUS to discuss specific requirements.
ADVISING
Each Comparative Literature concentrator is assigned a tutor who also functions as the student’s adviser. In the sophomore year, this tutor is assigned by the DUS, but in following years a student may either request a tutor from among the faculty members of the Department of Comparative Literature and the Tutorial Board; or the student will be assigned a tutor (generally a member of the Tutorial Board) by the DUS according to the student’s interests. Generally, this tutor changes from year to year as the student’s program and interests change. In certain cases, however, a student may request the same tutor for more than one year.

The department offers a variety of courses that might be of interest to first-year students and first-semester sophomores, but it has no specific course that is a pre-requisite. Students who are interested in the program might wish to take any of the 100-level courses listed in Comparative Literature in the course search in courses.my.harvard.edu. Students interested in Comparative Literature might also wish to take a language course in their language of choice if they wish to improve their non-English language competency.

For up-to-date information on advising in Comparative Literature, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

HOW TO FIND OUT MORE
First-year students interested in finding out more about Comparative Literature should contact Dr. Sandra Naddaff by email (snaddaff@fas.harvard.edu) or should make an appointment to see her during office hours by calling 617-495-4186.

For general information contact Dr. Sandra Naddaff, DUS; or Ms. Isaure Mignotte, Comparative Literature Program Coordinator, at Dana Palmer House, 617-495-4186.

ENROLLMENT STATISTICS
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Harvard’s Computer Science concentration aims to guide students through the beautiful, dynamic, creative, and versatile discipline of computer science. Our requirements expose students to the most important and elegant results in computer science and empower students to use CS to improve the world. They guide students from course to course to facilitate learning and mastery while allowing significant flexibility in course choice.

Computer science is about tools and technology, and also about understanding and engaging with the world. From swarms of insects to elementary particles, rational agents in a market, and neurons in a brain, the computational viewpoint has proven a fruitful way to understand natural, social, and engineered systems. Correspondingly, the Computer Science concentration has strong ties not just to engineering, but also economics, law, biology, physics, statistics, mathematics, linguistics, and more. Because information technology affects every aspect of society, graduates with computer science degrees have access to a huge variety of careers, including engineering, teaching, medicine, law, basic science, entertainment, and management.

The Computer Science concentration requires basic grounding in: mathematics; basic software programming; computational formal reasoning (the ability to reason rigorously about computation); larger-scale systems development; and the design and evaluation of computational systems that interact with the world at large, including natural and social systems.

The Computer Science concentration has the following learning outcomes for our graduates: students will design and code correct solutions to problems; design and reason about algorithms; and develop and analyze the ways computation interacts with other systems. Academic computer science extends far beyond programming (though it does include programming). It provides students with a foundational understanding of the strengths and limitations of information and computation. This perspective is practically important—it helps students quickly adapt to new computational systems and approaches. It has also been increasingly revealed as a beautiful way to understand the world.

REQUIREMENTS

The requirements detailed below apply to students declaring a concentration in Computer Science beginning in academic year 2021-22. Students declaring the concentration prior to 2021-22 should consult the relevant archived version of the student handbook and contact the department for further information.

Basic Requirements: 11–14 courses (44–56 credits)

1. Required courses (11–14 courses): A student’s Plan of Study must satisfy each of the requirements below.
   a. Mathematical preparation (2–5 courses, see Note on Mathematical preparation in item c. below):
      i. Pre-calculus and single-variable calculus: Either MATH MA, MB, and 1B, or MATH 1A and 1B. Students may place out of some or all of this requirement depending on their starting Mathematics course.
ii. **Linear algebra:** One course in linear algebra. Satisfied by APMTH 22A, MATH 21B, MATH 22A, MATH 23A, MATH 25A, MATH 55A, or a more advanced course.

iii. **Probability:** One course in probability. Satisfied by STAT 110, ENG-SCI 150, MATH 154, or a more advanced course.

b. **Computer Science core (9 courses):** Nine courses from an approved list on the concentration's website. This list contains Computer Science courses and some courses in related fields. These courses must, taken together, satisfy the following “tag” requirements. The concentration website has a list of tags and the corresponding courses. (For convenience, a table of tags and courses as of 2021 is included below.) A tag requirement is satisfied or partially satisfied by a Plan of Study containing a corresponding course. Each course on a Plan of Study may satisfy zero, one, two, or more tag requirements. Example Plans of Study satisfying these requirements can be found on the concentration website. While some courses can satisfy multiple tags, students still need to take nine Computer Science core courses.

i. **Programming 1 and Programming 2 tags (2 courses in the Computer Science core):** Two courses on software construction and good software engineering practices. The requirement is satisfied by either one course tagged Programming 1 and one tagged Programming 2, or by two courses tagged Programming 2. Note that some Programming 1 courses, such as COMPSCI 32 and COMPSCI 50, cannot be taken for concentration credit after more advanced programming courses.

ii. **Formal Reasoning tag (3 courses in the Computer Science core):** Three courses on formal reasoning about computer science, including at least:
   1. **Discrete Mathematics tag (0 or 1 course in the Computer Science core):** One course with significant discrete math content. Students may skip this requirement with approval from the Directors of Undergraduate Studies; see the Computer Science website for more information.
   2. **Computational Limitations tag (1 course in the Computer Science core):** One course covering topics in computability and complexity.
   3. **Algorithms tag (1 course in the Computer Science core):** One course covering topics in algorithms.

iii. **Systems tag (1 course in the Computer Science core):** One course containing significant computer system development.

iv. **Computation and the World tag (1 course in the Computer Science core):** One course on interactions between computation and the world (for example, concerning informational, natural, human, or social systems).

v. **Advanced Computer Science tag (4 courses in the Computer Science core):** Four sufficiently advanced Computer Science courses, roughly corresponding to all CS courses numbered 100 and above. (See the concentration website for the full list.)

c. **Note on Mathematical preparation:** The total number of required courses for the concentration depends on the starting Mathematics course (see Requirements above).

i. Students starting in MATH MA: 14 courses (five courses to complete the mathematics requirements).

ii. Students starting in MATH 1A: 13 courses (four courses to complete the mathematics requirements).

iii. Students starting in MATH 1B: 12 courses (three courses to complete the mathematics requirements).

iv. Students starting in MATH 21B or similar: 11 courses (two courses to complete the mathematics requirements).
2. **Tutorial:** Optional. Available as COMPSCI 91R. This course is repeatable, but may be taken at most twice for academic credit, and only one semester of COMPSCI 91R may be counted toward concentration requirements as a Computer Science core course. Students wishing to enroll in COMPSCI 91R must file a project proposal to be signed by the student and the faculty supervisor and approved by the Directors of Undergraduate Studies. The project proposal form can be found on the Computer Science website.

3. **Thesis:** None.

4. **General Examination:** None

5. **Other Information:**
   a. **Approved courses:** With the approval of the Directors of Undergraduate Studies, other courses may be used to satisfy requirements. If a course is cross-listed with another department, it meets the same requirements for the concentration as the COMPSCI-numbered course. In general, a course may be substituted with a more advanced version on the same or similar topic. Students must secure advance approval for course substitutions by filing a Plan of Study to be approved by the Directors of Undergraduate Studies. The Plan of Study form and a description of the process to submit the form can be found on the Computer Science website.
   b. **Pass/fail and SAT/UNSAT:** No more than two of the courses used to satisfy CS Requirements may be taken pass/fail or SAT/UNSAT. Of the tag requirements, courses taken pass/fail or SAT/UNSAT can be used only for the Programming 1 and Advanced Computer Science tags. For instance, if taken pass/fail, COMPSCI 124 would not satisfy the Formal Reasoning or Algorithms tags.
   c. **Reduction of requirements for prior work:** Except for MATH MA, MATH MB/1A, and MATH 1B, there is no reduction in concentration requirements for prior work.
   d. **Plans of Study:** Concentrators must file a Plan of Study showing how they intend to satisfy these degree requirements and keep their plan of study up to date until their program is complete. If the plan is acceptable, the student will be notified that it has been approved. To petition for an exception to any rule, the student should file a new Plan of Study and notify the Directors of Undergraduate Studies of the rationale for any exceptional conditions. Approval of a Plan of Study is the student's guarantee that a given set of courses will satisfy degree requirements. The Plan of Study form and a description of the process to submit the form can be found on the Computer Science website.

**Honors Requirements: 13–16 courses (52–64 credits)**

1. **Required courses (13–16 courses):** A student’s Plan of Study must satisfy each of the requirements below. Courses are allowed to satisfy multiple requirements, but a student’s Plan of Study must still comprise thirteen to sixteen courses in total.
   a. **Mathematical preparation (2–5 courses):** Same as Basic Requirements.
   b. **Computer Science core (11 courses):** Eleven courses from an approved list on the concentration’s website. This is the same list as for the basic requirements, but two more courses are required. These courses, taken together, must satisfy the following tag requirements.
      i. **Programming 1 and Programming 2 tags (2 courses in the Computer Science core):** Same as Basic Requirements.
      ii. **Formal Reasoning tag (3 courses in the Computer Science core):** Same as Basic Requirements, but requiring Intermediate Algorithms rather than Algorithms, as follows.
         1. **Discrete Mathematics tag (0 or 1 course in the Computer Science core):** Same as Basic Requirements.
2. **Computational Limitations tag (1 course in the Computer Science core):** Same as Basic Requirements.
3. **Intermediate Algorithms tag (1 course in the Computer Science core):** One course covering basic and intermediate topics in algorithms. Replaces the Algorithms tag from the Basic Requirements.
   iii. **Systems tag (1 course in the Computer Science core):** Same as Basic Requirements.
   iv. **Computation and the World tag (1 course in the Computer Science core):** Same as Basic Requirements.
   v. **Artificial Intelligence tag (1 course in the Computer Science core):** One course covering topics in artificial intelligence. (Most such courses will simultaneously satisfy the Computation and the World tag.)
   vi. **Advanced Computer Science tag (5 courses in the Computer Science core):** Five sufficiently advanced Computer Science courses (one more than in the Basic Requirements).

2. **Tutorial:** Same as Basic Requirements.
3. **Thesis:** Optional but encouraged. See honors requirements on the Computer Science website at [https://csadvising.seas.harvard.edu/concentration/degrees/](https://csadvising.seas.harvard.edu/concentration/degrees/). Students writing theses are often enrolled in COMPSCI 91R. This course is repeatable, but may be taken at most twice for academic credit, and only one semester of COMPSCI 91R may be counted toward concentration requirements as a Computer Science core course. Students wishing to enroll in COMPSCI 91R must file a project proposal to be signed by the student and the faculty supervisor and approved by the Directors of Undergraduate Studies. The project proposal form can be found on the Computer Science website.
4. **General Examination:** Same as Basic Requirements.
5. **Other Information:** Same as Basic Requirements.

**Requirements for Joint Concentrations: 10–13 courses (40–52 credits) for Computer Science Field**

Joint concentrations with certain other fields are possible. This option is intended for students who have interests in the intersection of two fields, not simply in the two fields independently; for example, a combined concentration in Computer Science and Linguistics might be appropriate for a student with a special interest in computational linguistics. Course requirements are the same as the **Basic Requirements**, with three exceptions: only eight (instead of nine) Computer Science core courses are required, COMPSCI 91R may be used to satisfy an Advanced Computer Science requirement, and a thesis that combines the two fields is required. Note that courses satisfying Computer Science requirements may also be double-counted towards the requirements of the other field.

Joint concentrations are not “double majors.” Joint concentrators should be interested in the overlap between two fields, not simply in both. A thesis in the intersection of the fields is required for joint concentrators, read by both concentrations. The student is typically awarded the minimum honors recommended by the two concentrations separately. These requirements, including the Thesis Requirement, are the same whether Computer Science is the primary field or the allied field of the joint concentration.

Students interested in combined programs should consult the Directors of Undergraduate Studies at an early date and should work carefully with both concentrations to ensure all deadlines and requirements of both concentrations are met. Students with separate interests in more than one field should consider pursuing a secondary field rather than a joint concentration or simply using some of their electives to study one of the fields. We advise all of our joint
concentrators to make sure that they satisfy the non-joint requirements for at least one concentration, in case they are unable to complete a thesis.

**Requirements for Mind, Brain, and Behavior (MBB) Program: 13–16 courses (52–64 credits)**

Students interested in addressing questions of neuroscience and cognition from the perspective of computer science may pursue a special program of study affiliated with the University-wide Mind, Brain, and Behavior Initiative that allows them to participate in a variety of related activities. (Similar programs are available through the Anthropology, History and Science, Human Evolutionary Biology, Linguistics, Neurobiology, Philosophy, and Psychology concentrations.) Requirements for this honors-only program are based on those of the Computer Science requirements for honors eligibility, as explained below:

1. **Required courses (13–16 courses):**
   a. *Mathematical preparation (2–5 courses):* Same as honors requirements.
   b. *Computer Science core (8 courses):* Same as honors requirements, with the following exceptions:
      i. Eight courses, rather than 11 courses, are required.
      ii. *Advanced Computer Science (4 courses in the Computer Science core):* Four sufficiently advanced Computer Science courses, rather than 5 courses, are required. In addition, one COMPSCI 91R course may be used to satisfy this requirement.
   c. *Mind, Brain, and Behavior courses (3 courses):*
      i. MCB/NEURO 80.
      ii. An approved course in an MBB-related field outside Computer Science.
      iii. An approved MBB junior tutorial.

2. **Tutorial:** Same as honors requirements.

3. **Thesis:** A computationally-oriented thesis on a Mind, Brain, and Behavior-related topic is required. Students pursuing thesis research may want to enroll in COMPSCI 91R.

4. **General Examination:** None.

5. **Other information:** Same as honors requirements.

6. **Note:** Students pursuing the Mind, Brain, and Behavior track are assigned an adviser in the field and are expected to participate in the University-wide Mind, Brain, and Behavior research milieu, including a non-credit senior year seminar for Mind, Brain, and Behavior thesis writers. To participate in the MBB track, students must both complete the Computer Science concentration Plan of Study and register at the beginning of every academic year on the MBB website at http://mbb.harvard.edu. Interested students should contact the Computer Science liaison to the MBB program, Professor Stuart Shieber (shieber@seas.harvard.edu).

**ADVISING**

Students interested in concentrating in Computer Science are urged to consult the Directors or the Assistant Director of Undergraduate Studies early and often for advice on placement in courses and selection among courses. The Directors and the Assistant Director of Undergraduate Studies are happy to talk with first-year students and sophomores about their Plans of Study and to answer questions. When a student enters the concentration mid-way through the sophomore year, the Directors and Assistant Director of Undergraduate Studies assign a professor to serve as the student’s faculty adviser. Every effort is made to match the student’s special interests to the expertise of the adviser. Students should consult their advisers regularly, certainly at the beginning of each term. When a faculty adviser is on leave, the
student is temporarily reassigned to a new adviser. Students desiring a change of adviser for any reason should contact the Directors and Assistant Director of Undergraduate Studies. The Directors and Assistant Director of Undergraduate Studies are also available to discuss problems or questions of any kind with students in the concentration.

HOW TO FIND OUT MORE
Students interested in Computer Science are invited to join the mailing list for Computer Science, which carries announcements of new courses, colloquia, job and internship opportunities, and a variety of get-togethers for the Harvard Computer Science community. Information about other community resources can be found on the Computer Science website at http://www.seas.harvard.edu/computer-science.

For further information, students should consult the Directors and Assistant Director of Undergraduate Studies, (cs-dus@seas.harvard.edu).

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Earth and Planetary Sciences

Professor Roger Fu, Co-Head Tutor
Professor Zhiming Kuang, Co-Head Tutor

Harvard offers outstanding opportunities for students who wish to pursue studies in Earth and Planetary sciences. Research and coursework in the Earth and Planetary Sciences (EPS) department encompass a broad range of science disciplines, technology, and applications to environmental and economic endeavors. These studies involve students in the development and application of new tools and technologies, state-of-the-art computational modeling of a wide range of Earth planetary processes, and field work in remote and challenging settings.

These are intellectually exciting times for the Earth and planetary sciences, which are of unprecedented importance to contemporary society. Our environment is increasingly subject to stresses placed upon it. As never before, we have an imperative to better understand the consequences of human activities for the Earth’s atmosphere, the oceans, the solid Earth, and the organisms that live on it. Exploring, extracting, and conserving natural resources are vital to the global political economy. We must mitigate the ill effects of earthquakes, landslides, volcanic eruptions, and climate change by learning to predict and forecast their time and place. Moreover, new technologies, data sets, and computational capacity are allowing us to better understand the functioning of Earth systems and the interplay between tectonics, climate, and life.

Because the Earth’s natural systems (atmosphere, ocean, biosphere, solid earth) are interconnected, the training of Earth and planetary scientists broadly spans the boundaries between biology, chemistry, engineering, physics, mathematics, and the Earth sciences themselves, and provides a broad intellectual foundation that is beyond what is typically possible in a "pure" science program. The department trains students rigorously in the basic sciences, typically in the same foundational courses as students in Astrophysics, Chemistry, Engineering Sciences, and Physics. These foundational courses are followed by upper-level courses that focus on disciplines within Earth and Planetary Sciences. Within the EPS Department, students may focus on atmospheric and ocean science, energy and climate, environmental geoscience, geobiology, geochemistry, geology, planetary sciences, and solid earth geophysics.

To facilitate and reinforce our interdisciplinary vision, students are required to take at least one course in each of the three major sub-disciplines in the department: Atmosphere(s) and Oceans; Earth History and Geobiology; and Geology, Geophysics, and Planetary Science. Moreover, all students are encouraged to participate in department-sponsored field experiences. Many students complete their studies with a senior thesis that affords them the opportunity to do original research under the guidance of department faculty.

Career opportunities in Earth and planetary sciences are diverse, spanning the private, government, and academic sectors. Government service includes research and administration in NASA, the National Oceanographic and Atmospheric Agency, the US Geological Survey, the Environmental Protection Agency, and many other agencies and departments. Earth scientists work in and direct a number of oil and mineral exploration and production companies. Many opportunities continue to grow for entrepreneurs who build companies specializing in resources, natural hazards, waste repositories, and cleanup, and environmental impacts. There also are abundant opportunities in the academic world for those continuing onto graduate degrees; in addition to scientific career paths, an undergraduate degree in Earth and Planetary Sciences provides an excellent background for continuing study in law, business, and medicine.
The research environment of the department is an unparalleled resource for undergraduate education. Concentrators may work with faculty and graduate students on major research projects as a research or field assistant, in the context of course work, or as part of an undergraduate research project. Class sizes are small and student-professor contact is frequent and informal. Each graduating senior becomes personally acquainted with numerous faculty members in the department. Writing a senior thesis, which may be based on field, laboratory, or theoretical research, provides students with the opportunity to explore beyond the elementary level in one or more of the subspecialties of Earth and Planetary Sciences.

REQUIREMENTS

Concentration Requirements: 14 courses (56 credits)

1. Required courses:
   a. E-PSCI Courses (6 courses): At least one course at the 50- or 100-level sampling all three sub-disciplines: Atmosphere(s) and Oceans; Earth History and Geobiology; and Geology, Geophysics, and Planetary Science.
      a. A minimum of two foundational courses from either E-PSCI 10 or GENED 1018, 1070, 1094, 1098, 1137, 1158, and 1167, and all 50-level E-PSCI courses. Note: No more than one of these from E-PSCI 10 or GENED 1018, 1070, 1085, 1094, 1098, 1137, 1158, and 1167. In order for a GENED course to count toward concentration credit, a student should take it prior to enrolling in any E-PSCI courses.
   b. Four additional courses in E-PSCI, at least three of which must be numbered 99 or above.
   b. Basic science requirements (6-7 courses):
      i. Physics (1 course in mechanics): PHYSCI 12A or PHYSICS 15A, 16, or 19.
      ii. Chemistry (1 foundational course):
         a. PHYSCI 11 or if a student has taken PHYSCI 1 before declaring EPS concentration, PHYSCI 1 can be used in place of PHYSCI 11.
         i. CHEM 17, 20, or 60 for advanced students not taking PS 11.
      iii. Physics or Chemistry (1-2 additional courses; a second course will automatically count toward concentration):
         a. PHYSICS 12B, 15B, or 15C.
         b. CHEM 17, 20, 40, or 60.
      iv. Mathematics (2 courses) through or above MATH 21A and 21B, or APMTH 22A and 22B.
      v. Statistics, Computation, and Data Science (1 course):
         a. E-PSCI/ESE 102; E-PSCI 100; APMTH 111 and 120; COMPSCI 109A; or STAT 109, 110, or 111.
   c. Additional courses (ordinarily 1-2 courses) in E-PSCI or selected courses in related fields to complete the requirement of at least 14 courses

2. Honors eligibility: E-PSCI 99A and E-PSCI 99B: Senior Thesis Tutorial. Students ordinarily complete two terms of E-PSCI 99 (A and B) to be eligible for honors. E-PSCI 99B must be taken for a letter grade. E-PSCI 99B will count toward concentration credit in 1.a.ii. Mid-year poster and final oral presentations of the thesis are required.
3. Tutorial: Required. (Generally taken in the sophomore year, non-credit.)
4. Thesis: Optional for basic concentration; required for departmental (English) honors.
5. General Examination: None.
6. **Substitutions:** Advanced placement may be used to allow students to complete higher-level courses under a-b; but a minimum of one Physics, one Chemistry, and two Mathematics courses must be completed to satisfy concentration requirements. Students interested in substituting a course in place of the above requirements should consult their EPS concentration adviser and submit a petition to the Academic Programs Manager.

7. **Other information:**
   a. None of the courses required for concentrators may be taken pass/fail and C– is normally the minimum acceptable grade.
   b. Students must complete the two foundational courses by the end of their first year in the concentration (ordinarily no later than the first semester of the junior year).
   c. Students are strongly encouraged to consult with a faculty adviser during their first year to plan appropriate choices of coursework in Math, Chemistry, and Physics.
   d. **Related fields:** Includes selected departmental courses offered in Applied Mathematics, Astronomy, Chemistry, Computer Science, Engineering Sciences, Environmental Science and Public Policy, Mathematics, Organismic and Evolutionary Biology, Physics, and Statistics, which count towards the respective concentration requirements upon approval of the Undergraduate Curriculum Committee. Students must petition to count related field courses for concentration credit prior to enrollment in the course. Courses offered through the General Education program are not admissible for the related field requirement, except as noted above in 1.
   e. MATH MA, 1A, 1B; LS 1A and 1B normally do not count toward concentration credit.
   f. **Thematic Plan of Study:** Students must discuss and develop individual Plans of Study together with their concentration adviser. Students are strongly encouraged to focus their departmental coursework in a thematic subfield (atmospheric and ocean science, energy and climate, environmental geoscience, geobiology, geochemistry, geology, planetary sciences, or solid earth geophysics).
   g. **Summer School/Study Abroad:** Courses from study abroad, Harvard Summer School, or other Harvard schools may count toward concentration credit if approved by the EPS Undergraduate Curriculum Committee prior to the student’s enrollment in these courses. Students must petition for such credit by contacting the Academic Programs Manager.
   h. **Freshman Seminars:** Freshman Seminars ordinarily do not count for concentration credit because they are SAT/UNSAT courses.
   i. **Field Trips:** An important aspect of the EPS concentration is participation in field trips and/or summer and January field camps, supported by the Department.

**Joint Concentration Requirements: 11 courses (44 credits)**

1. **Required Courses:**
   a. E-PSCI courses (5 courses):
      i. A minimum of two foundational courses from either E-PSCI 10 or GENED 1018, 1070, 1085, 1094, 1098, 1137, 1158, and 1167 and all 50-level EPS courses. Note: No more than one of these from E-PSCI 10 or GENED 1018, 1070, 1085, 1094, 1098, 1137, 1158, and 1167. In order for a GENED course to count toward concentration credit, a student should take it prior to enrolling in any E-PSCI courses.
      ii. Three additional courses in E-PSCI, at least two of which must be numbered 99 or above.
   b. Basic science requirements (6-7 courses):
i. Physics (1 course in mechanics):
   1. PHYSCI 12A or PHYSICS 15A, 16, or 19

ii. Chemistry (1 foundational course):
   1. PHYSCI 11 or, if a student has taken PHYSCI 1 before declaring
      E-PSCI concentration, PHYSCI 1 can be used in place of PHYSCI
      11.
   2. CHEM 17, 20, or 60 for advanced students not taking PHYSCI 11.

iii. Physics or Chemistry (1-2 additional courses; a second course will
     automatically count toward concentration):
   1. PHYSICS 12B, 15B, or 15C.
   2. CHEM 17, 20, 40, or 60.

iv. Mathematics (2 courses) through or above MATH 21A and 21B,
    or APMTH 22A and 22B.

v. Statistics, Computation, and Data Science (1 course):
   1. E-PSCI/ESE 102; E-PSCI 100; APMTH 111 and 120; COMPSCI
      109A; or STAT 109, 110, or 111.
   2. Honors eligibility: E-PSCI 99A and E-PSCI 99B: Senior Thesis Tutorial, or similar course
      in the student’s other concentration. Students must complete at least one term as part
      of the joint concentration. E-PSCI 99B must be taken for a letter grade. E-PSCI 99B will
      count toward concentration credit in 1.a.ii. Mid-year poster and final oral presentations
      of the thesis are required.
   3. Tutorial: Required. (Generally taken in the first year of declaring, non-credit.)
   5. General Examination: None.
   6. Substitutions: Advanced placement may be used to allow students to complete higher-
      level courses under B; but a minimum of two Physics, two Chemistry, and two
      Mathematics courses must be completed to satisfy concentration requirements.
      Students interested in substituting a course in place of the above requirements should
      consult their E-PSCI concentration adviser and submit a petition to the
      Academic Programs Manager.

7. Other information: Same as Concentration Requirements.

ADVISING
At the beginning of the first term of concentration, each student is assigned a faculty adviser.
Students normally continue with the same adviser throughout their concentration, although
advisers may be changed upon student request. For students writing a thesis, the senior thesis
adviser will also act as an additional concentration adviser. Students should meet individually
with their advisers at least once each term to discuss course selections and other academic
matters. Students may also seek advice from the Head Tutors at any time. Students seeking
additional advising about course options in Chemistry are encouraged to speak with Professor
James G. Anderson (Link Building 270, 495-5922; anderson@huarp.harvard.edu).

For up-to-date information on advising in Earth and Planetary Sciences, please see the Advising
Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
The Department of Earth and Planetary Sciences is housed partly in the Hoffman Laboratory of
Experimental Geology, which is directly connected with department classrooms and offices in
the Geological Museum on Oxford Street. Some of the atmospheric sciences are housed in
Pierce Hall, just across Oxford Street from Hoffman Laboratory. Biological oceanography and
paleontology are housed in the Geological Museum, with direct connection through the museum to the parts of the department located in Hoffman Laboratory.

**HOW TO FIND OUT MORE**

All essential information about the concentration is included here. Additional information may be obtained from the department's Academic Office, on the fourth floor of Hoffman Laboratory, from the Head Tutors, or on our website at http://www.eps.harvard.edu. Outside of the Academic Office is a bulletin board that contains many notices of job opportunities, lectures, fellowships, and other matters of interest.

Co-Head Tutor: Professor Roger Fu, Geo Museum 204B, 617-384-6991, rogerfu@fas.harvard.edu.

Co-Head Tutor: Professor Zhiming Kuang, Geo Museum 455, 617-495-2354, kuang@fas.harvard.edu.

Academic Programs Manager: Campbell Halligan, Hoffman Labs 403, 627-384-9760, campbellhalligan@fas.harvard.edu.

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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East Asian Studies

Professor Melissa McCormick, Director of Undergraduate Studies

The concentration in East Asian Studies seeks to develop a critical understanding of the human experience in East Asia. To study East Asia is to be exposed to a world with different forms of political activity and social relations, religious traditions of great depth and philosophical schools with enduring insights, and literatures of unusual range and power. It is also to study a world that, since the 19th century, has come to share in the dilemmas of modernity that we all confront. For some, this inquiry provides a challenging and satisfying addition to a liberal arts education. For some, it is an opportunity to restore connections to an ancestral past. For others, it leads to graduate studies. And for many others, it is the beginning of a professional career with an East Asian component. The program provides preparation for a variety of fields of work and advanced study after graduation. Study abroad is encouraged.

A concentrator develops skills in a language, participates in the tutorial program, and selects from a rich offering of lecture courses and seminars. The program allows students to learn about East Asia as a whole and also to pursue specialized study of one or more East Asian societies: China, Japan, Korea, or Vietnam. While there are some commonalities among the many cultures and peoples of East Asia, there are also innumerable differences that mark each of these cultures and peoples as distinct in their own right. Thus, a primary goal of the concentration in East Asian Studies is to expose students to both the unity and the multiplicity of this vast and complex region.

The concentration offers a broad range of possibilities for students interested in the social sciences or the humanities. EAS facilitates course work in social sciences, incorporating approaches to modern East Asia drawn from political science, sociology, anthropology, economics, and psychology. Students with an interest in the humanities can choose to study modern and pre-modern East Asia from the perspectives of history, literature, art history, cultural studies, religion, philosophy, and folklore. EAS faculty are drawn from the departments of East Asian Languages and Civilizations, Anthropology, Economics, Government, History, History of Art and Architecture, Sociology; the schools of Business and Law; and the Kennedy School of Government. The sophomore tutorial introduces a variety of perspectives from the humanities and the social sciences and offers concentrators a forum to interact with Harvard’s East Asia faculty. At the end of the sophomore year, students typically decide on a disciplinary or area focus or choose a comparative perspective (involving one or more than one area or discipline) in consultation with the Director of Undergraduate Studies and their assigned faculty adviser. Juniors take an EASTD 98 offering or an approved course to serve as their junior tutorial and may choose to spend the summer in East Asia doing research or internships. Honors candidates usually spend the senior year researching and writing the honors thesis.

The East Asian Studies concentration welcomes joint concentrators. Primary concentrators in another field who are interested in language study take six courses of language, the sophomore tutorial, and two area courses. Those interested in area studies take the sophomore tutorial and five additional courses on East Asia. Please consult the East Asian Studies tutorial office for detailed requirements.
REQUIREMENTS

Basic Requirements: 12 courses (48 credits)

1. **Required courses:**
   a. **Language:** At least four, and no more than six, courses in Chinese, Japanese, Korean, Mongolian, Tibetan, or Vietnamese; or an approved combination of courses involving two East Asian languages. The language requirement is met by attaining a level of competence equivalent to four courses of language study; thus, it is possible for the requirement to be satisfied in part by work done or experience gained elsewhere than in formal course work at Harvard. However, students who are allowed to take fewer than four courses of language due to previous training or knowledge are required to substitute other courses. No more than six courses of language may be counted for concentration credit.
   b. **Tutorials:** Two courses of tutorial or courses designated as equivalents. See 2.a. and 2.b. for more information.
   c. **Area Courses:** Four to six non-language courses in East Asian or related subjects, selected from the list available in the undergraduate office. One of these courses must be one of the following survey courses: GENED 1136: Power and Civilization: China (formerly SW 12), HIST 1023: Japan in Asia and the World (formerly SW 13), or GENED 1100: The Two Koreas in the Modern World (formerly SW 27). It is recommended that at least two area courses be upper-level seminars. The number of courses required depends on the number of East Asian language courses that a student chooses. Together these must total ten, so a student who chooses to count six courses of language requires four additional area courses, and a student who chooses to count four language courses requires six area courses.

2. **Tutorials:**
   a. EASTD 97AB: Sophomore Tutorial (may be taken in sophomore or junior year).
   b. EASTD 98: Junior Tutorial. With permission of the Director of Undergraduate Studies, an approved replacement course may be substituted for EASTD 98.

3. **Thesis:** None.
4. **General Examination:** None.
5. **Other information:** Courses counted for concentration credit may not be taken pass/fail, except by special petition. EASTD 97AB may not be taken pass/fail. General Education classes on East Asia can be counted for concentration credit. Content courses taught in an East Asian language can count toward the language or area course requirement. A content course taught in an East Asian language may also count as a junior tutorial replacement course with the written permission of the Director of Undergraduate Studies. One humanities frameworks 4-credit course may count towards EAS area credit.

Requirements for Honors Eligibility: 13 courses (52 credits)

1. **Required courses:**
   a. **Language:** Four courses in Chinese, Japanese, Korean, Mongolian, Tibetan, or Vietnamese, or an approved combination of courses involving two East Asian languages (see Basic Requirements, item 1.a. above).
   b. **Tutorials:** Four courses of tutorial or courses designated as equivalents. See note 2 above in Basic Requirements for more information.
   c. **Area Courses:** Three to five courses selected from among East Asian or related subjects (see item 1.c. of Basic Requirements), including language courses beyond Basic Requirements. The number of courses required depends on the number of East Asian language courses that a student chooses. Together, these
must total nine, so a student who chooses to count six courses of language requires three additional area courses, and a student who chooses to count four language courses requires five area courses.

2. **Tutorials:** Same as **Basic Requirements.** Plus:
   a. **Senior year:** EASTD 99 (two terms), preparation of thesis, required. Letter-graded. The senior tutorial consists of weekly meetings with the graduate student adviser and regular (usually bi-weekly) meetings with the faculty adviser. There are also periodic meetings with other seniors writing theses. EASTD 99 counts towards course requirements.

3. **Thesis:** Required of all honors candidates.

4. **General Examination:** None.

5. **Other information:** Courses counted for concentration credit may not be taken pass/fail, except by special petition. EASTD 97AB may not be taken pass/fail. General Education classes on East Asia can be counted for concentration credit. Content courses taught in an East Asian language can count toward the language or area course requirement. A content course taught in an East Asian language may also count as a junior tutorial replacement course with the written permission of the Director of Undergraduate Studies. One humanities frameworks 4-credit course may count towards EAS area credit.

**Concentration requirements for the Joint Concentration in East Asian History: 14 courses (56 credits)**

Students whose interest in East Asian civilization is primarily historical should consider concentrating in East Asian History. East Asian History is a joint concentration co-sponsored by the History Department and the East Asian Studies concentration. It aims to take advantage of the strengths of both concentrations. The goal of the program is to introduce students to the craft of historical study—the ways historians make sense of the past, and the skills of historical analysis, writing, and research—as well as to promote a critical understanding of the historical experience of East Asian societies. In addition to in-depth language study and substantial course work in the history of East Asia, students enrolling in this concentration will do one half of their tutorial work in the History Department and the other half in the East Asian Studies concentration. The sophomore tutorial in History introduces students to the analysis of historical writing in various genres, while the EAS sophomore tutorial introduces the history, literature and intellectual traditions of China, Japan, and Korea. By taking a History department research seminar or an East Asian Languages and Civilizations (EALC) research seminar, students are introduced to methods of historical research and writing and have the opportunity to conduct in-depth research projects. In the senior year, joint concentrators will work with an appropriate faculty adviser and graduate student tutor to write a thesis, an original work in some aspect of East Asian history.

1. **East Asian Language Courses (4 courses):** Four courses of study of an East Asian language.

2. **Additional Coursework (8 courses):**
   a. HIST 97.
   b. EASTD 97. Both 97 tutorials are offered in the spring term only; students may choose to take both during their sophomore spring, or to take one in the sophomore spring and the other in the junior spring.
   c. One seminar focused on East Asian History and culminating in a 20-page research paper involving primary search. Must be completed by the end of the junior spring, in preparation for the senior thesis.
   d. One course that focuses significantly on U.S. or European history.
   e. One course in pre-modern East Asian History.
f. One course in modern East Asian History.
g. Two additional electives within East Asian History.

3. **Senior Thesis (2 courses):** Students who wish to pursue a joint concentration in East Asian History must write a senior thesis, which also requires enrollment in one of two year-long senior thesis seminars: either HIST 99 or EASTD 99. Students may select either seminar.

4. **Please also note the following information:**
   a. Two types of courses count automatically toward East Asian History concentration requirements:
      i. Courses listed in courses.my.harvard.edu "History" course search (especially 1600-level courses) and "East Asian Languages and Civilizations" section (especially under "East Asian Studies," as well as "Japanese History," "Chinese History," and "Korean History"), including cross-listed courses.
      ii. Courses taught in the General Education and/or Freshman Seminar programs by full members of the History faculty or historical courses taught by faculty in East Asian Languages and Civilizations. Students wishing to count such courses toward their concentration requirements should consult the Undergraduate Office, as they may need to file a petition requiring approval by the Director of Undergraduate Studies. Students may also apply to do an independent study, or HIST 91R, with a member of the department; HIST 91R can be used to fulfill one of the elective course requirements.

   b. The joint concentration also regularly accepts credit from both Study Abroad and Advanced Standing toward concentration requirements. With the exception of certain Freshman Seminars taught by History or East Asian Studies faculty (see above), courses taken on pass/fail basis may not be counted for concentration credit.

**ADVISING**

All concentrators meet individually with the Director of Undergraduate Studies and the Assistant Director of Undergraduate Studies during the first week of each term. At other times, students are welcome to drop in during office hours as often as is desired or necessary. At the end of the sophomore year, students consult with the Director of Undergraduate Studies and the Assistant Director of Undergraduate Studies regarding their choice of disciplinary and area focus. Students are also encouraged to make appointments to meet with the Director of Undergraduate Studies, the Assistant Director of Undergraduate Studies, and faculty adviser or to come to their office hours.

For up-to-date information on advising in East Asian Studies, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

**RESOURCES**

Students of East Asia at Harvard, in whatever program, benefit from a number of unusual resources. Among these are the magnificent collections of the Harvard-Yenching Library—the Chinese collection is perhaps the most comprehensive in the world, while those on Japan and Korea also are imposing. The Harvard-Yenching Institute, in addition to its support of the library, operates programs that bring younger East Asian scholars and graduate students to Harvard. The Fairbank Center for East Asian Research and the Reischauer Institute of Japanese Studies also have a number of scholars on East Asia in residence annually, and sponsor workshops and other enriching activities. Harvard, moreover, sponsors certain study programs abroad, and the
existence of these and other opportunities has led to an increasing number of students spending one of their undergraduate years in East Asia.

HOW TO FIND OUT MORE
First-year students or sophomores interested in concentrating in East Asian Studies should contact the Director of Undergraduate Studies, Ryuichi Abe, or the Coordinator for EAS, Nicole Escolas. They can also stop by the EAS office at 9 Kirkland Place during office hours, come to the office hours of the Director of Undergraduate Studies and the Assistant Director of Undergraduate Studies, or make appointments with them. A copy of our brochure, East Asian Studies at Harvard University, A Guide for Undergraduates is available on the EAS website at http://ealc.fas.harvard.edu/undergraduate. More information can be obtained by emailing eas@fas.harvard.edu or calling 617-495-8365.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Economics

Professor Jeffrey Miron, Director of Undergraduate Studies

Economics is a social science that covers a broad subject matter in seeking to understand the social world. An economic analysis begins from the premise that individuals have goals and that they pursue those goals as best they can. Economics studies the behavior of social systems—such as markets, corporations, legislatures, and families—as the outcome of interactions through institutions between goal-directed individuals. Ultimately, economists make recommendations that they believe will make people better off.

Traditionally, economics has focused on understanding prices, competitive markets, and the interactions between markets. While topics such as monopolies and antitrust, income inequality, economic growth, and the business cycle continue to be important areas of inquiry, the subject matter of economics has broadened. Today, economists address a remarkable variety of social science questions. Will school vouchers improve the quality of education? Do politicians manipulate the business cycle? What sort of legal regime best promotes economic development? Does religiosity affect economic growth? What can be done about grade inflation? Why do people procrastinate in saving for retirement—or in doing their homework?

Economics today is a scientific discipline. Bringing their particular perspective to social science questions, economists formulate theories and collect evidence to test these theories against alternative ideas. Doing economic research involves asking questions about the social world and addressing those questions with data and models, employing mathematical and statistical tools whenever possible to aid the analysis.

An undergraduate education in economics focuses on learning to analyze the world in terms of tradeoffs and incentives—that is, to think like an economist. Students concentrating in economics begin, ordinarily, in their first year with ECON 10A and 10B, the introductory courses in economics. Because marginal conditions hold a central place among economists' analytical tools, prospective economics concentrators are required to complete math at the level of MATH 1A. Students who have already met this requirement may choose to continue their study of mathematics in order to prepare for courses that assume familiarity with more advanced topics in mathematics or for graduate study in economics. Students hoping to graduate with honors must complete additional math courses; see the specific requirements below. First-year students are also encouraged to take the required introductory statistics course. The ability to interpret quantitative data and to understand statistical arguments is essential to understanding the economy. Students who have not completed this requirement their first year are advised to fulfill it their sophomore year.

Concentrators ordinarily take four or five economics courses in their sophomore year. Two courses make up the intermediate theory sequence: one of ECON 1010A or 1011A (Intermediate Microeconomics) and one of ECON 1010B or 1011B (Intermediate Macroeconomics). These courses teach the analytical tools that economists use. The 1011 courses assume a more advanced background in mathematics than the 1010 courses. The third course generally taken in the sophomore year is ECON 970, the sophomore tutorial, which is taught in classes of eight to 10 students. The sophomore tutorial is an intensive experience aimed at helping concentrators understand the nature of economics research, discuss economic arguments both orally and in writing, and start to carry out their own research. Finally, students are advised to fulfill the econometrics requirement (ECON 1123 or 1126) in the sophomore year. This helps students get the most out of their sophomore tutorials as they use the tools learned in econometrics.
Beyond these foundational courses, all concentrators are required to take three additional elective courses in the Economics Department. Students can pursue honors either by writing a senior thesis or taking the non-thesis Advanced Course Track (ACT); see the specific requirements below. Honors candidates must also take the economics honors exam in the spring of their senior year.

In recent years, approximately 25 percent of economics concentrators have chosen to write a senior thesis. Senior thesis topics often spring from a question of interest first raised in an economics elective course. Students are therefore strongly advised to take courses before their senior year in areas in which they might want to write their theses.

Undergraduates are welcome in graduate courses and often do well in them. Because coverage of the professional literature is a primary objective of such courses, they are generally demanding and time-consuming for undergraduates.

A detailed description of the Economics Department and its requirements can be found on the Economics Undergraduate Program website. In particular, economics-interested undergraduates are encouraged to reach out to an Economics adviser at https://economics.harvard.edu/advising and to explore the handbook, Undergraduate Economics at Harvard: A Guide for Concentrators at https://economics.harvard.edu/concentrator-guide.

**REQUIREMENTS**

**Basic Requirements: 11 courses (44 credits)**

1. **Required courses:**
   a. ECON 10A and 10B (Principles of Economics). Students with Economics AP scores of 5, or A level grade of A*, or IB scores of 7, may choose to skip either/both parts of ECON 10. However, they must replace each semester of ECON 10 that is skipped with one elective course in Economics. Consult the Economics Concentrator Guide or a concentration adviser for details.
   b. MATH 1A (or placement into MATH 1B or higher on the Harvard Math Placement Exam, or an AP Calculus AB or BC score of 5). Students who place out of this course do not need to replace it with an additional course.
   c. ECON 970: Sophomore Tutorial.
   d. STAT 100, 104, 109, or 110; or Econ 20; or APMTH 101; or MATH 154. Note: the first eligible statistics course on your transcript will be the one counted for the Economics concentration.
   e. ECON 1010A or 1011A (Intermediate Microeconomics).
   f. ECON 1010B or 1011B (Intermediate Macroeconomics).
   g. ECON 1123 or 1126 (Econometrics).
   h. Three additional courses in economics that include:
      i. One course that satisfies the writing requirement (see item 5.a.).
      ii. One course that has ECON 1010A, 1010B, 1011A, or 1011B as a prerequisite.
      iii. *Note:* Some courses can be used to satisfy both the “writing” and “prerequisite” requirements simultaneously. However, a total of three economics courses must still be taken.

2. **Tutorials** (letter-graded):
   a. **Sophomore Tutorial:** ECON 970 is required, as mentioned in item 1.c.

3. **Thesis:** None required for the basic track.
4. **General Examination:** None required for the Basic Track.
5. **Other information:**
a. Writing Requirement: A list of courses that satisfy the writing requirement is available from the Undergraduate Office at https://economics.harvard.edu/courses-tutorials-and-seminars.

b. Pass/fail: Concentrators may take up to two courses pass/fail, except for (i) those courses used to fulfill items 1.a–g. of the required courses, (ii) tutorials, and (iii) courses used to meet the writing requirement in item 1.h.

c. Joint Concentrations: The Economics Department does not participate in joint concentrations.

d. Theory Requirement: Concentrators must demonstrate their command of the basic tools of economic analysis by receiving a grade of B- or higher in both ECON 1010A/1011A and ECON 1010B/1011B. (Please see a concentration adviser for the grade requirement for ECON 1010/1011AB taken prior to Fall 2014.) Students who receive below a B- in 1010A/1011A must either register for 975A or take an extra Economics elective with 1010A/1011A as a prerequisite. Those who receive below a B- in 1010B/1011B must register for 975B or take an extra Economics elective with 1010B/1011B as a prerequisite. The ECON 975AB courses involve retaking the corresponding intermediate theory course. In all cases, students must receive a grade of B- or higher in the make-up course. Concentrators will not receive a degree in Economics until this requirement is met. ECON 975AB does not satisfy any Economics electives required in item 1.h.; however, it will it be factored into the Economics GPA of students pursuing honors.

Concentrators may take either one approved Harvard Summer School class listed on the Economics Summer School webpage (https://economics.harvard.edu/summer-school) or one approved study abroad course or one approved cross-registered course at MIT to meet a course requirement for the concentration. Courses from study abroad and at MIT are approved at the department's discretion as outlined on the Department Study Abroad webpage at https://economics.harvard.edu/study-abroad.

Please note: Due to COVID-19, the Economics Department is allowing concentrators in the Classes of 2021, 2022, and 2023 to count more Harvard Summer School classes (and “study away” classes) towards the Economics concentration. Please see the Economics COVID-19 webpage (https://economics.harvard.edu/COVID19undergrad) for details.

Requirements for Honors Eligibility: 15 courses (60 credits)

1. Required courses: Same as Basic Requirements, plus:

   a. MATH 1B and one of MATH 18, MATH 21A, APMTH 21A, or a higher-level calculus course. Students who choose to skip MATH 1B do not need to replace it with an additional course.

   b. For Thesis Track Honors: ECON 985 (two terms) or 990 (two terms) and completion of a thesis.

   c. For Advanced Course Track (ACT) Honors: Two additional Economics elective courses, which must include an additional “writing” requirement and an additional “theory prerequisite.” Details in item 5.a. of this section below.

2. Tutorials (All letter-graded): Same as Basic Requirements, plus:

   a. Thesis Tutorial: As discussed in 1.b. above, Thesis Track honors candidates must enroll in ECON 985 (two terms) or ECON 990 (two terms) during their final
two terms. ECON 990 is generally for off-cycle students who are graduating in the fall term.

3. **Thesis**: Required for a recommendation for high or highest honors in Field. See item 5.a. of this section below.

4. **General Examination**: In the spring term of their senior year, all Economics honors candidates must take a general examination covering microeconomics, macroeconomics, and econometrics.

5. **Other information**: Same as **Basic Requirements**, plus:
   a. In order to be considered for an honors recommendation in Economics, a student has two options:
      i. **Thesis Track**: To be considered for a high or highest honors recommendation in Economics, a student must complete a thesis, in addition to the requirements specified above.
      ii. **Advanced Course Track**: To be considered for an honors recommendation in Economics, a student can pursue the ACT, which is the non-thesis honors option. The requirements are discussed above. As stated in item 1.c., two additional courses in Economics are required (beyond the three courses and requirements in item 1.h. in Basic Requirements). Within this total of five courses, the student must have at least two courses that have Economics 1010A, 1010B, 1011A, or 1011B as a prerequisite and at least two courses that satisfy the writing requirement.
   b. A document explaining the Economics Department honors calculations is available on the Department honors webpage at [https://economics.harvard.edu/honors-program](https://economics.harvard.edu/honors-program).

**ADVISING**

Students interested in Economics are encouraged to visit the Economics Undergraduate Advising Office, located on the first floor of Littauer Center, for information and advice about Economics courses, the Economics concentration, and their Economics interests more broadly. The office is headed by Jeffrey Miron—the Director of Undergraduate Studies—five PhD economists who serve as concentration advisers, and the Undergraduate Program Coordinator. Concentration advisers are available in the Economics Undergraduate Advising Office (Littauer 109-116) on a walk-in basis, from 10am to 4pm, Monday through Friday, during the semester; they are happy to respond to any student questions or concerns.

Concentration advisers can lift advising holds, approve concentration declaration forms, sign add/drop forms, and advise/approve courses for concentrators from study abroad. More importantly, they can explain department requirements, discuss students’ academic and research interests, offer advice on course choices, and discuss future plans, such as job possibilities or graduate or professional school.

Note: If the College is under remote instruction, the advisors will continue to hold their usual office hours via Zoom. Details are on the Economics Advising webpage at [https://economics.harvard.edu/advising](https://economics.harvard.edu/advising).

Each concentrator has an assigned adviser based on their residential House. Students will hear from their concentration adviser periodically to inform them of office hours, important deadlines, meetings, and requirements. Students may, at any time, contact their concentration adviser for help or for information. Students are also welcomed to seek advice from any of the advisers during advising office hours.
For up-to-date information on Economics advising, please see the Economics Advising webpage at https://economics.harvard.edu/advising.

STUDY ABROAD
The Economics Department supports study abroad for a term or an academic year. It is generally recommended for students to study abroad during their junior year. Students may earn concentration credit for up to one course (4 credits) taken while abroad. Students may postpone ECON 970 (sophomore tutorial) if they choose to go abroad during their sophomore year.

After choosing a university and obtaining College approval for planned courses from the Office of International Education, students should visit their concentration adviser during office hours (or contact them via email) and provide copies of course syllabi. The adviser will grant credit toward fulfilling Economics concentration requirements for appropriate courses (although some students choose not to fulfill Economics concentration requirements while abroad). To count for concentration credit, a course must be primarily economic in content and methodology and roughly equivalent in difficulty to a Harvard Economics Department course. Courses with an intermediate theory prerequisite may count toward the theory prerequisite requirement. Students who write a paper longer than 15 pages for a course can submit the graded paper to their concentration adviser, who may grant writing requirement credit for the course if the paper has substantial economic content. Details available on the Economics Study Abroad webpage at https://economics.harvard.edu/study-abroad.

HOW TO FIND OUT MORE
There is an abundance of information on the Economics Department website at https://economics.harvard.edu/undergraduate. To declare an Economics concentration, students must (1) submit their declaration on my.harvard.edu and then (2) bring a completed copy of the Economics Declaration and Plan of Study form to a concentration adviser for approval. A detailed description of the Economics Department and its requirements can be found in the Handbook, Undergraduate Economics at Harvard: A Guide for Concentrators, available online at https://economics.harvard.edu/concentrator-guide.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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* Economics does not participate in joint concentrations.
Electrical Engineering

Professor Yue Lu, Director of Undergraduate Studies
Dr. Chris Lombardo, Associate Director of Undergraduate Studies

Electrical Engineering has long played a critical role in undergirding the innovation that has improved quality of life, supported economic growth, and addressed societal problems. Its emergence as a separate field of study in the late 19th century paralleled, and was responsive to, the large-scale introduction of telegraphy and electrical lighting. Electrical engineering has continued to play a pivotal role in power and energy distribution, communications, and computation, even as the power-carrying channels have evolved from heavy metal cables to nanowires or optical fibers, the networks of communications have evolved from wires to wireless to neurons, and electrical switches have evolved from vacuum tubes to transistors to carbon nanotubes. The essential technologies that join us all together—mobile phones, laptops, wireless communications, downloaded videos, light-emitting diodes, electronic displays, the electrical power grid, and ATM transactions—are all evidence of the impact and continual innovation of electrical engineering.

Electrical Engineering is a broadly diverse field that encompasses, for example, controls, communications, signal processing, circuit design, computer engineering, and electronic and photonic devices. This concentration requires a foundational group of five courses including ENG-SCI 150, 152, 155, 156, and COMPSCI 141. It also requires completion of a minimum of three Electrical Engineering electives and two additional Engineering electives.

The objectives of the Electrical Engineering program are to provide students a solid foundation in electrical engineering within the setting of a liberal arts college for preparation for a diverse range of careers in industry and government, or for advanced work in engineering, business, law, or medicine. It enables the acquisition of a broad range of skills and attitudes drawn from the humanities, social sciences, and sciences in addition to engineering, which enhances engineering knowledge and contributes to future leadership and technical success.

The SB degree program requires a minimum of twenty courses (80 credits). The curriculum is structured with advanced courses building on the knowledge acquired in math, science, and introductory engineering science courses. Concentrators are strongly encouraged to complete the common prerequisite course sequence in their first two years at Harvard. This includes Math (through MATH 1A and 1B; plus 21A and 21B, 22A and 22B, 23A and 23B, or APMTH 21A and 21B, or 22A and 22B), Physics (through PHYSCI 12A and 12B, PHYSICS 15A and 15B, or APPHY 50A and 50B), and COMPSCI 50. Students are cautioned that it is more important to derive a solid understanding of these basic subjects than to complete them quickly without thorough knowledge; this material is extensively used in many subsequent courses. If in doubt, it may be wise to enroll in the MATH 1 sequence rather than proceed to MATH 21A or 23A with marginal preparation.

The SB programs in Electrical Engineering and Engineering Sciences share many course requirements, and there is some flexibility in moving between these programs. To get an early sample of engineering coursework, entering students are invited to enroll in ESE 6 (Environmental Science and Engineering), ENG-SCI 50 (Electrical Engineering), ENG-SCI 51 (Mechanical Engineering), and ENG-SCI 53 (Biomedical Engineering). These introductory courses have minimal prerequisites and have been very popular with prospective engineering concentrators. ENG-SCI 50 and 51 have extensive hands-on laboratory sections.
Upon graduation, students in the Electrical Engineering concentration should demonstrate the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environmental, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

REQUIREMENTS
Concentration Requirements: 20 courses (80 credits)

1. Required courses:
   a. Mathematics/Probability and Statistics/Applied Mathematics (four courses):
      i. MATH 1A and 1B; APMTH 21A and 21B, APMTH 22A and 22B, MATH 21A and 21B, MATH 22A and 22B, or MATH 23A and 23B.
      ii. Probability and Statistics (one course): ENG-SCI 150.
      iii. Applied Mathematics (one course): At least one of APMTH 104-108, or 120 (if starting in MATH 21A, 22A, or 23A or APMTH 21A or 22A).
   b. Physics (two courses): APPHY 50A, PHYSICI 12A, or PHYSICS 15A or 16; and APPHY 50B, PHYSICI 12B, or PHYSICS 15B. Appropriate advanced-level Physics courses may also fulfill this requirement (please consult with SEAS advisers).
   c. Introductory Science (two courses): LS 1A or LPS A, PHYSCI 1 or 11, PHYSCI 10, PHYSICS 15C, and other relevant introductory science courses (please consult with SEAS advisers).
   d. Computer Science (one course): COMPSCI 50, 51, or 61.
   e. Engineering Design (two courses): ENG-SCI 96 and 100HF (see item 3 below). ENG-SCI 96 must in taken in junior year, prior to ENG-SCI 100HF.
   f. Required Electrical Engineering Core (four courses): ENG-SCI 152, 155, 156, and COMPSCI 141.
   g. Electrical Engineering Electives (three courses):
      i. ENG-SCI 50 or 54, 143, 151, 153, 154, 157, 158, 159, 170, 173, 175, 176, 177.
      ii. APPHY 195.
      iii. COMPSCI 61, 143, 144R, 146, 148, 189, 249R.
      iv. BE 128, 129, 130, 131.
      v. Note: Not more than two from: ENG-SCI 50 or 54, COMPSCI 61, ENG-SCI 170.
      vi. Note: By prior approval, advanced-level Engineering Science courses relevant to Electrical Engineering and advanced-level MIT courses in Electrical Engineering.
h. **Engineering Electives (two courses):**
   i. ENG-SCI 51, 53, 111, 115, 120, 121, 123, 125, 181, 190; ESE 6, 160, 166; COMPSCI 51.
   ii. **Note:** ABET accreditation requires that all students complete at least 8 courses in math and science and 12 courses in engineering topics. Students who start in MATH MA will need to take 22 courses, and students who start in MATH 1A will need to take 21 courses, in order to fulfill the degree requirements. ENG-SCI 150 counts as a course in math. Given the number and complexity of the requirements, students interested in pursuing Electrical Engineering should consult with the Associate Director of Undergraduate Studies or Director of Undergraduate Studies about their plans of study as early as possible.

2. **Sophomore Forum:** Sophomore year. Non-credit. Spring term.

3. **Tutorial:** Required. ENG-SCI 100HF.

4. **Thesis:** Required. An individual engineering design project is an essential element of every SB program and is undertaken during the senior year as part of ENG-SCI 100HF. Faculty-supervised reading and research is an important aspect of this requirement.

5. **General Examination:** None.

6. **Other Information:**
   a. ENG-SCI 50, 51, and 53, and ESE 6: No more than two of these courses may count toward concentration credit. ENG-SCI 50 and 53 and ESE 6 can only count as an engineering elective when taken during the freshman or sophomore year.
   b. By prior petition and approval, other advanced undergraduate or graduate courses, as well as courses at MIT, can be used to satisfy general requirements and track requirements and electives. Petitions will only be considered for courses that possess engineering content at a level similar to other technical engineering courses at SEAS.
   c. **Pass/fail and SAT/UNSAT:** None of the courses used to satisfy the concentration requirements may be taken pass/fail or SAT/UNSAT.
   d. **Plan of Study:** Concentrators are required to file an approved departmental Plan of Study during their third term (i.e., the first term of their sophomore year) and to keep their plan up to date in subsequent years. All SB programs must meet the overall ABET program guidelines, a minimum of four courses in basic sciences, four courses in mathematics and twelve courses in engineering topics. Plan of Study forms may be obtained from the School of Engineering and Applied Sciences’ Office of Academic Programs, SEC 1.101, and from the SEAS website at https://www.seas.harvard.edu/electrical-engineering/undergraduate-programs/concentration-information/concentration-requirements.
   e. **Additional Terms:** Concentrators who wish to remain beyond the end of the second term of their senior year to complete the SB requirements must be approved to do so by the Undergraduate Engineering Committee. A written petition is required and should always be submitted as early as possible and under discussion with the Associate Director of Undergraduate Studies or Director of Undergraduate Studies. Petitions can be submitted no later than January 15 between the student’s fifth and sixth terms (i.e., middle of junior year), or August 15 between the student’s fifth and sixth terms if the student’s fifth term is the spring. Under no circumstances will the Committee grant a student permission for more than two additional terms. Petitions are only granted in exceptional cases and only to meet specific SB degree requirements. More information can be found on the SEAS website at https://www.seas.harvard.edu/electrical-engineering/undergraduate-programs/concentration-information/concentration-requirements.
   f. **Joint Concentrations:** Electrical Engineering does not participate in joint concentrations.
g. Only one of ENG-SCI 91R (4 credits) or ENG-SCI 91HFR (4 credits) can count as an approved elective in the degree requirements.

h. Any exceptions to these policies must be approved via written petition.

ADVISING
Students interested in concentrating in Electrical Engineering should discuss their plans with the Director of Undergraduate Studies or the Associate Director of Undergraduate Studies. Each undergraduate who elects to concentrate in Electrical Engineering is assigned a faculty adviser depending on the student's area of specialization. The faculty adviser might also be a member of the Undergraduate Engineering Committee, whose members have the responsibility for reviewing departmental Plans of Study. If students do not request a change in adviser, they have the same adviser until they graduate. Each student is reassigned to another faculty member while the original faculty adviser is on leave. It is expected that students will discuss their Plans of Study and progress with their Director of Undergraduate Studies or Associate Director of Undergraduate Studies at the beginning of each term. Students may seek advice from their faculty adviser, the Director of Undergraduate Studies, the Associate Director of Undergraduate Studies, or the Academic Programs Administrator at any time.

HOW TO FIND OUT MORE
Further information is available from the Director of Undergraduate Studies, Professor Yue Lu, yuelu@seas.harvard.edu, (617) 496-8615; and the Associate Director of Undergraduate Studies, Dr. Christopher Lombardo, lombardo@seas.harvard.edu, (617) 496-5185. Students can also contact the Academic Programs Administrator, Sarah Colgan, scolgan@seas.harvard.edu, in the SEAS Office of Academic Programs (SEC 1.101).

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Electrical Engineering was a new concentration in 2012-13.
Engineering Sciences

Professor Zhiming Kuang, Director of Undergraduate Studies

Engineering innovation has long played a critical role in enhancing social progress and bringing about an improved quality of life. Within the past 50 years, the pace and impact of innovation have increased dramatically, facilitating modern health, energy, transportation, communications, and computational infrastructures that knit together the countries of the world. At the same time, engineering innovation has enabled dramatic advances in basic science. Imaging and manufacturing structures at the nanoscales, near-lossless transmission of information, and unprecedented levels of computational power have led to fantastic new discoveries. These types of technologies, for instance, have allowed us to decode the genome, understand the formation of galaxies, and make correlations between social networks and underlying human psychology. In the 21st century, rapid and efficient access to the new innovations, necessary to tackle today’s myriad challenges, has become even more imperative. Equally important is the need to educate both those who will be future engineering innovators and those who will use those innovations, deploy them, and make critical legal and political decisions about them.

Engineering has evolved over the years to not only dive deeply into specific fields, but also to seek out solutions to real-world problems by combining concepts from a broad range of scientific inquiries and innovations. For example, robotics is a highly interdisciplinary field that straddles multiple traditional engineering disciplines such as mechanical, electrical, and materials engineering and computer science. While roboticists have traditionally been trained in specific engineering disciplines, next generation roboticists must tackle large complex systems comprising multiple parts that span myriad disciplines—from the mechanical underpinnings of the physical device to electronic control, materials properties, and high-level algorithms—all of which must work in concert to achieve broad-level objectives while adhering to numerous constraints. Alternative energy is another growing and immensely important field that requires integration of solutions across a wide range of science and engineering disciplines. Topics range from understanding the inherent properties of materials and devices that harness the sun’s rays to thinking about challenges associated with large-scale production and distribution of electricity and addressing both the societal and environmental impacts of new technologies. The Engineering Sciences concentration is ideally positioned to provide students with both the breadth and depth of study needed to excel in these and other exciting integrative areas of engineering within the liberal arts setting of Harvard.

Harvard offers two degrees in Engineering Sciences: the Bachelor of Arts (AB) and the Bachelor of Science (SB). The degree requirements differ for each of these programs: the AB program requires between 14 and 16 courses (56-64 credits) and the SB program requires 20 courses (80 credits). Students in the Engineering Sciences AB program specialize in one of four engineering tracks: biomedical sciences and engineering, electrical and computer engineering, engineering physics, or mechanical and materials science and engineering. Students interested in an AB degree may also consider the Biomedical Engineering concentration and the Environmental Science and Engineering concentration, which are also listed in this publication. Students pursuing the SB degree in the Engineering Sciences concentration typically specialize in one of two tracks: Bioengineering or Environmental Science and Engineering. Students interested in an SB degree specializing in Electrical Engineering or Mechanical Engineering should refer directly to those concentrations, which are also listed in this publication. Students may also apply to a cross-disciplinary track within the Engineering Sciences SB program, which provides the opportunity to learn between or across traditional engineering areas.
The SB degree program requires a minimum of 20 courses (80 credits). The curriculum is structured with advanced courses building on the knowledge acquired in math, science, and introductory Engineering Science courses. Concentrators are encouraged to complete the common prerequisite course sequence in their first two years at Harvard. This includes Math (through MATH 1A and 1B; plus 21A and 21B, 22A and 22B, 23A and 23B, or APMTH 21A and 21B, or 22A and 22B), Physics (through APPHY 50A and 50B, PHYSSCI 12A and 12B, or PHYSICS 15A and 15B), and COMPSCI 50 or APMTH 10. Students are cautioned that it is more important to derive a solid understanding of these basic subjects than to complete them quickly without thorough knowledge; this material is extensively used in many subsequent courses. If in doubt, it may be wise to enroll in the MATH 1 sequence rather than proceed to MATH 21A or 23A with marginal preparation.

The SB and AB degree programs in Engineering Sciences share many course requirements, and there is some flexibility in moving between these programs. To get an early sample of engineering coursework, entering students are invited to enroll in ESE 6 (Environmental Science and Engineering), ENG-SCI 50 (Electrical Engineering), ENG-SCI 51 (Mechanical Engineering), and ENG-SCI 53 (Biomedical Engineering). These introductory courses have minimal prerequisites with extensive hands-on laboratory sections and have been very popular with prospective engineering concentrators.

The Engineering Sciences program seeks to educate future leaders that have the technical background necessary to develop and critically evaluate the next wave of engineering innovations; to apply these innovations to important global and local problems; and to make informed decisions about them in a societal context.

Upon graduation, students in the Engineering Sciences AB concentration should demonstrate the following student outcomes:

- Quantitative problem-solving skills based in the fundamentals of mathematics, basic sciences, engineering sciences, and engineering design.
- The ability to apply engineering principles to problems in a range of fields and with important societal, economic, and environmental impacts.
- The ability to communicate technical information clearly and efficiently through written, visual, or oral presentations.

Upon graduation, students in the Engineering Sciences SB concentration should demonstrate the following student outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environmental, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

OPTIONS

1. Bachelor of Arts in Engineering Sciences
   - Biomedical Sciences and Engineering
   - Electrical and Computer Engineering
   - Engineering Physics
   - Mechanical and Materials Science and Engineering

2. Bachelor of Science in Engineering Sciences
   - Bioengineering
   - Environmental Science and Engineering
   - Cross-disciplinary

REQUIREMENTS

Bachelor of Arts (AB) in Engineering Sciences: 14-16 courses (56-64 credits)

1. Required courses for all tracks:
   a. Mathematics (four courses): MATH 1A and 1B; APMTH 21A and 21B, APMTH 22A and 22B, MATH 21A and 21B, MATH 22A and 22B, MATH 23A and 23B, or higher levels.
   b. Physics (two courses): APPHY 50A, PHYSCI 12A, or PHYSICS 15A or 16; and APPHY 50B, PHYSCI 12B, or PHYSICS 15B. Appropriate advanced-level physics courses may also fulfill this requirement (please consult with SEAS advisers).
   c. Computer Science (one course): COMPSCI 50, 51, or 61.

2. Tracks:
   a. Biomedical Sciences and Engineering – Mechanical Subtrack, Electrical Subtrack, and Chemical and Materials Subtrack:
      i. Required for all Subtracks (three courses):
         1. ENG-SCI 53 and BE 110.
         2. LS 1A.
      ii. Required for Mechanical Subtrack (four courses):
         1. ENG-SCI 120, 123, and 181.
         2. Either ENG-SCI 54 or 153.
      iii. Required for Electrical Subtrack (four courses):
         1. ENG-SCI 150.
         2. Circuits: Select ENG-SCI 54 or 153, or both of ENG-SCI 152 and COMPSCI 141.
      iv. Required for Chemical and Materials Subtrack (four courses):
         1. ENG-SCI 123, 112 or 181, and BE 191 (preferred) or ENG-SCI 190.
         2. PHYSCI 1.
      v. Approved Electives (two courses):
         1. ENG-SCI 51, 91R (one term only), 120, 123, 128, 181,190, 211, 220, 221, 228, 240.
         2. BE 121, 125, 128, 129, 130, 131, 191.
3. Either APMTH 101 or ENG-SCI 150.
4. One from ENG-SCI 54, 153.
5. PHYSICS 136, 140, 143A, 151, 153.
6. One from PHYSCI 1, CHEM 17 or 20.
7. APMTH 104 or 105.

b. Electrical and Computer Engineering:
   i. **Required (five courses):**
      1. ENGSCI 150, 152, 155, and 156, and COMPSCI 141.
   ii. **Approved Electives (four courses):**
       1. BE 128, 129, 130, 131.
       2. ENG-SCI 50, 51, 53, 91R (one term only), 120, 121, 123, 151, 159, 173, 175, 177, 181, 183, 190.
       3. COMPSCI 51, 141, 143, 144r, 146, 148, 175.
       4. APMTH 104, 105, 108.
       5. APPHY 195.
       6. CHEM 160.
       7. PHYSICS 143A, 153.

c. Engineering Physics – Materials, Optoelectronics, and Photonics Subtrack and Earth and Planetary Physics Subtrack:
   i. **Required for all Subtracks (four courses):**
      2. ENG-SCI 190.
      3. Either ENG-SCI 181 or PHYSICS 181.
      4. Either PHYSICS 143A or CHEM 160.
   ii. **Required for Materials, Optoelectronics, and Photonics Subtrack (three courses):**
       1. ENG-SCI 173 and 177.
       2. Either APPHY 195 or ENG-SCI 120.
   iii. **Required for Earth and Planetary Physics Subtrack (three courses)**
       1. One from E-PSCI 121, ASTRON 110, 189.
       2. One from ENG-SCI 120, E-PSCI 161, 166, 171.
       3. One from ENG-SCI 123, ESE 131, 132, 162.
   iv. **Approved Electives (two courses):**
       1. PHYSICS 140, 153, 175.
       2. E-PSCI 161, 166, 171.
       3. ASRON 110, 189.
       4. APPHY 195.
       5. APMTH 104, 105, 108, 120.
       6. ESE 131, 132, 162.
       7. ENG-SCI 51, 53, 91R (one term only), 111, 115, 120, 123, 125, 128, 153, 173, 175, 177.

d. Mechanical and Materials Science and Engineering
   i. **Required (seven courses):**
      1. ENG-SCI 120, 123, 125, 181, and 190.
      2. One from APMTH 104, 105, 120, ENG-SCI 111.
      3. One from ENG-SCI 54 or 153, or both of ENG-SCI 152 and COMPSCI 141 (if both ENG-SCI 152 and COMPSCI 141 are taken, the second course can count as an elective below).
   ii. **Approved Electives (two courses):**
      1. BE 110.
      2. COMPSCI 141.
      3. ENG-SCI 50, 51, 53, 54, 91R (one term only), 96, 128, 151, 152, 156, 159, 173, 175, 177, 183, 192.
      4. ESE 131, 132, 162.
5. APPHY 195.
6. CHEM 160.
7. PHYSICS 143A.

4. General Examination: None.
5. Thesis: Required for recommendations of high honors and highest honors, and for joint concentrators.
6. Other information:
   a. Advanced Placement credit in MATH 1A or 1B can be included in satisfying the requirement of 16 courses, thus potentially reducing the number of required courses to 14 or 15. Credit for additional courses such as MATH 21A or 21B does not further reduce the number of required courses. Moreover, in cases when a course can satisfy both an elective and a requirement of a track, the total number of courses is not reduced. In these cases, additional electives must be taken.
   b. By prior petition and approval, other advanced undergraduate or graduate courses, as well as courses at MIT, can be used to satisfy general requirements and track requirements and electives. Electives alternative to those listed in the tracks may be counted for credit upon prior petition and approval. Petitions will only be considered for courses that possess engineering content at a level similar to other technical engineering courses at SEAS.
   c. ENG-SCI 50, 51, and 53, ESE 6: No more than two of these courses may count toward concentration credit. ENG-SCI 50, and ENG-SCI 53, and ESE 6 can only count as an engineering elective when taken during the freshman or sophomore year.
   d. Only one of ENG-SCI 91R (4 credits) or ENG-SCI 91HFR (4 credits) can count as an approved elective in the degree requirements.
   e. Pass/fail or SAT/UNSAT: None of the courses used to satisfy concentration requirements may be taken pass/fail or SAT/UNSAT.
   f. Plan of Study: Concentrators are required to file an approved departmental Plan of Study and to keep their plan up to date in subsequent years. Plan of Study forms may be obtained from the Office of Academic Programs (SEC 1.101) or from the School of Engineering and Applied Sciences (SEAS) website at http://seas.harvard.edu.
   g. Joint Concentrations: The Engineering Sciences AB program participates in joint concentrations (though the Engineering Sciences SB program does not participate in joint concentrations). The requirements for joint concentrators are the same as for sole concentrators; in addition, a joint concentrator is required to write an interdisciplinary thesis that combines the two fields. This thesis is required regardless of whether Engineering Sciences AB is the primary or allied concentration.
   h. Any exceptions to these policies must be approved via written petition.

Bachelor of Science (SB) in Engineering Sciences: 20 courses (80 credits)

Prospective concentrators are encouraged to make early contact with concentration representatives. Students wishing to enter the concentration must obtain the appropriate Engineering Sciences SB Plan of Study and related instructions for their intended Track from the Office of Academic Programs (SEC 1.101) or on the SEAS website (Bioengineering Track at https://www.seas.harvard.edu/bioengineering/undergraduate-program/concentration-information/concentration-requirements, or Environmental Science and Engineering Track at https://www.seas.harvard.edu/environmental-science-engineering/undergraduate-program/concentration-information/concentration) and review materials before meeting with an Assistant/Associate Director or the Director of Undergraduate Studies. Students should be
aware that the Engineering Sciences SB degree is more demanding than typical AB degrees, requiring 20 courses (80 credits).

Students typically follow specific guidelines provided for one of two tracks: Bioengineering or Environmental Science and Engineering. Students interested in an SB degree specializing in Electrical Engineering or Mechanical Engineering should refer directly to those concentrations. Students may also apply to a cross-disciplinary track in their junior or senior years, which provides the opportunity to learn between or across traditional engineering areas.

In addition to the courses listed specifically below, other relevant and/or advanced courses may be approved by petition in the context of a particular Plan of Study. A petition must propound in writing a coherent and persuasive argument for the intellectual merit of the proposal in question.

1. **Required courses for all tracks:**
   a. **Mathematics/Probability and Statistics/Applied Mathematics (four courses):**
      i. MATH 1A and 1B; and APMTH 21A and 21B, APMTH 22A and 22B, MATH 21A and 21B, MATH 22A and 22B, or MATH 23A and 23B. (Note: Students who start in MATH 1A will not be required to satisfy either the probability and statistics requirement or the applied math requirement. Students who start in MATH 1B must take a course that satisfies the probability and statistics requirement. Students who start in MATH 21A, 22A, 23A, or APMTH 21A or 22A must complete the courses in both probability and statistics and applied mathematics.)
      ii. Probability and Statistics (one course): At least one of APMTH 101, ENG-SCI 150, or STAT 110 (if starting in MATH 1B, 21A, 22A, or 23A, or APMTH 21A or 22A). Please note that ENG-SCI 150 is preferred for students pursuing the Electrical Subtrack of the Bioengineering Track.
      iii. Applied Mathematics (one course): At least one of APMTH 104, 105, 106, or 107 (if starting in MATH 21A or 23A or APMTH 21A).
   b. **Physics (two courses):** APPHY 50A, PHYSCI 12A, PHYSICS 15A or 16; APPHY 50B, PHYSCI 12B, or PHYSICS 15B. Appropriate advanced-level Physics courses may also fulfill this requirement (please consult with SEAS advisers).
   c. **Computer Science (one course):** APMTH 10, COMPSCI 50, 51, or 61.
   d. **Engineering design (two courses):** ENG-SCI 96 and ENG-SCI 100HF (see item 4 below). ENG-SCI 96 must in taken in junior year, prior to ENG-SCI 100HF.

2. **Tracks**
   a. Bioengineering – Mechanical Subtrack, Electrical Subtrack, and Chemical and Materials Subtrack:
      i. **Required for all Subtracks (five courses):**
         1. ENG-SCI 53, BE 110.
         2. Engineering Electives (three courses): Three courses from the list in item 7 (any area), with at least two at the 100 or 200 level.
      ii. **Required for Mechanical Subtrack:**
         1. Biology and/or Chemistry (two courses): Two of the following: LS 1A or LPS A, LS 1B, PHYSCI 1, PHYSCI 10, PHYSCI 11, and, by approval, other relevant introductory courses in biology or chemistry (please consult with SEAS advisers).
         2. Mechanical core (four courses): ENG-SCI 120, 123, 181, and ENG-SCI 190 or BE 191 (preferred).
      iii. **Required for Electrical Subtrack:**
         1. Biology and/or Chemistry (two courses): Two of the following: LS 1A or LPS A, LS 1B, PHYSCI 1, PHYSCI 10, PHYSCI 11, and, by
approval, other relevant introductory courses in biology or chemistry (please consult with SEAS advisers).
2. Electrical core (four courses):
   a. Circuits: ENG-SCI 54 or 153, or both of ENG-SCI 152 and COMPSCI 141 (If both ENG-SCI 152 and COMPSCI 141 are taken, the second course can count as the Electrical Engineering elective below.)
   b. At least two courses from: BE 128, 129, 130, 131, ENG-SCI 157 (formerly 155).
   c. Up to one additional Electrical Engineering elective to reach 4 courses for the Electrical core.
   
iv. Required for Chemical and Materials Subtrack:
   1. Biology and/or Chemistry (one course): LS 1A or LPS A, LS 1B, PHYSCI 1, PHYSCI 10, PHYSCI 11, and, by approval, other relevant introductory courses in biology or chemistry (please consult with SEAS advisers).
   2. Organic Chemistry (one course): CHEM 17 or 20.
   3. Chemical & Materials core (four courses): ENG-SCI 123, BE 121 or 125, ENG-SCI 112 or 181, and ENG-SCI 190 or BE 191 (preferred).

b. Environmental Science and Engineering
i. Chemistry (two courses): Two from: PHYSCI 11 (preferred) or PHYSCI 1; LS 1A or LPS A; PHYSCI 10; CHEM 17 or 20.
   1. Note: Students should be aware that many upper-level courses in the Environmental Science and Engineering track have PHYSCI 1 or 11 as a prerequisite.
ii. Environmental Science and Engineering core (five courses):
   1. ESE 6.
   3. Engineering breadth (three courses): One upper-level (>100) course from each of the following depth areas (see item 7 below):
      b. Electrical.
      c. Engineering Physics and Chemistry.
   4. Engineering electives (one course): At least one course from the list in item 7 (any area).

c. Cross-disciplinary
i. Biology and/or Chemistry (two courses): Two of the following: LS 1A or LPS A; LS 1B, PHYSCI 1 or 11; PHYSCI 10; and, by approval, other relevant introductory courses in biology or chemistry (please consult with SEAS advisers).
ii. Engineering depth (three courses): At least three courses from one area of Engineering Sciences (see item 7 below).
iii. Engineering breadth (three courses): At least three courses from three other areas of Engineering Sciences (see item 7 below).
iv. Engineering electives (three courses): At least three courses in Engineering Sciences or relevant related fields with engineering topics (see items 7 below).
4. Tutorial: Required. ENG-SCI 100HF.
5. Thesis: Required. An individual engineering design project is an essential element of every SB program and is undertaken during the senior year as part of ENG-SCI 100HF. Faculty-supervised reading and research is an important aspect of this requirement.
6. **General Examination**: None.

7. Engineering Sciences courses organized by area:
   
   a. Biomedical: ENG-SCI 53, 211, 221, 228, BE 110, 121, 125, 128, 129, 130, 131, 191.
   
   b. Computer: COMPSCI 51, 61, 120, 124, 141, 143, 144r, 146, 148, 175, 179, 181, 182, 183, 187, 189R, 249R.
   
   c. Electrical: ENG-SCI 50, 54, 143, 151, 152, 153, 154, 155, 156, 157, 158, 159, 170, 173, 175, 176, 177, COMPSCI 141, 143, 144R, 146, 148, 189R, 249R.
   
   
   

8. **Note**: Students entering Harvard with secondary school preparation that places them beyond the level of any of the required courses listed above may substitute appropriate advanced level courses. However, ABET accreditation requires that all students complete at least 8 courses in math and science and 12 courses in engineering topics. Students who start in MATH MA will need to take 21 courses in order to fulfill the degree requirements. Given the number and complexity of the requirements, students interested in pursuing Engineering should consult with the Director or Assistant/Associate Director of Undergraduate Studies about their Plans of Study as early as possible.

9. **Other Information**:
   
   a. By prior petition and approval, other advanced undergraduate or graduate courses, as well as courses at MIT, can be used to satisfy general requirements and track requirements and electives. Petitions will only be considered for courses that possess engineering content at a level similar to other technical Engineering courses at SEAS.
   
   b. ENG-SCI 50, 51, and 53, ESE 6: No more than two of these courses may count towards concentration credit. ENG-SCI 50, 53, and ESE 6 can only count as an Engineering elective when taken during the freshman or sophomore year.
   
   c. Only one of ENG-SCI 91R (4 credits) or ENG-SCI 91HFR (4 credits) can count as an approved elective in the degree requirements.
   
   d. **Pass/fail or SAT/UNSAT**: None of the courses used to satisfy the concentration requirements may be taken pass/fail or SAT/UNSAT.
   
   e. **Plan of Study**: Students entering the concentration must file an Engineering Sciences SB Plan of Study and present an intellectually coherent plan in consultation with an Assistant/Associate Director or the Director of Undergraduate Studies. Subsequent modifications to the plan must be reviewed by a relevant Assistant/Associate Director of Undergraduate Studies.
   
   f. **Cross-Disciplinary Track Requirements**: Admission to the cross-disciplinary track is by application. To apply to the track, students must have at least a 3.5 College grade point average at the time of application. Applications can be submitted no earlier than the end of sophomore year, and no later than the fifth Monday of the student's seventh semester.
   
   g. **Additional Terms**: Concentrators who wish to remain beyond the end of the second term of their senior year to complete the SB requirements must be approved to do so by the Undergraduate Engineering Committee. A written petition is required and should always be submitted as early as possible and under discussion with the Assistant/Associate Director of Undergraduate Studies or Director of Undergraduate Studies. Petitions can be submitted no later than January 15 between the student's fifth and sixth terms (i.e., middle of junior year), or August 15 between the student's fifth and sixth terms if the student's fifth term is the spring. Under no circumstances will the Committee grant a student permission for more than two additional terms. Petitions are only granted in exceptional cases, and only to meet specific SB degree requirements. More
information can be found on the SEAS website for the Bioengineering Track at https://www.seas.harvard.edu/bioengineering/undergraduate-program/concentration-information/concentration-requirements, or the Environmental Science and Engineering Track at https://www.seas.harvard.edu/environmental-science-engineering/undergraduate-program/concentration-information/concentration.

h. **Joint Concentrations.** The Engineering Sciences SB program does not participate in joint concentrations.

i. Any exceptions to these policies must be approved via written petition.

**ADVISING**

Students interested in concentrating in Engineering Sciences should discuss their plans with the Director of Undergraduate Studies or the Assistant/Associate Director of Undergraduate Studies. Each undergraduate who elects to concentrate in Engineering Sciences is assigned a faculty adviser depending on the student's track. The faculty adviser might also be a member of the Undergraduate Engineering Committee, whose members have the responsibility for reviewing departmental Plans of Study. If students do not request a change in adviser, they have the same adviser until they graduate. Each student is reassigned to another faculty member while the original faculty adviser is on leave. It is expected that students will discuss their Plans of Study and progress with their Director of Undergraduate Studies or Assistant/Associate Director of Undergraduate Studies at the beginning of each term. Students may also seek advice from their faculty adviser, the Director of Undergraduate Studies, or the Assistant/Associate Director of Undergraduate Studies, or the Academic Programs Administrator at any time.

**HOW TO FIND OUT MORE**

Further information is available from the Director of Undergraduate Studies in Engineering Sciences, es-dus@seas.harvard.edu; or the relevant Assistant/Associate Director of Undergraduate Studies: for Mechanical and Materials Science and Engineering and Electrical and Computer Engineering, Dr. Christopher Lombardo (lombardo@seas.harvard.edu); for Bioengineering, Dr. Linsey Moyer (lmoyer@seas.harvard.edu); for Environmental Science and Engineering, Dr. Bryan Yoon (byoon@seas.harvard.edu). Students can also contact the Academic Programs Administrator, Sarah Colgan (scolgan@seas.harvard.edu) in the SEAS Office of Academic Programs (SEC 1.101).

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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Humans use stories to cope and thrive, from prehistoric cave paintings to distilling experience in novels, screenplays, and hip-hop rhymes. By studying English literature, you will learn how to analyze and appreciate the language of the past and to contribute to the narrative of the future. You will develop expertise in interpreting others’ rhetoric and learn to communicate meaningfully yourself – skills that are more crucial than ever with the explosion of online forms of textual exchange. In addition, you will be exposed to the dazzling imaginary worlds that have brought readers and writers together across vast expanses of space and time.

The path through English normally begins with the Gateway Course, English 10: Literature Today. This wide-ranging lecture course, exploring writing since the year 2000, is geared particularly towards students in their first or second years as an introduction to English literary study at Harvard. The course focuses on work by contemporary writers from around the world and speaks directly to today’s urgent problems—exclusionary and divisive politics, economic disruption, technological innovation, social alienation, racism, misogyny, and colonialism.

Our two Common Courses, normally completed by the end of sophomore year, give students the tools they need to succeed in the concentration. English 20: Literary Forms, introduces the concepts of style, form, and genre, exploring how writers use literary language to address personal and societal concerns and challenges. English 97: Sophomore Tutorial: Literary Methods, looks at the questions that arise when we make the written word an object of study. What is the secret power of literary interpretation? How do our personal histories inform encounters with literature? How do critical race theory, psychology, gender studies, linguistics, political science, philosophy, and more alter our approach to reading and writing? Together, the Gateway and Common Courses provide a shared foundation for literary study among each year's cohort of students.

Junior Tutorials, required of all concentrators, let students define their own areas of study and produce original research on that topic. Through additional electives, students pursue a range of topics and approaches, always exploring how literature reflects and changes the world. Among their electives, concentrators must include three courses focused on literary periods (pre-1700, 1700–1900, and 1900–2000), which provide students the historical knowledge essential to understanding literature’s transformations. In studying historical literatures, students learn how each literary period struggles to find new expressions to fit its contemporary moment by building on earlier innovations and styles. Most elective courses meet one of these period requirements.

Through their coursework, students will acquire knowledge of:

- The global breadth and historical depth of writing in English;
- Some of the myriad bodies of imaginative writing produced in the English language, in its many and proliferating forms, across space and time;
- The roles of genres, intellectual traditions and media, and of the cultural forces of privilege, oppression, and marginalization, in shaping literary production;
- The history of English studies as a field, and what is at stake in that history.
English concentrators can pursue either the Honors Program or the Elective Program. Students in the Honors Program write a two-semester senior honors thesis or a one-semester senior project. In either format, students may investigate a critical topic or produce creative work. Professors in the English faculty direct all theses or projects. The Elective Program omits the senior project or thesis. A third option, for honors candidates only, is a joint concentration, which culminates in a thesis supervised by faculty in English and one other department. All honors candidates must have a concentration grade point average of 3.40 or higher and of 3.60 or higher for the joint concentration.

We offer a wide array of creative writing workshops in poetry, fiction, and nonfiction, as well as work for screen, stage, and other media. Our workshops are small, providing writers an opportunity to focus intensively on one genre. All undergraduates may apply for admission to creative writing workshops, though preference is given to English concentrators.

A degree in English prepares students for any field that values clear expression, careful reading, critical thinking, and persuasive writing. Our concentrators go on to careers in media and publishing, as novelists, journalists, playwrights, and poets, as well as to careers in law, education, business, medicine, politics, and many other fields. They will enter those fields confident in their ability to:

- Speak and write persuasively and with nuance in one or more literary genres, including the genres of non-fiction;
- Enjoy literary texts aesthetically (in the body) and philosophically (in the mind);
- Analyze texts from stylistic, generic, contextual, and theoretical perspectives;
- Understand the difference between good and bad arguments;
- Conduct research and present it lucidly in oral and written forms;
- Read, perform, and write literary texts with a trained awareness of how they at once shape and are shaped by the societies in which they are written and received.

We commit ourselves to helping students immerse themselves in the literary worlds they know and love, discover new worlds they might not think to explore, acquire the means to find their own paths, and sustain themselves on their intellectual and creative journeys.

The requirements detailed below apply to students declaring a concentration in English beginning in academic year 2020-21. Students declaring the concentration prior to 2020-21 should consult the relevant archived version of the Handbook for Students at https://registrar.fas.harvard.edu/archived-handbooks and contact the Department for further information.

**REQUIREMENTS**

**Honors Program: 14 courses (56 credits)**

1. *Required Courses and Tutorials – 4 courses:*
   a. ENGLISH 10: Literature Today.
   b. ENGLISH 20: Literary Forms.
   d. ENGLISH 98R: Junior Tutorial.

2. *Electives – 8 or 9 courses:*
   a. One must primarily address texts written before 1700 (see 4.b.).
   b. One must primarily address texts written between 1700 and 1900 (see 4.b.).
c. One must primarily address texts written between 1900 and 2000 (see 4.b.).

d. Two may be creative writing workshops (see 4.c.).

e. One may be a related course from outside the English Department (see 4.d.).

f. Note: A student writing a two-semester senior thesis completes 8 electives. A student writing a one-semester senior project completes 9 electives.

3. Senior Thesis or Senior Project – 1 or 2 courses:

a. The Senior Thesis: The two-term senior tutorial, ENGLISH 99R, culminates in an honors thesis. Students may investigate any critical or research question in literary studies, or may write an imaginative work in any creative genre. Theses are by application during the junior year. Students applying to write a creative thesis should have taken at least one course in creative writing by the middle of their junior year. Thesis applicants may be asked to propose a senior project in its place.

b. The Senior Project: Students may instead complete a senior project in the fall semester. Senior projects may resemble senior theses, but on a smaller scale, or may explore more public-facing forms of writing. Students who choose this option will be eligible to receive a departmental degree recommendation of “honors” or “high honors.”

4. Other Information:

a. Grading Basis and Concentration Grade Point Average: All letter-graded courses taught by English department faculty will count for the concentration grade point average. Courses counting for concentration credit must be taken for a letter grade. The only exceptions are the Senior Thesis Tutorial and one Freshman Seminar, if taught by a member of the English department faculty, which are graded SAT/UNSAT.

b. Historical Period Requirements: Courses meeting these requirements introduce students to the variety of writers and genres that make up the 1300-year tradition of literature in English.

c. Creative Writing Courses: Admission to creative writing courses is by application only. No more than two creative writing courses may count toward the total number of required courses for the concentration. Students may apply to and enroll in as many as their Plan of Study can accommodate.

d. Related Course: Students may petition to count one related course (ordinarily from other humanities departments) as an English elective.

e. Oral Examination for Highest Departmental Honors: To qualify for a departmental degree recommendation of highest honors, all eligible senior honors concentrators must take an oral examination during reading period of their final term. Eligibility is determined by concentration grade point average and thesis grades, explained in detail on the department’s website.

Elective Program: 12 courses (48 credits)

1. Required Courses and Tutorials – 4 courses:
   a. ENGLISH 10: Literature Today.
   b. ENGLISH 20: Literary Forms.
   d. ENGLISH 98R: Junior Tutorial.

2. Electives – 8 courses:
   a. One must primarily address texts written before 1700 (see 4.b.).
   b. One must primarily address texts written between 1700 and 1900 (see 4.b.).
c. One must primarily address texts written between 1900 and 2000 (see 4.b.).
d. Two may be creative writing workshops (see 4.c.).
e. One may be a related course from outside the English Department (see 4.d.).

3. **Thesis** – None.

4. **Other Information:**
   a. *Grading Basis and Concentration Grade Point Average:* All letter-graded courses taught by English department faculty will count for the concentration grade point average. Courses counting for concentration credit must be taken for a letter grade. The only exception is one Freshman Seminar, if taught by a member of the English department faculty, which is graded SAT/UNSAT.
   b. *Historical Period Requirements:* Courses meeting this requirement introduce students to the variety of writers and genres that make up the 1300-year tradition of literature in English.
   c. *Creative Writing Courses:* Admission to creative writing courses is by application only. No more than two creative writing courses may count toward the total number of required courses for the concentration. Students may apply to and enroll in as many as their Plan of Study can accommodate.
   d. *Related Course:* Students may petition to count one related course (ordinarily from other humanities departments) as an English elective.

**Joint Concentration: 7 or 9 courses (28 or 36 credits) in English**

Upon approval from the Director of Undergraduate Studies, honors candidates may combine a concentration in English with a concentration in another department, supervised by advisers in each department. Joint concentrators may declare English to be either their primary or allied concentration; the requirements are the same for both, with the exception of the Thesis Tutorial (99r), which is listed in the primary concentration. Ordinarily, only students with a concentration GPA of 3.60 or above, an overall strong record, and a clearly formulated project across two disciplines will receive approval. A joint senior thesis is required.

1. **Required Courses and Tutorials – 4 courses:**
   a. ENGLISH 10: Literature Today.
   b. ENGLISH 20: Literary Forms.
   d. ENGLISH 98R: Junior Tutorial.

2. **Electives – 3 courses:**
   a. One must primarily address texts written before 1700 (see 4.b.).
   b. One must primarily address texts written between 1700 and 1900 (see 4.b.).
   c. One must primarily address texts written between 1900 and 2000 (see 4.b.).

3. **Senior Thesis – 0 or 2 courses:**
   a. The Senior Thesis: The two-term senior tutorial, ENGLISH 99R, culminates in an honors thesis, and theses are by application during the junior year. Students may investigate any critical or research question in literary studies, or may write an imaginative work in any creative genre. Students applying to write a creative thesis should have taken at least one course in creative writing by the middle of their junior year.
   
   b. *Note:* If English is the allied field, the senior tutorial is taken in the primary concentration and the student does not enroll in ENGLISH 99R.

4. **Other Information:**
a. **Grading Basis and Concentration Grade Point Average:** All letter-graded courses taught by English department faculty will count for the concentration grade point average. Courses counting for concentration credit must be taken for a letter grade. The only exceptions are the Senior Thesis Tutorial and one Freshman Seminar, if taught by a member of the English department faculty, which are graded SAT/UNSAT.

b. **Historical Period Requirements:** Courses meeting these requirements introduce students to the variety of writers and genres that make up the 1300-year tradition of literature in English.

c. **Creative Writing Courses:** Admission to creative writing courses is by application only. Students may apply to and enroll in as many as their Plan of Study can accommodate.

d. **Oral Examination for Highest Departmental Honors:** To qualify for a departmental degree recommendation of highest honors, all eligible senior honors concentrators must take an oral examination during reading period of their final term. Eligibility is determined by concentration grade point average and thesis grades, explained in detail on the department’s website.

The requirements outlined above are intended for students declaring a concentration in English beginning in academic year 2020-21.

**ADVISING**
The English Department is committed to providing high quality advising to undergraduate concentrators, prospective concentrators, and any Harvard student interested in the study of English literature. Each concentrator is paired with a faculty adviser, with whom students discuss substantive and practical Plans of Study. All concentrators are encouraged to visit other members of the English faculty during scheduled office hours. The staff of the Undergraduate Program Office is available to discuss specific questions regarding the program.

**RESOURCES**
English concentrators may apply for Department-administered awards and fellowships. These range from funds for thesis research to post-graduate scholarships and annual essay, fiction, and poetry prizes.

Odile Harter is the library liaison to the English Department and is available to answer research questions.

Child Memorial Library, located on the top floor of Widener Library, is the English Department research library and open to all students. Its extensive, non-circulating collection comprises works from all areas and periods of English and American literature. Maintained and staffed by graduate students, Child Library is dedicated to providing up-to-date, scholarly editions of authors, as well as a cross-section of recent and influential criticism.

**HOW TO FIND OUT MORE**
The Guide for Concentrators, along with all advising worksheets and forms, is available on the department website at [https://english.fas.harvard.edu](https://english.fas.harvard.edu).

Questions may be directed to any member of the staff:

- Deidre Lynch, Director of Undergraduate Studies, [deidrelynch@fas.harvard.edu](mailto:deidrelynch@fas.harvard.edu).
- Derek Miller, Associate Director of Undergraduate Studies, dmiller@fas.harvard.edu.
- Lauren Bimmler, Undergraduate Program Administrator, lbimmler@fas.harvard.edu.
- Henry Vega Ortiz, Undergraduate Program Assistant, henryvegaortiz@fas.harvard.edu.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Environmental Science and Engineering

Professor Elsie Sunderland, Director of Undergraduate Studies
Dr. Bryan Yoon, Assistant Director of Undergraduate Studies

Environmental Science and Engineering (ESE) is an interdisciplinary program with the goal of understanding, predicting, and responding to natural and human-induced environmental change. Addressing environmental issues such as global warming, stratospheric ozone depletion, or local and regional air and water pollution requires perspectives from a diverse set of scientific disciplines including atmospheric physics and chemistry, oceanography, glaciology, hydrology, geophysics, ecology, and biogeochemistry. This program is structured around the view that the environmental system is comprised of a complex set of chemical, physical, and biological interactions, all impacted by the various activities of human society. Through exploration of the underlying processes and feedbacks within the Earth system, and with a range of approaches from theory and modeling to experiments and observations, students are trained to think about environmental processes in an integrated fashion, preparing them to manage the environmental challenges we face.

At its core, Environmental Science and Engineering exemplifies the pursuit of a technical liberal arts degree. In order to better understand and address environmental challenges, environmental scientists and engineers draw on core knowledge from other closely related fields to develop technical solutions and advance innovations in environmental measurements, modeling, control and regulation. This cross-disciplinary nature is reflected in the fact that many of Harvard’s ESE faculty are jointly appointed or affiliated in other Schools or departments in Faculty of Arts and Sciences (FAS). The liberal arts nature of the discipline is reflected in the flexible degree requirements of the concentration. Students have the intellectual freedom to select a program that provides fundamentals in ESE that are aligned with their specific interests. Working closely with their concentration advisers, students develop a plan of study consisting of core courses from within the basic sciences and the ESE program and approved electives from the closely related fields like Earth and Planetary Sciences, Integrative Biology, Applied Mathematics, and other engineering disciplines and natural sciences to best support their individual academic goals.

The AB degree consists of 14 courses (56 credits). Concentrators study the fundamental processes underlying environmental systems, including atmospheric sciences and climate dynamics; pollution of our air, water, and soil; and the development of sustainable energy systems. Throughout their coursework, students learn to apply these principles to understand and model complex environmental problems and to mitigate human impacts on the environment. Concentrators are required to take a fundamental set of introductory math, physics, and chemistry courses as the foundation of their studies (6 of the 14 required courses). Students also take one foundational course (ESE 6) to provide an introduction to the field. The remaining 7 courses are selected from a list of approved electives from across the breadth of the ESE course offerings, as well as related natural sciences. To provide a core foundation in Environmental Science and Engineering, all students will be strongly recommended to take at least one course on environmental physics and at least one course on environmental chemistry. Additionally, 1 of the 5 remaining approved electives must be a course approved to have significant engineering design content, which provides each student with exposure to the design challenge of solving an environmental problem.
REQUIREMENTS
14 courses (56 credits)

1. **Required courses:**
   a. **Mathematics (two courses):** APMTH 21A and 21B, APMTH 22A and 22B, MATH 21A and 21B, MATH 22A and 22B, MATH 23A and 23B, or higher levels. Students should begin the mathematics sequence according to placement.
   b. **Physics (two courses):** PHYSCI 12A, PHYSICS 15A or 16, or APPHY 50A; and PHYSCI 12B, PHYSICS 15B, or APPHY 50B.
   c. **Chemistry (two courses):** Select two courses from the following list:
      i. Recommended: PHYSCI 11 (or PHYSCI 1, according to placement).
      ii. LS 1A (or LPS A, according to placement).
      iii. PHYSCI 10.
      iv. CHEM 17 or 20.
   d. **Environmental Science and Engineering Introductory Course (one course):** ESE 6 (or GENED 1085, 1094, 1137, or 1158, or E-PSCI 50 by petition).
   e. **Breadth in Environmental Science and Engineering (two courses):**
      i. Note: Strongly recommended to select one course on environmental physics and one course on environmental chemistry. With permission from the Director of Undergraduate Studies, alternative ESE courses may be substituted.
      ii. One course on environmental physics: ESE 101, 129, 131, 132, or 162.
      iii. One course on environmental chemistry: ESE 133, 161 or 164, ENG-SCI 112.
   f. **Approved Electives (five courses):** With permission from the Director of Undergraduate Studies, up to two of these five courses can be substituted with relevant, upper-level courses from other areas of natural sciences and engineering.
      ii. ENG-SCI 50, 54, 91R (one term), 96, 112, 123, 181, 183.
      iii. EPS 53, 187.
      iv. OEB 55, 120, 157.

2. **Design Experience:** All students must take an approved course with significant design experience as one of their Approved Electives. This requirement may also be satisfied with a design component within a senior thesis, or a design component within an independent research project (ENG-SCI 91R).
3. **Sophomore Forum:** Sophomore year. Non-credit. Spring term.
4. **Thesis:** A thesis is required for recommendations of high honors and highest honors, and for joint concentrators.
5. **General Examination:** None.
6. **Other Information:**
   a. By prior petition and approval, other advanced undergraduate or graduate courses, as well as courses at MIT, can be used to satisfy general requirements and track requirements and electives. Petitions will only be considered for courses that possess technical content at a level similar to other upper-level engineering courses at SEAS.
b. Only one of ENG-SCI 91R (4 credits) or ENG-SCI 91HFR (4 credits) can count as an approved elective in the degree requirements.

c. **Joint Concentrations:** Environmental Science and Engineering participates in joint concentrations. A joint concentrator must fulfill all of the course requirements for the stand-alone degree; in addition, a joint concentrator is required to write an interdisciplinary thesis that combines the two fields. This thesis is required regardless of whether Environmental Science and Engineering is the primary or allied concentration.

d. **Plan of Study:** Concentrators are required to file an approved departmental Plan of Study and to keep their plan up to date in subsequent years. Plan of Study forms may be obtained from the Office of Academic Programs (Pierce Hall 110) or from the School of Engineering and Applied Sciences (SEAS) website at [http://seas.harvard.edu/](http://seas.harvard.edu/).

e. **Pass/fail and SAT/UNSAT:** All courses for concentration credit must be letter-graded.

f. Any exceptions to these policies must be approved via written petition.

**ADVISING**

Students interested in concentrating in Environmental Science and Engineering should discuss their plans with the Director of Undergraduate Studies, Professor Elsie Sunderland, ems@seas.harvard.edu, (617) 496-0858; or the Assistant Director of Undergraduate Studies, Dr. Bryan Yoon. Each undergraduate who elects to concentrate in Environmental Science and Engineering is assigned a faculty adviser. If students do not request a change in adviser, they have the same adviser until they graduate. Each student is reassigned to another faculty member while the student’s original faculty adviser is on leave. It is expected that students will discuss their Plans of Study and progress with their Director or Assistant Director of Undergraduate Studies at the beginning of each term. Students may also seek advice from their faculty adviser, the Director or Assistant Director of Undergraduate Studies at any time.

**HOW TO FIND OUT MORE**

Further information is available from Sarah Colgan, the Academic Programs Administrator in the School of Engineering and Applied Sciences Office of Academic Programs, SEC 1.101 (617-495-2833).

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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*Environmental Science and Engineering was a new concentration for 2018-19.*
Environmental Science and Public Policy

Professor N. Michele Holbrook, Head Tutor

The concentration in Environmental Science and Public Policy (ESPP) is designed to provide a multidisciplinary introduction to current problems of the environment. It is founded on the premise that the ability to form rational judgments concerning many of the complex challenges confronting society today involving the environment requires both an understanding of the underlying scientific and technical issues and an appreciation for the relevant economic, political, legal, historical, and ethical dimensions. All students have to satisfy a core of requirements in the physical, biological, and social sciences and mathematics. Depending on preparation, students may be encouraged to substitute more advanced courses for these requirements. In consultation with their concentration adviser, students also develop an individual plan of study for a series of advanced courses around a particular field of specialization. Through their field of specialization, students develop expertise in a particular field of study relating to the environment.*

In the junior year, students take one or more seminars to complement their field of specialization. The seminars are envisaged as a central integrating component of the concentration. The seminars cover a number of current environmental issues, comprehensively and in depth. They are taught by faculty from a number of departments in the Faculty of Arts and Sciences and from several of the professional schools, including the Law School, the School of Public Health, and the Business School. Topics covered change from year to year, but have included policy issues relating to environmental health, renewable energy, conservation and biodiversity, and world food systems and the environment.

In the senior year, students undertake a capstone project in which they conduct an in-depth examination of a particular environmental issue consistent with their field of specialization, applying skills and knowledge gained in their courses and tutorial experiences. For students wishing to be considered for honors, the capstone project consists of a year-long 8-credit course senior thesis, while for non-honors students the typical requirement is a one-course term paper or equivalent.

The concentration is overseen by a Committee on Degrees functioning as a Board of Tutors including representatives from other departments of the Faculty of Arts and Sciences and from other Schools as appropriate to ensure the requisite breadth of the program.

*To the level that would enable them to pursue graduate level study in the relevant discipline(s) if they choose to do so.

REQUIREMENTS

Basic Requirements: 13 courses (52 credits)

1. Introductory Course: The introductory course is designed to provide a multi-disciplinary examination of a particular current environmental challenge.
   a. 1 course chosen from:
      ii. ESE 6: Introduction to Environmental Science and Engineering.
iii. GENED 1085: Energy Resources and the Environment.
v. GENED 1137: The Challenge of Human Induced Climate Change:
    Transitioning to a Post Fossil Fuel Future.
vi. GENED 1158: Water and the Environment.

2. **Physical Sciences**: PHYSCI 1 or PHYSCI 11 – 1 course.
3. **Mathematics and/or Statistics**: 2 courses minimum: MATH 1A and MATH 1B. More advanced courses are encouraged.
4. **Biological Sciences**: OEB 10 or OEB 55 – 1 course.
5. **Social Sciences**: ESPP 77 or 78 – 1 course.
6. **Economics**: ECON 1661 – 1 course (Depending on a student’s background, an additional course in Microeconomics may be required in order to take ECON 1661).
7. **Advanced Courses**: – 4 courses in the student’s field of specialization. At least one course must be from the social sciences/policy, and at least one course must be chosen from the natural sciences or engineering. One course must be in E-PSCI unless a student has taken E-PSCI 50, ENG-SCI 6, GENED 1085, GENED 1094, GENED 1137, or GENED 1158, as their Introductory Course (see 1.a. above).
8. **Junior Seminar**: ESPP 90 – 1 course, chosen from ESPP 90 Junior Seminar offerings (consistent with focus field of specialization).
9. **Capstone Project (non-honors)**: ESPP 91R: Supervised Reading and Research – 1 course in the capstone project, students conduct an in-depth examination of a particular environmental issue consistent with their field of specialization (the typical requirement is a term-paper or equivalent).
10. **Tutorials**: Junior year: ESPP 90 seminar required of all concentrators.
11. **Thesis**: None.
12. **General Examination**: None.
13. **Other Information**:
   a. Students must file a concentration Plan of Study and identify their field of specialization by the end of their sophomore year. The Plan of Study will be developed in consultation with the student’s adviser and will be reviewed and approved by the ESPP Board of Tutors. The Plan of Study is to be revised and reviewed at the end of the junior year.
   b. **Course Substitutions**: Students interested in substituting a course in place of the above requirements should consult their concentration adviser and submit a petition to the Head Tutor.

**Honors Requirements: 14 courses (56 credits)**

1. **Required courses**:
   a. Same as **Basic Requirements**.
2. **Tutorials**:
   a. Junior year: ESPP 90 Seminar, required of all concentrators.
4. **General Examination**: None.
5. **Other Information**: Same as **Basic Requirements**.
ADVISING
At the beginning of the first term of concentration, the Head Tutor assigns each student to one of the faculty members of the ESPP Board of Tutors who will act as their concentration adviser. These assignments are based on the student's interests and their current intended field of specialization.

For many students, their interests and planned field of specialization will evolve over time. We view this evolution as an integral part of the ESPP advising process. If desired, students may be subsequently re-assigned to an adviser more appropriate for the student's developing field of specialization.

Students are expected to meet individually with their adviser at least once each term to discuss their Plan of Study and their resulting course selections, research opportunities, and other academic matters. However, students are encouraged to meet with their advisers more often throughout the year as their interests and desired field of specialization develops. Students may also seek advice from any member of the Board of Tutors in Environmental Science and Public Policy.

RESOURCES
The concentration's physical and administrative home is located in the Harvard University Center for Environment. The Center serves the larger Harvard community and provides a focus for interdisciplinary, cross-faculty research and education. The Center draws its strength from faculty members and students from across the University and complements the environmental education and research activities of the community of scholars based in Harvard’s academic units. Stewarded by the Faculty of Arts and Sciences, the Center is designed to serve the entire Harvard community by developing and facilitating projects and activities in the areas of environmental education, research, and outreach—adding the value of an integrated, collaborative approach to traditional academic pursuits.

The Center’s website at www.environment.harvard.edu provides a wealth of information resources, including: an online guide to environmental studies; courses; student groups; faculty and researchers; centers at Harvard; and electronic list serves for environmental events. The Center also supports a series of distinguished lectures, colloquia, and other events throughout the calendar year.

HOW TO FIND OUT MORE
Additional information may be obtained from the Head Tutor, Professor N. Michele Holbrook (holbrook@oeb.harvard.edu), or Ms. Lorraine Maffeo, Program Administrator, 26 Oxford Street, Fourth Floor, (617-496-6995, maffeo@fas.harvard.edu), or by visiting www.espp.fas.harvard.edu.
## ENROLLMENT STATISTICS

### Number of Concentrators as of December

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Folklore and Mythology

Dr. Lowell Brower, Head Tutor
Professor Stephen Mitchell, Chair

Folklore and Mythology is a liberal education in and of itself. The program encourages the study of any given society through its language and culture, offering an array of choices for drawing on a variety of disciplines in the humanities and social sciences. To focus on the folklore and mythology of a society (at local, regional as well as national levels) is to understand how that group or society defines itself through epics, music, folktales, legends, dramas, dance, rituals, “beliefs,” proverbs, customs, law codes, festival celebrations, “wisdom literature,” and many other forms of expressive culture. To study the folklore and mythology of any group is to discover how that group identifies itself in relation to others. Concentrators conduct independent research on the material, oral, written, or performed forms of folklore and mythology in a variety of cultures, among them African, North and South American, Celtic, Chinese, English, German, Greek, Indian, Japanese, Scandinavian, and Slavic.

The purpose of the basic courses outlined below is to provide concentrators with a general knowledge of the materials of folklore and mythology, its genres and divisions, and the various kinds of intellectual approaches to the materials that have been, and still are, used to understand and interpret them. The course on fieldwork and ethnography continues this purpose of providing general background by critiquing and applying various anthropological methods of interpreting cultural expressions. In these basic courses and early tutorials, materials from many cultures are used.

The special fields are designed to assure that the concentrator has an in-depth knowledge of folklore and mythology in one given area. There is considerable variation in the special fields administered by the Committee on Degrees in Folklore and Mythology, and the specific requirements vary from field to field. They can be roughly divided between those that are language and literature based and those that are not, such as music or social anthropology. Sample programs for several special fields are available through the Head Tutor’s office, but each student should work out the details of the student's own Plan of Study with the Head Tutor or the committee member or members representing the particular special fields.

The tutorials in the second half of the junior year and throughout the senior year are in the special field, the senior tutorials being either devoted largely to developing a senior thesis, or to a senior project. During the senior year, we expect students concentrating in Folklore and Mythology to demonstrate their command of cultural theory and analysis. All students will complete one of three potential senior capstone projects: 1) an analytical thesis, 2) a creative thesis, or 3) a senior project.

Students who choose the Analytical Thesis option are expected to submit an analytical thesis of 40-60 pages. Analytical theses are graded based on Latin Honors by outside readers, and eligible for all levels of honors.

Students who choose the Creative Thesis option are expected to submit a creative thesis, accompanied by a 15-20 page analytical component. Creative theses are graded based on Latin Honors by outside readers, and eligible for all levels of honors.

Students who choose the Senior Project option are expected to produce a capstone project, including an explanatory component, to be determined in consultation with the Project Advisor.
and the Folklore and Mythology Head Tutor/Director of Undergraduate Studies. Senior projects are graded by the student’s FOLKMYTH 96R instructor and are eligible for “honors”.

Analytical and creative theses are carried out over two semesters as FOLKMYTH 99, under the supervision of a faculty adviser. Senior projects are carried out over one or two semesters as FOLKMYTH 96R, under the supervision of a faculty adviser. While most senior honors theses take the form of written analyses based on original research, the creative thesis and senior project options allow students to demonstrate their competence through performances, exhibits, or other creative forms of expression, usually in connection with specific Folklore and Mythology courses (or related courses approved by the Head Tutor).

Students interested in concentrating in Folklore and Mythology should make an appointment with the Head Tutor to discuss the concentration and special field interests. Joint concentrations with other fields are possible and students should discuss their interests of combining fields with the Head Tutors or Directors of Undergraduate Studies of both Folklore and Mythology and the allied program. In joint concentrations, Folklore and Mythology can be either the Primary or the Allied Field.

REQUIREMENTS
Concentration Requirements: 14 courses (56 credits)

1. Required courses:
   a. GENED 1097: Tradition, Performance, and Culture.
   b. FOLKMYTH 97.
   c. FOLKMYTH 98A and 98B.
   d. FOLKMYTH 99 (two terms) or FOLKMYTH 96R (one or two terms). See item 2 below.
   e. One Folklore and Mythology seminar: One approved seminar-style course from among the Folklore and Mythology offerings.
   f. Five courses in a special field to be selected with the advice of the Head Tutor or a committee member in that field.
   g. Two courses outside the special field, to be selected from among such courses as the committee may designate.

2. Tutorials:
   c. Senior year: FOLKMYTH 99 (two terms), graded SAT/UNSAT, or FOLKMYTH 96R (one or two terms). Letter-graded.


4. General Examination: Required of all concentrators in the final term of the senior year; includes both a written and an oral component.

5. Other information:
   a. Pass/fail: Courses counting for concentration credit may not be taken pass/fail, except that one Freshman Seminar may be counted for concentration credit if the student received a positive evaluation and if permission to do so is obtained from the Head Tutor.
   b. Special Fields: Before or during fall term of the junior year each concentrator must choose a special field in consultation with the Head Tutor and an appointed adviser.
   c. Language Study: Proficiency in a language other than English, equivalent to that acquired by two years of college study, is highly recommended. Up to three courses of language study may, in individual cases and with the approval of the
Head Tutor in consultation with an adviser in the relevant special field, be counted toward concentration. The specifics of language study within the concentration should be discussed at an early stage with the Head Tutor and the adviser in the concentrator’s special field.

ADVISING
Students planning to concentrate in Folklore and Mythology should consult with the Head Tutor and a faculty member in the student’s prospective special field, normally a member or affiliated member, of the committee. Concentrators are required to see the Head Tutor at the beginning of each term about selection of courses and tutorials, preparation for the senior thesis or senior project, and general examination, and for his signature on study cards.

For up-to-date information on advising in Folklore and Mythology, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
The Milman Parry Collection of Oral Literature is one of the largest and best of its kind in the world. It contains unpublished epics, ballads, songs, tales, and other kinds of lore from Europe, Africa, Asia, and North America in the original languages. Students interested in folk life or ethnography will find the superb collections in the Peabody Museum of value. The Archives of World Music in the Loeb Music Library constitute a rich source, not only for ethnomusicologists but also for folklorists in general.

HOW TO FIND OUT MORE
Students are invited to consult the Head Tutor, Dr. Lowell Brower (labrower@fas.harvard.edu or 608-774-2128); the Chair, Professor Stephen Mitchell (samitch@fas.harvard.edu); or the Department Administrator Holly Hutchison (hhutchis@fas.harvard.edu or 617-495-4788). Please see our website: https://folkmyth.fas.harvard.edu/

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Folklore and Mythology participates in joint concentrations as either the primary or the allied concentration.
Germanic Languages and Literatures

Dr. Lisa Parkes, Director of Undergraduate Studies, German
Dr. Agnes Broomé, Director of Undergraduate Studies, Scandinavian

The Department of Germanic Languages and Literatures offers a rich and diverse program of literary and cultural studies, including film and music. We offer students the option to pursue a concentration in German Studies, Scandinavian Studies, or a joint concentration in German and another field. Our goal is to provide students with the enriching experience of studying languages, literatures, and cultures different from their own so they can gain new perspectives on their languages and countries of origin. At the same time, students will learn how the German-speaking and Nordic countries have influenced the development of Western culture and society. Our graduates are well positioned to understand the central role played by modern Germany in international politics and economics. They can explain why Germany takes the positions it does, the role of the European Union, and why international organizations call on distinguished members of the Scandinavian countries to represent them on taskforces involving matters of conscience. We aim above all to equip students with proficient language, analytical and critical skills for academic, professional, or personal use, as well as an understanding of the politics, culture, history, and ideas through literature, film, music, and other media. Thus, the program is designed not only for students who wish to pursue graduate study in Germanic studies, but also for students who choose careers in education, medicine, law, government, the social sciences, scientific research, business, the arts, design, and other fields.

Our department has a highly favorable ratio of full-time faculty to concentrators, which enables the faculty to provide students with individual guidance and support. Much of the tutorial work is done by full-time faculty, and all seniors writing a thesis have the opportunity to work individually with a professor. The department actively supports both work and study abroad, and all concentration options are designed to accommodate them.

There are no prerequisites for the concentration; however, students should first develop their language skills to meet the required level of proficiency. German language is offered from beginning to advanced levels; students with prior knowledge of German should take a placement test. Students may begin to study the German language with GERMAN 10 (elementary German) or with GERMAN 10AB (intensive elementary). Most concentrators in German take the sequence of GERMAN 20 (second year) and at least one 60-level course (third year) in order to prepare them for the 100-level courses. The introductory survey courses, GERMAN 101 and 102, count as the sophomore tutorial in German, though students are permitted to postpone this sequence until their junior year. Students interested in the Scandinavian concentration (or a Scandinavian language citation) are likewise urged to begin their language study as soon as possible. Students with prior knowledge of a Scandinavian language should contact Dr. Broomé for placement. Our program offers Swedish courses through the second-year level, from SWEDISH 10 (Beginning Swedish Language and Literature) to SWEDISH 20 (Special Topics in Swedish Literature and Culture), as well as Old Norse (SCAND 160A and 160BR). SCAND 91R (Independent Study) is available for advanced language students. Danish, Finnish, modern Icelandic, and Norwegian are available as language tutorial courses (SCAND 90R.A-C). Students interested in these languages should contact Dr. Broomé at their earliest opportunity, preferably prior to the start of the academic term when they wish to begin their language study.

Concentrators desiring to be considered for honors write a senior thesis of 40 to 50 pages. The thesis is designed to demonstrate that a candidate can read and interpret a literary text or a complex cultural or social phenomenon with authority, insight, and originality, and that s/he is
familiar with the major critical writings on the subject. All seniors are required to pass a three-hour written examination. The questions for this examination, designed to give students the opportunity to synthesize the knowledge they have gained from their studies, are based on individual reading lists submitted by each senior to a faculty committee.

OPTIONS:
- German Studies
- Scandinavian Studies

REQUIREMENTS
Basic Requirements for All Options

1. **Required courses:** See Specific Requirements for each option.
2. **Tutorials:**
   a. **Sophomore year:** Optional, see Specific Requirements.
   b. **Junior year:** Optional, see Specific Requirements.
   c. **Senior year:** GERMAN 99A & 99B (two terms) or SCAND 99A & 99B (two terms) required of honors candidates. Graded SAT/UNSAT. Non-honors candidates: 99C (one term).
3. **Senior Thesis:** Required of honors candidates only.
4. **Senior Capstone:** Required of non-honors candidates only (spring semester).
5. **General Examination:** Required of honors and joint concentrators in the senior year.
6. **Other information:**
   a. **Pass/fail:** None of the courses counted for concentration may be taken pass/fail except for 200-level courses.
   b. Courses counted for concentration credit must be passed with a grade of B- or above.
   c. One Freshman Seminar may, upon approval of the Director of Undergraduate Studies, be approved for concentration credit.
   d. The degree of honors recommended is based on the results of the general examination, the grade average, and the thesis evaluation.
   e. One of the Frameworks courses in the Humanities (HUM 11A–C) may count toward concentration credit.

German Studies
Specific Requirements

1. **Basic required courses:** Eleven courses (44 credits).
   a. GERMAN 20A, 20B, or 20AB (or may be waived on basis of equivalent preparation).
   b. Up to two courses in German on the 60 level.
   c. GERMAN 101 and 102.
   d. Three additional courses in German on the 100 level or above.
   e. An additional three courses either in German or in related fields with sufficient focus on the German aspect of the field. In consultation with the Director of Undergraduate Studies, students coordinate these courses into a coherent but flexible program of study. Courses may be selected from such fields as English; Folklore and Mythology; Government; History; History of Art and Architecture; History of Science; Linguistics; Literature; Music; Philosophy; Psychology; Comparative Study of Religion; Visual and Environmental Studies; Women, Gender, and Sexuality; and others, including German itself.
   i. Up to three courses (combined from 1.d. and 1.e.) may be courses in which the instruction and readings are entirely in English. Together, these
courses should address a wide spectrum of German culture from the medieval period to the present, and at least one should address a literary genre.

2. **Senior Capstone:** all non-honors seniors (spring semester).

3. **Courses required for honors eligibility:** Same as item 1, plus two terms of GERMAN 99 (Thesis Tutorial) and the General Examination.

4. **Other information:**
   a. The concentration is designed to make it possible to begin with elementary German (GERMAN 10 or 10AB) in the freshman year and to complete the concentration without difficulty.
   b. Students who place out of GERMAN 20 have completed two courses towards the concentration and need not substitute with additional coursework.
   c. One Freshman Seminar may, upon approval of the Director of Undergraduate Studies, be approved for concentration credit.
   d. One of the Frameworks courses in the Humanities (HUM 11A-C) may count toward concentration credit.

**Joint Concentration Requirements**
This option is intended for students who wish to combine the study of German culture and literature with the study of one other field significantly related to some aspect of the larger field of Germanic languages and literatures. Programs in German and History of Art and Architecture, German and Music, and German and Philosophy have been approved by the departments concerned. Programs in German and another literature, or German and another field may be submitted for approval of the departments concerned. For information about other possible combinations, consult the Director of Undergraduate Studies.

**Required courses:** Seven courses (28 credits).
1. GERMAN 20A and 20B (or may be waived on basis of equivalent preparation).
2. Five numbered courses in German, which should include GERMAN 101 or 102.
3. For German primary: GERMAN 99 (two terms). Thesis.

**Scandinavian Studies**
**Specific Requirements: 10 courses (40 credits)**
This option is intended for students who wish to combine the study of Scandinavian literature and culture with the study of some aspect of Western civilization closely related to a special area of the larger field of Scandinavian Languages and Literatures. Programs in Scandinavian and other literatures (including German), drama, folklore, history, linguistics, or an aspect of the social sciences may be submitted for approval by the Director of Undergraduate Studies. Note that this is not considered a joint concentration and that the level of honors will be determined solely by the Department of Germanic Languages and Literatures.

1. **Basic required courses:** Ten courses (40 credits).
   a. Six courses in SCAND (may include SCAND 91R and SCAND 97 and 98).
   b. Four courses in related subjects.
2. **Courses required for honors eligibility:** Twelve courses. Same as Item 1, plus two terms of SCAND 99 (Thesis Tutorial).
3. **Other information:** For a list of approved related courses, see the Director of Undergraduate Studies, who must also approve each concentrator’s courses. One of the Frameworks courses in the Humanities (HUM 11A-C) may count toward concentration credit.
ADVISING
Departmental advising of concentrators in all three years is carried out by the Directors of Undergraduate Studies. Students meet with the Director of Undergraduate Studies in their field regularly at the beginning of each term and thereafter as desired (contact information can be found below).

For up-to-date information on advising in Germanic Languages and Literatures, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
Widener Library offers the most complete research collection in German and Scandinavian literatures, history, and civilization available in the United States. Valuable manuscripts and papers from the estates of such distinguished German poets as Hofmannsthal, Rilke, and Brecht and of such distinguished Scandinavian playwrights as Henrik Ibsen and August Strindberg, can be found in Houghton Library together with manuscripts from medieval Germany and Iceland. A unique and important resource is the Busch-Reisinger Museum, the only museum on this continent dedicated to Germanic art. The museum, located within the Fogg Museum, was established at the beginning of this century by Kuno Francke, a distinguished professor in the German Department, with the intention of acquainting language and literature students with the artistic heritage of the German-speaking peoples. The Goethe-Institut Boston (170 Beacon Street) offers a wide variety of lectures, exhibitions, films, and concerts on all aspects of Germany and its present and past culture, and the Scandinavian Library (206 Waltham Street, West Newton) likewise hosts lectures, a Nordic film series, and a weekly coffee hour. Students can gain additional practice in conversation by attending the German and Scandinavian tables held in the various Houses, a weekly Stammtisch at The Queen’s Head, or a monthly Kaffeestunde in the Barker Center. Harvard is also home to the German Club, the Harvard College Scandinavian Society, and the Harvard Club of Sweden.

HOW TO FIND OUT MORE
More detailed information on all concentration programs can be obtained by contacting the Director of Undergraduate Studies for German, Dr. Lisa Parkes (lparkes@fas.harvard.edu, 617-495-3548); or the Director of Undergraduate Studies for Scandinavian, Dr. Agnes Broomé (agnesbroom@fas.harvard.edu, 617-496-4158). They are available to answer all questions regarding the department’s concentrations, and can provide students with reading guides, lists of courses approved each year, copies of past general examinations, etc. All potential concentrators are encouraged to contact them. The Department’s offices are located in the Barker Center. Additional information is available on our department website at http://german.fas.harvard.edu/.

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Government

Dr. Nara Dillon, Director of Undergraduate Studies

The concentration in Government introduces students to the discipline of political science: the study of power in all of its many forms and consequences. Aiming both to prepare students to lead engaged civic lives and to introduce them to the ways in which political scientists explain and analyze the social and political world around us, the concentration has four curricular goals.

Our first goal is to make all students aware and critical of their unexamined assumptions about politics. Learning to think independently and with some critical distance, to analyze arguments—theoretical, empirical and rhetorical—to weigh alternatives, to write cogently, and to speak persuasively are essential skills for responsible global citizenship as well as professional careers. GOV 97 (the sophomore tutorial) begins the process by asking students to write a research paper on real-world issues important to them. This training in research and analysis is provided in the context of small seminars on a variety of topics, giving students an opportunity to read cutting-edge research and to debate these issues with students who share the same interests.

To achieve breadth in the discipline of political science is our second aim. Political science covers many different subjects, including the philosophy and ethics of exercising power and the history of political ideas (political theory); the operation of politics in the United States (American politics); the diversity of political regimes, institutions, and behaviors in the contemporary world and the significance of these divergences (comparative politics); and, finally, the interaction among international actors, the causes of war and peace, and the roots of global poverty and prosperity (international relations). Political scientists work in and across these disciplinary subfields using a large and varied tool kit: qualitative methods such as historical and archival research, fieldwork, interviews, and textual analysis; and various quantitative approaches including statistical analysis, formal modeling and experiments. Our goal is to assure that concentrators grasp the main approaches and topics in the discipline by requiring concentrators to take at least one course in each of the traditional subfields, and by requiring GOV 50: Data, or a higher-level methods course.

Third, we encourage students to chart a distinctive path through political science. We offer each student the possibility of satisfying his or her particular intellectual bent and curiosity through a cluster of electives and at least one required seminar. Each student has the freedom to choose his or her particular path through the diverse Government curriculum, but we want to assure that choices are thoughtful and informed. Therefore, students begin to work on a particular plan to navigate the rich resources in the department in sophomore spring in consultation with their sophomore tutor and concentration adviser. During the next four semesters students refine this plan with the help of advisers and faculty. Often students cluster electives either in a subfield, a geographical area, or a particular methodological approach, and enroll in a seminar that allows them to think about framing a research question using their chosen focus.

Finally, we encourage students to produce as well as consume political science research. All concentrators are required to take at least one seminar, in which they produce a research paper or other project under the guidance of teaching faculty. They are also welcomed to fulfill
one elective requirement through GOV 92R: Faculty Research Assistantship for Credit. Those who choose the honors track (which requires a thesis) are normally expected to take one of the research practice courses: GOV 52 (Models), GOV 62 (Research Practice in Qualitative Methods), or GOV 63 (Topics and Resources in Political Theory). Honors concentrators often use multiple seminars to explore possible research directions for the senior thesis, a substantial work of independent scholarship that serves as the capstone of their experience in Government.

Government as a Secondary Field

Many students pursue a secondary field in Government, which requires five courses, with no more than two at the foundational level (e.g., GOV 10, 20, 30 or 40). For examples of how students have used secondary fields in government, please consult the Secondary Field page on our website at https://undergrad.gov.harvard.edu/secondary-field.

Government as Part of a Joint Concentration

Government offers students the possibility of a joint concentration, with Government as either the primary or allied concentration. Petitions for joint concentrations are entertained twice a year: once in September and once in February. For more about this option, see the Joint Concentration page on our website at https://undergrad.gov.harvard.edu/joint-concentration, and note the special requirements for joint concentrators listed below.

REQUIREMENTS

Basic Requirements: 10 courses (40 credits)

1. Required courses:
   a. Field Requirements: One course in each of the four subfields. These need not be foundational courses (i.e., GOV 10, 20, 30, and 40). The four subfields are:
      i. Political Thought and Its History.
      ii. Comparative Government.
      iii. American Government.
      iv. International Relations.
   v. Note: The courses that count for each subfield in any given academic year may be found by searching my.harvard as follows:
      1. Political Thought and Its History: keyword search “theory_subfield”.
      2. Comparative Government: keyword search “comparative_subfield”.
      3. American Government: keyword search “american_subfield”.
      4. International Relations: keyword search “ir_subfield”.
   b. Research Methods Requirement: GOV 50: Data or a higher-level course such as GOV 51: Data Analysis and Politics, or GOV 52: Models. A Statistics course, such as STAT 104, may be substituted for GOV 50. If a Statistics course is substituted, one more Government elective is required.
   c. Government Electives: Three additional courses in government, four if substituting STAT 100 or 104 for GOV 50. Up to two may be from a list of pre-approved Harvard Kennedy School courses, which can be found at https://undergrad.gov.harvard.edu/courses-harvard-kennedy-school.
   e. Seminar: One Undergraduate Seminar (GOV 94).
3. **General Examination**: Not required.
4. **Other information**:
   a. **Pass/fail and SAT/UNSAT**: Only one Government elective may be taken pass/fail or SAT/UNSAT. All other courses counted for concentration requirements must be letter-graded. Courses to fulfill subfield, seminar, or methods requirements must be taken for a letter grade. [The emergency SEM/USEM grades for Spring 2020 courses are exempt from this rule.]
   b. **GOVt 50 and Statistics**: Students should take either GOVt 50, 51, or 52, or a Statistics course to fulfill the Research Methods requirement. If a student takes both courses, both courses will count into the student’s concentration GPA, and the Statistics course cannot count as one of the three required Government electives.
   c. **GOV 91R, Supervised Reading and Research**, cannot count towards the Government concentration requirements.

**Requirements for Honors Eligibility: 13 courses (52 credits)**

1. **Required courses**:
   a. **Field Requirements**: One course in each of the four subfields (same as Basic Requirements).
   b. **Research Methods Requirement**: GOV 50: Data or an alternative (same as Basic Requirements) GOV 51 is also strongly encouraged for thesis writers.
   c. **Electives**: Three additional courses in government, four if substituting a Statistics course for GOV 50. Up to two may be from a list of pre-approved Harvard Kennedy School courses at [https://undergrad.gov.harvard.edu/courses-harvard-kennedy-school](https://undergrad.gov.harvard.edu/courses-harvard-kennedy-school).
   d. **Tutorials**:
      i. **Sophomore year**: GOV 97. Letter-graded.
      ii. **Senior year**: GOV 99R (two terms), devoted to the writing of a thesis. Graded SAT/UNSAT. Students should consult the Assistant Director of Undergraduate Studies for more information.
      iii. **Two Seminars**: Ordinarily, a research practice course (GOV 52, 62, or 63) and at least one GOV 94 Undergraduate Seminar. Students may substitute a second GOV 94 seminar for a research practice course.

2. **Thesis**: Required of all candidates for honors. A student may not earn credit for the second semester of GOV 99R without submitting a completed thesis. To earn credit for the first semester of GOV 99R, a student must submit at least thirty pages of written work that is acceptable to the thesis adviser and must be enrolled and actively participate in the senior thesis workshop.
3. **General Examination**: An oral examination is required under certain circumstances.
4. **Other information**:
   a. **Pass/fail and SAT/UNSAT**: Only one Government elective may be taken pass/fail or SAT/UNSAT. All other courses counted for concentration requirements must be letter-graded. Courses to fulfill subfield, seminar, or methods requirements must be taken for a letter grade. (The emergency SEM/USEM grades for Spring 2020 courses are exempt from this rule.)
   b. **GOV 50 and Statistics**: Students should take either GOV 50 or a Statistics course to fulfill the Research Methods requirement. If a student takes both courses, both courses will count into the student’s concentration GPA, and the Statistics course cannot count as one of the three required Government electives.
   c. **Advanced Standing**: Same as Basic Requirements.
   d. **GOV 91R, Supervised Reading and Research**, cannot count towards the Government concentration requirements.
Joint Concentration

Government as the Primary Field: 17 courses (68 credits) total
(11 courses in Government—44 credits)

1. **Required courses:**
   a. **Government Field Requirements:** one course in each of the four subfields (same as Basic Requirements).
   b. **Tutorials:**
      i. **Sophomore year:** GOV 97. Letter-graded.
      ii. **Senior year:** GOV 99R (two terms), devoted to the writing of a thesis. Graded SAT/UNSAT. Students should consult the Director of Undergraduate Studies for more information.
   c. **Research Methods Requirement:** GOV 50: Data, GOV 51: Data Analysis and Politics, or GOV 52: Models. A Statistics course, such as STAT 104, may be substituted for GOV 50.
   d. **Electives:** one additional course in Government.
   e. **Seminars:** Two Undergraduate Seminars (GOV 94). Students may substitute one Research Practice course (GOV 52, 62, or 63) for one of the required seminars. On petition to the Director of Undergraduate Studies, one seminar may be from the allied field.

2. **Thesis:** Required.
3. **General Examination:** An oral examination is required under certain circumstances.
4. **Other information:**
   a. **Petitions:** Properly qualified candidates for honors interested in pursuing a joint concentration must petition the Director of Undergraduate Studies for approval.
      Further details are available at the Government Undergraduate Program Office and on the department’s website at [https://undergrad.gov.harvard.edu/joint-concentration](https://undergrad.gov.harvard.edu/joint-concentration).

Government as the Allied Field: 6 courses (24 credits) in Government

1. **Required courses:**
   a. **Government Field Requirements:** Two courses in each of two of the four subfields listed under Basic Requirements.
   b. **Research Methods Requirement:** GOV 50: Data, or a higher-level course: GOV 51: Data Analysis and Politics, or GOV 52: Models. A Statistics course, such as STAT 104, may be substituted for Government.

2. **Thesis:** Required.
3. **General Examination:** A written general examination is not required. An oral examination is required under certain circumstances.
4. **Other information:**
   a. **Petitions:** Properly qualified candidates for honors interested in pursuing a joint concentration must petition the Director of Undergraduate Studies for approval, even if they do not intend Government to be their primary field. Further details are available at the Government Undergraduate Program Office and on the department’s website at [https://undergrad.gov.harvard.edu/](https://undergrad.gov.harvard.edu/).

**STUDY ABROAD**

The Government Department encourages study abroad for a term, and it is also possible to study abroad for an entire academic year. The Government Department is very flexible in granting credit towards the concentration requirements for political science courses taken
elsewhere although all such courses must be discussed with, and approved by, the Director of Undergraduate Studies (DUS). Ordinarily, a student can count two courses taken abroad in any one semester towards Government concentration requirements. Students must receive a grade of B– (or equivalent) or higher in order to receive final approval for courses taken abroad.

SUMMER SCHOOL
Generally, students can count only one Harvard Summer School Government course, taught either on campus or abroad, towards their Government concentration requirements. If that course is not taught by a Harvard Government Department faculty member, the student must petition the Government Director of Undergraduate Studies (DUS) before the course is taken.

ADVISING
For information and advice about the Government concentration, students are encouraged to meet with the Director of Undergraduate Studies and with the concentration advisers in the Houses. Please consult the department’s website at https://undergrad.gov.harvard.edu/ for a listing of advisers and office hours.

HOW TO FIND OUT MORE
For further information concerning a concentration in Government, students should visit the Government Undergraduate Program Office (617-495-3249). The office, located at CGIS Knafel Building, room K151, 1737 Cambridge Street, is open Monday through Friday, 9:30–5:00. Additional information is also available on the department’s website at https://undergrad.gov.harvard.edu/.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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History

Professor Ian Miller, Director of Undergraduate Studies

What is History, and how do we view the world?
History is a broad discipline encompassing every dimension of human interaction in the past, including social life, the economy, culture, thought, and politics. Students of history study individuals, groups, communities, and nations from every imaginable perspective—employing all the techniques of the humanities and social sciences to raise questions and probe for answers. Students explore the origins and developments that have shaped our contemporary world; and take courses that span the globe and range in chronological scope from antiquity to today.

What is it like to study History at Harvard?
The History concentration combines rigorous training with flexibility, facilitates close student engagement with our diverse faculty, and solicits regular student input. The History Department faculty teach courses that seek to unsettle students – encouraging them to confront unfamiliar ideas, cultures, and eras – and to question their own assumptions about the world and their place in it. Interdisciplinarity is essential to historical practice. Our students familiarize themselves with the methods and theoretical assumptions of other disciplines, even while learning how these methods and theories are just as much products of history as the questions they were developed to address.

What is the value of studying History?
History students examine issues critically and creatively, grasp details while seeing the big picture, and think boldly but flexibly enough to change their opinions when change is warranted. These are the skills of a sophisticated thinker and a responsible citizen. They are also valued in countless fields. Our graduates move on to careers in consulting, business, law, journalism, government, and non-profit work. Only a small percentage of our concentrators pursue post-graduate work in history. Students wind up in exciting places during college as well, through summer jobs, internships, academic programs, service initiatives, and terms or school years abroad.

What are the goals of the History concentration?
History students study how societies and people functioned in various contexts in the past and how the past continues to shape the present. Our faculty help students learn how to analyze complex events and craft original arguments from large amounts of disparate evidence. This capacity for research is one of the central goals of the concentration and provides skills fundamental to a wide array of career opportunities, especially those that value the ability to process complicated sets of information, to take multiple perspectives on that information, and to communicate effectively and concisely about it. Students are encouraged to follow their own interests while the department provides structured guidance and rigorous training in research skills, critical reading, oral communication, effective writing, and problem solving. The discipline enables students to engage with the unfamiliar with confidence and creativity.

How can I decide if History is the right concentration for me?
The best way to explore the History concentration is to take a course with one of our faculty members. All of our courses are open to non-concentrators and none have prerequisites. The department also has a series of foundations courses (HIST “101s”) that are especially welcoming to freshmen and to pre-concentrators (You do not need prior knowledge of the time or place studied to take one of these courses, nor are you expected to have done any prior college-level history.) Our “101s” are wonderful gateways into the Department.
The Department has also developed a series of thematic and career course clusters to provide students additional pathways into the concentration. These clusters can help guide your course selections depending on your intellectual interests or the future career you might be considering. Explore our foundations courses and our thematic and career course clusters on our undergraduate webpage at https://history.fas.harvard.edu/undergraduate-programs.

Do I have to write a thesis?
History has two tracks, the standard program and the honors program. They differ only in that the honors track requires a thesis as well as enrollment in HIST 99, our year-long Thesis Seminar. Our advising programs support students who begin preliminary thesis work as early as junior year, and numerous college fellowships provide funding for summertime research. The thesis program itself is flexible enough that students can decide as late as shopping week senior fall whether to write a thesis. Meanwhile, the requirement to produce a substantial research paper in one of your History seminars ensures that either way, you will produce an original work of historical scholarship that can be the capstone to your undergraduate academic career.

Are there other options instead of a full concentration?
Our robust secondary field requires five courses, including one seminar. See also below information on joint concentrations with History. Our faculty are well represented in the General Education course offerings and in interdisciplinary courses with a variety of disciplines. Hundreds of non-concentrators every semester take classes from History faculty, gaining an introduction to the critical and creative skills historians emphasize. No matter what interests you, History has something to offer—everything has a history, and our department teaches you how to recover, recreate, and interpret it.

REQUIREMENTS
Basic Program Requirements: 10 courses (40 credits)
Thesis Program Requirements: 12 courses (48 credits)

1. Required courses:
   a. One course that focuses significantly on U.S. or European history.
   b. One course that focuses significantly on history beyond the U.S. and Europe.
   c. One course that focuses significantly on historical societies before 1750.
   d. Four additional courses in History, to be chosen in consultation with the student’s House adviser, who signs the Crimson Cart. Each concentrator may petition the Director of Undergraduate Studies (DUS) to receive History credit for one non-departmental course. This “related field” might be a course of a historical nature taught by other faculty in the College, or a course providing auxiliary knowledge or skills related to the concentrator’s historical interests.

2. Tutorials:
   a. HIST 97 (offered in spring): Taken during the first term in the concentration (required and letter-graded).
   b. Two Seminars: Ordinarily taken by the end of the second term of the junior year (required and letter-graded). In at least one of these students must write a substantial research paper. For students wishing to write a senior thesis, that research paper must be at least 20 pages long and involve primary source research.
   c. Basic Program: No thesis.
   d. Thesis Program: HIST 99 (year-long 8-credit course, required, and graded SAT/UNSAT).

3. General Examination: Oral Examination for highest (departmental) honors candidates.

4. Other information:
a. History courses: The courses listed under “History” in my.harvard.edu (including cross-listed courses) as well as other courses taught outside the Department by members of the Department of History are available for History credit without petition. Courses of a historical nature taught by other faculty in the College in related fields may be taken for History credit by petition to the DUS.

b. SAT/UNSAT: Courses, aside from HIST 99, taken on a SAT/UNSAT (pass/fail) basis may not be counted for concentration credit.

c. Advanced Placement: The History Concentration does not grant credit for AP scores, unless the student is pursuing Advanced Standing.

d. Study Abroad: The History Department encourages study out of residence and urges interested students to consult the DUS about their programs at their earliest convenience. Additional information is available at our website at http://history.fas.harvard.edu/main-concentration-study-abroad.

e. Freshman Seminars: Freshman Seminars taught by members of the History Department count toward concentration credit; as a general rule, other Freshman Seminars do not. In case of uncertainty please contact the Undergraduate Office.

Joint Concentrations

History offers pre-approved Joint Concentrations in African and African American Studies, Anthropology, East Asian Studies, Near Eastern Languages and Civilizations, and Ancient (Greek and Roman) History. Joint concentrations with other fields are also possible and are designed in consultation with both departments. If you wish to discuss an individualized joint, please consult Ian Miller, DUS or Carla Heelan, Assistant Director of Undergraduate Studies (ADUS).

Students whose interest in African and African American Studies, Anthropology, East Asian Studies, Near Eastern Languages and Civilizations, or Ancient (Greek and Roman) Civilizations is primarily historical in character should consult the relevant joint concentration which has been pre-approved in each of these areas. Students pursuing one of the pre-approved joint concentrations will complete one half of their tutorial work in the History Department (HIST 97) and the other half in African and African American Studies, Anthropology, East Asian Studies, Near Eastern Languages and Civilizations, or Classics. Students take a History seminar, typically in junior year, in which they write a 20-page research paper based on primary sources; in addition, they take a seminar or junior tutorial in the joint field as specified in each case. In the senior year, joint concentrators write an honors thesis, an original work of research which is advised and evaluated in both concentrations and which typically focuses on some aspect of African, African American, East Asian, Near Eastern, or Ancient Greek and Roman history, or is located at the intersection of History and Anthropology (archaeological or social).

All joint concentrators are required to take 14 courses, including the senior thesis tutorial in History or the joint field if History is the allied field. For further information on our joint requirements, please see the department website at https://history.fas.harvard.edu/joint-concentrations.

ADVISING

Students are encouraged to come to the History Undergraduate Office in Robinson 100 for information and advice about the History concentration. It is particularly important for anyone considering a concentration in History to make an appointment with the Director of Undergraduate Studies or the Assistant Director of Undergraduate Studies – the sooner, the better and in any case in advance of the concentration deadline (mid-November of sophomore year). The Director of Undergraduate Studies is Professor Ian Miller. He and the Assistant Director of Undergraduate Studies both hold weekly office hours and see students throughout
the year. Each House has a History Adviser on staff (resident or non-resident), and each History concentrator who requests one will be assigned a faculty adviser.

EXPLORING HISTORY
First-year students interested in exploring History as a concentration are encouraged to take two or more of the following in the pre-concentration period: a History “101,” (these include General Education courses taught by History faculty), a Freshman Seminar led by a member of the department, any lecture course designated as a broad survey in the department, and/or a seminar in the fall of the sophomore year.

For lists of History Department Student Advisory Board Members and House Advisers in History and other useful links, please see the History Department’s website for undergraduates at https://history.fas.harvard.edu/undergraduate-programs.

RESOURCES
In addition to the advising resources listed above, the History Department’s Widener Library liaisons Fred Burchsted (burchst@fas.harvard.edu) and Anna Assogba (assogba@fas.harvard.edu), have been working with the History Department for several years. They welcome and invite you to email them whenever you have questions about any library matter. They are happy to answer questions via email, help you with finding sources for your papers, and are happy to meet with you in person to talk about your work.

HOW TO FIND OUT MORE
Please visit the department’s website at https://history.fas.harvard.edu/ for more information about the History concentration. The office is open Monday–Friday 9:00am–5:00pm and may be reached by telephone at 617-495-2157. Students may sign up for an appointment with the Director of Undergraduate Studies or Assistant Director of Undergraduate Studies at the History Department's website for undergraduates at https://history.fas.harvard.edu/undergraduate-programs.

ENROLLMENT STATISTICS
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*Joint concentrators with history as the primary field.

**Joint concentrators with history as the allied field.
History & Literature

Dr. Lauren Kaminsky, Director of Studies

History & Literature is the oldest concentration at Harvard. At the heart of History & Literature are individual and small group tutorials which provide individual instruction, opportunities to pursue specific topics in depth, and dedicated mentoring. Beyond the core History & Literature tutorials, concentrators take courses across a wide variety of departments and programs for concentration credit.

Students take a History & Literature tutorial each semester. Sophomore tutorial—taught in the sophomore spring by two instructors, one a historian, the other a literary scholar—introduces students to interdisciplinary methods and explores topics in depth. In the fall semester of junior tutorial, small groups of students collaboratively design a syllabus with the guidance of an instructor. In the junior spring, students focus on researching and writing the junior essay. The senior tutorial is one-on-one instruction, both in fall and spring, primarily devoted to researching and writing the thesis.

Students work closely with concentration advisers to select a field of study at the end of the sophomore year. These fields are American Studies, Ethnic Studies, European Studies, Latin American Studies, Modern World, World Before 1800, and Medieval Studies. In the junior and senior years, the fields of study provide a structure to ensure that concentrators gain knowledge that is broad as well as deep. History & Literature aspires to promote the integration of disciplines and a balance between general knowledge and specific expertise.

History & Literature encourages concentrators to grow as writers and researchers, and the concentration is designed to teach students to think in interdisciplinary ways. Students develop skills in close reading, identifying and analyzing primary and secondary sources, posing research questions, conducting original research, making arguments, and communicating clearly and persuasively.

Many concentrators choose to study abroad as a means for augmenting their work in the concentration. Advisers in the concentration work closely with students who elect to study abroad to help craft plans of study that integrate courses taken out-of-residence.

Students interested in History & Literature are encouraged to schedule an advising meeting. One of the best ways to learn about what History & Literature has to offer is to enroll in one of our HIST-LIT 90 seminars, which are open to non-concentrators.

History & Literature welcomes joint concentrations and secondary fields, and it aspires to make the integration of two concentrations as seamless as possible. History & Literature must be the primary concentration in any joint Plan of Study, except when the student plans to pursue a creative senior project. In that case, the department providing artistic training may be the primary concentration. Please see the Director of Studies with any questions about joint concentrations.
REQUIREMENTS
14 courses (56 credits)

At the end of sophomore year, each History & Literature concentrator selects a field of study and submits a Field Worksheet. Revised worksheets are submitted in the junior and senior years. A regularly updated list of the courses that count in the various fields is available on the History & Literature website at https://histlit.fas.harvard.edu/courses-count. Courses in the social sciences on subjects related to the student's field may be accepted for concentration credit by the Committee on Instruction on an individual basis.

1. Required courses:
   a. At least eight courses in the field of study, balanced between history and literature. Specific period requirements exist in several of the fields of study. Details on fields of study and their requirements are available on the History & Literature website at http://histlit.fas.harvard.edu/fields. Generally, courses must be letter-graded to count for concentration credit.
   b. Language Requirement: Students must take at least one course in which they read sources in a language other than English. A list of ways to fulfill the language requirement, including by earning a language citation, is available on the History & Literature website at http://histlit.fas.harvard.edu/language-requirement.

2. Tutorials:
   a. Sophomore year: HIST-LIT 97 (one course) required. Letter-graded.
   b. Junior year: HIST-LIT 98 (two courses) required. Letter-graded.
   c. Senior year: HIST-LIT 99 (two courses) required. Graded SAT/UNSAT.

3. Junior Essay: A required 6,000-word research paper is the focus of the second semester of Junior tutorial.

4. Senior Thesis: A 10,000-20,000-word thesis is expected of all concentrators and required for concentration honors. A student enrolled in HIST-LIT 99 who does not complete a thesis can receive credit for this course by completing a paper in the relevant field.

5. Senior Honors Oral Examination: A one-hour oral examination is required of all concentrators, except those who do not submit a thesis by the deadline for consideration for honors.

6. Other information:
   a. Fields of Study:
      i. American Studies.
      ii. Ethnic Studies.
      iii. European Studies.
      iv. Latin American Studies.
      v. Modern World.
      vi. World before 1800.
   b. Subfields: In the junior year, concentrators may propose subfields, which consist of 2 or 3 courses that would not otherwise count toward the student's field of study. Students will be examined on the subfield during the senior oral exam.
   c. Study Abroad: History & Literature encourages study abroad. Generally, students will take an additional course that counts for concentration credit to replace the tutorial they miss while abroad. Students who successfully complete the junior essay process while studying abroad in the junior spring will receive a one-course reduction in the 14 total concentration courses.
d. **Joint Concentrations:** History & Literature allows joint concentrations, but it must be the primary concentration in any joint Plan of Study, except when the student plans to pursue a creative senior project.

e. **Independent Study:** With the permission of the Director of Studies, concentrators may be allowed to take HIST-LIT 91R for credit.

**ADVISING**

Each student is assigned to a tutor who also functions as that student’s academic adviser. The adviser and student work closely together to assemble a Plan of Study that fits the student’s intellectual interests and fulfills concentration requirements. Each student is also assigned a concentration adviser who will be a resource for the student through every stage of the concentration. History & Literature’s personalized academic advising gives students a flexible, individualized educational experience.

**HOW TO FIND OUT MORE**

Students are invited to visit History & Literature in Barker 122 and online at [http://histlit.fas.harvard.edu/](http://histlit.fas.harvard.edu/). Lauren Kaminsky is the Director of Studies.

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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*History & Literature must be the primary concentration in any joint Plan of Study, except when the student plans to pursue a creative senior project. In that case, the department providing artistic training may be the primary concentration. Please see the Director of Studies with any questions about joint concentrations.
History and Science

Professor Anne Harrington, Director of Undergraduate Studies

The History and Science concentration at Harvard is a flourishing interdisciplinary field of study. We are also a small and friendly concentration, with a real sense of community, and we pride ourselves on finding ways to nurture students’ individual interests through a flexible curriculum, and opportunities for one-on-one instruction, internships, behind the scenes museum and exhibition design opportunities, and research assistantships with faculty.

Why should I consider History of Science?
History and Science may be a good choice for you if:

1. You would like to do significant work in some area of science (any field taught in the College) and combine it with historical, ethical and social analysis of how science, medicine, or technology works in the world.

2. You are interested in the ways in which science, medicine or technology is affected by (and in turn affects) important issues in politics, industry and policy, whether climate change, the teaching of evolution in the public schools, the patenting of genes and new forms of life, and more.

3. You are interested in big questions – the existence of God, the nature of free will, the roots of human morality, and more – and would like to understand the ways in which science has shaped or is shaping the ways in which we think about them.

4. You are considering attending medical school and would like a concentration that allows you to count many of your premed science requirements, even as you take classes and do advanced research in the history of medicine, medical anthropology, and health policy.

5. You are interested in computer science, or considering a career in engineering or information technology, and would like a concentration that allows you to count many computer science and engineering classes for concentration credit, even as you take classes and do advanced research in the history and social analysis of technology, computer science, and the world of big data.

6. You are interested in health or science policy, including problems of global health and health inequities, and want a concentration that will offer you an interdisciplinary path of study for engaging with the issues.

7. You are – or aspire to be – a person who is equally literate in the world of the sciences and the world of the humanities and the social sciences.

8. You would value a concentration that cares deeply about teaching, provides abundant opportunities for interaction with faculty, and will rigorously train you in essential analytic, presentation, and research skills that will be valuable for you, no matter what career you choose to pursue.

How is the concentration structured?
The concentration has a two-track structure that provides students with high levels of flexibility. Both of the tracks offer an honors and a non-honors option.

The Science and Society Track is designed for students who have an interest in doing significant course work in an area of science but who also want to study how science develops and affects the world: how it relates to industry, policy, politics, and the broader culture. Students can both do science and analyze how science functions in the world of human affairs.
The History of Science Track does not require students to take science courses beyond the level mandated by General Education (though some may choose to do so and receive concentration credit). It offers students the possibility of studying the history and social relations of science more broadly. By taking a combination of courses from our department and also outside of it, students can learn how sciences as diverse as theoretical physics and economics interact with other areas of culture such as literature, film, art, or government.

Concentrators in History and Science generally combine coursework in the history of science, medicine, or technology (broadly defined) with coursework focused in any area of science taught in the College. Our students also often take courses for concentration credit in global health, science and religion, medical ethics, sociology of science, philosophy of science, anthropology of medicine, and more. Tutorials are aimed at introducing concentrators to some of the most exciting questions in the field and training them with the reading, research, and writing skills they need to do original research of their own. By the time of graduation, all our concentrators possess advanced social science research skills, and often produce original academic work of very high quality.

The concentration also offers three special foci or paths through the program: (1) Medicine and Society, (2) Mind, Brain, and Behavior, and (3) Technology, Information, and Society.

1. Medicine and Society offers pre-medical students an opportunity to combine the science work required of them for medical school with disciplined historical and social science analysis of medicine, health care, public health and the allied medical sciences and medical technologies. This is an honors-only Plan of Study, and all students must write a senior thesis.

2. Mind, Brain, Behavior offers students with interdisciplinary leanings an opportunity to join a College-wide community of undergraduates from six different departments who have interests in the neurosciences and their allied fields, all while focusing their own studies in a mix of psychology, brain science, and the history of the mind, brain and human sciences. This is an honors-only Plan of Study, and all students must write a senior thesis.

3. Technology, Information and Society offers students an opportunity to combine coursework in computer science and its allied fields (including select courses in Engineering Sciences) with courses in the history and social study of technology, computing, and information science. This is an honors-optional Plan of Study. Students are encouraged to write a senior thesis, but some may choose instead to take more advanced work in engineering or computer science during the course of their senior year.

**What are the requirements?**

Every concentrator will take HISTSCI 100, which is offered in the fall semester. In addition, every concentrator will take one semester of sophomore tutorial and one semester of junior tutorial, taught by faculty members and teaching fellows from the Department of the History of Science.

**HISTSCI 97**, the sophomore tutorial, is a hands-on course that introduces students to some of the most exciting and productive questions in the history of science, technology, and medicine, while developing critical reading, presentation, and discussion skills. Students work in groups to explore different aspects of a larger theme each week and share discoveries in sessions led by the faculty instructor. The course is further enhanced by a series of supervised individual group projects.

**HISTSCI 98**, the Junior tutorial, is a course designed to train students in historical research, from how to work in archives to how to master relevant theoretical perspectives needed to think
well about a research question. All students enrolled in this course are guided through an intense but supportive mentoring process that results in a 25-page independent research paper.

*HISTSCI 99AB*, the Senior Thesis Tutorial, is an opportunity to spend a sustained period of time working on a research problem. Students choosing to write a senior thesis may be supervised by a faculty member or an advanced graduate student and are free to pursue a diverse range of topics. Many of our theses go on to win College awards, and some have even been published. Students are welcome to look through the collection of past and present senior theses which are located in the Department of the History of Science.

**What can graduates do with a degree in History and Science?**

Our graduates frequently go on to successful careers in many areas, especially in jobs or forms of further professional training that require or value both technical and social scientific understanding of information science, biotechnology, medicine, health and global health, the law, and public policy. Many win prestigious fellowships that allow them to pursue further academic study. Our alumni have had this to say about their experience with us:

“It was the most flexible, versatile, and practical concentration on campus. It prepared me for both research endeavors within the halls of academia as well as the critical thinking skills needed for graduate degree work.”

“History and Science is the best concentration of all time. Period...Liberal arts educations aren’t intended to ‘qualify’ you for any particular job, but History and Science provides you with a truly broad based, well-rounded education and teaches you novel ways of looking at the world which have been invaluable to me as a lawyer and as a human being.”

Employers are increasingly looking for graduates who are not just literate but also scientifically literate, not just technically skilled in a special subject but able to see the larger cultural, social, and policy implications and impact of scientific and technical developments. If this kind of breadth of vision appeals, our concentration may be right for you.

**REQUIREMENTS**

**History of Science Track**

**Basic Requirements: 11 courses (44 credits)**

1. **Required courses:**
   a. HISTSCI 100: Knowing the Word: Introduction to the History of Science.
   b. Six courses in the history of science, medicine, and technology. These courses should be coherent and be chosen in consultation with a departmental adviser and serve the students’ goals. By senior year, some students may opt for a 200-level course, with the approval of the instructor. One course, if desired, may consist of supervised reading and research, beyond that required by tutorial.
   c. Two courses, normally outside the department, designed to allow students to connect special interests in the History of Science to relevant course work offered in other departments; examples include certain courses in History, Film Studies, Sociology, Comparative Study of Religion, Medical Anthropology, Philosophy of Science, and Literature.

2. **Tutorials:**
   a. *Sophomore year:* HISTSCI 97 (one course) required, group tutorial. Letter-graded.
   b. *Junior year:* HISTSCI 98 (one term) required. Letter-graded.
3. Thesis: None.
4. General Examination: None.
5. Other information:
   a. Pass/fail: Two non-letter-graded courses, including relevant Freshman Seminars taught by department faculty, may count for concentration credit.
   b. Study Abroad: Students may elect to study abroad during their junior year. The department will count up to two approved courses out of residence towards concentration requirements. There is also the possibility of receiving two courses' worth of credit for participation in a summer study abroad program led by a member of the Department. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

History of Science Track
Requirements for Honors Eligibility: 13 courses (52 credits)

1. Required courses:
   a. HISTSCI 100: Knowing the World: Introduction to the History of Science.
   b. Six courses in the history of science, medicine, and technology. These courses should be coherent and be chosen in consultation with a departmental adviser and serve the students' goals. By senior year, some students may opt for a 200-level course, with the approval of the instructor. One course, if desired, may consist of supervised reading and research, beyond that required by tutorial.
   c. Two courses, normally outside the department, designed to allow students to connect special interests in the history of science to relevant course work offered in other departments; examples include certain courses in History, Film Studies, Sociology, Comparative Study of Religion, Medical Anthropology, Philosophy of Science, and Literature.

2. Tutorials:
   a. Sophomore year: HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. Junior year: HISTSCI 98 (one term) required. Letter-graded.
   c. Senior year: HISTSCI 99AB (two terms) required (preparation of senior honors thesis). Graded SAT/UNSAT.

4. General Examination: None.
5. Other information:
   a. Pass/fail: Two non-letter-graded courses, including relevant Freshman Seminars taught by Department faculty, may count for concentration credit.
   b. Study Abroad: Students may elect to study abroad during their junior year. The Department will count up to two approved courses out of residence towards concentration requirements. There is also the possibility of receiving two courses' worth of credit for participation in a summer study abroad program led by a member of the Department. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

History of Science Track
Non-Thesis Option: 12 courses (48 credits)

1. Required courses: Same as Basic Requirements.
2. Tutorials: Same as Basic Requirements.
3. Thesis: None.
4. General Examination: None.
5. Other information: Same as Basic Requirements, plus the following:
   a. Minimum concentration GPA: Students must have a concentration GPA equivalent to the College-wide cut-off for degrees magna cum laude in the field. Concentration grade-point averages will be calculated from a student’s best twelve courses that meet the requirements, including final semester grades.
   b. One graduate-level course: Students must successfully complete (with a minimum B+ grade) at least one graduate-level (i.e., 200-level) course taught by a member of the History of Science faculty or in an appropriate other department (e.g., History). This requirement can also be met by completing a graduate-level track of work, as determined by the faculty instructor, offered within a 100-level course. The requirement is normally fulfilled in the senior year.
   c. Determination of Departmental Honors: A degree recommendation of honors (not high or highest honors) will be awarded to students who meet these requirements.

Science and Society Track
Basic Requirements: 11 courses (44 credits)

1. Required courses:
   a. HISTSCI 100: Knowing the World: Introduction to the History of Science.
   b. Four courses in the history of science, medicine, and technology. If you have chosen one of the special foci, these courses will normally be concentrated in your area of interest. Historically-oriented courses dealing with science, medicine or technology offered in other departments may be counted towards this requirement, with the approval of the Director of Undergraduate Studies. By senior year, some students may opt for a 200-level course, with the approval of the instructor. One course, if desired, may consist of supervised reading and research, beyond that required by tutorial
   c. Four courses in science, all in one coherent field, though not necessarily in one department. No more than two may be introductory. Note: Courses may be drawn from any of the physical and biological or life sciences.

2. Tutorials:
   a. Sophomore year: HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. Junior year: HISTSCI 98 (one term) required. Letter-graded.
3. Thesis: None.
4. General Examination: None.
5. Other information:
   a. Two non-letter-graded courses, including relevant Freshman Seminars taught by Department faculty, may count for concentration credit.
   b. Students may elect to study abroad during their junior year. The Department will count up to two approved courses out of residence towards concentration requirements. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

Science and Society Track
Requirements for Honors Eligibility: 13 courses (52 credits)

1. Required courses:
   a. HISTSCI 100: Knowing the World: Introduction to the History of Science.
   b. Four courses in the history of science, medicine and technology. Normally, these courses will be concentrated in your area of interest. Historically-oriented courses
dealing with science, medicine or technology offered in other departments may be counted towards this requirement, with the approval of the Director of Undergraduate Studies. By senior year, some students may opt for a 200-level course, with the approval of the instructor. One course, if desired, may consist of supervised reading and research, beyond that required by tutorial

c. Four courses in science, all in one coherent field, though not necessarily in one department. No more than two may be introductory. Note: Courses may be drawn from any of the physical and biological or life sciences.

2. Tutorials:
   a. Sophomore year: HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. Junior year: HISTSCI 98 (one term) required. Letter-graded.
   c. Senior year: HISTSCI 99AB (two terms) required (preparation of senior Honors thesis). Grade SAT/UNSAT.

4. General Examination: None.
5. Other information:
   a. Pass/fail: Two non-letter-graded courses, including relevant Freshman Seminars taught by department faculty, may count for concentration credit.
   b. Study Abroad: Students may elect to study abroad during their junior year. There is also the possibility of receiving two courses worth of credit for participation in a summer study abroad program led by a member of the Department. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

Science and Society Track
Non-Thesis Option: 12 courses (48 credits)

1. Required courses: Same as Basic Requirements.
2. Tutorials: Same as Basic Requirements.
3. Thesis: None.
4. General Examination: None.
5. Other information: Same as Basic Requirements, plus the following:
   a. Minimum concentration GPA: Students must have a concentration GPA equivalent to the College-wide cut-off for degrees magna cum laude in field. Concentration grade-point averages will be calculated from a student’s best twelve courses that meet the requirements, including final semester grades.
   b. One graduate-level course: Students must successfully complete (with a minimum B+ grade) at least one graduate-level (i.e., 200-level) course taught by a member of the History of Science faculty or in an appropriate other department (e.g., History). This requirement can also be met by completing a graduate-level track of work, as determined by the faculty instructor, offered within a 100-level course. The requirement is normally fulfilled in the senior year.
   c. Determination of Departmental Honors: A degree recommendation of honors (not high or highest honors) will be awarded to students who meet these requirements.

Medicine and Society
Requirements for Honors Eligibility: 14 courses (56 credits)
The Medicine and Society focus in the Science and Society track is appropriate for students considering a career in medicine, health sciences, health policy, or who otherwise have a pronounced interest in the medical sciences. It allows students to combine course work in many
of the scientific subjects required for medical school admission with a coherent program of courses that look at health and medicine from a range of historical, social scientific and humanistic perspectives.

1. **Required courses:*
   a. HISTSCI: Knowing the World: Introduction to the History of Science.
   b. Four courses in medical sciences. No more than two courses may be introductory. Courses should be relevant courses in chemistry, the life sciences, the physical sciences, mathematics, molecular and cellular biology, organismic and evolutionary biology, neurobiology, or human evolutionary biology.
   c. **Five additional courses:**
      i. At least four courses must be in the history of medicine or its allied fields (including the life sciences, mind sciences, bioethics, and biotechnology) and be taught by members of the Department of the History of Science. Up to two courses may (though are not required to be) drawn from other disciplines concerned with the social, ethical, or humanistic analysis of medicine and health (e.g., anthropology, economics, ethics, sociology).
      ii. One course may be an open-ended elective that can be fulfilled by taking any of the courses offered by the Department of the History of Science.

2. **Tutorials:**
   a. **Sophomore year:** HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. **Junior year:** HISTSCI 98 (one term) required. Letter-graded.
   c. **Senior year:** HISTSCI 99AB (two terms) required. Preparation of senior honors thesis; normally, this will deal with some historical question to do with medicine and health, broadly understood. Graded SAT/UNSAT.

3. **Thesis:** Required.

4. **General Examination:** None.

5. **Other information:**
   a. **Pass/fail:** Two non-letter-graded courses, including relevant Freshman Seminars taught by Department faculty, may count for concentration credit.
   b. **Study Abroad:** Students may elect to study abroad during their junior year. There is also the possibility of receiving two courses worth of credit for participation in a summer study abroad program led by a member of the department. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.
   c. More information may be found in the Guide to the Focus in Medicine and Society, which is available on the History of Science department website at [https://histsci.fas.harvard.edu/](https://histsci.fas.harvard.edu/).

**Mind, Brain, and Behavior Sciences**

**Requirements for Honors Eligibility:** 14 courses (56 credits)

Students interested in integrating serious study of the sciences of mind, brain, and behavior with thoughtful attention to sociocultural, philosophical, and historical questions raised by those sciences may pursue a Mind, Brain, and Behavior (MBB) focus in History and Science, developed in collaboration with the Standing Committee on Neuroscience and the University-wide Mind/Brain/Behavior Interfaculty Initiative ([https://mbb.harvard.edu/](https://mbb.harvard.edu/)) (Mind, Brain, and Behavior tracks are also available in Computer Science, Human Evolutionary Biology, Linguistics, Neuroscience/Neurobiology, Philosophy, and Psychology.) Requirements for this program are based on those of the Science and Society track, except that:

1. At least three of the five sociocultural courses should be historical in nature. Up to two courses may be taken in an auxiliary area, such as:
   a. Health and Science Policy.
b. Medical Anthropology.
c. Religion and Ethics.
d. Philosophy of Mind & Behavior.

2. The four courses in science must include PSY 1: Introduction to Psychological Science; the remaining three courses in science must include MCB 80 (ordinarily in the sophomore year), and at least two advanced science courses that focus in one of the following areas (in some circumstances, courses from two areas may be combined):
   b. Psychopathology.
   c. Human Evolutionary Biology.
   d. Child Development and the Brain.
   e. Computational Neuroscience.
   f. Neurobiology.

3. Students pursuing the MBB track are also expected to participate in the University-wide MBB research milieu, including a non-credit senior year seminar for MBB thesis writers.

Technology, Information, and Society
Basic Requirements: 12 courses (48 credits)

1. **Required courses:**
   a. HISTSCI 100: Knowing the World: Introduction to the History of Science.
   b. Four courses in the history of science and technology designed to study the larger historical, ethical, and social implications of technology, engineering, and information in the modern world. Two of the four courses may be taken in the General Education program, but two should normally be at least 100-level courses in the History of Science Department. Normally, one of the courses may be taken in an area outside the primary focus (e.g., history of medicine).
   c. Five courses in Computer Science or an area of engineering taught in the College (Bioengineering, Electrical Engineering, Mechanical Engineering, Environmental Science and Engineering). No more than two may be introductory.

   *Note:* Normally, students will begin with a foundational course recommended by the relevant science department and then take a minimum of four additional courses.

2. **Tutorials:**
   a. Sophomore year: HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. Junior year: HISTSCI 98 (one term) required. Letter-graded.

3. **Thesis:** None.

4. **General Examination:** None.

5. **Other information:**
   a. Two non-letter-graded courses, including relevant Freshman Seminars taught by Department faculty, may count for concentration credit.
   b. Students may elect to study abroad during their junior year. The Department will count up to two approved courses out of residence towards concentration requirements. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

Technology, Information, and Society
Requirements for Honors Eligibility: 14 courses (56 credits)

1. **Required courses:**
   a. HISTSCI 100: Knowing the World: Introduction to the History of Science.
b. Four courses in the history of science and technology designed to study the larger historical, ethical, and social implications of technology, engineering, and information in the modern world. Two of the four courses may be taken in the General Education program, but two should normally be at least 100-level courses in the History of Science Department. Normally, one of the courses may be taken in an area outside the primary focus (e.g., history of medicine).

c. Five courses in computer science or an area of engineering taught in the College (Bioengineering, Electrical Engineering, Mechanical Engineering, Environmental Science and Engineering). No more than two may be introductory. *Note:* Normally, students will begin with a foundational course recommended by the relevant science department and then take a minimum of four additional courses.

2. *Tutorials:*
   a. *Sophomore year:* HISTSCI 97 (one term) required, group tutorial. Letter-graded.
   b. *Junior year:* HISTSCI 98 (one term) required. Letter-graded.
   c. *Senior year:* HISTSCI 99AB (two terms) required. Preparation of senior honors thesis; normally, this will deal with some historical question to do with technology, information, and society, broadly understood. Graded SAT/UNSAT.


4. *General Examination:* None.

5. *Other information:*
   a. *Pass/fail:* Two non-letter-graded courses, including relevant Freshman Seminars taught by Department faculty, may count for concentration credit.
   b. *Study Abroad:* Students may elect to study abroad during their junior year. There is also the possibility of receiving two courses worth of credit for participation in a summer study abroad program led by a member of the department. Please consult with the Director of Undergraduate Studies or the Manager of Student Programs for more information.

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**Technology, Information, and Society**

**Non-thesis Option: 13 courses (52 credits)**

1. *Required courses:* Same as **Basic Requirements**.
2. *Tutorials:* Same as **Basic Requirements**.
4. *General Examination:* None.
5. *Other information:* Same as **Basic Requirements**, plus the following:
   a. *Minimum concentration GPA:* Students must have a concentration GPA equivalent to the College-wide cut-off for degrees magna cum laude in field. Concentration grade-point averages will be calculated from a student’s best twelve courses that meet the requirements, including final semester grades.
   b. *One graduate-level course:* Students must successfully complete (with a minimum B+ grade) at least one graduate-level (i.e., 200-level) course taught by a member of the History of Science faculty or in an appropriate other department (e.g., History). This requirement can also be met by completing a graduate-level track of work, as determined by the faculty instructor, offered within a 100-level course. The requirement is normally fulfilled in the senior year.
   c. *Determination of Departmental Honors:* A degree recommendation of honors (not high or highest honors) will be awarded to students who meet these requirements.
ADVISING
Anne Harrington, Director of Undergraduate Studies, has overall responsibility for advising in the concentration. She is also available for individual consultation (aharring@fas.harvard.edu). Students seeking advice on course selection, or any other aspect of the concentration, should first contact Alice Belser, the Manager of Student Programs (ajbelser@fas.harvard.edu). Faculty in charge of students’ History of Science tutorials also function as advisers: sophomores may consult with the faculty in charge of the sophomore tutorial; juniors with faculty responsible for their Junior Tutorials; and seniors with the senior tutorial course head.

For up-to-date information on advising in History and Science, please see the History of Science website or the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

HOW TO FIND OUT MORE
For more information, students can contact the Manager of Student Programs, Alice Belser, ajbelser@fas.harvard.edu, 617-495-3742, Science Center 355, or the Director of Undergraduate Studies, Professor Anne Harrington, aharring@fas.harvard.edu, Science Center 360. The Department's main website is: histsci.fas.harvard.edu.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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History of Art and Architecture

Professor Jennifer Roberts, Director of Undergraduate Studies

The History of Art and Architecture concentration offers training in the historical interpretation and critical analysis of the visual arts and architecture. It develops the skills of visual discrimination and verbal expression fundamental to art historical analysis.

Encompassing material from the widest range of geographic and historical origins, art history is itself a multifaceted discipline embracing many different methods, perspectives and interests. Sometimes it deduces from works of art the time and place of their making, or the identity of their makers. Sometimes it examines how concepts, ideals, and sensibilities of people of the past are expressed in their art, and further, how that art influenced wider aspects of their culture. Sometimes it explores within large-scale fabrications (buildings, towns, cities) the dynamic between human and natural worlds. These and other approaches are reflected in the teaching and scholarship of the History of Art and Architecture faculty.

Training in the critical analysis of art seeks to clarify the perception—and understanding—of how artworks relate to the techniques and materials used in their making, and to the environment in which they are seen. It also fosters the ability to make and explain judgments of quality and value. Instruction in critical analysis is aided by the History of Art and Architecture Department’s partnership with one of the world’s greatest teaching museums, comprising the Fogg, Busch-Reisinger, and Sackler Museums. This offers students a unique opportunity of first-hand study of original works of art in many media.

Concentration requirements ensure that students are well versed in both the historical and critical facets of the field. Generally, course work offers coverage of the history of art, while a sequence of small-group tutorials develops critical skills. For students with a special interest in architecture, the concentration offers courses on architectural history and urban planning, while also helping to advise in, and coordinate, relevant coursework undertaken beyond the department. Courses in the History of Art and Architecture undergraduate curriculum are structured as a three-tier system, consisting of a sequence of entry-level and field-specific introductory courses, upper-level courses, and tutorials.

HUMAN 20: A Colloquium in the Visual Arts and HAA 11: Landmarks of World Architecture are general, conceptual introductions (to world art from pre-history to the present, and history of world architecture, respectively) each of which could serve as a point of entry into the courses and concentration of History of Art and Architecture. Other double-digit lecture courses in HAA, or offered through the program in General Education are also suitable points of entry into the concentration.

Tutorials are small-group seminars which discuss the methodology of the discipline or examine a specific research topic in the discipline. These are intended to provide increasing expertise in critical and analytical thinking, and serve as a basis for independent senior research projects. The senior thesis offers a student the opportunity to apply in greater depth one or more of the methods and aims developed in courses and tutorials, although, of course, theses often deal with subjects not included in class work.

The concentration in History of Art and Architecture can be pursued in conjunction with several other concentrations, most commonly Art, Film, and Visual Studies, English, Anthropology, area
studies, or Romance Languages and Literatures. Together with the departments of the Classics, Near Eastern Languages and Civilizations, and Anthropology, the Department of History of Art and Architecture initiates students in the study of archaeology.

Architecture Studies is a track within the History of Art and Architecture concentration, jointly administered by the History of Art and Architecture and the Graduate School of Design. The track has its own requirements, which are detailed below. Students wishing to pursue other specific interests may receive advising from appropriate faculty as arranged by the Director of Undergraduate Studies.

Requirements for all concentrators, joint and full, provide exposure to a variety of areas within the History of Art and Architecture, as well as allow for the selection of a major field focus from among the following: African, African-American, American, Ancient (Egypt, Ancient Near East, Greece, Rome), Architecture, Baroque and Rococo, Byzantine, Chinese, European 18th and 19th centuries, Japanese, South Asian, Islamic, Latin American/Pre-Columbian, Medieval, Modern and Contemporary, Photography, and Renaissance (Northern and Southern).

A History of Art and Architecture concentration is an effective core to a liberal arts education, and not merely pre-professional training for future art historians working in the academy or in the museum. The History of Art and Architecture is virtually unique among academic disciplines in studying the products of societies in every part of the world over the entire span of human history, from the Paleolithic cave paintings to the works of our closest contemporaries.

Students concerned with joint concentration, credit for work done elsewhere, and late transfer into History of Art and Architecture should consult with the Director of Undergraduate Studies. All concentrators should arrange advising appointments with the Director of Undergraduate Studies at the start of each term.

REQUIREMENTS

Basic Requirements: 12 courses (48 credits)

1. Required courses:
   a. Three courses from offered introductory courses, numbered HAA 1–89.
      (Freshmen considering the concentration should normally take at least one of these in their freshman year, although this is not a prerequisite for the concentration.)
   b. Three courses in a major field chosen from the list in item 5.c.
   c. Three courses in at least two different areas outside the major field to be chosen from courses with two or three-digit numeration or offerings in the Program in General Education.
   d. One course of HAA 97R (see item 2.a.).
   e. Two courses of HAA 98AR (see item 2.b.).
   f. Note: Of the twelve courses required, a distribution requirement must be fulfilled as follows:
      i. One course in items 1.a., 1.b., 1.c., or 1.d. must be in Asian, Islamic, African, or Latin American/Pre-Columbian if the major field is in any area of European or North American art or architecture; or one course in European or North American art or architecture if the major field is Asian, Islamic, African, or Latin American/Pre-Columbian.
      ii. Two courses in two different periods other than that of the major field. No more than five of the series of courses numbered HAA 10-89 may be taken for concentration credit, except with the approval of the Director of
Undergraduate Studies. The balance should be tutorials and upper-level courses.

2. Tutorials:
   a. Sophomore year: HAA 97R (one term) required. Letter-graded. Group tutorial, is an introduction to the practice of art and architectural history through object-based teaching led by faculty members in HAA.
   b. Junior year: HAA 98AR (two terms) required. Letter-graded. HAA 98AR, Group Tutorial, consists of weekly meetings with a graduate student, with regular reading and writing assignments. HAA 98AR offers concentrators the choice of several study groups investigating a particular field or topic in art history, including each year: museums and collections; race and aesthetics; the art of looking and writing; and architectural methods. Concentrators select two of the four group tutorial topics.

3. Thesis: None.
4. General Examinations: None.
5. Other information:
   a. History of Art and Architecture courses may include: General Education courses given by members of the Department of History of Art and Architecture; all historical courses in Visual and Environmental studies; Classical Archaeology; selected courses in the Program in General Education, the humanities, Anthropology, and African and African American Studies; certain offerings of the Graduate School of Design; and certain Freshman Seminars. The designation of any course taken outside the Department of History of Art and Architecture as a concentration course is subject to the approval of the Director of Undergraduate Studies. No more than two half-courses may be “imported” into the concentration by petition over and above those which are already cross-listed; exceptions for coursework done as part of study abroad programs will be considered on a case-by-case basis.
   b. Pass/fail: Normally, no work taken pass/fail will be accepted as part of the concentration; however, the Director of Undergraduate Studies may make an exception for not more than one Freshman Seminar (graded SAT/UNSAT).
   c. Major fields: Students elect one of the categories below as an area of focus.

<table>
<thead>
<tr>
<th>African</th>
<th>Ancient</th>
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<tr>
<td>African-American</td>
<td>Baroque and Rococo</td>
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<td>South Asian</td>
<td>Latin American/Pre-Columbian</td>
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<tr>
<td>Japanese</td>
<td>Modern and Contemporary</td>
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Requirements for Honors Eligibility: 14 courses (56 credits)

1. **Required courses:** Same as **Basic Requirements**.

2. **Tutorials:**
   a. Same as **Basic Requirements**.
   b. Same as **Basic Requirements**.
   c. **Senior year:** HAA 99 (two terms). Graded SAT/UNSAT. In the fall term, HAA 99 includes several group tutorial meetings with the senior honors adviser, where assignments are aimed at facilitating the writing of a senior thesis.

3. **Thesis:** Required, ordinarily written as part of HAA 99. A student who does not complete the thesis but wishes to receive year-long 8-credit or year 4-credit course credit for HAA 99 must submit a paper or other substantial piece of work. Only students with a minimum grade point average of 3.00 within the concentration are eligible to write a thesis.

4. **General Examination:** None.

5. **Other information:** Same as **Basic Requirements**.

Architecture Studies Track

Requirements for Honors Eligibility: 14 courses (56 credits) and thesis

Architecture Studies is a track within the History of Art and Architecture concentration, jointly administered by the History of Art and Architecture and the Graduate School of Design, it pursues the study of architecture within the spirit of a liberal arts education.

The track has its own requirements, which are detailed below. A statement of purpose and a proposed course plan is required for Architecture Studies. Interested students should contact the HAA Coordinator of Undergraduate Studies for further information on this process and on the curriculum overall.

Architecture stands at the intersection of creative imagination, practical realization, and social use, comprising not only material structures of human occupation, but also the dynamic processes that shape human action and experience. The study of architecture integrates technical and humanistic methods of inquiry with written and visual modes of representation, in traditional classroom venues and “making”-based studios designed especially for this concentration.

Within the Architecture Studies track, two broad areas of emphasis may be chosen: (1) **History and Theory**, which includes the study of architecture, cities, landscapes, designed objects, ornament, architectural photography, and material culture, in diverse places and time periods including Africa, the Americas, China, Europe, India, the Islamic world, and Japan, all from antiquity to the present; and (2) **Design Studies**, which includes investigations into the social and aesthetic dimensions of contemporary architecture, landscapes, cities, and territories, emphasizing issues of sustainable environments, new forms of urbanism, and the use of digital media for visualization and analysis.

Both the “History and Theory” and the “Design Studies” areas teach architecture within the larger visual culture.
1. **Required courses:**
   - b. Three courses in architecture or a related field from offered courses numbered HAA 12-89 and 100-199, adhering to the following guidelines: at least one course in Asian, Islamic, African, South Asian, or Latin American/Pre-Columbian art or architecture; one course in any area of European or North American architecture; and one course in architecture before 1800. See the Undergraduate Coordinator for a list of approved courses.
   - c. HAA 96A: Architecture Studio 1: Transformations (course). Studio may be taken sophomore or junior year. No prerequisite. Studio meets for six hours per week.
   - d. HAA 96B: Architecture Studio 2: Connections (course). Studio may be taken junior or senior year. HAA 96A must be taken as a prerequisite. Studio meets for six hours per week.
   - e. One course of HAA 98AR (see basic requirements item 2.b.).
   - f. One course of HAA 97R (see basic requirements item 2.a.).

2. **Distribution Requirements for Areas of Emphasis:**
   - a. **Option 1 – History and Theory:** Four courses in architecture or a related field, from offered courses numbered HAA 100-299 or related courses at the GSD, with approval by the Director of Undergraduate Studies (e.g., GSD 4121, 4122, 4223, 4141, 4142). Courses should be balanced between the two departments. Courses in the HAA 200 range require permission of instructor. Other courses from the HAA or GSD rosters, or courses from other departments, may be substituted with approval of the Director of Undergraduate Studies (see item 6.a.).
   - b. **Option 2 – Design Studies:** Four courses from offered courses that investigate design media, and the social, ecological, and aesthetic dimensions of environments, numbered HAA 100-199 or related course at the GSD with approval by the Director of Undergraduate Studies (e.g., GSD 2223, 3241, 3242, 3332). Courses should be balanced between the two departments. GSD courses require permission of instructor. Other courses from the HAA or GSD rosters, or courses from other departments, may be substituted with approval of the Director of Undergraduate Studies (see item 6.a.).

3. **Tutorials:**
   - a. **Junior year:** HAA 98AR (one term) required. Letter-graded. Tutorial led by graduate student, offers concentrators the choice of several topics in the field of art and architectural history.
   - b. **Sophomore year:** HAA 97R (one term) required. Letter-graded. HAA 97R is an introduction to the practice of art and architectural history through object-based teaching led by faculty members in HAA.

4. **Thesis:** None required.
5. **General Examinations:** None.
6. **Other information:**
   - a. The designation as a concentration course of any course taken outside of those listed above or on the program’s list of approved courses is subject to the approval of the Director of Undergraduate Studies. No more than two courses may be “imported” into the concentration by petition over and above those courses already cross-listed; exceptions for coursework completed as part of study abroad programs will be considered on a case-by-case basis.
   - b. **Pass/fail:** Normally, no work taken pass/fail will be accepted as part of the concentration; however, the Director of Undergraduate Studies may make an exception for not more than one Freshman Seminar (graded SAT/UNSAT).
Architecture Studies Track

Requirements for Honors Eligibility: 14 courses (56 credits) and thesis

1. Required courses: Same as Basic Requirements.
2. Tutorials:
   a. Same as Basic Requirements.
   b. Same as Basic Requirements.
   c. Senior year: HAA 92R (two term). Graded SAT/UNSAT. Strongly recommended is HAA 99 (two terms), which includes several group tutorial meetings with the senior honors adviser, where assignments are aimed at facilitating the writing of a senior thesis.
3. Thesis: Required, ordinarily prepared as part of HAA 99 and/or 92R. The student may choose to research and write a thesis or prepare a thesis design project. A student who does not complete the thesis but wishes to receive year-long 8-credit or year 4-credit course credit for HAA 99 or 92R must submit a paper or other substantial piece of work. Only students with a minimum grade point average of 3.00 within the concentration are eligible to prepare a thesis.
4. General Examination: None.
5. Other information: Same as Basic Requirements.

ADVISING

Departmental academic advising is provided by the faculty, and by the Director of Undergraduate Studies, Professor Jennifer Roberts, who meets individually with concentrators to discuss course selection, tutorials, and thesis topics (usually at the beginning of each term and by appointment at other times).

Students are reminded, however, that they are each ultimately responsible for the fulfillment of concentration requirements, and should check regularly on the current status of their progress. Procedural information and advice is available throughout the year in the Undergraduate Office. Please contact the Coordinator of Undergraduate Studies at the Sackler Building, 485 Broadway, (617-495-2310), who is available on a walk-in basis during most regular office hours. Senior Honors Adviser is Professor Felipe Pereda and Director of Graduate Studies is Professor Ewa Lajer-Burcharth. Our Department Chair is Professor David Roxburgh.

RESOURCES

History of Art and Architecture concentrators benefit from the unusually rich University collections of Harvard’s five museums: the Fogg, Sackler, Busch-Reisinger (the Harvard Art Museums), Semitic, and Peabody museums containing Western, Asian, and ethnographic art. Concentrators often have an opportunity to be involved in aspects of museum operations, working with curators and museum staff to research pieces in the collection and/or share in the mounting of exhibitions. Harvard’s library holdings in art and archaeology include more than 250,000 books and more than 1,500,000 photographs and slides.

The Museum of Fine Arts, the Isabella Stewart Gardner Museum, and the Institute of Contemporary Arts are three of Boston’s great cultural resources. Entrance to these institutions is free to undergraduates who show their Harvard ID cards at the door.

HOW TO FIND OUT MORE

For further information regarding the concentration, please visit the Department website: https://haa.fas.harvard.edu/why-study-art-history.
Office hours: Monday through Friday, 9 a.m.–5 p.m.

### ENROLLMENT STATISTICS

**Number of Concentrators as of December**

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Human Developmental and Regenerative Biology

Dr. William J. Anderson, Director of Undergraduate Studies
Dr. Amie L. Holmes, Assistant Director of Undergraduate Studies

Human Developmental and Regenerative Biology (HDRB) is a life science concentration that educates students on how human beings develop from a fertilized egg, are maintained and repaired throughout adulthood, and age till life’s end. Students will be given a broad education in modern life sciences by studying important biological principles within the specific rubric of the developing and regenerating body. By adding an explicit and heavy emphasis on hands-on research opportunities in all four undergraduate years, HDRB will engage students with an interest in research and take advantage of Harvard’s special strengths as a teaching college and research university.

To the extent that “translational” or “applied” research focuses on the application of discoveries made in model systems to humans, the HDRB concentration will embrace the opposite approach. Its emphasis will be on rigorous basic science with a focus on what the study of humans reveals about fundamental biology and reciprocally, what a greater understanding of biology teaches us about ourselves. We believe that a fundamental understanding of how the human organism develops and maintains itself requires foundational knowledge in life sciences, chemistry, and physical sciences, which are in turn dependent on a fundamental knowledge of quantitative science. The requirements for the concentration reflect this view.

Students begin their study via foundational courses in the life sciences. Ordinarily, students next will enroll in Stem Cell and Regenerative Biology (SCRB) 10, which is a gateway course for the HDRB concentration. SCRB 10 introduces concentrators to concepts presented in depth by later electives. Students will delve deeper into more focused topics through at least three upper-level lecture or laboratory courses. SCRB 91R, which serves as the concentration tutorial, is ordinarily taken in the junior year. SCRB 91R is a semester-long course of independent laboratory research. Honors candidates must also enroll in SCRB 99 and submit a thesis.

The framework of the concentration takes advantage of faculty strength in both the Faculty of Arts and Sciences, and Harvard Medical School through the Department of Stem Cell and Regenerative Biology. The curriculum provides a range of courses that will benefit students interested in medicine and biomedical research, as well as other fields in which a comprehensive understanding of human biology is needed.

**REQUIREMENTS**

**Basic Requirements: 13 courses (52 credits)**

1. **Required courses:**
   a. *Life Sciences (2 courses):* LS 1A (or LPS A) and LS 1B.
   b. *Quantitative Science (1 course):* Above the level of MATH 1A. Ordinarily, this is fulfilled by MATH 1B, MATH 19A, MATH 21A, or equivalent. This can also be fulfilled with a course in Statistics (STAT 102, 104, 107, 110, 115, or equivalent).
   c. *Chemistry (1 course):* PHYSCI 1, PHYSCI 11, or equivalent.
   d. *Human Developmental and Regenerative Biology (1 course):* SCRB 10. Concentrators would ordinarily take this course in the first semester of their sophomore year.
   e. *Molecular Biology (1 course):* MCB 60, SCRB 50, or equivalent.
f. **Physics (1 course):** PHYSCI 2 or equivalent.

g. **Organic Chemistry (2 courses):** CHEM 17 and CHEM 27, or CHEM 20 and CHEM 30, or equivalent.

h. **Advanced courses:** Three courses above the introductory level. Any of the 100-level SCRB courses may be used to fulfill these requirements. Certain advanced courses in Molecular and Cellular Biology, Chemistry and Chemical Biology, Human Evolutionary Biology, and Organismic and Evolutionary Biology may also be used to fulfill this requirement. Consult the concentration office for a list of courses categorized by area of inquiry.

i. **Research experience and tutorial:** SCRB 91R. All concentrators will be required to carry out at least one semester of supervised undergraduate research in the lab of a SCRB faculty member, Harvard Stem Cell Institute principal faculty member, or others with the permission of the Director of Undergraduate Studies. Consult the concentration office for a list of approved faculty members. Concurrently with this research experience, students will meet with their undergraduate research adviser twice per month to discuss progress in their coursework, their research, and current literature in their field of inquiry. Ordinarily, these two components will be combined in one term of SCRB 91R, usually taken in the junior year. Students carrying out thesis research ordinarily enroll in two terms of SCRB 99, one of which may be used to fulfill this requirement.

2. **Thesis:** None. See Requirements for honors eligibility.

3. **General Examination:** None.

4. **Other information:**
   a. **Pass/fail:** Courses counted for concentration credit may not be taken pass/fail.
   b. Advanced Placement credits may be counted (with or without Advanced Standing), provided the total number of concentration courses taken at Harvard does not fall below twelve courses, and provided the student does not enroll in a course for which the advanced placement credit was granted. Advanced Placement credit for PHYSCI 1 may ordinarily be counted if the student begins with CHEM 17 or 20.
   c. Certain courses offered by the School of Engineering and Applied Sciences and by the Division of Medical Sciences may also be counted for concentration credit if appropriate.
   d. Courses required to fulfill General Education subject areas may also be counted toward concentration credit where appropriate.

Requirements for Honors Eligibility: 15 courses (60 credits)

1. **Required courses:** Same as **Basic Requirements**.
2. **Thesis:** Required. Students enroll in two terms of SCRB 99 during the senior year.
3. See 1.i. (Research experience and tutorial) under **Basic Requirements**.
4. **General Examination:** None.
5. **Other information:** Same as Basic Requirements.

**ADVISING**

The Assistant Director of Undergraduate Studies for HDRB, Dr. Amie Holmes, is available to concentrators and pre-concentrators to provide guidance on course selection, laboratory research, and the fulfillment of concentration requirements. To learn more, visit [http://lifesciences.fas.harvard.edu/hdrb](http://lifesciences.fas.harvard.edu/hdrb) or contact Dr. Holmes ([amie_holmes@harvard.edu](mailto:amie_holmes@harvard.edu)).
1-617-496-1417, or visit https://lifesciences.fas.harvard.edu/hdrb-office-hours to schedule a one-on-one meeting).

HOW TO FIND OUT MORE
The Director of Undergraduate Studies for HDRB is Dr. Bill Anderson and the Assistant Director of Undergraduate Studies is Dr. Amie Holmes. For more information about the HDRB concentration, visit https://lifesciences.fas.harvard.edu/hdrb. Students may also contact Dr. Amie Holmes (Bauer Room 206, 7 Divinity Avenue; 617-496-1417; amie_holmes@harvard.edu) for more information.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Human Developmental and Regenerative Biology does not participate in joint concentrations.
Human Evolutionary Biology

Professor Daniel Lieberman, Co-Director of Undergraduate Studies
Dr. Carole Hooven, Co-Director of Undergraduate Studies

The concentration in Human Evolutionary Biology (HEB) allows students to explore all aspects of human biology from an evolutionary perspective. HEB engages students to develop knowledge and skills to investigate questions about how and why humans are the way we are and how the answers can help solve modern problems related to health, society, and environment. Research in human evolutionary biology is increasingly relevant to medical science, economics, linguistics, psychology, and political science. HEB concentrators explore human biology at every level, from genes to bodies to people in their ecological contexts, to answer questions such as:

- Why are humans the only apes that walk upright?
- Are humans adapted to eating mostly meat, mostly carbohydrates, or something else?
- How does our gut microbiota affect the amount of energy we get from the food we eat?
- How did human societies expand from small hunter-gatherer bands to vast nation states?
- Are culture and language unique to humans?
- What are the genetic bases for human traits?
- What does being aggressive, a good parent, or gender identity have to do with hormones?
- How can an evolutionary perspective be used to improve obesity and diabetes?
- What has been the impact of environmental change on humans in the past and present?

HEB provides a general foundation in human and organismic biology as part of the life sciences cluster of concentrations.

All HEB concentrators receive a core introduction to basic evolutionary biology as well as human and nonhuman primate genetics, physiology, anatomy, behavioral biology, and paleontology. HEB courses also explore interactions between genes and environments, and the co-evolution of biology and culture.

Students interested in human cognition or psychology, who want to understand the evolutionary influences on our thoughts and behaviors, may pursue the thesis honors Mind, Brain and Behavior track within HEB ("MBB Track"). Requirements are below.

We encourage our students to get involved in research in HEB, and we offer many small, advanced courses for students to work intensively with members of the faculty. Opportunities vary from primarily lab-based research—such as in behavioral endocrinology, primate and human cognition, evolutionary genetics, physiology, anatomy, or nutrition—to field-based work—such as studying primates in East Africa or working on paleoanthropological excavations. Our faculty work closely with undergraduates on research projects of all kinds, for senior theses, research seminars and tutorial classes.

HEB offers a rigorous background in human evolutionary biology while encouraging interdisciplinary work. We offer students three options: the basic non-honors degree, thesis honors, and non-thesis honors. All students take LS 1A, LS 1B (or their equivalents), the sophomore tutorial, and a Junior Research Seminar.
REQUIREMENTS

Basic Requirements: 13 courses (52 credits)

1. Required Courses:
   a. LS 1A (or LPS A) and LS 1B or LS 50A/50B; normally in freshman year.
   b. Five courses, selected from those offered in HEB. Three of the five courses must
      fulfill subfield requirements in behavior, evolution, and anatomy/physiology.
      Courses are selected in close consultation with advisers.
   c. Four additional courses in related fields, to be chosen from: Integrative Biology,
      Molecular and Cellular Biology, Neurobiology, Chemistry, Physical Sciences,
      Math, Statistics, Computer Science, Archaeology, and approved courses from
      Psychology, History of Science, and more.

2. Tutorials (All letter-graded)
   a. Sophomore year: sophomore tutorial (HEB 97, ordinarily taken in the spring term
      of the sophomore year). This seminar introduces the major issues and methods
      of human evolutionary biology through weekly readings and discussions and
      provides a shared experience for all concentrators.
   b. Junior year: Junior Research Seminar. Normally taken in the junior year (may be
      taken senior year), including an independent research component. Students may
      choose from a number of qualifying seminars.

3. Thesis: None.
4. General Examination: None.
5. Other information:
   a. Pass/fail: Ordinarily all courses must be taken for a letter grade. All tutorials are
      letter-graded. Freshman seminars and other courses that are appropriate for
      concentration credit and that are graded SAT/UNSAT—such as courses taken
      while studying abroad—may count toward the concentration with the approval of
      a concentration adviser.
   b. Languages: No requirement.

Requirements for Honors Eligibility: 15 courses (60 credits)

Thesis Track Honors

1. Required Courses: Same as Basic Requirements.
2. Tutorials (All letter-graded):
   a. Sophomore year: sophomore tutorial (ordinarily taken in the spring term of the
      sophomore year). Same as Basic Requirements.
   b. Junior year: Ordinarily thesis candidates take a thesis research-related course,
      either a junior research seminar or a supervised reading and research course
      (HEB 91R).
   c. Senior year: HEB 99A and HEB 99B (in the Fall and Spring, respectively),
      culminating in the submission of a senior thesis and participation in a thesis
      conversation with the adviser and other HEB faculty.

4. General Examination: None.
5. Other information: Same as Basic Requirements.

Non-Thesis Track Honors

1. Required Courses: Same as Basic Requirements, plus two additional courses in HEB
   or related fields approved in advance by a concentration adviser. These courses are
ordinarily advanced lectures, seminars, or supervised reading courses on a focused topic.

2. **Tutorials:**
   a. **Sophomore year:** Same as Basic Requirements.
   b. **Junior year:** Junior Research Seminar. Same as Basic Requirements.
   c. **Senior year:** None.

3. **Thesis:** None.

4. **Other information:** Same as Basic Requirements. Honors recommendations are based on concentration GPA.

**Human Evolutionary Biology/Mind, Brain, and Behavior Track**

15 courses (60 credits)

1. **Required Courses:**
   a. LS 1B (normally in freshman year) or LS 50B.
   b. PSY 1 (previously SLS 20) or HEB 1280: Human Nature.
   c. MCB 80 or equivalent.
   d. PSY 16 or HEB 1386, plus two courses to be chosen from HEB.
   e. Two additional courses in Mind, Brain, and Behavior.
   f. Three additional courses in related fields. Qualifying courses are the same as for Basic Requirements.

2. **Tutorials (All letter-graded):**
   a. **Sophomore year:** sophomore tutorial (ordinarily taken in the spring term of the sophomore year). Same as Basic Requirements.
   b. **Junior year:** One MBB-approved seminar course.
   c. **Senior year:** HEB 99A and HEB 99B (in the Fall and Spring, respectively), culminating in the submission of a senior thesis, followed by an oral examination on the thesis.

3. **Thesis:** Required.

4. **General Examination:** None.

5. **Other information:** Same as Basic Requirements.

**Gateway Courses for exploring HEB:**

**Fall:**
- LS 2: Evolutionary Human Physiology and Anatomy.
- HEB 1328: Evolutionary Medicine.

**Spring:**
- HEB 1330: Primate Social Behavior.
- GENED 1027: Human Evolution and Human Health.
- HEB 1420: Human Evolutionary Anatomy.

**ADVISING**

HEB concentration advisers (contact information below) provide guidance on matters such as course selection, research, concentration requirements, summer plans and career paths. For up-to-date information on advising in Human Evolutionary Biology, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.
HOW TO FIND OUT MORE
Concentration advisers: Dr. Neil Roach, Associate Concentration Adviser (Peabody 46, ntroach@fas.harvard.edu) and Dr. Carole Hooven, Concentration Adviser/Co-Director of Undergraduate Studies (Peabody 52F, hooven@fas.harvard.edu). Co-Director of Undergraduate Studies: Prof. Daniel Lieberman, (danlieb@fas.harvard.edu). For more information, visit the HEB page of the Life Sciences website at http://lifesciences.fas.harvard.edu/heb.

ENROLLMENT STATISTICS
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Integrative Biology

Professor David Haig, Head Tutor

The concentration in Integrative Biology (IB) is designed to provide students with opportunities both to explore topics across all of biology, and to focus in detail on areas of particular interest.

IB asks questions about the function, evolution, and interaction of organisms, both now and in the past. What kinds of organisms are there and how are they related? How is an organism's functional design and behavior related to its environment? What are the genetic and morphological mechanisms underlying an organism's development, and how is evolution influenced by development? Integrative Biology can be approached in many ways, reflecting an interest in a specific group of organisms (e.g., plants, animals, microorganisms), in level of organization (e.g., ecological systems, population genetics), in approach (e.g., systematics, biogeography, biomechanics, developmental biology, mathematical theory, neurobiology), or in sampling broadly across multiple areas. IB is, therefore, inherently an interdisciplinary field, ranging over different levels of biological organization, evolutionary processes, taxa, and physiological and molecular systems. Courses emphasize student learning, critical thinking, and may include participation in research and field experiences, with the goal of fostering a foundation of knowledge and appetite for life-long learning, as students prepare for careers in the life sciences and related fields and professions.

Students who are considering IB as a concentration are encouraged to complete the three introductory courses (LS 1A, LS 1B, OEB 10) by the end of their sophomore year. From the foundation of these introductory courses, students explore one or more areas in depth by taking upper-level courses. Students are encouraged to consult the concentration website at https://lifesciences.fas.harvard.edu/ib for further details on various pathways through the concentration (i.e., suggested combinations of mid-level and upper-level courses). Students are also free to design their own pathway.

For many students, the concentration will culminate in independent research leading to a senior thesis, but a thesis is not the only means by which a student may participate in research. The concentration website at https://lifesciences.fas.harvard.edu/ib provides information on research opportunities in IB as well as general advice about how to identify and contact faculty whose research is of interest. The concentration also provides opportunities to study biological diversity in the field, whether close to home or abroad. IB does not participate in joint concentrations but will consider senior theses that incorporate work from a secondary field.

REQUIREMENTS

Basic Requirements: 13 courses (52 credits)

1. Required courses:
   A. Three courses in introductory biology: LS 1A, LS 1B, OEB 10. (LPS A can substitute for LS 1A; LS 50A and 50B can substitute for LS 1A and 1B).
   B. At least three courses introducing broad fields of biology to be chosen from OEB 11, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60; MCB 60, 63, 80, 121; LS 2; SCRB 10.
   C. Three advanced-level courses in biology, one of which may be a supervised research or reading course.
   D. At least four courses (two courses for students who have taken LS 50A and 50B) to be chosen from offerings in Applied Mathematics, Chemistry, Computer
Science (above the level of COMPSCI 1), Mathematics (above the level of MATH 1A), Physics, and Statistics.
2. Thesis: Optional but required for highest honors in field.
3. Supervised Reading and Research Courses: (OEB 91R, 99R). Any supervised research and reading course undertaken with mentors outside of OEB must be approved and co-sponsored by an OEB faculty member
4. General Examination: None.
5. Pass/fail: All concentration requirements must be taken for letter-grade credit.

ADVISING
Questions should be addressed to the IB Concentration Adviser (Andrew Berry; 617-495-0684; berry@oeb.harvard.edu) or Head Tutor (David Haig; dhaig@oeb.harvard.edu). Students considering doctoral studies in the life sciences should consult with Andrew Berry and other relevant faculty to ensure that their undergraduate program is appropriate to their interests and goals. Those contemplating careers in medicine, dentistry or veterinary medicine are encouraged to consult with the Office of Career Services and appropriate pre-professional advisers regarding entrance requirements for these programs.

RESOURCES
In addition to faculty research laboratories, several special facilities offer unique and exciting opportunities for IB concentrators. These include a supercomputer cluster, a state of the art high-throughput DNA sequencing facility, imaging centers, greenhouses, and animal facilities. The Museum of Comparative Zoology (MCZ) houses extensive systematic collections of recent and fossil vertebrates and invertebrates. The Harvard University Herbaria (HUH) houses the Farlow reference library and Farlow Herbarium, the Gray Herbarium, and the Orchid Herbarium of Oakes Ames. The Botanical Museum houses the Ware collection of botanical models (“glass flowers”). The Arnold Arboretum in Jamaica Plain, the Harvard Forest in Petersham, and the Concord Field Station in Bedford also provide research facilities. Links to these and other facilities can be found on the OEB Department website at http://oeb.harvard.edu/.

HOW TO FIND OUT MORE
Head Tutor, IB: Professor David Haig, Room 410A, Museum of Comparative Zoology, 26 Oxford Street (dhaig@oeb.harvard.edu). More information about the IB concentration can be found at https://lifesciences.fas.harvard.edu/. The IB Concentration Adviser is Dr. Andrew Berry, Biological Laboratories, Room 1082B (617-495-0684, berry@oeb.harvard.edu).

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Integrative Biology does not participate in joint concentrations.
Linguistics

Professor Gennaro Chierchia, Director of Undergraduate Studies

Linguistics, the scientific study of language, is perhaps the ultimate interdisciplinary enterprise, cutting across the humanities, social sciences, cognitive sciences, physical sciences, and biological sciences. Since it is not taught in high school, most undergraduates, including many future Linguistics concentrators, only “discover” linguistics after they come to college. Some are intrigued by the prospect of discovering formal rules to model a complex form of behavior like language; others are interested in the relationship of natural languages to other symbolic systems; still others are curious about similarities and differences they have noticed among individual languages. In exploring these and similar topics, students of linguistics not only learn a great deal about a fascinating field; they also master a variety of conceptual and empirical techniques that stand them in good stead after graduation. Recent Harvard Linguistics concentrators have gone to graduate school in linguistics, mathematics, computer science, cognitive science, English, and music; to medical school, law school, and business school; and into employment in fields as diverse as editing, writing, translating, and language-processing software design.

The Department understands that undergraduates are interested in linguistics for a variety of reasons. Some plan to pursue graduate studies in linguistics or a related discipline; some plan to go on to professional work; and some see a concentration in Linguistics as interesting and valuable intellectually, but do not base their future vocational plans upon it. The department has kept all of these considerations in mind in designing its course offerings and concentration requirements.

Many students who are curious about linguistics but who have never taken a linguistics course assume that it is chiefly a subject for people with an extensive background in foreign languages. This is incorrect. While it is true that some kinds of linguists need to have active control of a variety of languages, the overriding fact is that linguistics and language learning are completely separate pursuits. People who are “good at languages” are not always good at linguistics, and vice versa; many of the world’s most successful professional linguists are fluent only in their native language.

The courses offered by the Department of Linguistics reflect the diversity of the field. The emphases are on linguistic theory, historical linguistics, and the relationship between language and cognition.

**Linguistic Theory**

Every typically-developing child learns a language between the ages of one and five. Linguistic theory seeks to characterize this knowledge explicitly and to account for the ease and speed with which humans acquire it. Since the bulk of the knowledge that enables us to speak and use language is unconscious, most people are unaware of its almost unbelievable complexity and richness. Nor is it obvious to the casual observer that the underlying structures of languages as superficially different as English, Zulu, and Navajo are deeply and fundamentally the same. The traditional branches of linguistic theory are syntax, the study of sentence structure; phonology, the study of the sounds and sound systems; morphology, the study of word structure; and semantics, the study of meaning.

**Historical Linguistics**

All languages change over time, sometimes giving rise to one or more daughter languages and, eventually, to families of related languages. Depending on their specific interests, historical
linguists may investigate the processes and principles by which language change occurs, or study the documented history of individual languages, or try to recover the prehistory of language families by using the “comparative method” to reconstruct the unattested common parent of a set of attested daughter languages. A much-studied example of a reconstructed language is “Proto-Indo-European,” the parent language of the family that includes most of the ancient and modern languages of Europe (including English) and northern India.

**The Linguistics Track in Mind, Brain, Behavior (MBB)**

Since language is a distinctively human characteristic, the study of language provides an important take-off point for investigating the complexities of the human mind/brain. Linguistics spearheaded the “cognitive revolution” in the 1950s and has occupied a privileged position in debates on cognitive issues ever since. At Harvard, the Mind/Brain/Behavior (MBB) Initiative was founded to help faculty in distinct research areas collaborate on projects making use of emerging techniques in neuroscience. One such technique, brain imaging, has long been of interest to linguists; newer experimental work is establishing connections between linguistic theory and language processing, language acquisition, language use, spatial and social cognition, evolutionary psychology and biology, and neuroscience.

The implications of the study of language are broad and interdisciplinary. Modern linguistics theory attempts to characterize a very complex domain of human knowledge, and is thus an area of central concern to philosophers of mind as well as to cognitive psychologists. Furthermore, since the models of language constructed by theoretical linguists are formal in character and inspired by computational and mathematical methodologies, linguistics has a mutually beneficial relationship with computer science and the study of artificial intelligence. Linguistics also offers a firm understanding of the nature of language to literary scholars and language teachers. Finally, since languages are cultural artifacts, the reconstruction of an extinct language can shed light on the physical surroundings and the social institutions of its speakers, making linguistics a topic of interest to anthropologists, sociologists, and archaeologists.

**Concentration Requirements**

Since high schools and even many universities do not offer courses in linguistics, the Department’s introductory courses presuppose no prior background in the field. Many linguistics concentrators, in fact, were unaware of the existence of linguistics as a subject before they took their first linguistics course at Harvard. Our courses therefore aim to introduce students to linguistic analysis and actively engage them in it. They also expose students to the great diversity found in the languages of the world. An extensive foreign language background is not required or assumed.

Concentrators in Linguistics can choose among three tracks: Linguistics; Linguistics with Related Field; and Linguistics with Mind, Brain, and Behavior. The three tracks have the same tutorial program and share a core set of required courses that emphasize argumentation and methodology in phonology, syntax, semantics, and historical linguistics. The Linguistics with MBB track has an additional set of three required core courses that emphasize argumentation and methodology in mind, brain, and behavioral science. Students who choose the straight Linguistics track meet the remainder of the non-tutorial course requirements by taking a
combination of more advanced Linguistics courses within the Department and linguistics-related offerings in other departments. Examples of linguistics-related offerings in other departments include courses on the linguistic structure of particular languages (e.g., History of the German Language) and on the computational, philosophical, and psychological aspects of language (e.g., Psychology of Language). Students who choose the Linguistics with Related Field combine courses in Linguistics proper with linguistics-related courses in an approved second field such as Anthropology, Classics, Computer Science, or Psychology. Students who choose Linguistics with MBB meet the remainder of the non-tutorial course requirement by taking a combination of more advanced courses on Linguistics or on Mind, Brain, and Behavior. Examples of MBB-related courses typically include courses offered by the Philosophy Department (e.g., Philosophy of Language), by the Psychology Department (e.g., Cognitive Neuropsychology), and by the Computer Science Department (e.g., Natural Language Processing).

Note that the Linguistics with Related Field and the Linguistics with MBB tracks are not the same as a joint concentration in Linguistics and another field. Students should consult with both concentrations for finalizing their Crimson Cart in my.harvard. The other field may require additional courses beyond those needed for the Linguistics with Related Field or Linguistics with MBB tracks. Such students graduate with a concentration in Linguistics and the other field (e.g., Linguistics and Mathematics; Linguistics and Anthropology). Students in the Linguistics with Related Field or with MBB tracks, on the other hand, have their study plans approved only in Linguistics, and graduate with a concentration in Linguistics alone. Students in the Linguistics with MBB track receive a certificate from the MBB program as well. Additional information about the requirements for joint concentrators is provided below.

OPTIONS

- Linguistics
- Linguistics with Related Field
- Linguistics with MBB
- Joint Concentration with a second field

REQUIREMENTS

Linguistics Track

Basic Requirements: 12 courses (48 credits); 1 language requirement; no thesis.
Requirements for Honors Eligibility: 14 courses (2 additional thesis-writing tutorials) (56 credits); 2 language requirements; thesis.

1. Required non-tutorial courses (9 courses):
   a. One of the introductory courses:
      i. LING 83: Language, Culture, and Cognition.
      iii. Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 61Q: the Origins of Meaning).
   b. LING 102: Sentence Structure.
   c. LING 105: Sounds of Language.
   d. LING 106: Knowledge of Meaning.
   e. One of the following:
      i. LING 104: Word Structure.
      ii. LING 107: Introduction to Indo-European.
      iii. LING 108: Introduction to Historical Linguistics.
      iv. LING 148: Language Universals.
f. **Four additional courses:** At least one of these courses must be in Linguistics. Courses in Linguistics include any course in the Linguistics Department, or a course on a Linguistics topic in another department. For the other three courses, any course in Linguistics or in a Related Field (e.g. Philosophy of the Mind; Neurobiology of Behavior) will do. Alternatives outside of this domain must be approved by the Head Tutor.

2. **Required Tutorials** (Basic Requirements: 3 courses; for honors eligibility: 5 courses):
   a. **Sophomore year:** LING 97 is required in the spring term and consists of two consecutive six-week small-group tutorials.
   b. **Junior year:** LING 98A (fall) consists of two consecutive six-week small-group tutorials. LING 98B (spring) is a one-term individual tutorial with a faculty member (for honors candidates) or two consecutive six-week small-group tutorials (for non-honors candidates).
      i. **Note:** The specific topics covered in group tutorials change from year to year. Students are free to choose the tutorials they find most interesting, though the Head Tutor may require a student to select a different tutorial if enrollments have exceeded a certain level.
      ii. **Note:** For non-honors candidates, it is possible to replace LING 98B with LING 97R (taken twice) or with any other elective course in Linguistics.
   c. **Senior year:** LING 99A (fall) and 99B (spring), required for honors candidates and focused on the research and writing of the senior honors thesis. LING 99A is a one-term group tutorial led by a faculty member in Linguistics with the participation of honors candidates’ thesis advisers. LING 99B is a one-term individual tutorial with each honors candidate’s thesis adviser. Graded SAT/UNSAT.

3. **Required Languages:**
   a. Regular concentrators must demonstrate knowledge of one foreign language by the end of the junior year as required by the College (see the language requirement in the Handbook for Students at [https://handbook.fas.harvard.edu/book/welcome](https://handbook.fas.harvard.edu/book/welcome)).
   b. Honors candidates must demonstrate knowledge of an additional foreign language by the end of the senior year. This can be done in the following ways:
      i. By being a native speaker of the language.
      ii. By obtaining at least a B grade in a year-long 8-credit, second year language course.
      iii. By passing a Harvard College language placement exam (end of second year).
      iv. In some cases, by passing a special departmental reading exam.
   c. **Note:** The same language course cannot count toward both the concentration requirement and the language requirement. But a language course that does not count toward the language requirement can count toward the concentration requirement as an additional half-course in Linguistics or in the relevant related field.
   d. **Note:** Native speakers of a foreign language are normally not allowed to take courses of basic instruction in that language. Any such courses taken by a native speaker will not be counted toward the departmental language or related field requirements.

4. **Thesis:**
   a. Regular: Not required.
   b. Honors candidates: Required. During the fall term of the senior year, honors candidates produce a thesis prospectus for approval by the Head Tutor. After completing the thesis, honors candidates present the results of their research at a departmental colloquium during Reading Period of the spring term.

5. **Other information:** Courses taken pass/fail may not be counted for concentration credit.
Linguistics with Related Field Track

Regular Requirements: 12 courses (48 credits); 1 language requirement; no thesis.
Requirements for Honors Eligibility: 14 courses (2 additional thesis-writing tutorials) (56 credits); 2 language requirements; thesis.

1. **Required non-tutorial courses in Linguistics (5 courses):**
   a. **One of the following introductory courses:**
      i. LING 83: Language, Structure, and Cognition.
      iii. Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 61Q: the Origins of Meaning).
   b. **Two of the following courses:**
      i. LING 102: Sentence Structure.
      ii. LING 104: Word Structure.
      iii. LING 105: Sounds of Language.
      iv. LING 106: Knowledge of Meaning.
      vi. LING 108: Introduction to Historical Linguistics.
   c. **Two additional courses in Linguistics.**
   d. **Four courses in a related field** (for example: Psychology, Romance Languages and Literatures, Computer Science, etc.): These may include courses relevant for the scientific study of language, but not directly within its purview; for example, not only courses such as “Semitic Linguistics” are acceptable, but also courses such as “Complex Fourier Analysis” and “Philosophy of the Mind.” Each program of study is approved on an individual basis by the Head Tutor.

2. **Required Tutorials:** Same as Linguistics Track.

3. **Required Languages:** Same as Linguistics Track.

4. **Thesis:** Same as Linguistics Track.

5. **Other information:**
   a. **Pass/fail:** Courses taken pass/fail may not be counted for concentration credit.
   b. Students with an unusually strong background may be permitted to substitute another Linguistics course for LING 101.

Linguistics with Mind, Brain, and Behavior (MBB) Track
Requirements: 14 courses (2 additional thesis-writing tutorials) (56 credits); 2 language requirements; thesis.

1. **Required non-tutorial courses (9 courses):**
   a. **Four required courses in Linguistics:**
      i. LING 83: Language, Culture, and Cognition.
      iii. Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 61Q: the Origins of Meaning).
      iv. LING 102: Sentence Structure.
      v. LING 105: Sounds of Language.
      vi. Linguistics 106: Knowledge of Meaning.
   b. **Three required courses in MBB:**
      i. PSY 1: Psychological Science, MCB 80, or NEURO 80: Neurobiology of Behavior.
      ii. An MBB interdisciplinary seminar (see the MBB website at http://mbb.harvard.edu/ for more information).
   c. **One additional course in Linguistics.**
d. **One additional course in MBB.**
   i. **Note:** No course can be counted doubly to satisfy requirements 1.a.-1.c. The courses to be counted towards the MBB requirements must be approved by the Head Tutor. Approval is automatic if the course is chosen from those listed in the Requirements for the Linguistics with MBB Track at [http://linguistics.fas.harvard.edu/pages/mind-brain-behavior-mbb](http://linguistics.fas.harvard.edu/pages/mind-brain-behavior-mbb) (also available upon request from the Department).

2. **Required Tutorials:** Same as Linguistics Track - Honors.
3. **Required Languages:** Concentrators in the MBB track must demonstrate knowledge of one foreign language by the end of the junior year as required by the College (see "Language Requirement" in the Handbook for Students at [https://handbook.fas.harvard.edu/book/welcome](https://handbook.fas.harvard.edu/book/welcome)).
4. **Thesis:** Same as Linguistics Track - Honors.
5. **General Information:** Same as Linguistics Track.
6. **Other information:**
   a. **Pass/fail:** Courses taken pass/fail cannot be counted for concentration credit.
   b. **Study Abroad:** Courses taken abroad that are directly related to Linguistics count towards the relevant requirements. Please discuss your courses with the Head Tutor.
   c. Students with an unusually strong background may be permitted to substitute another Linguistics course for LING 101.

**Joint Concentrations**

*Note:* There is a crucial difference between the Linguistics with Related Field track or the Linguistics with MBB track and a joint concentration in Linguistics and another field. A student in Linguistics with Psychology as a related field or in Linguistics with MBB is solely under the jurisdiction of the Linguistics Department, while a student with a joint concentration in Linguistics and Psychology is under the jurisdiction of both Linguistics and Psychology—that is, the student needs to fulfill the requirements for joint concentration outlined by both fields. A student in Linguistics with Psychology as a related field graduates with a concentration in Linguistics; a student in Linguistics with MBB also graduates with a concentration in Linguistics and is awarded a certificate by the MBB program; a joint concentrator graduates with a concentration in Linguistics and Psychology. Joint concentrations must be approved by both participating concentrations. Typically, joint concentrators take six courses in Linguistics and six in the joint field and write a thesis that, to some degree, combines the two fields. Note that the same course cannot be counted as a required course for both fields simultaneously. Courses in the joint field should be selected in consultation with the Head Tutor of that field. Under normal circumstances, the following courses will be taken:

**Linguistics as primary field (8 courses):**

1. One of the following introductory courses:
   c. Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 61Q: the Origins of Meaning).
2. Three of:
   a. LING 102: Sentence Structure.
   b. LING 104: Word Structure.
   c. LING 105: Sounds of Language.
   d. LING 106: Knowledge of Meaning.
   e. LING 107: Introduction to Indo-European.
   f. LING 108: Introduction to Historical Linguistics.
3. One additional course in Linguistics:
a. LING 97R or LING 98A (1 term).
b. LING 99A and LING 99B (Senior Tutorial).

**Linguistics as allied field (6 courses):**

1. LING 101 or LING 83 or Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 61Q: the Origins of Meaning).
2. Three of:
   A. LING 102.
   B. LING 104.
   C. LING 105.
   D. LING 106.
   E. LING 107 or 108.
3. Two additional courses in Linguistics.

Joint concentrators ordinarily also enroll in two terms of senior tutorial in the primary field (the field listed first). Thesis advisers may be drawn from either of the two departments, subject to approval by the Directors of Undergraduate Studies of both concentrations.

**ADVISING**
The Head Tutor and Assistant Head Tutor meet with concentrators individually at the beginning of each term to approve course selection and determine tutorial assignments. In addition, they are available to meet with students during regularly scheduled office hours or by appointment. Concentrators are also encouraged to contact other members of the faculty to discuss specific linguistics issues throughout the term. For up-to-date information on advising in Linguistics, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

**RESOURCES**
Concentrators are welcome to use the departmental lounge, library, and computing facilities located on the third floor of Boylston Hall. A phonetics lab where students can experiment with the acoustic and articulatory properties of the sounds of the world’s languages is located in Boylston 334. Concentrators may also frequent the department’s special collection of linguistic materials in Room B, on the top floor of Widener Library. Information about access to these locations can be obtained from the Department Administrator, Cheryl Murphy.

**STUDY ABROAD**
The Department of Linguistics encourages study abroad for concentrators. Students working on a specific language or language area may wish to spend a term or a summer abroad. They should discuss their options with the staff of the Office of International Education before meeting with the Director of Undergraduate Studies (DUS). Under appropriate circumstances, work done abroad may be counted toward the concentration requirement. Concentrators are encouraged to discuss their interests with the DUS.

**HOW TO FIND OUT MORE**
For further information about the Linguistics concentration, please contact the Director of Undergraduate Studies, Professor Kate Davidson ([kathryndavidson@fas.harvard.edu](mailto:kathryndavidson@fas.harvard.edu)), or the Department Office located on the third floor of Boylston Hall. The department website at [https://linguistics.fas.harvard.edu/](https://linguistics.fas.harvard.edu/) also contains a variety of useful information for undergraduates.
ENROLLMENT STATISTICS
Number of Concentrators as of December

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Mathematics

Professor Cliff Taubes, Director of Undergraduate Studies

Mathematics is the science of order, and mathematicians seek to identify instances of order and to formulate and understand concepts that enable us to perceive order in complicated situations.

Perhaps the most important concept of mathematics is that of function, which provides us with the means to study dependence and change. The study of real functions of a real variable (and later complex functions), particularly in connection with the limit concept, is called analysis. The most effective tool for this study is the infinitesimal calculus that analyzes the relation between functions and their derivatives. The study of number systems and their generalizations is called algebra. Here the primary concepts are group, ring, field, and module. The last great branch of Mathematics is geometry, which now goes far beyond the classical study of the space we live in to include spaces of high dimension and topology, the abstract theory of shape.

Pure Mathematics is concerned with these concepts and their interrelationships, while Applied Mathematics considers the relation of mathematical concepts to problems arising in other disciplines. Applied Mathematics is not a single subject; rather it is almost as many different subjects as there are other disciplines. (But it would be a mistake to think that Applied Mathematics is organized in terms of the disciplines to which it is applied.)

The concentration in Mathematics is designed to acquaint the student with the most important general concepts underlying the three branches of modern mathematics. Concentration in Mathematics will provide an adequate basis for further study in either pure or applied mathematics. Because so many disciplines now rely on the mathematical sciences, a concentration in Mathematics provides a valuable background for many different careers. Concentrators who do not choose to continue in mathematics have often gone on to graduate work in other academic subjects or to professional training in law, business, or medicine.

Concentration in Mathematics requires a minimum of either twelve letter-graded courses or eleven letter-graded courses plus one Freshman Seminar, subject to the following conditions:

Eight of the letter-graded courses must be listed as courses taught by the Mathematics Department while the remaining courses can be either Mathematics courses or courses in approved, related subjects. These eight Mathematics courses must include at least one course in analysis, one in algebra or group theory, and one in geometry or topology (all at the 100 level or higher). Tutorials (MATH 99R) are encouraged, but not required. Ordinarily no more than one MATH 99R course may count toward the concentration requirement. Reading courses, MATH 91R, and MATH 60R (the latter for senior thesis research only; SAT/UNSAT only), can be arranged, but do not ordinarily count toward concentration requirements. A Freshman Seminar can be used in lieu of one of the twelve letter-graded courses in Mathematics or related fields if it is taught by a faculty member of the Mathematics Department and if permission to do so is obtained from the Director of Undergraduate Studies in Mathematics.

Each student is required to submit a five-page expository paper in Mathematics. The paper should be an original, coherent, and correct exposition of a topic in pure or applied mathematics. The paper should be written during the sophomore or junior year under the supervision of a professor or tutor in a tutorial (MATH 99R), a MATH 91R reading course, or a 100- or 200-level course that the student is contemporaneously enrolled in. The paper must be accepted by both that professor or tutor and the Director of Undergraduate Studies. Ordinarily, students enrolled in a tutorial automatically satisfy the expository requirement as part of the
structure of the tutorial. The expository requirement must be met before the end of the Reading Period of the second term of the junior year. Extensions may only be granted by the Director of Undergraduate Studies.

A candidate for high or highest honors must, in addition to the course requirements, submit a senior thesis. The thesis may be on any topic in pure or applied mathematics not directly covered in a student’s course work. It need not be an original piece of mathematical research, but should be an original exposition of material culled from several sources. If there is original research, there should also be a very substantial expository component to the thesis with the original research comprising the last parts. Candidates for straight honors (neither highest nor high) can either submit a senior thesis or take four extra courses in Mathematics or approved related fields in addition to the twelve-course requirement described below under the heading Basic Requirements. (See below under Requirements for Honors Eligibility for more details.)

In addition, the Department offers a Mathematics and Teaching option designed for students who are enrolled in the Undergraduate Teacher Education Program (UTEP). Students who choose this option will acquire eligibility for the teaching certification required for public school teaching in many states.

The Department encourages students to take the most advanced courses for which they are qualified. Nevertheless, students who enter as first-years or Advanced Standing sophomores will not ordinarily be permitted to count courses taken elsewhere toward the twelve-course requirement. Transfer students wishing to concentrate in Mathematics should consult the Director of Undergraduate Studies, who will review their transcripts and arrange their concentration requirements.

The Department welcomes students who want to change their concentration to Mathematics if it is plausible that they can fulfill the requirements within the time remaining. Students considering Mathematics may also wish to consider Applied Mathematics, Computer Science, or Statistics. Joint concentrations with Computer Science, Philosophy, Physics, or other fields can be arranged.

**REQUIREMENTS**

**Basic Requirements: 12 courses (48 credits)**

1. **Required courses:**
   a. Eight letter-graded courses in Mathematics, at least four of which must be at the 100 level and including at least one in each of the areas of analysis (numbered 110–119), algebra (numbered 120–129), and geometry (numbered 130–139). Appropriate graduate-level courses may be substituted for these area requirements. Courses listed in the course catalog in other departments which are cross-listed by the Mathematics Department do not count towards this requirement but may count toward requirement 1.b.
   b. Four letter-graded courses in either Mathematics or related subjects. Related courses include:
      i. APMTH 21A, 21B, 22A, 22B (APMTH 22A and 22B may not be counted in addition to MATH 21, 23A, 25A, 55A) 50 (may not be counted in addition to MATH 99R or a Freshman Seminar), 101, 104, 105, 106 (may not be counted in addition to MATH 122), 107, 111, 115, 120 (may not be counted in addition to MATH 121) 121, 147, 201, 202, 205, 207, 210, 211. Neither APMTH 21A nor 21B may count toward requirements 1.a. or 1.b.
in addition to any of the following courses: MATH 18, 19A, 19B, 21A, 21B, 23A, 23B, 25A, 25B, 55A, 55B.

ii. ASTRON 193, 200.

iii. OEB 173, 181, 252.


ix. NEURO 140.

x. PHIL 140, 144, 146, 248.

xi. PHYSICI 10, 12A, 12B.

xii. Physics or Applied Physics, all except 90R, 91R, 95, and courses which are primarily laboratory courses such as 123 and 191.

xiii. STAT 107, 110, 111, 131, 139, 140, 149, 170, 171, 185, 210, 211, 215, 220, 221.

xiv. SYSBIO 200.

xv. Many other courses are given in the University that make substantial use of Mathematics. Such courses may be counted as related for concentration credit if approved by the Director of Undergraduate Studies. Students must secure approval for courses not listed in item 1.b. before enrolling through my.harvard.

c. One Freshman Seminar (graded SAT/UNSAT) can be substituted for one of the twelve letter-graded courses listed in parts 1.a. and 1.b. above provided that the following three conditions are met:

i. The Freshman Seminar is taught by a faculty member of the Department of Mathematics.

ii. The Freshman Seminar is not used in lieu of one of the required 110–119, 120–129, or 130–139 courses noted in 1.a. above.

iii. Permission is obtained from the Director of Undergraduate Studies in Mathematics before the approval of the Plan of Study. A grade of SAT in the seminar is a necessary but not sufficient condition for such permission.

iv. Ordinarily, a Freshman Seminar may not be counted in addition to another seminar or tutorial course, such as MATH 99R.

d. Each student is required to submit a five-page expository paper in Mathematics. The paper should be an original, coherent, and correct exposition of a topic in pure or applied mathematics. The paper should be written during the sophomore or junior year under the supervision of a professor or tutor in a tutorial (MATH 99R), a MATH 91R reading course, or a 100- or 200-level course that the student is contemporaneously enrolled in. The paper must be accepted by both that professor or tutor, and the Director of Undergraduate Studies. Ordinarily, students enrolled in a tutorial automatically satisfy the expository requirement as part of the structure of the tutorial.

i. Note: The expository requirement must be met before the end of the Reading Period of the second term of the junior year. Extensions may only be granted by the Director of Undergraduate Studies.

2. Tutorial: None are required, but MATH 99R is suggested. Although MATH 99R may be repeated, only one tutorial will count for concentration.

3. Thesis: None.

4. General Examination: None.

5. Other information:
a. Exceptional programs are frequently approved, especially for students doing advanced work. Consult the Director of Undergraduate Studies.

b. A student whose record does not include a course in calculus may be asked to demonstrate familiarity with this subject by a special examination.

c. MATH 91R will not ordinarily be counted for concentration credit.

d. MATH 60R will not be counted for concentration credit.

e. MATH MA and MB together count as one course of concentration credit.

f. MATH QA and MATH QB together count as one course of concentration credit.

Requirements for Honors Eligibility: 12 courses (48 credits) plus thesis

1. **Required courses**: Same as Basic Requirements.

2. **Additional Requirements**: Either of the following:
   a. For straight honors only (no high or highest honors): 4 additional courses (16 credits) in either Mathematics or the related fields listed under Basic Requirements. Course grades in these courses and the 12 basic requirement courses must average B+ or higher.
   b. For straight honors, or high or highest honors: A senior thesis is required. There is also a thesis examination on the area of Mathematics germane to the area of the thesis. No additional courses are required, but course grades in the 12 basic requirement courses must average B+ or higher.

Requirements for Joint Concentrations
The requirements in Mathematics for a joint concentration differ according to whether Mathematics is the primary or allied field. If Mathematics is first, then the requirements are the same as the requirements for honors Eligibility as described above. If Mathematics is second, then the requirements are 5 courses in Mathematics, at least three of which must be at the 100 level and include at least one in each of the areas of analysis (numbered 110-119), algebra (numbered 120-129), and geometry (numbered 130-139). In addition, a B+ average must be maintained in all Mathematic courses. For a joint concentration in which Mathematics is second, no expository paper is required.

Mathematics and Teaching Option
This option is offered by the Department of Mathematics to encourage students with a degree in mathematics to enter secondary school teaching. It is designed for undergraduates who are enrolled in the Undergraduate Teacher Education Program (UTEP). Students who complete UTEP will thereby obtain eligibility for the teaching certificate required for public school teaching by about thirty states, including Massachusetts. See Chapter 2 for more information on UTEP. **Note**: Those who plan to teach only in independent schools will not need a teaching certificate, and hence do not need to take this program. However, they too may wish to take UTEP courses to enhance their career preparation.

Requirements for Mathematics and Teaching Option: 12 courses (48 credits)

1. **Required Courses**: 
   a. Seven letter-graded courses in Mathematics, including at least one in each of the areas of analysis (numbered 110-119), algebra (numbered 120-129), and geometry (numbered 130-139). MATH 101 can be used to fulfill any one (but only one) of these area requirements. Courses listed in the course catalog in other departments which are cross-listed by the Mathematics Department do not count toward this requirement.
b. Graduate School of Education (HGSE) T-300A or equivalent practicum in the
teaching of Mathematics.

c. Three letter-graded courses in Computer Science, Statistics, or Physics, with at
least two courses in the same field. The courses that can be used to satisfy this
requirement include the courses listed in Basic Requirements item 1.b (iii., x.,
and xi.), and, in addition, COMPSCI 50 and STAT 102, 104 and 109.

d. One Freshman Seminar or one letter-graded course in Mathematics or a related
field in addition to those chosen in 1.a. and 1.c., above. Related courses include
all the courses listed in Basic Requirements 1.b., and also COMPSCI 50 and
STAT 109. A course in the History of Science may be included with the prior
permission of the Director of Undergraduate Studies. The Freshman Seminar
can be used for this requirement provided the conditions listed in Basic
Requirements are met. Note: Other courses in Statistics or Applied Mathematics
offered in the Harvard Graduate School of Education or in the Graduate School
or Arts and Sciences may count as related courses with the approval of the
Director of Undergraduate Studies.

e. Expository paper requirement as in item 1.d. of Basic Requirements.

2. Tutorial: Same as Basic Requirements.

3. Thesis: None.

4. General Examination: None.

5. Undergraduate Teacher Education Program (UTEP): The course and teaching
requirements of the Undergraduate Teaching Education Program must be completed
before graduating under the Mathematics and Teaching option. See UTEP at
https://utep.gse.harvard.edu for more information.

Other information: Interested students are encouraged to inquire about the program at any time.
Questions should be directed to the UTEP Associate Director, who is responsible for advising
program participants. For further information please contact the Teacher Education Office at the
Graduate School of Education, Longfellow Hall, (617-495-2783)
beth_simpson@gse.harvard.edu, or visit the UTEP website (https://utep.gse.harvard.edu).

ADVISING
Concentrators are assigned a faculty member to act as their concentration adviser when their
Plan of Study is approved by the Director of Undergraduate Studies. Advisers assist
concentrators in selecting courses and also approve enrollment through my.harvard. In addition,
each junior will be asked to meet privately at some point during the academic year with two
faculty members to discuss academic progress and career goals. For up-to-date information on
advising in Mathematics, please see the Advising Programs Office Website at
https://advising.college.harvard.edu/concentrations.

RESOURCES
The Department common room (fourth floor, Science Center) is open to all Mathematics
concentrators. The Department library (third floor, Science Center) is open to all concentrators
during regular hours (Monday through Friday, 9–5). The library may be used at other hours by
seniors writing theses and by other Mathematics concentrators with permission from the
Department.

HOW TO FIND OUT MORE
Six pamphlets are available at the Mathematics Department: Concentration in Mathematics
describes the resources of the Department; Courses in Mathematics may be useful in the
selection of a study plan; Beyond Math I focuses on the differences among the 20-level math
courses; *honors in Mathematics* gives details of the procedure for writing a senior thesis; *Graduate Schools and Fellowships in Mathematics* may be useful in formulating graduation plans; and *Mathematical Sciences at Harvard*, published by the School of Engineering and Applied Sciences, describes the resources, courses, and concentrations available to undergraduates interested in pure or applied mathematics. These pamphlets can be obtained from the Undergraduate Studies Coordinator, Cindy Jimenez, Science Center Room 334, 617-495-9116, cindy@math.harvard.edu. Other information about the concentration and the Department can be found on the Internet at [www.math.harvard.edu](http://www.math.harvard.edu).

All questions about the Mathematics concentration should be directed to the Director of Undergraduate Studies, Professor Cliff Taubes, contact info chtaubes@math.harvard.edu. Information about tutorials, jobs, fellowships, and other matters is posted on the undergraduate bulletin board opposite Science Center Room 320. All Mathematics concentrators are urged to subscribe to the Department’s undergraduate electronic news network by sending their email addresses to Cindy Jimenez, (cindy@math.harvard.edu).

## ENROLLMENT STATISTICS
### Number of Concentrators as of December

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Mechanical Engineering

Professor Frans Spaepen, Director of Undergraduate Studies
Dr. Chris Lombardo, Associate Director of Undergraduate Studies

Mechanical Engineering is a discipline of engineering that uses the principles of physics and materials science for the analysis and design of mechanical and thermal systems. Mechanical Engineering is critical to the success of many human enterprises - it plays a central role in the generation and distribution of energy, transportation, manufacturing, and infrastructure development. Nearly every product or service in modern life has been touched in some way by a mechanical engineer.

The concentration in Mechanical Engineering is structured for a diversity of educational and professional objectives. For students who are planning to work as practicing engineers or who may be preparing for careers in business, education, government, or law—and for those whose career objectives may be less specific—the concentration provides an ideal framework for a well-rounded technical and scientific education.

The technologies that engineers create are changing at an amazing rate, but the fundamental tools of engineering change more slowly. The Harvard Mechanical Engineering curriculum emphasizes a solid background in the applied sciences and mathematical analysis and provides ample opportunity to learn about state-of-the-art technologies. Students also gain experience in the engineering design process, the unique engineering activity that requires creative synthesis as well as analysis to fulfill specified needs.

The objectives of the Mechanical Engineering program are to provide students a solid foundation in mechanical engineering within the setting of a liberal arts college for preparation for a diverse range of careers in industry and government or for advanced work in engineering, business, law, or medicine. It enables the acquisition of a broad range of skills and attitudes drawn from the humanities, social sciences, and sciences in addition to engineering, which enhances engineering knowledge and contributes to future leadership and technical success.

The SB degree program requires a minimum of twenty courses (80 credits). The curriculum is structured with advanced courses building on the knowledge acquired in Math, Science, and introductory Engineering Science courses. Concentrators are encouraged to complete the common prerequisite course sequence in their first two years at Harvard. This includes MATH (through 1A and 1B; plus, 21A and 21B, 22A and 22B, 23A and 23B, or APMTH 21A and 21B, or 22A and 22B), Physics (through PHYSCI 12A and 12B, PHYSICS 15A and 15B, or APPHY 50A and 50B), and COMPSCI 50. Students are cautioned that it is more important to derive a solid understanding of these basic subjects than to complete them quickly without thorough knowledge; this material is extensively used in many subsequent courses. If in doubt, it may be wise to enroll in the MATH 1A/1B sequence rather than proceed to MATH 21A or 23A with marginal preparation.

The SB programs in Mechanical Engineering and Engineering Sciences share many course requirements, and there is some flexibility in moving between these programs. To get an early sample of engineering coursework, entering students are invited to enroll in ESE 6 (Environmental Science and Engineering), ENG-SCI 50 (Electrical Engineering), ENG-SCI 51 (Mechanical Engineering), and ENG-SCI 53 (Biomedical Engineering). These introductory courses have minimal prerequisites and have been very popular with prospective Engineering concentrators. ENG-SCI 50 and 51 have extensive hands-on laboratory sections.
Upon graduation, students in the Mechanical Engineering concentration should demonstrate the following student outcomes:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- An ability to communicate effectively with a range of audiences.
- An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environmental, establish goals, plan tasks, and meet objectives.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

OPTIONS
Students select a track in:
- Mechanical Systems.
- Thermal Systems.

REQUIREMENTS
Basic Requirements: 20 courses (80 credits)

1. Required courses for all Tracks:
   a. Mathematics/Probability and Statistics/Applied Mathematics (four courses):
      i. MATH 1A and 1B; and APMTH 21A and 21B, APMTH 22A and 22B, MATH 21A and 21B, MATH 22A and 22B, or MATH 23A and 23B. (Note: Students who start in MATH 1A will not be required to satisfy either the Probability and Statistics requirement or the Applied Math requirement. Students who start in MATH 1B must take a course that satisfies the Probability and Statistics requirement. Students who start in MATH 21A, 22A, 23A, or APMTH 21A or 22A must complete the courses in both Probability and Statistics and Applied Math.)
      ii. Probability and Statistics (one course): At least one of APMTH 101, ENG-SCI 150, or STAT 110 (if starting in MATH 1B, 21A, 22A or 23A, or APMTH 21A or 22A).
      iii. Applied Mathematics (one course): At least one of APMTH 104-108, or 120 (if starting in MATH 21A, 22A, or APMTH 21A or 22A).
   b. Physics (two courses): APPHY 50A, PHYSCI 12A, or PHYSICS 15A or 16; and APPHY 50B, PHYSCI 12B, or PHYSICS 15B. Appropriate advanced-level Physics courses may also fulfill this requirement (please consult with SEAS advisers).
   c. Chemistry/Advanced Science (two courses): LS 1A or LPS A, PHYSCI 1 or 11, or PHYSCI 10. Advanced science courses by permission.
   d. Computer Science (one course): APMTH 10, COMPSCI 50, 51, or 61.
   e. Electronics (one course): ENG-SCI 54, 153, or both of ENG-SCI 152 and COMP-SCI 141. (If both ENG-SCI 152 and COMPSCI 141 are taken, the second course can count as the Engineering elective, see g. below.)
f. **Engineering Design (two courses):** ENG-SCI 96 and ENG-SCI 100HF (see item 3 and 4 below). ENG-SCI 96 must be taken in junior year, prior to ENG-SCI 100HF.

g. **Engineering Elective (one course):**
   i. ENG-SCI 50, 53, 111, 115, 121, 151, 152, 155, 162, 173, 175, 177, 227, 231.
   ii. ESE 160, 166.
   iii. *Note:* By prior petition and approval, advanced-level Engineering Science courses relevant to Mechanics and Materials Engineering and advanced-level MIT courses in Mechanical or Materials Engineering can be taken. Petitions will only be considered for courses that possess engineering content at a level similar to other technical Engineering courses at SEAS.
   iv. COMPSCI 51, 61, 141, 189R.
   v. APPHY 195.
   vi. *Note:* Students entering Harvard with secondary school preparation that places them beyond the level of any of the required courses listed above may substitute appropriate advanced-level courses. However, ABET accreditation requires that all students complete at least 8 courses in math and science and 12 courses in engineering topics. Students who start in MATH MA will need to take 21 courses in order to fulfill the degree requirements. Given the number and complexity of the requirements, students interested in pursuing Mechanical Engineering should consult with the Associate Director of Undergraduate Studies or Director of Undergraduate Studies about their Plans of Study as early as possible.

2. **Track Requirements:**
   a. **Mechanical Systems Track:**
      i. Required Core (four courses):
         1. ENG-SCI 51, 120, and 125.
         2. ENG-SCI 123 or 181 (other can be taken as track elective).
      ii. Track electives (three courses):
         1. Select at least one course on thermal systems: ENG-SCI 181, 183.
         2. Select from the following to reach a total of three track electives: ENG-SCI 123, 128, 159, 192.
   b. **Thermal Systems Track**
      i. Required Core (four courses):
         1. ENG-SCI 181 and 183.
         2. ENG-SCI 120 or 123 (other can be track elective).
         3. ENG-SCI 51 or 125 (other can be track elective).
      ii. Track electives (three courses):
         1. Select three from: ENG-SCI 51, 120, 123, 125, 173, 190, 192.

3. **Sophomore Forum:** Sophomore year. Non-credit. Spring term.
4. **Tutorial:** Required. ENG-SCI 100HF.
5. **Thesis:** Required: An individual engineering design project is an essential element of every SB program and is undertaken during the senior year as part of ENG-SCI 100HF. Faculty supervised reading and research is an important aspect of this requirement.
6. **General Examination:** None.
7. **Other Information:**
   a. *Advising Note:* Students who score below a letter grade of B in their math courses, particularly in the 1A/1B and 21A/21B series, are strongly encouraged to speak with the Mechanical Engineering Director or Associate Director of Undergraduate Studies to discuss their math preparation for Mechanical Engineering.
b. ENG-SCI 50 and 53 and ESE 6 can only count as an Engineering elective when taken during the freshman or sophomore years.

c. Only one of ENG-SCI 91R (4 credits) or ENG-SCI 91HFR (4 credits) can count as an approved elective in the degree requirements.

d. **Pass/fail and SAT/UNSAT:** None of the courses used to satisfy the concentration requirements may be taken pass/fail or SAT/UNSAT.

e. **Plan of Study:** Concentrators are required to file an approved departmental Plan of Study during their third term (i.e., the first term of their sophomore year) and to keep their plan up to date in subsequent years. All SB programs must meet the overall ABET program guidelines, a minimum of four courses in basic sciences, four courses in Mathematics and twelve courses in Engineering topics. Plan of Study forms may be obtained from the School of Engineering and Applied Sciences’ Office of Academic Programs, SEC 1.101, and from the SEAS website at [https://www.seas.harvard.edu/materials-science-mechanical-engineering/undergraduate-programs/concentration-information/requirements](https://www.seas.harvard.edu/materials-science-mechanical-engineering/undergraduate-programs/concentration-information/requirements).

f. **Additional Terms:** Concentrators who wish to remain beyond the end of the second term of their senior year to complete the SB requirements must be approved to do so by the Undergraduate Engineering Committee. A written petition is required and should always be submitted as early as possible and under discussion with the Associate Director of Undergraduate Studies or Director of Undergraduate Studies. Petitions can be submitted no later than January 15 between the student’s fifth and sixth terms (i.e., middle of junior year), or August 15 between the student’s fifth and sixth terms if the student’s fifth term is the spring. Under no circumstances will the Committee grant a student permission for more than two additional terms. Petitions are only granted in exceptional cases, and only to meet specific SB degree requirements. More information can be found on the SEAS website at [https://www.seas.harvard.edu/materials-science-mechanical-engineering/undergraduate-programs/concentration-information/requirements](https://www.seas.harvard.edu/materials-science-mechanical-engineering/undergraduate-programs/concentration-information/requirements).

g. **Joint Concentrations:** Mechanical Engineering does not participate in joint concentrations.

h. Any exceptions to these policies must be approved via written petition.

**ADVISING**

Students interested in concentrating in Mechanical Engineering should discuss their plans with the Director of Undergraduate Studies, the Associate Director of Undergraduate Studies, or the Academic Programs Administrator. Each undergraduate who elects to concentrate in Mechanical Engineering is assigned a faculty adviser depending on his or her area of specialization. The faculty adviser might also be a member of the Undergraduate Engineering Committee, whose members have the responsibility for reviewing departmental Plans of Study. If students do not request a change in adviser, they have the same adviser until they graduate. Each student is reassigned to another faculty member while his or her original faculty adviser is on leave. It is expected that students will discuss their Plans of Study and progress with their Director of Undergraduate Studies or Associate Director of Undergraduate Studies at the beginning of each term. Students may seek advice from their faculty adviser, the Director of Undergraduate Studies, the Associate Director of Undergraduate Studies, or the Academic Programs Administrator at any time.
HOW TO FIND OUT MORE
Further information is available from the Director of Undergraduate Studies, Professor Frans Spaepen, spaepen@seas.harvard.edu; or the Associate Director of Undergraduate Studies, Dr. Christopher Lombardo, lombardo@seas.harvard.edu, (617) 496-5185; or the Undergraduate Academic Programs Administrator, Sarah Colgan, scolgan@seas.harvard.edu.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Mechanical Engineering was a new concentration for 2012-13.
Molecular and Cellular Biology

Professor Vlad Denic, Head Tutor

The Molecular and Cellular Biology (MCB) concentration emphasizes the intersection of modern research in cellular biology with medicine and society. It is rooted in the investigation of biological processes based on the study of molecules and their interactions in the context of cells and tissues, and in understanding how the vast information context of the genome orchestrates the behavior of the cell. MCB is therefore ideally suited for students who wish to study molecular and cellular processes at the heart of both normal physiology and disease. It focuses on fundamental principles of modern biology at the hub of nearly all life science sub-disciplines, and integrates many different methodologies ranging from chemistry and genetics to computer science and engineering, as well as fundamental concepts in physics and mathematics.

MCB concentrators will acquire an understanding of scientific logic and approaches as they explore a wide range of contemporary subjects, spanning biochemistry, cell biology, genomics, systems biology, developmental biology, immunology, cancer biology, molecular medicine, the microbiome, global health, and infectious disease. Students will also have the opportunity to tackle subjects of a more applied nature, such as drug design, personalized medicine, and biotechnology.

Through coursework and hands-on research, students in the concentration will have the opportunity to explore many of the central questions in modern biology and medicine. The MCB faculty is dedicated to supporting undergraduate research, and we encourage students to join the laboratory of an MCB faculty member or a laboratory in one of the affiliated Centers, at Harvard Medical School, the Harvard School of Public Health, and affiliated institutes. We consider the senior thesis to be the capstone academic experience, and the concentration will provide extensive support to seniors to make thesis writing an enriching experience.

MCB graduates will be informed citizens who can understand and evaluate the impact of new research discoveries in the life sciences, discoveries that are unfolding at a breathtaking and accelerating pace. Both courses and programs that promote interactions with faculty members link basic, mechanistic insights with human disease and show how the study of disease leads to fundamental biological discoveries. Graduates of the MCB concentration will stand poised to pursue a wide range of careers, including biological and medical research, public and global health, science policy, law and intellectual property, business, education, and science writing.

The Board of Tutors in Biochemical Sciences, which was established in 1926, runs the Tutorial program for the Molecular and Cellular Biology concentration and the Chemical and Physical Biology concentration. The tutorial program offers individualized instruction to all concentrators beginning at the time of declaration. Concentrators typically meet with their tutors every two weeks and discuss primary research literature in a small group or one-on-one setting. Mentoring on career choices, the research experience, and other academic matters is a logical extension of the tutorial. The tutorial is not taken for credit and therefore does not appear on the my.harvard crimson cart or transcript. The Head Tutor and Concentration Advisers make all tutorial assignments and are available throughout the academic year to answer questions from students or their tutors. A handout that describes the history, goals, and format of the tutorial program is available on the web at https://lifesciences.fas.harvard.edu/files/lifesci/files/boft_handout.pdf.

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REQUIREMENTS
Basic Requirements: 12-13 courses (48 -52 credits)

1. Required courses:

   a. **Life Sciences**: Two courses. LS 1A (or LPS A) and LS 1B.
   b. **Biology**: Two courses. MCB 60 and one additional course selected from MCB 63, MCB 64, MCB 65, MCB 68, or MCB 80.
   c. **Chemistry**: Two courses. One of these courses should be general chemistry, such as PHYSCI 1, and the remaining course should be organic chemistry and may be chosen from CHEM 17 or CHEM 20. See items 3.b. and 3.c. below.
   d. **Mathematics and Computational Skills**: One or two courses. In addition to mathematics, statistics and computational skills are increasingly important in our discipline. According to a student’s preparation level, this requirement can be fulfilled in two ways. One path is to take MATH 1B and one of the following:
      i. MATH 19A or higher.
      ii. STAT 102 (or 110 or 111 or an approved alternative).
      iii. Computer science such as COMPSCI 50 or an approved alternative.
      iv. **Note**: An alternative path is to demonstrate competency beyond the MATH 1B level by taking:
          1. MATH 19A or higher, or:
          2. An approved calculus-based Statistics course (such as STAT 110 or 111).
   v. **Note**: Students are encouraged to discuss which path is most appropriate for their preparation level and interests with the concentration advising team. Please note that students who are able and choose to meet the mathematics/computational skills requirement using only one course may need to take one additional course to meet the minimum course requirement for the concentration.
   e. **Physics**: Two courses. One course in mechanics (PHYSCI 2 or equivalent) and one course in electricity and magnetism (PHYSCI 3 or equivalent).
   f. **Advanced courses**: Two courses above the introductory level, including at least one MCB >100-level course. All >100-MCB courses and many advanced courses in the natural and Physical Sciences, Engineering, and/or Mathematics may be used to fulfill this requirement. Students are encouraged to consult concentration advisors when selecting upper-level courses.
   g. **Research experience**: The requirement for a research experience can be fulfilled by at least one semester of research (LS 100R; MCB 91R or MCB 99) or a summer research experience in an approved program. To fulfill the research requirement, a summer research experience ordinarily: (1) consists of at least 8 weeks of full-time research; (2) is sponsored by a Harvard-affiliated faculty member; (3) is broadly related to the field; and (4) culminates in a capstone experience (substantive written report, poster or oral presentation outside of the host lab). A list of approved programs that fulfill these requirements is available from the concentration office. Students doing thesis work ordinarily enroll in two terms of MCB 99 in their final year at the College, one of which is sufficient to fulfill this requirement.

2. **Tutorial**: The tutorial program is an important component of the concentration. It provides a mechanism for students to engage in mentorship relationships with the MCB faculty and members of the Board of Tutors in Biochemical Sciences. The goals are to (1) provide opportunities for discussions about science and its role in the larger community, (2) provide students with the foundation to apply their education and the scientific
method to life outside of the classroom and Harvard and (3) advise and inform students on curricular and pre-professional choices. The tutorial is a non-credit program that spans the whole length of time the student is part of the concentration.

3. **Other information:**
   a. *Pass/fail:* All courses for concentration credit must be letter-graded.
   b. The total number of concentration courses taken during the student’s College career (including approved study abroad or transfer credits) must be at least 12 (14 for honors eligibility). Students who place out of particular concentration requirements based on their preparation level should choose additional courses appropriate to their intellectual interests and skill level in consultation with the concentration advising team. Similarly, students who fulfill their research requirement in the summer may need to take an additional course to meet the minimum course requirement.
   c. *General Chemistry:* We highly encourage students who start with CHEM 17 or CHEM 20 (rather than PHYSCI 1) to take a course containing elements of inorganic and/or physical chemistry (such as CHEM 40 or 60, MCB 65 or 199, PHYSCI 10 or 11, or equivalent), especially if they are considering a career in research or medicine.
   d. Courses offered by the School of Engineering and Applied Sciences and by the Division of Medical Sciences may be counted for concentration credit wherever appropriate. Please consult the concentration office for more information.

**Requirements for Honors Eligibility: 14-15 courses (56-60 credits)**

1. **Required courses:**
   a. Same as Basic Requirements items 1-3 above.
   b. A second semester of organic chemistry (CHEM 27 or CHEM 30 or equivalent).
   c. One additional advanced course (see item 1.f. above).

2. **Thesis:** Optional for award of honors or high honors in Field, but required for highest honors in Field. To be considered for highest honors, a thesis based on independent laboratory research is required. Students intending to write a thesis should plan to enroll in two terms of MCB 99 in their final year at the College. One term of MCB 99 counts toward the requirements for a research experience (see item 1.g., above) and the other term counts as one of the three upper-level courses required for honors eligibility (see item 1.f., above).

**JOINT CONCENTRATIONS**

Students wishing to pursue a joint concentration with MCB must fulfill the MCB honors course requirements and complete a senior thesis that is at the intersection of the two fields of study. While a variety of joint concentrations are possible, quantitative fields such as Statistics and Computer Science may be particularly appropriate. Owing to the significant overlap in requirements, a joint concentration in MCB with any of the other life science concentrations (Neuroscience, Chemical and Physical Biology, Human Developmental and Regenerative Biology, Integrative Biology, Human Evolutionary Biology, Biomedical Engineering, Chemistry, Psychology (Life Science Track)) is not allowed. Joint concentrations are evaluated and approved on a case-by-case basis. The process for evaluation, approval and advising for joint concentrations is as follows:

1. The potential joint concentrator submits a form. Early submission facilitates advising and concentration requirement oversight by both potential concentrations, but the form must be submitted at the latest by March 15th of their junior year. Form submission is followed by a mandatory, in-person meeting with the Assistant Director of Undergraduate Studies.
The purpose of the form and meeting is to map out the study plan for a joint concentration (note: MCB course requirements are unaffected whether MCB is the primary or the allied concentration). The deadline is intended to give students sufficient time to develop and submit their thesis proposals during the month of July preceding their senior year. The Head Tutor, in collaboration with the Assistant Director of Undergraduate Studies (ADUS), will review the application for a joint concentration and respond with a decision accompanied by feedback within a month from the time of submission. Students whose applications are denied can address the comments in the feedback and resubmit by the final deadline of March 15.

2. A joint concentration degree will not be awarded if any thesis or coursework requirement was not met.

3. The student is responsible for mediating communications with the two concentrations to obtain approval of the thesis proposal and establish a plan for evaluation of the joint thesis by both concentrations.

4. Joint concentrators are required to discuss their progress at the start of each semester by meeting with advisers from both concentrations.

ADVISING
The MCB Concentration Advisers, Dr. Dominic Mao and Dr. Monique Brewster, are available to concentrators and pre-concentrators to provide guidance on course selection, laboratory research, and the fulfillment of concentration requirements.

RESOURCES
A tutorial reference library is housed in the MCB Undergraduate Office at 7 Divinity Avenue (95 Sherman Fairchild building), which contains books and hard copies of past senior theses (thesis titles from 2011-present can be viewed here at https://www.mcb.harvard.edu/undergraduate/molecular-and-cellular-biology-mcb/research-and-thesis/?course-button=pastthesisandprizewinners). Four rooms in the upper level of the undergraduate office are used by concentrators for tutorial meetings and as study spaces.

HOW TO FIND OUT MORE
The Head Tutor for the Molecular and Cellular Biology concentration is Professor Vlad Denic, and the Concentration Advisers are Dr. Dominic Mao (dominicmao@fas.harvard.edu or 617-496-1206) and Dr. Monique Brewster (mbrewst@g.harvard.edu or 617-496-6136). Visit https://www.mcb.harvard.edu/undergraduate/molecular-and-cellular-biology-mcb/ or contact the concentration advisers for more information.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Music

Professor Richard K. Wolf, Director of Undergraduate Studies

The concentration in Music exposes students to a wide variety of musical styles, sounds, and musical traditions in order to develop their critical understanding of music in diverse cultural and historical contexts. The concentration also provides a solid foundation in theory, analysis, composition, and criticism, as well as the opportunity to develop acute listening skills. The trained ear grounds the unique contribution of musical study to the humanities. Although the Department of Music is not in itself a school of music with a performance department, all of our courses support the intellectual development of musicians, and many of our courses incorporate or focus on performance.

Students are encouraged to participate (with credit) in faculty-led ensembles in orchestra, chorus, jazz, and dance. We offer a wide range of introductory and advanced courses in music theory, composition, historical musicology, ethnomusicology, in addition to many courses that incorporate or focus on musical performance. These courses reflect the specialties of our academic faculty: diaspora studies and migration, opera, jazz, music and politics, early music, musical theater, music and media, improvisation, hip hop, history of the book, film, Islam, American and European modernism, music and cognition, music and ecology, music and language, new music of the 21st-century, and cross-cultural composition; regular cross-cultural offerings include the musical traditions of Africa, Latin America, South Asia, Central Asia and West Asia.

Students choose their own pathways through these course offerings, creating a mix of introductory and advanced courses that best reflect their musical interests and aspirations. Students may enter the concentration from any Music course, including performance courses, Freshman Seminars, General Education, and introductory courses, as well as through the first-year theory course. The heart of the concentration is the two-semester concentration tutorial, MUSIC 97L: Critical Listening and MUSIC 97T: Thinking About Music. These required courses, taught by different faculty on a rotating basis, provide listening and analytical skills as well as a familiarity with a wide range of methodologies in music studies.

Students continue with electives that invite engagement with musical questions at a deeper level. In musicology and ethnomusicology, these courses take the form of proseminars for small groups that explore in detail selected musicological issues and direct students toward significant independent projects. Several courses in acoustic and electronic composition are given each year, along with occasional offerings in orchestration and other specific compositional topics. Advanced theory and analysis courses include such topics as tonal and post-tonal analysis, jazz harmony, and modal and tonal counterpoint. Performance-oriented courses include chamber music, jazz, South Indian, West African, historical performance practice, improvisation, conducting, and creative music.

There are three concentration tutorials: MUSIC 97T: Thinking about Music, MUSIC 97L: Critical Listening, and MUSIC 98: Advanced Tutorial. The two concentration tutorials, MUSIC 97T and MUSIC 97L, can be imagined as offering a macrocosm and microcosm of the musical world. Where MUSIC 97T tackles broad questions pertaining to music and its place in human existence, MUSIC 97L entails a more detailed level of engagement with music. MUSIC 98 (optional for joint concentrators), emphasizes skills that students may be able to use with the view to a senior thesis or capstone project.
For those writing senior theses, a year of senior tutorial (MUSIC 99R) is required. Options for senior theses include research papers, original compositions, or senior recitals. Students working toward a senior thesis will normally enroll in MUSIC 98 in the spring of junior year. There are no general examinations for undergraduates.

A capstone project can be either an extension of a final class project, or a fresh project, undertaken in the context of MUSIC 98. It is ungraded and serves as a culminating experience in the music department for those not pursuing a senior thesis. Where MUSIC 98 leads to a capstone project, it may be taken during the senior spring semester.

The department welcomes joint concentrations with other departments that allow them. Students who had wished to pursue a joint concentration with a department that does not allow them should consult with the Director of Undergraduate Studies (DUS) to explore how best to pursue their course interests in music. Joint concentrators need to fulfill a reduced number of course requirements, as outlined below. A senior thesis is required, usually on a topic that engages both fields.

For students who feel they require more time for applied practice and study, the Department offers a five-year performance program. Students approved by the Department and the Administrative Board for this program take the normal number of courses in their freshman year, but then work at the three-course rate for the four years following. This permits more intensive work in performance. These students are expected to give a senior recital.

Students who have taken college courses in Music at other institutions may receive concentration credit for work done elsewhere. This ordinarily involves a written petition to the faculty and may require taking an examination in the materials of the course for which credit is requested.

**REQUIREMENTS**

**10 courses (40 credits)**

1. *Required courses:*
   a. MUSIC 97T and MUSIC 97L; MUSIC 98 (see item 5: Tutorials).

2. *Electives:*
   a. Any 7 courses taught by Music Department faculty with no more than 2 each from the following categories:
      i. Faculty-led ensembles and introductory courses.
      ii. A particular course number followed by the letter ‘R’, indicating that it is repeatable (you can take as many repeatable courses with different numbers as you wish, but only two of a particular number, and only one time; so for example if you take MUSIC 160R twice and MUSIC 161R twice, either two 160Rs and one 161R count, or two 161Rs and one 160R count for concentration credit).
      iii. SAT/UNSAT courses.
      iv. Approved courses outside the Department that are not taught by Music Department faculty.

3. *Honors*

4. *Department of Music Course offerings are categorized as follows:*
   a. *Composition*: MUSIC 160R through 167R.
   b. *Conducting or orchestration*: MUSIC 121A through 128R.
   c. *Faculty-led Ensembles*: MUSIC 10 through 18.
d. **Introductory Music**: General Education and Freshman Seminars taught by Music Department faculty, MUSIC 1 through 9, and 20 through 49.

e. **Music Theory**: MUSIC 51A, 51B, 142R, and 150 through 159.

f. **Musicology, Ethnomusicology, Popular Music, and Music & Science**: MUSIC 176R and 190R through 194R.


h. **Supervised Reading and Research**: MUSIC 91R (must submit a proposal form prior to registration, concentration credit requires advance petition).

5. **Tutorials**:
   a. **Sophomore year**: MUSIC 97T and MUSIC 97L.
   b. **Junior year**: MUSIC 98: Advanced Tutorial – Graded SAT/UNSAT.
   c. **Senior year (honors only)** MUSIC 99 — Graded SAT/UNSAT.

6. **Concentration Examination**: None.

7. **Other information**: None.

8. **Thesis**: Required of all honors candidates. Maybe an original composition, a recital, or similar performance-based event, or a written thesis. Plan or subject to be approved by the Department at the end of the junior year. All students proposing to do a creative thesis must identify an adviser and submit examples of their work for pre-screening in the first term of the junior year. Students wishing to do a composition thesis must have taken an advanced composition course in the Department and submit a portfolio of work for consideration by the composition faculty; students wishing to pursue a recital must submit a representative recording for consideration by the performance committee, along with a resumé and a letter from their performance teacher. Any change of plan must be resubmitted to the Department.
   a. Examination: None.
   b. Thesis requires enrollment in MUSIC 99R graded SAT/UNSAT, which does not count toward the 10 courses.

**Joint Concentration Requirements: 8 courses (32 credits)**

1. **Required courses**:
   a. MUSIC 97T and MUSIC 97L.
   b. **Electives**: Any 6 courses drawn from the list of electives in Basic Requirements.

2. **Tutorials**:
   a. **Sophomore year**: MUSIC 97T and MUSIC 97L (see item 1. Required courses).
   b. **Junior year**: MUSIC 98: Advanced Tutorial is optional and may be counted toward the 6 electives.
   c. Students should enroll in two terms of senior tutorial MUSIC 99R in their primary department. They will need to find a faculty adviser in Music in any case. MUSIC 99 will not count toward Music concentration credit.

3. **Thesis**: Required. Plan or subject to be approved by both departments by the end of the junior year.

4. **Examination**: None.

5. **Other information**: MUSIC 98 cannot be taken for credit in the two joint departments during the same semester. In exceptional circumstances, the student may take 98 for college credit only while receiving concentration credit in the joint department. Otherwise, joint concentrators will fulfill the requirement as outlined for the full concentration.
ADVISING
All students are required to confer with the Director of Undergraduate Studies or the Assistant Director of Undergraduate Studies at the outset of their concentration or joint concentration, in order to develop an overall plan for fulfillment of requirements. All concentrators will continue to be advised by one of these two faculty members at the start of each term.

For up-to-date information on advising in Music, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
The Eda Kuhn Loeb Music Library offers an outstanding collection of books and scores, as well as listening equipment for its extensive recording collection. The Sound Lab provides access to cutting-edge tools for audio capture and recording, digital media and video editing, as well as audio mixing, mastering, and restoration. Musicians have access to the practice rooms, all of which have pianos, and to a limited number of instrument lockers. The many musical organizations on campus include the Harvard-Radcliffe Orchestra, the Bach Society Orchestra, the Mozart Society Orchestra, the Harvard Glee Club, the Collegium Musicum, the Radcliffe Choral Society, the University Choir, the Group for New Music at Harvard, and the Organ Society. Students interested in composition may submit works for performance at concerts offered by the Department and for the Harvard University Prizes. The Office for the Arts offers a special lesson subsidy program to concentrator and non-concentrators, as well as information on private teachers in the area.

HOW TO FIND OUT MORE
For further information, please contact the Director of Undergraduate Studies, Professor Richard K. Wolf (rwolf@fas.harvard.edu), Assistant Director of Undergraduate Studies, Professor Alexander Rehding (arehding@fas.harvard.edu), or the Undergraduate Coordinator in the Music Building (617-384-9507). You may also wish to consult the department website at http://music.fas.harvard.edu/undergraduate.shtml.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Near Eastern Languages and Civilizations

Gojko Barjamovic, Director of Undergraduate Studies

The Department of Near Eastern Languages and Civilizations (NELC) introduces students to the ancient and modern peoples, languages, cultures, and societies of the Near/Middle East. Loosely defined as stretching from Morocco in the west to Iran and Afghanistan in the east, the region is home some of the world’s major religions and civilizations. Its languages, religions, literatures, and great works of art have continued to shape our world, from the earliest permanent human settlements to today’s news headlines.

The Department offers instruction in a range of thematic courses and languages – ancient and modern – including Akkadian, Arabic, Aramaic, Armenian, Egyptian, Hebrew, Persian, Sumerian, Syriac, Turkish, and Yiddish.

The concentration offers students a multi-faceted and inter-disciplinary perspective on Near Middle Eastern cultures and languages that have been so influential throughout the world. Undergraduate concentrators develop skills in one or more of the languages of the region on their way to choosing from a wide variety of directions of study. Concentrators choose one of four specific tracks: The Middle East in Antiquity, Histories and Cultures of Muslim Societies (Islamic Studies), Jewish Studies, or Modern Middle Eastern Studies.

Undergraduate students also have the option of applying for an A.B./A.M. degree. For further information, consult with the Office of Undergraduate Education. Finally, the Department offers secondary fields in the same four pathways listed above, as well as language citations in several Middle Eastern languages.

The NELC concentration is of interest to students who are considering careers in academia, government and Foreign Service, law, journalism, education, business, and divinity, among others, as well as those who anticipate graduate study in Near Eastern or related fields.

FOCUS
One of the strengths of the concentration in Near Eastern Languages and Civilizations is the individual attention each student receives in pursuing her or his interests within the broader arena of the Near/Middle Eastern Studies. Students choose one of four specific tracks for concentration: The Middle East in Antiquity, Jewish Studies, Histories and Cultures of Muslim Societies (Islamic Studies), or Modern Middle Eastern Studies. The Director of Undergraduate Studies assists each student to make an informed choice among these options and assigns a faculty member to serve as the student's mentor/adviser, advising on courses and other work as the student progresses. There is no set way to meet the requirements, and students will benefit from the close guidance of their assigned adviser.

THE FOUR CONCENTRATIONS IN NELC
The Middle East in Antiquity explores the histories of the civilizations of ancient Western Asia and North Africa, which witnessed the first complex societies and the first major developments in social and political organization. The legacies of these ancient cultures, represented by Assyriology, Egyptology, Archeology, and several other fields, remain a critical force in
subsequent Middle Eastern—and world—history today. The goal of this track is to give students background in the history and culture of the principal civilizations of the region in order to analyze and synthesize linguistic, textual, artistic, and archaeological evidence.

**Jewish Studies** explores many facets of Jewish religion, law, literature, philosophy, and culture, and the histories of the Jews in the Middle East and beyond. To prepare students for independent study in one more areas of Jewish culture, the Department offers courses at several levels in Hebrew and Yiddish. This track covers Jewish studies in ancient, medieval, and modern periods.

**Histories and Cultures of Muslim Societies (Islamic Studies)** focuses on the literary, philosophical and religious traditions of the Islamic world from the rise of Islam to the present day. The language-areas covered are Arabic, Persian, Turkish and Urdu. The program in Histories and Cultures of Muslim Societies is structured to allow students flexibility in their approach to the field, and students are encouraged to incorporate disciplinary perspectives currently available in the Harvard curriculum (for example: Comparative Literature, Philosophy, Politics, Religious Studies, and Sociology).

**Modern Middle Eastern Studies** explores the cultures, histories, and politics of modern Middle Eastern societies and diasporas. Such study involves a combination of courses in a variety of fields drawn especially from the humanities and social sciences. The requirements are designed with sufficient flexibility so that students may pursue the field as an introduction to the region as a whole, or as a more narrowly focused exploration of a particular country or theme, depending on their interests.

**REQUIREMENTS**

**Basic Requirements:** 12 courses (48 credits)

1. **Required courses:**
   a. Four courses in a language of the Near/Middle East. The language will be chosen in consultation with the student's mentor/adviser to fit each student's particular focus. If students can show evidence at the beginning of their concentration that they already have two years' knowledge of their language, they will be asked to take the two years at a more advanced level or in another language relevant to their focus. Students are encouraged, in other courses for their concentration, to find ways to use their NELC language.
   b. Five courses to be chosen in consultation with the student’s mentor/adviser, in addition to the tutorials listed below. These should represent a coherent intellectual program. None of these courses may be taken pass/fail, with the possible exception of a Freshman Seminar (graded SAT/UNSAT) already taken by the student, providing that this seminar is accepted as relevant by the student’s departmental mentor/adviser and the Director of Undergraduate Studies.

2. **Tutorials:**
   a. **Sophomore year:** NEC 101 (one half-course). A group tutorial required of all concentrators, given in the spring term. It will comprise an introduction to the cultures, history, religion, literatures and politics of the Near/Middle East in ancient, classical, and modern times, and will also emphasize major themes and problems that cut across individual cultures and historical periods. The tutorial is team-taught by NELC and affiliated faculty members. The student chooses the track in NELC by the end of the sophomore year.
b. **Junior year:** In the fall of the junior year, concentrators are assigned a departmental concentration adviser based on their concentration. To fulfill their concentration requirements, students meet with other department concentrators in a seminar every second week throughout their junior year. With the help of their adviser, they define a research topic, compile a bibliography, and write a research paper under their adviser’s supervision during either the fall or the spring semester. The grade for the junior year (98R) is given in the spring semester.

c. **Senior year:** Concentrators meet for the biweekly concentration seminar to present and discuss their own work and that of their peers, as they research, prepare and write their senior thesis under the guidance of their academic adviser. Concentrators opting out of the senior thesis submit a shorter research paper under the supervision of their departmental concentration adviser (see below) and still attend the biweekly seminar.

3. **Thesis:** Not required.
4. **General Examination:** Required. An oral examination based on the student’s work, to be arranged under the supervision of the student’s mentor and the Director of Undergraduate Studies.

**Requirements for Honors Eligibility:** 14 courses (56 credits)

1. **Required courses:** Same as **Basic Requirements** above.
2. **Tutorials:** Same as **Basic Requirements** except, in the senior year, a full year (2 courses) of NEC 99, focused on the writing of the senior thesis, is required.
4. **General Examination:** Required. This will be based on the student’s concentration courses and thesis and will be arranged under the supervision of the student’s mentor/adviser and the Director of Undergraduate Studies.

**Joint Concentration**

Possibilities for joint concentrations exist and are welcome in NELC. The Department has formalized joint concentrations with the Departments of Government and History whose requirements are indicated below. For joint concentration with any other Departments, the student must make a case for it to both NELC and the other department or program concerned. Joint concentrators take four terms of a language, the sophomore and junior tutorials, and at least one other course in Near/Middle Eastern studies, in addition to a senior tutorial in two terms focused on the writing of a senior thesis that combines the two fields.

**Concentration Requirements for the Joint Concentration in Near Eastern History:** 14 courses (56 credits):

1. **Near Eastern Language Courses (4 courses):** Four courses of study of a Near Eastern language.
2. **Additional Coursework (8 courses):**
   a. HIST 97.
   b. NEC 101.
   c. Both tutorials are offered in the spring term only; students may choose to take both during their sophomore spring, or to take one in the sophomore spring and the other in the junior spring.
3. **Senior Thesis (2 courses)**: Students who wish to pursue a joint concentration in Near Eastern History must write a senior thesis, which also requires enrollment in one of two year-long senior thesis seminars: either HIST 99 or NEC 99. Students may select either seminar.

*Please also note the following information:*

Two types of courses count automatically toward NELC/History concentration requirements:

1. Courses listed in the course catalogue's "History" section and approved courses in the catalogue’s "Near Eastern Languages and Civilizations" section, as determined in consultation with the History Director of Undergraduate Studies.
2. Courses taught in the General Education and/or Freshman Seminar programs by full members of the History or NELC Department faculty. Students wishing to count such courses toward their concentration requirements should consult the Undergraduate Office, as they may need to file a petition requiring approval by the Director of Undergraduate Studies. Students may also apply to do an independent study, or HIST 91R, with a member of the Department; HIST 91R can be used to fulfill one of the elective course requirements.

The joint concentration also regularly accepts credit from both Study Abroad and Advanced Standing toward concentration requirements. With the exception of certain Freshman Seminars taught by History or NELC faculty (see above), courses taken on pass/fail basis may not be counted for concentration credit.

**Joint concentration with other Departments: 9 courses**

1. **Required courses**: Four courses in a language of the Near/Middle East, plus at least one other course in the Near/Middle East dealing with literature, religion, government, economics, or society, as approved by the student's NELC mentor/adviser and the NELC Director of Undergraduate Studies.
2. **Tutorials**:
   a. **Sophomore year**: NEC 101 (one half-course) required.
   b. **Junior year**: NEC 98 (one half-course) required.
   c. **Senior year**: NEC 99AB (two courses, one per each semester) or two terms of tutorial in the other concentration. Should be registered with the primary concentration and have the approval of the allied concentration.
3. **Thesis**: Required. Thesis must be related to both fields. Both concentrations will participate in the grading of the thesis.
4. **General Examination**: Same as **Requirements for Honors Eligibility**; however, it will normally involve faculty from both concentration departments/programs.
ADVISING
Sophomores and other new concentrators meet first with the Director of Undergraduate Studies, with whom they discuss their interests and arrange to meet with a member of the faculty who will serve as mentor/adviser in the concentration. Junior and senior concentrators meet with their mentors on a regular basis.

For up-to-date information on advising in Near Eastern Languages and Civilizations, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
Harvard’s library resources in the various fields of Near Eastern Studies are virtually unparalleled. Widener Library, for example, has a large collection of materials in Akkadian, Arabic, Armenian, Egyptian, Hebrew, Persian, Sumerian, Turkish, and Yiddish with several reading rooms specifically assigned to fields studies in NELC. The reading room of the Center for Middle Eastern Studies and the Andover-Harvard Library of the Harvard Divinity School also has excellent resources available to students. Students wishing to specialize in modern Near Eastern political or social studies should familiarize themselves with the resources and personnel of the Center for Middle Eastern Studies (38 Kirkland Street). Those interested in Jewish Studies should become familiar with the resources and personnel of the Center for Jewish Studies, located in the Semitic Museum, 2nd floor. The Harvard Semitic Museum, in which the Department is housed, has a superb collection of ancient and medieval manuscripts and artifacts representing many of the cultures of the Near East. As a University teaching museum, the Harvard Museum of the Ancient Near East is committed to providing access to these materials for study and teaching. For concentrators interested in the archaeology of the Near East, a variety of opportunities for archaeological work in the area available.

HOW TO FIND OUT MORE
Students interested in a concentration in Near Eastern Languages and Civilizations should arrange to meet with the Director of Undergraduate Studies, Gojko Barjamovic (barjamovic@fas.harvard.edu). Students are also encouraged to obtain a copy of our undergraduate handbook, The Concentration in Near Eastern Studies at Harvard, which is available online at http://nelc.fas.harvard.edu/concentration-requirements.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Neuroscience

Professor Jeff Lichtman, Head Tutor

Neuroscience, the study of the nervous system, is a field that investigates the biological mechanisms that underlie behavior and how brains process information. To develop a comprehensive understanding, we study the nervous system at every level: from the macroscopic (behavior and cognition) to the microscopic (cells and molecules). Consequently, the questions that neuroscientists ask are wide-ranging. For example, how do electrical, chemical, and molecular signals allow neurons to process and transmit information from the environment? What guides the development of the immense number of precise connections in the nervous system? How can the complex signals of many thousands of active neurons be recorded, interpreted, and modeled? What causes the profound behavioral deficits in Alzheimer’s disease or Autism Spectrum Disorder?

To answer these kinds of questions, neuroscientists study a variety of model systems including cultured cells, fruit flies, zebrafish, mice, monkeys, and humans. Simpler systems allow experimental manipulations (e.g., gene knockouts/knockins, drug treatments, activity silencing) and invasive recording techniques (e.g., electrically/optically recording neurons and networks, electron microscopy of the synapses and circuits). Studies in humans often focus on characterizing patterns of brain activity during development or disease using non-invasive recording techniques (e.g., fMRI and EEG). Neuroscientists may also use approaches from computer science and mathematics to analyze signals that arise from the brain or to understand the computational properties of neural networks. Thus, the study of neuroscience provides both a broad scientific training and a deep understanding of the biology of the nervous system. Given the diversity of interests in this field, the only prerequisite for students entering this concentration is an intense curiosity about the brain.

The Neuroscience curriculum includes a series of fundamental courses in the life and applied sciences. A central course on the neurobiology of behavior, NEURO/MCB 80, lays out the body of knowledge in neuroscience. In advanced elective courses, students explore specific areas of neuroscience more deeply based on their interests. We now list over 40 advanced courses on a range of topics: cells and circuits, physiology, learning and memory, cognitive science, development, genetics, computational modeling, and disease and therapeutics. In addition to the course offerings, Neuroscience is one of the most vibrant fields of research at Harvard, and students have many opportunities for hands-on laboratory experience and independent research projects to complement and deepen their studies.

We offer three tracks within the Neuroscience concentration. The first, the Neurobiology Track, provides the greatest focus on biology coursework and provides a flexible foundation in the life and physical sciences. For this track, honors is optional. The second track, the Mind, Brain, and Behavior Track, allows students to look beyond the biology of the brain and see how other disciplines (e.g., economics, computer science, history of science, linguistics, philosophy, psychology, etc.) approach the study of the mind. This is an honors track and requires an undergraduate thesis. The third track, the Computational Neuroscience Track, allows students to develop skills in mathematics and computer science to analyze and model the signals of the brain. For this track, honors is optional.
REQUIREMENTS

Basic Requirements: 13, 16, or 14 courses, depending on track

1. Required courses:
   a. Neurobiology Track: 13 courses (52 credits)
      i. Three courses in Biology:
         1. LS 1A (or LPS A) and LS 1B.
         2. One course chosen from the following: HEB 1420, LS 2, MCB 60, MCB 63, MCB 64, MCB 65, MCB 68, OEB 50, OEB 53; SCRB 50.
      ii. Five courses in Neuroscience:
          1. NEURO 80.
          2. One course chosen from the following (recommended sophomore or junior year): NEURO 57, 105, 115, 120, or 125.
          3. Three advanced courses in Neuroscience (chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=electives).
      iii. Three courses in Physical or Applied Science fields:
          1. Ordinarily, all courses in Chemistry, Physical Sciences, and Physics or Applied Physics fulfill this requirement; select courses in Computer Science, Earth and Planetary Sciences, Engineering Sciences, and Mathematics/Applied Math/Statistics may also fulfill this requirement.
      iv. Two courses in Math (at or above the level of MATH 1A or MATH MB), Applied Math, Statistics, or Programming, as described below:
         1. All students must demonstrate a fundamental understanding of basic calculus. This can be accomplished by either: having received an AP calculus score of 4 or 5 (AB or BC), having placed above MATH 1A on the Harvard placement exam, or having completed MATH 1A (or MATH MA and MB).
         2. For students who have fulfilled the basic calculus requirement above, we recommend one course in computer programming (e.g., APMTH 10 or COMPSCI 50) and/or one course in Statistics (e.g., STAT 102).
   b. Mind, Brain, and Behavior (MBB) Track: 16 courses (64 credits) (Honors Only Track)
      i. Same as Neurobiology Track Requirements, except as noted below:
         1. Two advanced courses in Neuroscience (chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=electives) instead of three.
         2. Two courses in Physical or Applied Science fields instead of three. Ordinarily, all courses in Chemistry, Physical Sciences, and Physics or Applied Physics fulfill this requirement; select courses in Computer Science, Earth and Planetary Sciences, Engineering Sciences, and Applied Math/Mathematics may also fulfill this requirement.
      ii. Two approved Mind, Brain, and Behavior course electives chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=mbbelectives. Not all of the courses listed in the
Mind, Brain, and Behavior course search at courses.my.harvard.edu/ are appropriate MBB electives for Neuroscience concentrators.

iii. Seminar in Mind, Brain, Behavior (MBB 980): one course, letter-graded, recommended junior year.

iv. Honors with Thesis: Required (See Honors Requirements item 2).

v. Other information: Students pursuing the Mind, Brain, and Behavior track are also expected to participate in key University-wide Mind, Brain, and Behavior activities, including the all-day MBB junior symposium (https://mbb.harvard.edu/pages/junior-symposium) and a non-credit senior year workshop for MBB thesis writers. Students are encouraged to join the student organization Harvard Society for Mind, Brain, and Behavior (HSMBB) (http://www.hcs.harvard.edu/~hsmbb/).

c. Computational Neuroscience Track: 14 courses (56 credits)

i. Three courses in Mathematics and Statistics:
   1. Multivariable calculus: MATH 19A, 21A, 23B, 25B, or MATH 55B; APMTH 22B.
   2. Linear algebra: MATH 18/19B, 21B, 23A, 25A, or 55A; APMTH 22A.
   3. STAT 110.

ii. Two courses in Computer Science:
   1. COMPSCI 50 or APMTH 10. Note, students with prior coding background who skip APMTH 10 or COMPSCI 50 (or take COMPSCI 50 non-letter-graded) must take both COMPSCI 51 and another approved programming course.
   2. COMPSCI 51 or COMPSCI 61.

iii. Two courses in Biology:
   1. Any one of the following: LS 1A (or LPS A), 1B, or 2; HEB 1420; MCB 60, 63, 64, 65, or 68; OEB 50 or 53; SCRB 50.
   2. One approved 100-level HEB, MCB, OEB, or SCRB course, or any second course from the list above.

iv. Five Neuroscience courses:
   1. NEURO 80.
   2. One foundational quantitative Neuroscience course: NEURO 105, 115, or 120. NEURO 120 strongly recommended.
   3. One additional advanced quantitative Neuroscience course: APMTH 226; BE 129, 130, 131; MCB 131; NEURO 105, 115, 120, 130, 140, 141; PSY 1401, 1406, 1451.
   4. Two additional advanced courses in Neuroscience (chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=mbbelectives).

d. Any two courses in modeling and analysis from a restricted set of Applied Math, BE, COMPSCI, ENG-SCI, MCB, and Statistics courses (chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=compneurotrack).

e. Other Information:
   i. Pass/fail: All requirements for the concentration must be taken for a letter grade.

f. Tutorials: Different NEURO 101-level courses are offered each year. These tutorials are counted as advanced Neuroscience courses. NEURO 101-level courses (full year 4 credit courses) are indivisible and cannot be divided or combined for credit. Only one tutorial may count towards the advanced Neuroscience course requirement. Tutorial seminars that are offered each year
are listed on the concentration website (https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=tutorials) and in the course search in courses.my.harvard.edu.

g. **LS 50 (16 credits):** Normally LS 50 can be counted as two courses in Biology, one course in the Physical Sciences, and one course in Mathematics.

h. **Other Course Credit:** Ordinarily, Harvard Summer School courses (other than Organic Chemistry) may not count towards the concentration except by petition. Courses taken through study abroad programs may be counted by petition. Courses taken at other Harvard faculties (e.g., Harvard Medical School) may count for credit if the course is one of the approved advanced Neuroscience courses; otherwise, it may be counted by petition.

### Requirements for Honors Eligibility: 14-16 courses (56-64 credits)

1. **Required courses:**
   a. Same as Basic [Requirements in 1.a., 1.b., or 1.c.](#).
   b. One course in independent research (NEURO 91, 99, or LS 100/MCB 100)

2. **Thesis:** Optional for the award of honors or high honors in Field, but required for highest honors in Field. The thesis is based on original research in Neuroscience and is ordinarily conducted in a laboratory. In their final semester, students are encouraged to take NEURO 99, the thesis-writing tutorial. All students planning to submit a senior thesis must submit a short thesis proposal, usually during the spring term of junior year. The thesis proposal form is available on the concentration website (https://www.mcb.harvard.edu/undergraduate/neuroscience/research-and-thesis/?course-button=91and99formsinformation). Members of the Committee on Degrees in Neuroscience evaluate theses based on input from the mentor and other faculty reviewers.

### Requirements for Joint Concentrations

*Students interested in a joint concentration should consult the advisers in both concentrations at an early date.*

1. Neuroscience as the Primary Field: 14-16 courses (56 credits)
   a. Students must satisfy the requirements of one of the three tracks above.
   b. Thesis required; must strongly relate to both fields and be approved by advisers from both concentrations.
   c. Students may double count a maximum of two courses between concentrations.

2. Another concentration as the Primary Field: 8 courses (32 credits)
   a. Students must satisfy the following requirements:
      i. One course in Statistics, Computer Science, Applied Math or Math (above the level of MATH 1A, or equivalent).
      ii. Two courses in Biology as described in Requirement 1.c.iii. above.
      iii. NEURO 80.
      iv. One course from the following: NEURO 57, 105, 115, 120, or 125.
      v. Three advanced courses in Neuroscience (chosen from a list maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/?course-button=electives.
   b. Thesis required; must strongly relate to both fields and be approved by advisers from both concentrations.
c. Students may double count a maximum of two courses between concentrations.

ADVISING
Dr. Ryan Draft and Dr. Laura Magnotti, the Neuroscience Concentration Advisers, are available to provide guidance to concentrators and pre-concentrators on course selection, laboratory research, and fulfilling concentration requirements.

Visit https://www.mcb.harvard.edu/undergraduate/neuroscience/ or contact Dr. Draft (BioLabs Room 1082A, 16 Divinity Ave., 617-496-9908, draft@fas.harvard.edu) or Dr. Magnotti (BioLabs Room 1082C, 16 Divinity Ave., 617-496-2432, magnotti@fas.harvard.edu) for more information. The Head Tutor and members of the Committee on Degrees in Neuroscience also provide mentoring on academic and career issues.

For up-to-date information on advising in Neuroscience, please see the Advising Programs Office website (https://advising.college.harvard.edu/neuroscience) or the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-contact-us/.

HOW TO FIND OUT MORE
Head Tutor of Neuroscience: Professor Jeff Lichtman, NW 249.50 Northwest Building, 52 Oxford St. Cambridge, MA 02138, 617-496-8943. Neuroscience Concentration Advisers: Dr. Ryan Draft, BioLabs 1082A, 16 Divinity Ave., 617-496-9908, draft@fas.harvard.edu; Dr. Laura Magnotti, BioLabs 1082C, 16 Divinity Ave., 617-496-2432, magnotti@fas.harvard.edu. More information about the Neuroscience concentration can also be found at https://www.mcb.harvard.edu/undergraduate/neuroscience/.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Neurobiology began offering joint concentrations in 2018-19.
Philosophy

Dr. Cheryl Chen, Director of Undergraduate Studies

Philosophy studies many of humanity’s fundamental questions: how should we live, what kind of society should we strive towards, what are the limits of human knowledge? What is truth? Justice? Beauty? These questions are central to our lives, because in much of what we do, we at least implicitly assume answers to them.

Philosophy seeks to reflect on these questions and answer them in a systematic, explicit, and rigorous way—relying on careful argumentation, and drawing from outside fields as diverse as economics, literature, religion, law, mathematics, the physical sciences, and psychology. And while most of the tradition of philosophy is Western, we seek to connect with non-Western traditions like Islam and Buddhism, as well.

Philosophy doesn’t just operate at this most abstract of planes. We often investigate more specific issues in our classes.

- What is race, and what does justice require when it comes to race?
- What is gender?
- What are the ethical issues raised by technology in society?
- When and why is punishment justified?
- How should we interpret quantum mechanics?
- How does language play into the constitution of ourselves and our society?
- In what sense are various kinds of facts, like natural and social facts, objective?
- Is the mind best thought of as a computer?
- What are the ethical challenges of climate change?

Philosophical questions are everywhere. If you find yourself drawn to them, studying Philosophy in college is likely the best opportunity in your life to deeply engage with them. In fact, many concentrators find their way into Philosophy from other disciplines, where they encounter interdisciplinary or foundational questions that can only be addressed through philosophical reflection. And given the small size of the Department, concentrators have the rare opportunity to closely engage with dedicated faculty at the top of their fields.

Whether they take just a course or two or end up concentrating, students find studying Philosophy to be among the most rewarding intellectual experiences of their college careers. The Department offers a rich array of classes to choose from, and students develop their own responses to the philosophical problems that attract them in conjunction with their study of philosophical writing. The Department’s introductory courses help students to develop their reading, writing, and reasoning skills while acquainting them with broad surveys of major areas and historical periods. The Department’s more advanced courses focus on more specific topics and allow students to explore their interests in the context of the broad foundation they acquired in the introductory courses.

Harvard Philosophy concentrators have gone on to pursue diverse and fulfilling careers in law, finance and consulting, business, internet start-ups, medicine, journalism, the arts, non-profit work, education, and academia. The skills that philosophy teaches students will always be in high demand: the ability to think and write clearly, the ability to bring to light unnoticed presuppositions, to explain complex ideas clearly, to tease out connections and implications, to see things in a broader context, to challenge orthodoxy. In short, philosophy gives you skills that you can apply to any line of work.
OPTIONS
• Philosophy
• Mind, Brain, and Behavior Track
• Joint Concentrations with Philosophy

REQUIREMENTS
Basic Requirements: 12 courses (48 credits)

1. Required courses:
   a. One course in each of the following four areas, taken by the end of the first term of senior year and passed with a grade of C− or better:
      i. Logic.
      ii. Contemporary metaphysics, epistemology, philosophy of science, philosophy of mind, philosophy of language.
      iii. Ethics, political philosophy, aesthetics.
      iv. History of ancient, medieval, or modern pre-20th-century philosophy.
   b. Tutorials: Two courses. See item 2 below.
   c. Six additional courses in Philosophy, up to three of which may be in approved related subjects. Related courses are approved individually by the Director of Undergraduate Studies, in many cases depending on the interests and overall program of the student. They count for concentration credit only if they are needed to reach the minimum number of concentration courses required.

2. Tutorials:
   a. Tutorial I: PHIL 97, group tutorials at the introductory level on different philosophical topics, required. Letter-graded. A one-semester course typically taken in the spring of the sophomore year.
   b. Tutorial II: PHIL 98, group tutorials at the advanced level on different philosophical topics, required. Letter-graded. A one-semester course typically taken fall or spring of the junior year.

3. Thesis: None.
4. General Examination: None.
5. Other information:
   a. Philosophy courses may include courses listed under Philosophy in the course search in courses.my.harvard.edu.
   b. Pass/fail: All courses counted for the concentration must be letter-graded.
   c. No more than four courses numbered lower than 91 may be counted for the concentration.

Requirements for Honors Eligibility (Thesis): 13 courses (52 credits)

1. Required courses:
   a. One course in each of the following five areas, taken by the end of the first term of senior year and passed with a grade of C− or better:
      i. Logic.
      ii. Contemporary metaphysics, epistemology, philosophy of science, philosophy of mind, philosophy of language.
      iii. Ethics, political philosophy, aesthetics.
      iv. History of ancient or medieval philosophy.
      v. History of modern pre-20th-century philosophy.
   b. Tutorials: Four courses. See item 2 below.
c. Four additional courses in Philosophy, up to two of which may be in approved related subjects. Related courses are approved individually by the Director of Undergraduate Studies, in many cases depending on the interests and overall program of the student. They count for concentration credit only if they are needed to reach the minimum number of concentration courses required.

2. **Tutorials:**
   a. Same as **Basic Requirements**.
   b. **Senior Tutorial**: PHIL 99, individual supervision of senior thesis. Permission of the Director of Undergraduate Studies is required for enrollment. Graded SAT/UNSAT. Honors candidates ordinarily enroll in both fall and spring terms. Enrolled students who fail to submit a thesis when due must, to receive a grade above UNSAT for the course, submit a substantial paper no later than the beginning of the spring term Reading Period.

3. **Thesis**: Required of all senior honors candidates. Due at the Tutorial Office on the Friday after spring recess. No more than 20,000 words (approximately 65 pages). Oral examination on the thesis, by two readers, during the first week of spring Reading Period.

4. **General Examination**: None.

5. **Other information**: Same as **Basic Requirements**.

**Requirements for Honors Eligibility (Non-Thesis): 14 courses (56 credits)**

*Students who earn honors through this track are only eligible to graduate with honors, not with high or highest honors.*

1. **Required courses:**
   a. One course in each of the following five areas, taken by the end of the first term of senior year and passed with a grade of C– or better:
      i. Logic.
      ii. Contemporary metaphysics, epistemology, philosophy of science, philosophy of mind, philosophy of language.
      iii. Ethics, political philosophy, aesthetics.
      iv. History of ancient or medieval philosophy.
      v. History of modern pre-20th-century philosophy.
   b. **Tutorials**: Two courses. See item 2 below.
   c. Seven additional courses in Philosophy, up to three of which may be in approved related subjects. Related courses are approved individually by the Director of Undergraduate Studies, in many cases depending on the interests and overall program of the student. They count for concentration credit only if they are needed to reach the minimum number of concentration courses required.

2. **Tutorials:**
   a. Same as **Basic Requirements**.

3. **Thesis**: None.

4. **General Examination**: None.

5. **Other information**:
   a. Same as **Basic Requirements**.
   b. Students must have an honors GPA of 3.7 or above. A student's honors GPA is computed as follows. All and only the courses that count towards concentration GPA count towards the honors GPA. Courses are weighted according to year in which they are taken.
      i. Courses in the first year are weighted normally.
      ii. Courses in the second year are weighted with a multiplier of 1.2.
      iii. Courses in the third year are weighted with a multiplier of 1.4.
      iv. Courses in the fourth year are weighted with a multiplier of 1.5.
Mind, Brain, and Behavior Track
15 courses (60 credits)

Students interested in studying philosophical questions that arise in connection with the sciences of mind, brain, and behavior may pursue a program of study affiliated with the University-wide Mind/Brain/Behavior (MBB) Initiative (http://mbb.harvard.edu/), which allows them to participate in a variety of related activities. MBB track programs must be approved on an individual basis by the Philosophy MBB adviser. Further information can be obtained from the Undergraduate Coordinator.

1. **Required courses:**
   a. Three basic MBB courses:
      i. PSY 1 (previously SLS 20).
      ii. MCB 80.
      iii. Junior year seminar in Mind, Brain, and Behavior.
   b. PHIL 156.
   c. One course in logic.
   d. Three further courses in contemporary metaphysics, epistemology, philosophy of science, philosophy of mind, or philosophy of language.
   e. Two courses covering two of the following three areas: history of ancient philosophy, history of modern philosophy, ethics.
   f. Two further MBB-listed courses from outside the Philosophy Department, to be selected in consultation with the MBB adviser.

2. **Tutorials:**
   a. Tutorial I: Same as Basic Requirements.
   b. Senior Tutorial: Same as Requirements for Honors Eligibility.

3. **General Examination:** None.

4. **Other information:** Same as Basic Requirements.

Joint Concentrations: Philosophy as Primary Concentration
8 courses in Philosophy (36 credits)

1. **Required courses:**
   a. One course in four of the five areas (see item 1.a. of Requirements for Honors Eligibility).
   b. Four additional courses in Philosophy; tutorials count toward this requirement.
   c. At least four courses in the other field. Many departments require more; consult the Head Tutor of other field.

2. **Tutorial:** Tutorial I: PHIL 97 (usually taken in the sophomore year). Normally a tutorial is also required in the other field.

3. **Thesis:** Required as for honors eligibility in Philosophy but must relate to both fields. Oral examination by two readers, one from each department.

4. **General Examination:** None required in Philosophy.

5. **Other information:**
   a. No more than three courses numbered lower than 91 may be counted for the concentration.
   b. Other requirements are the same as Basic Requirements.
Another Field as Primary Concentration
6 courses in Philosophy (24 credits)

1. **Required courses:**
   a. One course in three of the five areas (see item 1.a. of *Requirements for Honors Eligibility*). The introductory course (item 1.a.) also counts toward this requirement.
   b. Three additional courses in Philosophy; tutorial counts toward this requirement.
2. **Tutorial:** Tutorial I (PHIL 97), usually taken in the junior year.
3. **Thesis:** Required. Must relate to both fields. Directed in the primary field; one reader from Philosophy.
4. **General Examination:** None required in Philosophy.
5. **Other information:**
   a. No more than two courses numbered lower than 91 may be counted for the concentration.
   b. Other requirements are the same as *Basic Requirements*.

**ADVISING**
Advising is done by the Director of Undergraduate Studies, Dr. Cheryl Chen, and the Assistant Director of Undergraduate Studies. Their office hours are posted on the Philosophy Department’s website.

For up-to-date information on advising in Philosophy, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

**RESOURCES**
The Department of Philosophy is housed in Emerson Hall, which contains the department and tutorial offices, the offices of faculty members and teaching fellows, and the Robbins Library of Philosophy.

**HOW TO FIND OUT MORE**
Further information may be obtained from Ms. Nyasha Bovell, Undergraduate Coordinator, in the tutorial office, Room 308 Emerson Hall; nyashabovell@fas.harvard.edu.

**ENROLLMENT STATISTICS**
*Number of Concentrators as of December*

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Physics

Professor Howard Georgi, Director of Undergraduate Studies
Dr. David Morin, Co-Director of Undergraduate Studies

The concentration in Physics, administered by the Department of Physics, serves a variety of goals and interests. Many concentrators seek an understanding of the subtle, profound, and fundamental laws—relativity, quantum mechanics, and the basic force laws—that govern the behavior of all matter. Often these studies involve the smallest units of matter: molecules, atoms, nuclei, and sub-nuclear particles. A major interest of other Physics concentrators is the exploration and explanation of the diverse properties to which these laws give rise in macroscopic systems such as fluids and solids. Still others study aspects of more complex systems like oceans and atmospheres, stars, and living matter.

A concentration in Physics provides a foundation for subsequent professional work in physics, and also for work in computer science, astronomy, biophysics, chemical physics, engineering and applied physics, earth and planetary sciences, geology, astrophysics, and the history and philosophy of science. Less obviously perhaps, the intellectual attitudes in physics – blending imagination, prediction, observation, and deduction – provide an excellent base for subsequent graduate work in professional schools of medicine, education, law, business, and public administration.

It should be emphasized that since all the physical sciences require basic training in physics and mathematics, an early choice of concentration need not be a final one. It is quite possible to design a program that will permit a change in concentration at the end of the sophomore year or even later. For example, a student who has satisfied most of the requirements for a concentration in Astronomy probably has also satisfied most of the Physics requirements as well, and vice versa.

The Department tries to provide the essential content of undergraduate physics in concentrated form, leaving students sufficient time to develop interests through related courses offered by other science departments, to pursue more advanced and specialized aspects of physics through graduate-level courses and independent study or laboratory work, or to take advantage of the opportunities Harvard provides for a broad liberal arts education. Keeping the number of required courses small (twelve courses in Physics and related fields; 13 courses for honors candidates) allows individual students to construct programs suited to their interests and career plans.

There are several basic avenues for entering Physics or one of the other concentrations in which it plays a major role. One track is with the PHYSICS 15A, 15B, 15C sequence of courses. Students may also begin with PHYSICS 19 instead of PHYSICS 15A. These options are recommended for those who have had a normal high school course in physics or no previous physics at all. Students who enter with the appropriate Advanced Placement background may begin their study of Physics with PHYSICS 16 instead of PHYSICS 15A or 19. The PHYSICS 15A, 15B, 15C courses are taught both terms, so that those students who wish to begin Physics in the second term may do so. Students may also begin with PHYSCI 12A/B or APPHY 50A/B; see item 1.a. in the Basic Requirements below.

The Physics department does not require that undergraduates take tutorials (i.e., individual instruction). This is not because independent study is considered unimportant, but rather because it has been deemed more important to keep the concentration requirements flexible enough to satisfy the differing goals of a great variety of students. There are programs that
enable students to examine special fields and topics in some detail under the guidance of experts. We offer the following optional tutorial and independent study programs: (1) PHYSICS 91R: individual study of material not covered in regular courses, supervised by a member of the department; (2) PHYSICS 90R: individual research under the supervision of a faculty member interested in the field. The exact form of the project depends on the student’s experience and interest, the nature of the particular field, and the availability of necessary facilities and funds. Concentrators desiring to write a senior thesis may do so under this program.

Physics does offer joint concentrations with other programs (e.g., Physics and Mathematics, Physics and Astronomy, and Physics and History and Science) with the provision that the student’s Plan of Study be approved by the Director or Co-Director of Undergraduate Studies. Students must complete the honors Physics track if Physics is the primary (first) field in the joint concentration; the Basic Physics track suffices if Physics is the allied (second) field. Within the Physics Department we provide an Applied Physics option, which emphasizes courses covering physical applications (see Requirements for the Applied Physics Option). We also offer a Biophysics option, which allows a limited substitution of Biology courses for Physics-related courses (see Requirements for Biophysics Option). Finally, we offer a Physics and Teaching option, which provides both preparation in Physics and eligibility for the teaching certificate required for public school teaching in many states (see Requirements for the Physics and Teaching Option). See also the concentration in Chemistry and Physics at http://projects.iq.harvard.edu/book/chemistry-and-physics. We also collaborate in offering many of the courses required for concentrations in Astrophysics and in applied sciences.

No thesis or general examination is required for a degree with honors in Physics.

OPTIONS

- Physics
- Physics with Applied Physics emphasis
- Physics with Biophysics emphasis
- Physics and Teaching

REQUIREMENTS

Basic Requirements: 12 courses (48 credits)

1. Required courses:
   a. PHYSICS 15A, 15B, 15C. Students may take PHYSICS 19 instead of PHYSICS 15A. Students who have demonstrated sufficiently strong preparation in Physics and Mathematics may take PHYSICS 16 in place of PHYSICS 15A or 19. Students may also take PHYSCI 12A/B or APPHY 50A/B in place of PHYSICS 15A/B. These students should contact the Director or Co-Director of Undergraduate Studies, who will work with them to develop a coherent program.
   b. PHYSICS 143A.
   c. Two courses at the level of MATH or APMTH 21A, 21B, or above. While not required, taking one or more additional Mathematics courses is strongly recommended. Students should give special consideration to the courses listed in item 1.c. of the Requirements for Honors Eligibility.
   d. Two additional courses in Physics (see item 5.a.).
   e. Additional courses in Physics, or a related field (see item 5.b.), to complete the requirement of twelve courses (see item 5.c.).

2. Tutorial: None.
3. Thesis: None.
4. General Examination: None.
5. Other information:
a. Courses counted as Physics courses include:
   i. APMTH 201, 202.
   ii. Summer School PHYS S-123AB, a seven-week course that counts as a course.
   iii. PHYSCI 10.
   iv. ENG-SCI 120, 123, 125, 128, 151, 153, 154, 170, 173, 175, 181, 190, and any 200-level course containing a significant amount of physics. See the Director or Co-Director of Undergraduate Studies for approval.
   vi. ASTRON 120, 130, 151, 191, and any 200-level course.
   vii. APPHY (100 or 200 level)

b. Related courses include:
   i. Applied Mathematics.
   ii. Applied Physics.
   iii. ASTRON 16, 17, and courses numbered 100 or higher.
   iv. Chemistry.
   v. Computer Science.
   vi. E-PSCI 50, 52, 112, 130, 131, 132, 133, 135, 136, 141, 162, 166, and most 200-level courses. See the Director or Co-Director of Undergraduate Studies for approval.
   viii. MATH 1B or any 100- or 200-level Mathematics course. Statistics (110 or higher).

c. PHYSICS 90R and 91R can be used, together or individually, to satisfy at most two of the required courses.

d. Satisfactory grades (C- or better) are required in PHYSICS 15A, 15B, and 15C (or higher-level substitutions).

e. Pass/fail: Two courses may be taken pass/fail. These may not include PHYSICS 15A, 15B, 15C, 16, or 19.

f. Students with exceptional preparation in Physics may wish to discuss the possibility of substituting more advanced courses for some of these introductory courses. Written permission of the Director or Co-Director of Undergraduate Studies is required if this is done. Students who substitute more advanced courses for PHYSICS 15B and/or 15C must complete the lab component of these courses, on a pass/fail basis. See the Co-Director of Undergraduate Studies for further information.

Requirements for Honors Eligibility: 13 courses (52 credits)

1. \textit{Required courses}:
   a. Same as \textbf{Basic Requirements}.
   b. Mathematics courses including at least two courses above the level of MATH 21A/B-55A/B; or APMTH 21A/B, 22A/B. Students should consider especially APMTH 104 or MATH 113; APMTH 105 or MATH 110; APMTH 115; STAT 110.
   c. The laboratory course PHYSICS 191 (see item 5.d.).
   d. Three additional courses in Physics that should normally include PHYSICS 143B and 181.
   e. Additional courses in Physics, or a related field, to complete the requirement of 13 courses (see item 5.g.).

2. \textit{Tutorial}: None.
3. \textit{Thesis}: Optional. Students wishing to submit a thesis should obtain a copy of the departmental regulations from the office of the Co-Director of Undergraduate Studies, Lyman 238.
4. \textit{General Examination}: None.
5. \textit{Other information}:
a. Same as Basic Requirements.
b. Pass/fail: Two courses may be taken pass/fail. These may not include PHYSICS 15A, 15B, 15C, 16, 19, or 191.
c. The total number of concentration courses taken during the student's college career (including study abroad or transfer credits) must be at least 13.
d. ASTRON 191 may be substituted for PHYSICS 191 with the permission (no later than the end of the student's seventh semester) of the Director of Undergraduate Studies by students who have demonstrated a serious academic interest in Astrophysics by completing a number of appropriate courses in Astronomy and Astrophysics. Honors candidates are advised to obtain additional experience in experimental Physics by assisting in research through PHYSICS 90R, or by working during the summer in an industrial, university, or government laboratory.

Requirements for the Applied Physics Option: 13 courses (52 credits)

1. Required courses:
   a. Same as Basic Requirements.
   b. Mathematics courses must include at least one course above the level of MATH 21A/B-55A/B; or APMTH 21A/B, 22A/B. Among courses to choose from, consider especially APMTH 104, 105, 115.
   c. The laboratory course PHYSICS 191.
   d. PHYSICS 175 (Quantum Electronics and Modern Optics) and ENG-SCI 173 (Electronic and Photonic Semiconductor Devices).
   e. Additional courses in Physics or a related field, to complete the requirement of 13 courses.

2. Tutorial: None.
4. General Examination: None.
5. Other information:
   a. Same as Basic Requirements and Requirements for Honors Eligibility.
   b. APPHY 190 (Materials Physics) or APPHY 195 (Solid State Physics), and ENG-SCI 123 (Fluid Mechanics) are highly recommended.
   c. Students taking this option are advised to take PHYSICS 123 and to obtain additional experience in experimental Physics by taking PHYSICS 90R or ENG-SCI 91R, and/or by working during the summer in an industrial, university, or government laboratory.

Requirements for the Biophysics Option: 13 courses

1. Required courses:
   a. Same as Basic Requirements.
   b. Two courses of PHYSICS 90R under the supervision of a member of the Committee on Higher Degrees in Biophysics or another biophysicist approved by the Director of Undergraduate Studies in Physics.
   c. Two additional courses in Physics.
   d. Additional courses in Physics or a related field, to complete the requirement of 13 courses.

2. Tutorial: None.
4. General Examination: None.
5. Other information:
   a. Same as Basic Requirements and Requirements for Honors Eligibility.
   b. In fulfilling the requirement in item 1.d., a student may take up to two courses from the following: LS 1A, 1B; MCB 52, 54, 56, and 80; and Biophysics courses numbered above 100.
c. Students choosing this option are advised to take PHYSICS 181 or CHEM 161, and PHYSICS 141 in completing the requirements for honors eligibility in Physics. They should also take steps to acquire a basic knowledge of organic chemistry in its relation to biochemistry, although they need not enroll in CHEM 20.

Requirements for the Physics and Teaching Option
This option is offered by the Department of Physics to encourage well-prepared students with a degree in Physics to enter secondary school teaching in the much-needed areas of physics, physics and chemistry, physics and general science, and physics and mathematics. Students who choose this option will complete the Undergraduate Teacher Education Program (UTEP) as part of this program. They will thereby obtain eligibility for the teaching certificate required for public school teaching by about thirty states, including Massachusetts.

Note: Those who plan to teach only in independent schools will not need a teaching certificate, and hence do not need to take this program. However, they too may wish to take UTEP courses to enhance their career preparation. (Basic Physics concentrators who plan on teaching in public schools after graduation should inquire at the Graduate School of Education about the possibility of admission to UTEP, independent of this option.)

Under this option, there is a variety of choices depending upon the intended subject area of secondary school teaching.

Physics with Teacher Certification in Physics
1. Required courses in Physics and related subjects (13 courses):
   a. PHYSICS 15A (or 16 or 19), 15B, 15C as in the Basic Requirements.
   b. PHYSICS 143A and 181.
   c. Mathematics at least through MATH 21A/B (or MATH 22A/B-55A/B).
   d. One course chosen from LS 1A, PHYSCI 1, or CHEM 40. See item 6.e.
   e. One course in a related subject (see item 6.b.).
   f. Additional courses in Physics or related subjects (see item 6.b.), to make a minimum total of 13 courses.

2. Tutorial: None.
3. Thesis: None.
4. General Examination: None.
5. UTEP: The course and teaching requirements of the Undergraduate Teaching Education Program must be completed before graduating under this program. These consist of four courses, including student teaching, as well as (non-course) fieldwork, as described in detail in the booklet entitled UTEP Courses that Form Part of the Requirements for the Physics and Teaching Options.
   a. Normally, it should be possible to meet the UTEP requirements and to also fulfill the requirements in item 1 above during a four-year period as an undergraduate; but it is also possible to graduate under the Physics program without the Teaching Certification option and to complete the teacher preparation subsequently under UTEP as a post-baccalaureate student. To obtain more information on this option, contact the UTEP administrator (see item 6.f.).

6. Other information:
   a. Courses counted as Physics courses: See item 5.a. of Basic Requirements.
   b. Related courses: See item 5.b. of Basic Requirements but also including the courses in History of Science.
   c. Students who plan to count PHYSCI 12A/B or APPHY 50A/B for the concentration should contact the Director or Co-Director of Undergraduate Studies, who will work with them to develop a coherent program.
d. Pass/fail: Two courses may be taken pass/fail. These may not include PHYSICS 15A, 15B, 15C, 16, or 19.

e. The appropriate Advanced Placement background may substitute for the required Chemistry course in item 1.d., but the minimum of 13 courses total of actual courses taken in items 1.a.-f. must be completed.

f. Additional information regarding Undergraduate Teaching Education Program can be found on the UTEP website at http://gse.utep.harvard.edu/. The UTEP Director (beth_simpson@gse.harvard.edu) is responsible for advising all students who are considering or are enrolled in the program. In addition, each student in this option will have a Physics Department adviser for the subject area requirements.

Physics with Teacher Certification in both Physics and Chemistry
The requirements are the same as for Teacher Certification in Physics, except that:

1. PHYSICS 143A and 181 are replaced by CHEM 160 and 161.
2. An additional course, CHEM 17 or 20, is also required; but the minimum number of subject area courses to be taken will still be 13.
3. If the UTEP program is not completed, PHYSICS 143A must be taken to meet the basic requirements in Physics.

Physics with Teacher Certification in Physics and General Sciences
The requirements are the same as for Teacher Certification in Physics, with the addition of:

1. Two courses in Biology, normally LS 1A and 1B; but the minimum number of subject area courses to be taken will still be 13.

Physics with Teacher Certification in Physics and Mathematics
The requirements are the same as for Teacher Certification in Physics, except that:

1. The one course in a related subject (see item 5.b. of Basic Requirements) must be chosen from Mathematics, Statistics, or Computer Science courses (excluding MATH MA, MB).
2. One additional course in probability and statistics is required, normally STAT 100 or HGSE H-102.
3. One additional course in Computer Science is required, normally chosen from COMPSCI 50 or 51.

Note: It may be possible in items 2 or 3 to substitute other courses with a strong statistical or computer component, but in all cases the minimum number of subject-area courses taken must be 13.

ADVISING
Students interested in concentrating in Physics should discuss their Plans of Study with the Director or Co-Director of Undergraduate Studies. When these are approved by the Co-Director of Undergraduate Studies, each undergraduate who elects to concentrate in Physics is assigned an additional faculty adviser. Students keep the same adviser until they graduate unless they request a change. It is expected that students will discuss their programs and review their progress with faculty advisers at the beginning of each term. Students are encouraged to seek advice at any time and can see their advisers at regularly scheduled office hours or by making an appointment. Students may also seek advice from the Director or Co-Director of Undergraduate Studies at any time. For up-to-date information on advising in Physics, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.
RESOURCES
The Science Center houses many modern facilities for undergraduate instruction in Physics. For example, concentrators will find most of the books and journals needed for their undergraduate courses in the Godfrey Lowell Cabot Science Library which is located there. (More advanced references are available in the Physics Research Library in the Jefferson Laboratory.) In addition, the computers used in undergraduate Physics courses are located in the Science Center as are the instructional laboratories, one in practical laboratory electronics, and an advanced Physics laboratory.

Students desiring to extend their research experience beyond the experiments available through the teaching laboratories may obtain access through the PHYSICS 90R program to facilities for ongoing research in atomic and molecular Physics in the Lyman Laboratory, solid-state Physics in the Gordon McKay Laboratory and the Laboratory for Integrated Science and Engineering, high energy Physics in the High Energy Physics Laboratory, Astrophysics through the Center for Astrophysics, and in Biophysics through the various Biological Laboratories.

HOW TO FIND OUT MORE
For further information about the Physics concentration, the Physics Department, and related departments with a major physics component, the best single reference is the pamphlet The SPS Guide to Physics and Related Fields. Copies are available from the Co-Director of Undergraduate Studies in Lyman 238. Information is also available at https://www.physics.harvard.edu/undergrad.

Advice and personal consultation concerning the concentration can be obtained from the Director of Undergraduate Studies, Professor Howard Georgi, Jefferson 456, georgi@physics.harvard.edu (617-496-8293); or Co-Director of Undergraduate Studies, Dr. David Morin, Lyman 238, morin@physics.harvard.edu (617-495-3257). For office hours, check the website: www.people.fas.harvard.edu/~hgeorgi/.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Psychology

Professor Jill Hooley, Director of Undergraduate Studies

Psychology is the scientific study of the mind, and as such, we investigate the minds of humans and other species. We try to understand the mind at many different levels of analysis, from taking measurements from the brain, through learning about the individual, all the way to understanding groups and organizations. The kinds of questions psychologists attempt to answer are: How do we perceive the physical world? Does our view of it coincide with reality? How do we make sense of the social world? Can we really understand the minds of others? Which others, and do the groups “they” belong to matter? Why do we pay attention to some things and not others? How do memories form and how do we forget? Can we be said to have a memory even if we can’t “remember”? What are the rules by which we reason and think? What’s the role of emotion as expressed in the joy, surprise, sadness, anger and fear of everyday life as well as in depression, schizophrenia, and other disorders? What are the causes of these kinds of disorders, and how can they be treated? Are we rational beings or only boundedly so? Why do we believe in religion, do we have unshakable feelings of morality, and how best should we study our own consciousness? How do all these processes develop from infancy to adulthood? To answer these and other questions about the mind, psychologists pay attention to evolutionary factors, biological bases, cultural and social inputs, as well as the day-to-day situations in which individuals find themselves. Most of the research conducted in Harvard’s Department of Psychology concerns basic psychological processes such as attention, perception, memory, categorization, reasoning, decision-making, language, cognitive and social development, social cognition, intergroup relations, and morality. In addition, some members of the Department conduct research on the etiology, development, and treatment of psychopathology. All members of the Department share the common goal of understanding mind, brain, and behavior through empirical investigation, and their teaching and research reflect this goal.

As part of a liberal arts education, the primary goal of the Psychology concentration is to provide students with a fundamental understanding of the human mind. In the process of doing so, other goals will also be achieved: the skill to critically assess quantitative evidence from experimental and correlational data, to learn to take difficult and previously unstudied problems of mind and society and bring them under experimental scrutiny, to learn to speak and write about questions of great theoretical and social importance that involve the mind. Knowledge of human psychology informs students to be good practitioners of law, education, medicine, business, and life in general. Thus, the ultimate goal of the concentration is to engage students in the very exciting life of the mind.

The Department seeks to serve undergraduates with a diverse set of goals. It understands that a small number of concentrators seek to prepare themselves for graduate work in psychology or neuroscience; many plan to attend professional schools of law, medicine, public health, or business; and some see a concentration in Psychology as interesting and valuable intellectually but do not base their future vocational plans upon it. The Department has kept all these reasons in mind in designing its concentration requirements. The requirements have been structured so that students start with an Introductory Course that provides a broad introduction to the field, progress to Foundational Courses that each provide a more focused examination of a sub-area of Psychology, and then take Advanced Courses in more specialized areas of interest.
REQUIREMENTS
General Track in Psychology
Basic Requirements: 12 courses (48 credits)

1. Required courses:
   a. **Introductory Course**: PSY 1: Introduction to Psychological Science (formerly SLS 20), one course, recommended during the first year and required by the end of the sophomore year, or an approved substitute (see below). Letter-graded.
      i. PSYC S-1, offered in the Harvard Summer School.
      ii. It may be possible to substitute a Psychology AP score of 5 or IB score of 7, in which case an extra advanced course will be required. Please contact the Psychology Undergraduate Office at psychology@wjh.harvard.edu to learn more.
   b. **Sophomore Tutorial**: PSY 971, one course, required by end of sophomore year. Letter-graded. (See item 2.)
   c. **Statistics**: PSY 1900, one course, required by end of junior year. Must be passed with a grade of C- or higher.
   d. **Foundational Courses**: Two courses, recommended by end of sophomore year. Letter-graded. Select two of PSY 14, 15, 16, 18; SLS 15; NEURO 80 (formerly MCB 80) or MCB 81 (only one of these courses may be taken).
   e. **Research Methods**: PSY 1901, one course, required by end of sophomore year. Letter-graded. (Prior to Fall 2020, PSY 1901 or one lab course selected from a list on the concentration’s website at https://undergrad.psychology.fas.harvard.edu/lab-courses. If returning from leave, please consult with the Psychology Undergraduate Office).
   f. **Advanced Courses**: Six courses. All letter-graded. (See items 5.a.-d.). See the department's website (at https://undergrad.psychology.fas.harvard.edu/advanced-courses) for a list of advanced courses.

2. **Tutorial**: Sophomore Tutorial: PSY 971 is a semester-long tutorial required for concentrators by the end of sophomore year. Sophomores planning to concentrate in Psychology may enroll in the fall semester. Students who enter the concentration late should enroll in PSY 971 upon entering the concentration. The sophomore tutorial will examine from a variety of perspectives issues and phenomena addressed in contemporary psychological research.

3. **Thesis**: None.

4. **General Examination**: None.

5. **Other information**:
   a. **Counting Non-departmental Courses toward the Advanced Course Requirement**: Up to two non-departmental courses may be taken in partial fulfillment of the Advanced Course requirement (see item 1.f. above). These courses may either come from a list of pre-approved Expedited Non-departmental Courses from the concentration website (https://undergrad.psychology.fas.harvard.edu/non-departmental-advanced-courses), or students may petition for approval to count a non-departmental course not already on the pre-approved list.
   b. **Petitioned Courses** are other non-departmental courses that students believe will contribute significantly to their study of Psychology. These courses must include significant psychological content and relate directly to their own concentration.
A petition is required (forms available on the department website at https://undergrad.psychology.fas.harvard.edu/forms) and must be submitted by the appropriate deadline.

c. Expedited Courses are non-departmental courses that include a significant psychological content and could be a useful component of one’s concentration in Psychology. These courses are automatically approved but require students to designate them for non-departmental advanced course concentration credit by emailing psychology@wjh.harvard.edu by the appropriate deadline. These courses vary each year; a current list and relevant deadlines are available on the concentration website (https://undergrad.psychology.fas.harvard.edu/non-departmental-advanced-courses).

d. Advanced Course Requirement and Limits on Lab-based Courses: Students may count up to two lab-based courses (any combination of PSY 910R, lab courses [https://undergrad.psychology.fas.harvard.edu/lab-courses], or PSY 985) toward the advanced course requirement. Additional research courses may be taken for College elective credit. Students may enroll in PSY 910R up to a total of three times for any combination of concentration credit and college credit.

e. Graded Course Requirement: All courses taken for concentration credit must be letter-graded. The only exceptions are PSY 985 and the specific Freshman Seminars designated on the departmental Advanced Course list at https://undergrad.psychology.fas.harvard.edu/advanced-courses.

f. Undergraduate Teacher Education Program: Concentrators may be eligible to obtain certification to teach middle or secondary school in Massachusetts and states with which Massachusetts has reciprocity. See the Undergraduate Teacher Education Program (UTEP) website (http://utep.gse.harvard.edu/) for more information.

Requirements for Honors Eligibility
Non-Thesis Option: 12 courses (48 credits)

1. Required courses: Same as Basic Requirements.
2. Tutorial: Same as Basic Requirements.
3. Thesis: None.
4. General Examination: None.
5. Other information: Same as Basic Requirements, plus the following:
   a. Minimum Concentration GPA: Students must have a minimum concentration GPA of 3.850. Concentration grade point averages are calculated from a student’s best twelve courses that meet the requirements (e.g., Introductory Courses, Foundational Courses, Research Methods and Statistics, and Advanced Courses), including final semester grades.
   b. Admissions Requirement: No application or notification to the Department is required. Students who meet the requirements as listed in 1-5 above at the end of their final semester will receive an honors recommendation. (See item c.)
   c. Determination of Departmental honors: A degree recommendation of honors will be awarded to students who meet these requirements. Students who appear eligible for honors will receive an award letter from the Department prior to graduation.

Thesis Option: 14 courses (56 credits)
1. **Required courses:**
   a. *Introductory Courses*: Same as **Basic Requirements**.
   b. *Sophomore Tutorial*: Same as **Basic Requirements**.
   c. *Statistics*: Same as **Basic Requirements**.
   d. *Foundational Courses*: Same as **Basic Requirements**.
   e. *Research Methods*: Thesis students must complete two courses, both letter-graded:
      i. PSY 1901, required by end of sophomore year.
      ii. Lab course from list on the Department's website ([https://undergrad.psychology.fas.harvard.edu/lab-courses](https://undergrad.psychology.fas.harvard.edu/lab-courses)), required by end of junior year. (See item 5.d. in **Basic Requirements**).
   f. *Advanced Courses*: Five courses. All letter-graded. (See item 5.d. of **Basic Requirements**).
   g. PSY 991A and PSY 991B: Senior Tutorial, year-long 8-credit course. Graded SAT/UNSAT. (See item 2.c. below).

2. **Tutorials:**
   a. *Sophomore Tutorial*: Same as **Basic Requirements**.
   b. *Junior Tutorial*: Honors Thesis Preparation (PSY 985): Optional but strongly recommended one-term tutorial consisting of individual reading and research leading to a thesis prospectus, under the supervision of a departmental faculty member, supplemented by occasional required group meetings. Graded SAT/UNSAT. Prospectus or paper required. Application must be made to the Psychology Undergraduate Office prior to enrolling in courses.
   c. *Senior Tutorial*: The honors thesis (PSY 991A and 991B): Year-long 8-credit individual tutorial consisting of research leading to submission of the thesis, supplemented by required spring poster session and occasional, required group meetings. Graded SAT/UNSAT.

3. **Thesis**: Required. A thesis application is normally due in March of the junior year, but preparation for this application begins in the fall of the junior year. To apply to the thesis program, students must have completed Research Methods and Statistics. A thesis prospectus is due in April of the junior year, and a prospectus meeting giving thesis committee approval of the prospectus is normally required no later than October of the senior year. The completed thesis is due the Thursday before spring recess of the senior year. Required poster session and defense occur during spring of senior year.

4. **General Examination**: None.

5. **Other information:**
   a. *Counting Non-departmental Courses toward the Advanced Course Requirement*: Same as item 5.a. in **Basic Requirements**.
   b. *Advanced Course Requirement, Research Courses*: Students may count one additional Research Course (PSY 910R, PSY 985, or a Lab Course [https://undergrad.psychology.fas.harvard.edu/lab-courses]) toward concentration requirements in partial fulfillment of the advanced course requirement. Additional research courses may be taken for College elective credit; students may enroll in PSY 910R up to a total of three times for any combination of concentration and college credit.
   c. *Graded Course Requirement*: All concentration courses except PSY 985, PSY 991A and 991B, and the specific Freshman Seminars designated on the departmental Advanced Course list ([https://undergrad.psychology.fas.harvard.edu/advanced-courses](https://undergrad.psychology.fas.harvard.edu/advanced-courses)) must be letter-graded.
d. **Admissions Requirement:** A thesis application is required, normally in March of the junior year. To apply to the thesis program, students must have completed Research Methods and Statistics and ordinarily must have a 3.5 College grade point average.

e. **Determination of Departmental honors:** honors degree recommendations are normally determined by a combination of the concentration grade point average and the thesis evaluation. Departmental recommendations can range from no honors to highest honors under this option.

f. **Joint Concentrations:** Ordinarily, the Psychology Department does not participate in joint concentrations.

g. **Undergraduate Teacher Education Program:** See item 5.f. of Basic Requirements.

**Cognitive Science Track**  
**Requirements:** 14 courses (56 credits)

The Cognitive Science track is affiliated with the University-wide Mind/Brain/Behavior (MBB) Interfaculty Initiative ([http://mbb.harvard.edu/](http://mbb.harvard.edu/)), and is administered through the Psychology Undergraduate Office. A thesis is required. MBB tracks are also available in Computer Science, History and Science, Human Evolutionary Biology, Linguistics, Neurobiology, and Philosophy.

1. **Required courses:**
   a. **Introductory Course:** PSY 1: Introduction to Psychological Science (formerly SLS 20), one course, recommended during the first year and required by the end of the sophomore year, or an approved substitute (see below). Letter-graded.
      i. PSY S-1, offered in the Harvard Summer School.
      ii. It may be possible to substitute a Psychology AP score of 5 or IB score of 7, in which case an extra advanced course will be required. Please contact the Psychology Undergraduate Office at psychology@wjh.harvard.edu to learn more.
   b. **Sophomore Tutorial:** PSY 971, one course, required by end of sophomore year. Letter-graded.
   c. **Statistics:** PSY 1900, one course, required by end of junior year. Must be passed with a grade of C- or higher.
   d. **Foundational Courses:** One course from NEURO 80 (formerly MCB 80) or MCB 81, sophomore year, and one other course from PSY 14, 15, 16, 18; or SLS 15 recommended by end of sophomore year. Letter-graded.
   e. **Seminar in Mind/Brain/Behavior:** one course, junior year. Letter-graded. Select one from a list that varies each year, found at [https://undergrad.psychology.fas.harvard.edu/mbb-seminars](https://undergrad.psychology.fas.harvard.edu/mbb-seminars).
   f. **Research Methods:** Thesis students must complete two courses, both letter-graded:
      i. PSY 1901, required by end of sophomore year.
      ii. Lab course from list on the department's website ([https://undergrad.psychology.fas.harvard.edu/lab-courses](https://undergrad.psychology.fas.harvard.edu/lab-courses)), required by end of junior year.
   g. **MBB Track Advanced Courses:** Four courses. Letter-graded. See item 5.b.
   h. **Senior Tutorial:** PSY 991A and 991B, full course, senior year. Graded SAT/UNSAT. See item 5.a.
2. **Tutorials:** Same as Psychology General Track Requirements for Honors Eligibility: Thesis Option.

3. **Thesis:** Required. Same as Psychology General Track Requirements for Honors Eligibility: Thesis Option.

4. **General Examination:** None.

5. **Other information:**
   a. **Senior Tutorial:** PSY 991 requires participation in the Psychology spring poster session, MBB thesis activities, and attendance at group meetings of PSY 991A and 991B.
   b. **Advanced Courses:** Advanced courses are selected in consultation with a concentration adviser and faculty adviser of the MBB program and should include non-departmental courses from participating MBB concentrations. Ordinarily at least three of these advanced courses should come from one of the other MBB areas. Course selection will be reviewed and approved by the MBB Head Tutor in Psychology. Students typically do not count additional research courses toward track advanced course requirements. Additional research courses may be taken for College elective credit; students may enroll in 910R up to a total of three times for any combination of concentration and College credit.
   c. **Admission Requirements:** Students should plan to declare entry to the track no later than November 1 of the first semester of junior year.
   d. **Graded Course Requirement:** All concentration courses except PSY 985, PSY 991A and 991B, and the specific Freshman Seminars designated on the departmental Advanced Course list ([https://undergrad.psychology.fas.harvard.edu/advanced-courses](https://undergrad.psychology.fas.harvard.edu/advanced-courses)) must be letter-graded.

**Cognitive Neuroscience and Evolutionary Psychology Track**

**Basic Requirements:** 12 courses (48 credits)

**Requirements for Honors Eligibility:** Non-thesis Option: 12 courses (48 credits)

**Requirements for Honors Eligibility:** Thesis Option: 14 courses (56 credits)

Cognitive Neuroscience and Evolutionary Psychology is a specialized track within the Psychology concentration and part of the Life Sciences cluster of concentration options. As such, it is one of the major paths toward bridging the social and life sciences at Harvard. The track reflects the increasingly interdisciplinary nature of learning and research in Psychology, emphasizing integration across the sub-disciplines within Psychology (social psychology, cognitive psychology, development, psychopathology) as well as connections between Psychology and the other life sciences. Students in this track have the opportunity to study the interplay between traditional interests in Psychology such as vision, memory, language, emotion, intergroup relations, cooperation, and psychological disorders, and recent developments in neuroscience and evolutionary science.

To support this learning, the track will provide a strong foundation of basic knowledge in Psychology and the life sciences, as well as analytical, quantitative, and research skills scientists in these areas employ. Students will also take more advanced courses in social and cognitive neuroscience and/or evolutionary psychology and can choose to work in a faculty lab. A thesis option is available for students with strong interests in the research component of the program.

1. **Required courses:**
a. **Introductory Course**: PSY 1: Introduction to Psychological Science (formerly SLS 20), one course, recommended during the first year and required by the end of the sophomore year, or an approved substitute (see below). Letter-graded.
   i. PSY S-1, offered in the Harvard Summer School.
   ii. It may be possible to substitute a Psychology AP score of 5 or IB score of 7, in which case an extra advanced course will be required. Please contact the Psychology Undergraduate Office at psychology@wjh.harvard.edu to learn more.

b. ** Sophomore Tutorial**: PSY 975, one course, required by end of sophomore year. Examines issues and phenomena addressed in contemporary psychological and life science research from a variety of perspectives. Letter-graded.

c. **Statistics**: PSY 1900, one course, required by end of junior year. Must be passed with a grade of C- or higher.

d. **Foundational Courses**: One course from either NEURO 80 (formerly MCB 80)*, MCB 81* or PSY 14*, and one other course from PSY 15, 16, 18 or SLS 15**, recommended by end of sophomore year. Letter-graded. *Students interested in Neurobiology coursework or neuroscience graduate school are encouraged to take NEURO 80 (formerly MCB 80) or MCB 81 to meet this requirement. **Although it is not advisable due to the overlap in content, students can take both PSY 14 and one of NEURO 80 (formerly MCB 80) or MCB 81 to meet the Foundational Course requirement of 2 courses.

e. **Life Sciences Courses** (Related to Cognitive Neuroscience and Evolutionary Psychology): Three courses selected from a list on the concentration website (https://undergrad.psychology.fas.harvard.edu/related-life-science-courses). One of these courses must be either LPS A, LS 1A, LS 1B, or LS 50A. Letter-graded.

f. **Research Methods**: PSY 1901, one course, required by end of sophomore year. Letter-graded. (Prior to Fall 2020, PSY 1901 or one lab course selected from a list on the concentration's website at https://undergrad.psychology.fas.harvard.edu/lab-courses. If returning from leave, please consult with the Psychology Undergraduate Office).

g. **Psychology Advanced Courses**: Three courses, all letter-graded. Only one approved non-departmental course can be used toward this requirement.

2. **Other Information:**

   a. **Advanced Course Requirement and Limits on lab-based courses**: Students may count up to two lab-based courses (any combination of PSY 910R, lab courses [https://undergrad.psychology.fas.harvard.edu/lab-courses], or PSY 985) toward the advanced course requirement. Additional research courses may be taken for College elective credit. Students may enroll in PSY 910R up to a total of three times for any combination of concentration credit and College credit.

3. **For Honors Eligibility:**

   a. **Non-thesis option**: Same as **Cognitive Neuroscience and Evolutionary Psychology Basic Requirements**, plus the following:
      i. **Determination of Departmental honors**: A degree recommendation of honors will be awarded to students who meet these requirements. Students who appear eligible for honors will receive an award letter from the Department prior to graduation.
      ii. **Admissions Requirement**: No application or notification to the Department is required. Students who meet the requirements as listed above at the end of their final semester will receive an honors recommendation.
iii. **Minimum Concentration GPA**: Students must have a minimum concentration GPA of 3.850. Concentration grade-point averages are calculated from a student's best twelve courses that meet the requirements (e.g., Introductory Course, Foundational Courses, Research Methods and Statistics, Advanced Courses), including final semester grades.

b. **Thesis option**: 14 courses (56 credits). Same as Cognitive Neuroscience and Evolutionary Psychology Basic Requirements plus the following:

i. **Determination of Departmental honors**: honors degree recommendations are normally determined by a combination of the concentration grade point average and the thesis evaluation. Departmental recommendations can range from no honors to highest honors under this option.

ii. **Admissions Requirement**: A thesis application is required, normally in March of the junior year. To apply to the thesis program, students must have completed Research Methods and Statistics and ordinarily have at least a 3.5 College grade point average.

iii. **Thesis**: See item 5.

iv. **Senior Tutorial**: PSY 991A and 991B, year-long 8-credit course, senior year. Graded SAT/UNSAT.

v. **Advanced Course Requirement, Research Courses**: Students may count one additional research course (PSY 910R, PSY 985, or a lab course) toward concentration requirements in partial fulfillment of the advanced course requirement. Additional research courses may be taken for College elective credit; students may enroll in PSY 910R up to a total of three times for any combination of concentration and College credit.

vi. **Psychology Advanced Courses**: Two courses, letter-graded. Only one approved non-departmental course can be used toward this requirement.

vii. **Research Methods**: Thesis students must complete two courses, both letter-graded:

1. PSY 1901, required by end of sophomore year.
2. Lab course from the list on the Department's website (https://undergrad.psychology.fas.harvard.edu/lab-courses), required by end of junior year.

4. **Tutorials**:

a. **Sophomore Tutorial** (PSY 975): See Required courses, item 1.b. for description.

b. **Junior Tutorial**: Preparation for the honors thesis (PSY 985): Optional (but strongly recommended for students considering writing a thesis) course tutorial consisting of individual reading and research leading to a thesis prospectus, supplemented by occasional required group meetings. Graded SAT/UNSAT. Prospectus or paper required. Application must be made to the Psychology Undergraduate Office prior to enrolling in courses.

c. **Senior Tutorial**: The honors thesis (PSY 991A and 991B): Required of students completing the honors thesis option. Year-long 8-credit individual tutorial consisting of research leading to submission of the thesis, supplemented by required spring poster session and occasional group meetings in conjunction with PSY 991. Graded SAT/UNSAT.

5. **Thesis**: Required for honors eligibility if completing the thesis option. An adviser-approved thesis application is normally due in March of the junior year, but preparation for this application begins in the fall of the junior year. To apply to the thesis program, students must have completed Research Methods and Statistics. A thesis prospectus is
due in April of the junior year, and a prospectus meeting giving thesis committee approval of the prospectus is normally required no later than October of the senior year. The completed thesis is due the Thursday before spring recess of the senior year. Required poster session and defense occur during spring of senior year.

6. **General Examination:** None.

**ADVISING**

The Department of Psychology offers numerous opportunities for students to obtain advice about the field and concentration. The first stop for information should be the undergraduate website (https://undergrad.psychology.fas.harvard.edu), which is a comprehensive collection of requirements, departmental policies, and advice about navigating through the concentration. House-based concentration advisers are available to students throughout the academic year (see list of concentration advisers by house at https://undergrad.psychology.fas.harvard.edu/advisors). Concentration advising includes discussing concentration requirements, signing Crimson Carts and Plans of Study, helping plan future courses, discussing research opportunities, considering possible career options, and answering other related questions students may have. Students may also get advice and information throughout the year from program staff in the Psychology Undergraduate Office, William James Hall 218. Students may email brief questions to psychology@wjh.harvard.edu.

Pre-concentrators should read the Advising and Requirements sections of the undergraduate website (links to those sections are on the home page at https://undergrad.psychology.fas.harvard.edu). Posted pre-concentration drop-in advising hours can also be found online at https://undergrad.psychology.fas.harvard.edu/pre-concentrators. Students can also email psychology@wjh.harvard.edu or stop by the Psychology Undergraduate Office with questions.

**RESOURCES**

The Department of Psychology is situated in William James Hall, at the corner of Kirkland Street and Divinity Avenue. Copying machines are available in the basement of the building. Special facilities exist for individual interviews; group studies; observation of infants and children; and for work in the areas of vision and perception, and neuroscience. These laboratories are directed by individual faculty members and access is arranged through them.

The Psychology Undergraduate Office is located on the second floor of William James Hall (Rooms 218–222) and students can come by during business hours (https://undergrad.psychology.fas.harvard.edu/contact) or make an appointment. Students are welcome to come here for general information about the concentration and related matters. The Psychology undergraduate website (https://undergrad.psychology.fas.harvard.edu) includes information on concentration requirements, prizes, awards, and volunteer and job opportunities.

The Department of Psychology has long been committed to active student involvement in departmental activities. Each year, several concentrators serve as student representatives to the departmental Committee on Undergraduate Instruction (CUI). The CUI considers a wide variety of policy matters, and student participation in its deliberations allows concentrators to help plan and review aspects of the undergraduate curriculum and programs.

**HOW TO FIND OUT MORE**

The Psychology concentration has an extensive website (https://undergrad.psychology.fas.harvard.edu) that includes information about basic and honors
concentration requirements and the Psychology General, Cognitive Science (MBB), and Cognitive Neuroscience and Evolutionary Psychology (Life Science) tracks. The website contains information about departmental research opportunities, potential non-departmental thesis advisers, course petitions, and other forms. You can also contact the Undergraduate Office at psychology@wjh.harvard.edu or 617-495-3712.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Ordinarily, Psychology does not participate in joint concentrations.
Comparative Study of Religion

Professor Courtney Bickel Lamberth, Director of Undergraduate Studies

The concentration in the Comparative Study of Religion at Harvard invites students to explore the most consequential and momentous questions relevant to the understanding of individual and communal human life. Concentrators consider topics such as the significance of ritual and practice; differing conceptions of human nature and the nature of the divine; and comparative study of how people understand the meaning of life, suffering and death. Our program is unique in allowing students to ponder these and other “big” questions in rigorous and critical ways.

The Study of Religion as an academic field draws upon social scientific and humanistic methods to interpret religious phenomena worldwide. Scholars of religion use a range of tools: historical methods to think about how religions change over time; comparative methods to analyze rituals or texts in different religions; anthropological methods to study how religion shapes human cultures and societies; and literary-critical methods to interpret and understand religion texts. It is a diverse, creative field in which scholars talk across disciplinary boundaries. Due to this interdisciplinary approach, the concentration attracts creative, versatile students willing to learn different ways of thinking about and interpreting human life, community and culture.

Students studying religious traditions focus on sacred texts, rituals and symbols; philosophy and theology; and the history and lived experience of participants in the traditions. The program stresses the acquisition of certain skills: (1) the arts of reading and interpreting texts, practices and societies; (2) clear writing (essays are a substantial part of the requirements of the Sophomore and Junior Tutorials); and (3) the knowledge of the fundamental literature on theories of religion, and on the various methods of the study. Competency in religious studies indicates the ability to think critically and with historical and cultural learning about the complicated place of religious history, imagination, motivation, and memory in national and international affairs. Such skills have become one marker of an educated person, who is appropriately prepared for the responsibilities and pleasures of democratic citizenship and leadership.

Concentrators draw up an individual concentration Plan of Study under the supervision of the Director of Undergraduate Studies (DUS), their concentration adviser, at times also in consultation with appropriate members of the Committee on the Study of Religion. There are four options for the concentration: (1) a focus on two religious traditions (or one tradition and one thematic focus); (2) a focus on a single tradition in a comparative context; (3) a joint concentration with Religion as the primary field of study, and (4) a joint concentration with another field as the primary field of study. All four programs require general, methodological, or comparative courses outside of the major religious tradition(s) being studied. These courses provide analytical tools and knowledge of other traditions that enable students to think with comparative and theoretical imagination about diverse religious phenomena. Concentration credit for study abroad is possible in consultation with the Director of Undergraduate Studies.

CONCENTRATION OPTIONS

1. Two religious traditions/geographical areas; or one tradition/geographical area with a particular approach to the study of Religion.
2. One religious tradition or geographical area in comparative context.
3. Joint concentration with Religion as the primary field.
4. Joint concentration with Religion as the allied field.
REQUIREMENTS

Non-honors track: 12 courses (48 credits)/honors track: 14 courses (56 credits)

1. **Required courses:** These vary with the option chosen, as detailed below under each of the four options. All Plans of Study are tailored to individual student interests, in consultation with concentration advisers.

2. **Tutorials:** The tutorial program under each option is integrated closely into the student’s Plan of Study as detailed below. In Options A, B, and C the required tutorial courses are as follows:
   a. **Sophomore year:** RELIGION 97, tutorial seminar (one term), required. Letter-graded.
   b. **Junior year:** RELIGION 98R, an individual or small-group tutorial, required. Letter-graded.

3. **Honors Candidates:**
   a. **Thesis:** To be eligible to write a thesis, a student must maintain a minimum GPA average of B+ in the concentration through the first term of the junior year.
   b. **Senior Seminar:** RELIGION 99A and 99B (two terms), required only of students writing a thesis. Graded SAT/UNSAT.

4. **Other Information:**
   a. **Traditions:** The "tradition" can be either a major religious tradition (such as Judaism, Christianity, or Islam) or an historical complex, such as East Asia. The traditions listed are those for which there are ordinarily sufficient course offerings at Harvard. Other traditions may be possible, depending upon the availability of faculty and course offerings. The option of incorporating a particular approach into the Plan of Study allows students to focus their work on a closely affiliated discipline.
      i. Ancient Near Eastern and Israelite.
      ii. Buddhism.
      iii. Christianity.
      iv. East Asian Religions.
      v. Greek, Hellenistic, and Roman Religions.
      vi. Hinduism.
      vii. Islam.
      viii. Judaism.
      ix. Modern West and Religions of the Americas.
      x. South Asian Religions.
   b. **Interdisciplinary Approaches:**
      i. Philosophy of Religion.
      ii. Religion and Social Science.
      iii. Religion, Race, and Gender.
      iv. Religion, Literature and the Arts (e.g., music, fine arts, creative writing).
      v. Religion and Science.
   c. **Language Instruction:** In the evaluation of an honors thesis, the student’s ability to demonstrate an awareness of primary texts in their original language, when such considerations are relevant to the development of the thesis project, is ordinarily a consideration. Honors candidates are thus advised to study the language(s) they will need to interpret texts from the tradition(s) they choose. In general, students may count language courses towards concentration credit when the primary texts they are reading in the course are either from a religious tradition or relevant to the study of a religious tradition, beginning with the second year of a given language track.
   d. **Pass/fail:** In addition to RELIGION 99A and 99B (see above), one additional course taken pass/fail or SAT/UNSAT at Harvard can be counted.
for concentration credit. A relevant Freshman Seminar may therefore be counted for concentration credit, pending approval by the Director of Undergraduate Studies. Consult with the Director of Undergraduate Studies regarding pass/fail credit for courses taken abroad.

e. **Joint Concentration**: The Comparative Study of Religion may be combined with another field in the overall framework of a joint concentration. Ordinarily, students wishing to combine Religion as the primary field will do so in the context of Option C below. Students interested in a joint concentration involving Religion should consult the Director of Undergraduate Studies.

**Option A: Two religious traditions/geographical areas; or**

**one tradition/geographical area and a particular approach:**

1. **General: Comparative and Methodological Studies**: Three courses.
   a. One comparative course. Comparative courses vary from term to term, so consult the Director of Undergraduate Studies (DUS) for yearly options.
   b. RELIGION 97 (one term).
   c. One other course outside the student’s major tradition or geographical area.

2. **Major Tradition or Geographical Area**: Five courses.
   a. Four courses focusing on a particular era or cultural/geographical area important in the tradition.
   b. RELIGION 98R (one term).

3. **Second Tradition or Approach**: Four courses focusing on a particular era or cultural/geographical area, or four courses in a particular interdisciplinary approach (see above).

4. **For Honors Candidates**: RELIGION 99A and 99B.

**Option B: One religious tradition/geographical area (in comparative context):**

1. **General: Comparative and Methodological Studies**: Four courses (16 credits).
   a. One comparative course. Comparative courses vary from term to term, so consult the DUS for yearly options.
   b. RELIGION 97 (one term).
   c. Two other courses ordinarily in a tradition and/or geographical area other than the major one.

2. **Major Tradition**: Eight courses (32 credits).
   a. Seven courses, of which normally three focus on a particular era or cultural geographical area important in the tradition.
   b. RELIGION 98R (one term).

3. **For Honors Candidates**: RELIGION 99A and 99B.

**Option C: Joint Concentration with Religion as Primary Field:**

1. **General: Comparative and Methodological Studies**: Three courses (12 credits).
   a. One comparative course. Comparative courses vary from term to term. Consult the DUS for yearly options.
   b. RELIGION 97 (one term).
c. Two courses outside of the student’s major tradition or geographical area.

   a. Four courses focusing on a particular era or cultural/geographical area important in the tradition. For thesis writers, one of these courses will be RELIGION 99A.
   b. RELIGION 98R (one term).

3. Allied Field: At least four courses. As all joint concentrators must write a senior thesis, one of these courses will typically be RELIGION 99B, although in some instances, a senior tutorial in the other field may be substituted for RELIGION 99B or combined with it. One term of Junior tutorial in the other field is often required. Precise course requirements are subject to concentration requirements of the Department or committee that administers the program in the other field.

Option D: Joint Concentration with Religion as Allied Field
7 courses (28 credits)

1. General: Comparative and Methodological Studies: three courses
   a. RELIGION 97 (one term).
   b. Two other courses, at least one of which is outside the major tradition.

2. Major Tradition: Four courses (16 credits) focusing on a religious tradition or geographical area. RELIGION 98R is strongly recommended, though not required.

ADVISING
Each student is assigned a Concentration Adviser who will meet with the student at the beginning of each term to discuss the concentration plan. In most cases the Concentration Adviser will also serve as the special field adviser who counsels the student on issues related to the major tradition(s). When these two advisers are not the same, a special field adviser will be appointed in addition to the concentration adviser.

For up-to-date information on advising in the concentration please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES
Faculty members from a range of Faculty of Arts and Sciences departments and from the Harvard Divinity School share in the teaching and administration of the concentration. For study resources concentrators draw not only upon the collections at Widener Library, the Harvard Art Museums, and the undergraduate libraries, but also upon the Andover-Harvard Library and area studies libraries, such as the Harvard-Yenching and Tozzer libraries.

HOW TO FIND OUT MORE
The Handbook for Concentrators and names of current concentrators willing to discuss the program are available at the office of the Study of Religion, 302 Barker Center. For more information, contact the Director of Undergraduate Studies, Courtney Bickel Lamberth.
## ENROLLMENT STATISTICS
### Number of Concentrators as of December

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Romance Languages and Literatures

Kathy Richman, Director of Undergraduate Studies
Cathy Downey, Undergraduate Coordinator

In the Department of Romance Languages and Literatures (RLL), undergraduates discover the literatures, cultures, and critical approaches of societies worldwide where French, Italian, Portuguese, Spanish, and Catalan are spoken. RLL offers language courses from the beginning to advanced levels, as well as opportunities for accelerated work and study abroad. The heart of the concentration consists of courses about literature and society taught in French, Italian, Portuguese, and Spanish. Faculty also offer advanced courses in English on special topics that involve more than one language tradition. These are listed as Romance Studies and count toward the concentration.

Courses in RLL invite undergraduates to engage deeply and critically with all kinds of texts and questions – from Don Quixote to the legacies of colonialism and the politics of post-war Europe – in a language other than English. Students develop an understanding of the ways in which rhetorical devices like metaphor and hyperbole make cultural artifacts – from everyday materials to works of art – richer, more complex, and more demanding of in-depth analysis. RLL offers a challenging and supportive environment in which students can strengthen their capacity to interact in meaningful ways with people in dozens of countries in Africa, the Americas, Asia, and Europe. Students in RLL develop skills in analysis, critical thinking, and communication that prepare them to act as informed and sophisticated global citizens.

Undergraduates who arrive at Harvard with advanced language skills take courses that provide a panoramic introduction to the literature, film, and culture of different regions and eras, all taught in the original romance language. They continue with more specialized courses on specific topics or movements. Students with some foundation in a romance language enroll in the appropriate intermediate course in language and culture, where they focus on perfecting communication skills and cultural understanding in preparation for the advanced courses described above. Many undergraduates begin a new language at Harvard, and some go on to complete the concentration or a secondary field in RLL.

At all levels of courses in French, Italian, Portuguese, Spanish, and Catalan, students learn to communicate accurately and effectively. Equally importantly, they become more attuned listeners. As they develop an understanding of how people in different communities in the romance-speaking world conceive of artistic, social, ethical, and political issues, their own sense of self evolves. In RLL, undergraduates achieve the cultural and linguistic fluency so crucial in today’s globalized world.

RLL offers summer programs taught by our own faculty in Paris, Buenos Aires, Madrid, Milan/Siena, and Santiago de Chile. Students enjoy intensive, in-depth, location-specific curricula while earning credits that count as two term-time Harvard courses. Many find these programs to be an enriching and useful component of completing the concentration.

Concentrators in RLL work closely with faculty to develop and carry out research projects. Senior theses and independent studies address a wide range of topics, including: evolving images of the Basques in Spanish popular culture; self-representation and political struggles of Chinese immigrants in Mexico; political and social constructions in Italy’s American country music scene; cultural differences in the education policies of French, Spanish, and Arabic schools in Morocco; communication strategies for Zika prevention in Brazil; reading autofiction
in Borges and Barthes through the lens of social media; and ambiguities in medicine and fiction in 20th-century Latin America.

An undergraduate degree in RLL prepares students for work in the following areas, among others:

- Medicine – internships and residencies abroad; international medical humanitarian organizations; public health in the U.S. and overseas.
- Arts – museum curation; filmmaking; publishing; journalism; fiction and other creative writing.
- Law – foreign service and diplomacy; human rights organizations; U.S. firms based abroad; and international firms in the U.S.
- Teaching and Scholarship – 1-year assistantships in France, Spain, and Italy; bilingual and secondary schools; graduate programs leading to careers in teaching and research at colleges and universities.
- Business and Public Administration – consulting; international banking and investment firms; non-governmental organizations; foundations; advertising; import/export of specialty foods and wine.

CONCENTRATING IN ROMANCE LANGUAGES AND LITERATURES
A student concentrating in RLL will choose one of five special fields as the focus for work in the concentration, as follows:

- French and Francophone Studies.
- Italian Studies.
- Portuguese and Brazilian Studies.
- Spanish, Latin American and Latino Studies.
- Romance Studies (study of 2 or more romance languages and literatures).

Concentrators begin either with courses in language and culture or place directly into seminars in literature, film, and culture and society in their chosen special field. (General requirements are outlined below.) In consultation with the Special Field Adviser and the Director of Undergraduate Studies (DUS), concentrators develop and submit a Plan of Study that reflects both the scope of the special field and their individual interests and goals.

CONCENTRATION REQUIREMENTS
Basic Requirements: 12 courses (48 credits)
For a simple, graphic version of requirements, please see worksheets available for each RLL field at https://rll.fas.harvard.edu/pages/concentrations.

1. Required courses:
   a. Category A. Language and Culture courses: Two courses at the 40, 50, or 60-level. A maximum of two courses at this level may be counted toward the concentration requirement. A student who places out of category A must replace the two required courses with courses in categories B, D or E, or approved gateway courses. See 4.g. below, for information about concentration language requirement.
   b. Category B. Literature, film, and culture and society: Two courses at the 70 level.
   d. Category D. Four courses taught in Romance Languages and Literatures at levels 70, 80, 100, and 200. At least three of these courses must be taught in the special field language, and at least two must be at the 100-level or above.
e. **Two courses in related fields.** A maximum of two courses in related fields may be counted toward the concentration requirement. In consultation with the Faculty Adviser and the DUS, students choose courses related to the study of Romance Languages and Literatures from such fields as Anthropology, Classics, Comparative Literature, Economics, Government, History, History of Art and Architecture, History of Science, Linguistics, Music, Philosophy, Psychology; Sociology; Women, Gender and Sexuality; and Art, Film and Visual Studies, among others.

f. **One elective course** to be chosen from the categories above or as approved by the concentration adviser and DUS in accordance with the rules stipulated below in item 4, “Other information.”

2. **Tutorial** (letter-graded):
   a. **Sophomore Tutorial:** ROM-STD 97. See item 1.c. above.

3. **Thesis:** Optional (see below).

4. **Other information:**
   a. **Gateway courses:** One General Education course and one Freshman Seminar may, on approval from the DUS, receive concentration credit in categories B, D, E and F.
   b. **Study Abroad:** Though not a requirement, study abroad during the summer and/or the academic year is strongly encouraged. Summer courses taught in a romance language may be approved for up to two courses of concentration credit. RLL faculty offer summer courses that automatically count as 8 Harvard credits. Term-time study abroad courses are eligible for a maximum of three courses for one semester (12 credits), or six courses for a full year (24 credits). The Department works closely with the Office of International Education to recommend particular programs based on each student's specific needs and academic and cultural interests.
   c. At least one course in category B or D should deal with literature and culture before 1800.
   d. **Residence requirement:** RLL concentrators must take a minimum of six courses counted for the concentration in residence; honors concentrators must take a minimum of eight concentration courses in residence.
   e. **Pass/fail:** Courses taken for concentration credit may not be taken pass/fail (with the exception of an approved Freshman Seminar).
   f. The Faculty Adviser and the DUS may approve substitutions of work not specifically listed above.
   g. **Concentration language requirement:** By the end of the junior year, concentrators are expected to demonstrate advanced oral and written proficiency in one romance language (two for Romance Studies concentrators). Advanced proficiency may be demonstrated by a score of 780 or above on the SATII or on the Harvard Placement Test, or by completion of a course at the 50-level or above with a grade of B or higher.

**Requirements for Honors Track with Thesis:** 14 courses (56 credits):

1. **Required courses.** Same as **Basic Requirements.** Plus:
   a. **Junior Essay:** Students must complete a junior essay as part of their written work for a 100- or 200-level course offered in RLL.
3. **Thesis:** Required.
4. **Senior Honors Oral Examination:** Required.
5. **Other information:**
   a. Same as **Basic Requirements**.
   b. *Residence requirement:* honors concentrators must take a minimum of eight concentration courses in residence.

**Requirements for Honors Track, Non-Thesis: 14 courses (56 credits):**

1. **Required courses:** Same as **Basic Requirements**.
   a. *Two additional courses:* Two courses at the 100-level or above, completed with grade of A or A-.
2. **Tutorials** (letter-graded): same as **Basic Requirements**.
3. **Thesis:** None.
4. **Oral Examination:** None.
5. **Other information:**
   a. Same as **Basic Requirements**.
   b. *Residence requirement:* honors concentrators must take a minimum of eight concentration courses in residence.

**Honors Eligibility:** Concentrators with a minimum concentration GPA of 3.45 are eligible to participate in the honors program.

1. Students who take two additional courses at the 100-level, or one additional course at the 100-level and one additional course at the 200-level, with a minimum grade of A- in each, can be recommended for a departmental degree of honors (but not high or highest honors). Students who take two additional courses at the 200-level with a minimum grade of A- in each can be recommended for a departmental degree of honors or high honors (but not highest honors). To be considered for highest honors, students must pursue the Thesis Option.

**Joint Concentration: Romance Languages and Literatures as primary field: 8 courses (32 credits)**

1. **Required Courses:**
   a. *Language and Culture courses:* One course at the 40, 50, or 60-level. See notes in **Basic Requirements** for information about placement and substitution.
   b. *Literature, Film, and Culture and Society:* One course in introductory field survey at the 70-level.
   d. Three courses taught in Romance Languages and Literatures at the 70-level or above. At least one of these must include a 100- or 200-level course or an independent tutorial that culminates in a junior essay.
2. **Tutorials**
   a. *Sophomore year:* ROM-STD 97. See item 1.c. above.
   b. *Junior year:* Junior essay. See item 1.d. above.
   c. *Senior year:* French, Italian, Portuguese, Spanish or ROM-STD 99A and 99B (two terms) and successful completion of the thesis.
3. **Thesis:** Required.
4. **Senior Honors Oral Examination:** Required.
5. **Other Information:** Course substitutions as approved by the DUS.
Joint Concentration: Romance Languages and Literatures as allied field: 6 courses (24 credits)

1. Required Courses:
   a. Language and culture courses: One course at the 40, 50, or 60-level. See notes in Basic Requirements for information about placement and substitution.
   b. Literature, film, and culture and society: One course in introductory field survey at the 70-level.
   d. Three courses taught in Romance Languages and Literatures at the 70-level or above.

2. Tutorials
   a. Sophomore year: ROM-STD 97. See item 1.c. above.


4. Oral Examination: None.

5. Other Information: Course substitutions as approved by the DUS.

ADVISING
Close consultation with faculty is essential for planning and completing a rich and successful concentration in RLL. Concentrators are invited to meet regularly with the Director of Undergraduate Studies, Advisers in each Special Field, and the Undergraduate Coordinator.

- **Director of Undergraduate Studies** Dr. Kathy Richman, Boylston 422, 617-495-1929, richman@fas.harvard.edu.
- **Special Field Advisers for 2021-2022:**
  - French and Francophone Studies: Dr. Kathy Richman, Boylston 422, 617-495-1929, richman@fas.harvard.edu.
  - Italian: Prof. Ambrogio Camozzi Pistoja, acpistoja@fas.harvard.edu.
  - Spanish, Latin American and Latino Studies: Dr. María Luisa Parra, Boylston 326, 617-495-1868, parra@fas.harvard.edu.
  - Portuguese and Brazilian Studies: Prof. Josiah Blackmore, Boylston 322, 617-495-1931, jblackmore@fas.harvard.edu.
  - Romance Studies: Dr. Kathy Richman, Boylston 422, 617-495-1929, richman@fas.harvard.edu.
  - Language Citation Approval: Katherine Killough, Language Program Coordinator, Boylston 436, 617-495-2524, killough@fas.harvard.edu.

RESOURCES FOR RESEARCH AND INTERNSHIPS
The combined holdings of Widener, Lamont, and Houghton libraries constitute one of the major collections of Romance literatures in the world. Other important resources available to RLL concentrators include research and internship opportunities at the Harvard Art Museums; the Harvard Film Archive; the Center for European Studies; the Lauro de Bosis Committee; Villa i Tatti: The Harvard University Center for Italian Renaissance Studies; the David Rockefeller Center for Latin American Studies; the Real Colegio Complutense at Harvard; the Office of Career Services; the Office of International Education; and numerous other centers. RLL concentrators are encouraged to consult the Research Guide for Concentrators posted on the Department’s website at https://rll.fas.harvard.edu.
HOW TO FIND OUT MORE
The Department's offices are located on the fourth floor of Boylston Hall. Faculty offices may be found on the third, fourth and fifth floors of Boylston. For general Information and support: Contact Cathy Downey, Undergraduate Program Coordinator, Boylston 405, 617-495-1860, cdowney@fas.harvard.edu.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Slavic Languages and Literatures

Professor Nariman Skakov, Director of Undergraduate Studies

The concentration in Slavic Languages and Literatures offers you the opportunity to study the great works and cultural traditions, past and present, of Russia and the other Slavic countries, especially Ukraine, Poland, and the Czech Republic. These countries share a rich cultural life as well as a turbulent and fascinating history. In the Slavic concentration, you will develop proficiency in Russian or another Slavic language such as Czech, Polish, or Ukrainian; you will learn to read literary works in the original language, gain valuable experience for working and traveling abroad, and come to understand these cultures and the important role they have played in the modern world. The concentration requirements are five courses in Russian or another Slavic language, two courses of tutorial, one 100-level course that has a section with texts in Russian (or in another Slavic language), one survey course in Russian or another Slavic literature, two electives, and a senior project in the final year. (Native speakers and students with advanced language preparation must still take at least one language course in the Department and have the option of testing out of the other four courses, which they would take in literature instead.) Study abroad, whether a summer or a semester, is strongly encouraged and easily accommodated within the concentration.

Your Slavic tutorials will give you a rigorous introduction to contemporary methodologies of reading texts and studying foreign cultures. All tutorials in the Slavic Department are taught exclusively by full-time faculty. The sophomore tutorial (spring term only) will introduce you to major issues in the field of Slavic studies, including methods of interpreting literary texts as well as visual culture, and the forces structuring national and regional identities. The Junior tutorial introduces students to shorter canonical texts of Slavic literature, read in the original. In order to fulfill your tutorial requirements, in your junior year, you will also take one 100-level course with readings in Russian (or another Slavic language). Normally, the 100-level course is taken in the fall, the tutorial in the spring (both in the junior year), but students who study abroad or have other constraints on their schedules may work with the Director of Undergraduate Studies (DUS) to make other arrangements. Many of our concentrators combine a love of literature with a strong interest in other disciplines, and we highlight the interdisciplinary nature of Slavic studies by incorporating history, politics, and visual culture into our tutorials and other Department courses. In the senior year, non-honors concentrators will design a fall-term capstone project in consultation with the DUS, allowing them to study with a faculty member from the Department and write a 25–30 page senior project. Honors candidates will work with a faculty member for the entire senior year and write a thesis. The Department awards prizes for superior honors theses.

In addition to the required survey course in Russian literature, students are encouraged to use their two elective courses to explore a broad variety of subjects offered by the Department, including one-author seminars on Tolstoy, Dostoevsky, Nabokov, Chekhov, and others; the interwar avant-gardes in literature, art, and film; the cultures of great European cities such as Moscow, St. Petersburg, and Prague; twentieth-century Ukrainian literature and its political contexts; the culture of Medieval Rus'; Russian women readers and writers; Russian theater and ballet; Russian and Central European film; and the traditions of Slavic intellectual history from anarchism to Communism and political dissent. Many of our courses cover aspects of Slavic critical theory (formalism, structuralism, Bakhtin, cultural semiotics), as well as other contemporary theoretical approaches to literature.

Study abroad, though not required, is strongly encouraged by the Department, and the majority of our concentrators spend time abroad, typically during their junior year or in the summer after
their sophomore or junior year. Slavic Department faculty currently run one summer abroad
program each year in Prague and Tbilisi. Many of our students also study in Russia or Central
Europe with other programs such as the Bard-Smolny Program, the American Council of
Teachers of Russian (ACTR), or the Council on International Educational Exchange (CIEE);
entrance to these programs is competitive, but Harvard students have traditionally done well.
Credit toward concentration requirements is granted to those who successfully complete such
programs; in order to receive concentration credit for this or any other external study, the
student must receive permission in advance from the DUS.

The Department welcomes all students with an interest in Slavic languages and cultures and is
happy to accept late transfers so long as the applicants have already begun language study.
We also welcome joint concentrators and those interested in a secondary field in Russian
Studies or Central European Studies (see below for more information). Although the
undergraduate concentration will prepare you for graduate study in Slavic, comparative
literature, history, and other programs, many of our students follow careers in other areas,
including medicine, law, business, and government; they find that the experience of learning a
language and getting to know a foreign culture greatly expands their opportunities for work and
travel.

REQUIREMENTS

Slavic Literatures and Cultures
Basic Requirements: 12 courses (48 credits)

1. Required Courses:
   a. Five courses in Russian language (the first semester of RUSS A may be
      included), or five courses in another Slavic language (Ukrainian, Polish, Czech,
      or Bosnian, Croatian, and Serbian [BCS]; all five must be taken in the same
      language). Native speakers, or students with advanced language preparation,
      must still take at least one language course in the Department, and have the
      option of testing out of the other four courses, which they would take in literature
      instead.
   b. Two semesters of tutorial (including sophomore tutorial) and one 100-level
      course that has a section with texts in Russian (or in another Slavic language).
      See item 2.
   c. A survey course in Slavic literature or culture: The list of courses that count for
      the survey requirement is updated each year on
      https://slavic.fas.harvard.edu/pages/basic-requirements.
   d. Two additional courses from the Slavic Department or in related areas (see item
      4).

2. Tutorials:
   a. Sophomore year: SLAVIC 97 (one term, spring semester) required. Letter-
      graded.
   c. Junior year: one 100-level course that has a section with texts in Russian (or in
      another Slavic language).

3. Capstone Project: The non-honors capstone project (SLAVIC 99A) will be a 25–30-page
research paper or annotated translation, developed in consultation with the DUS and
written under the guidance of a faculty adviser. Graded SAT/UNSAT.

4. Other information:
   a. The two elective courses may include any Slavic Department literature or
      linguistics course at the 125-level or above; Slavic-related General Education
      courses, a Freshman Seminar or relevant courses in the departments of
      Comparative Literature, Linguistics, VES, History, or Government if approved by
the Director of Undergraduate Studies; or an Independent Study approved by the Director of Undergraduate Studies.

b. All courses for the concentration must be letter-graded, except approved Freshman Seminars and SLAVIC 99A, which are graded SAT/UNSAT.

Slavic Literatures and Cultures

Requirements for Honors Eligibility: 13 courses (52 credits)

1. Required Courses: Same as Basic Requirements.
2. Tutorials: Same as Basic Requirements.
3. Thesis: Two terms (SLAVIC 99A and 99B) required. Graded SAT/UNSAT. (Progression to 99B will be contingent on satisfactory completion of 99A.)
4. Other Information: Same as Basic Requirements.

Joint Concentration: Slavic Languages and Literatures as primary field: 11 courses (44 credits)

1. Required Courses:
   a. Five semesters in Russian language (the first semester of RUSS A may be included), or five semesters in another Slavic language (Ukrainian, Polish, Czech, Bosnian, Croatian, and Serbian [BCS]); all five must be taken in the same language). Native speakers, or students with advanced language preparation, must still take at least one language course in the Department, and have the option of testing out of the other four courses, which they would take in literature instead.
   b. Two semesters of tutorial. (See item 2).
   c. One survey course in Slavic literature or culture: the list of courses that count for the survey requirement is listed on https://slavic.fas.harvard.edu/pages/basic-requirements.
   d. One additional course from the Slavic Department.
2. Tutorials
   a. Sophomore year: SLAVIC 97 (one term, spring semester) required. Letter-graded.
   b. Junior year: SLAVIC 98 (spring term) required. Letter-graded. Thesis: Two terms (SLAVIC 99A and 99B) required. Graded SAT/UNSAT. (Progression to 99B will be contingent on satisfactory completion of 99A.)

Joint Concentration: Slavic Languages and Literatures as allied field: 8 courses (32 credits)

1. Required Courses:
   a. Five semesters in Russian language (the first semester of RUSS A may be included), or five semesters in another Slavic language (Ukrainian, Polish, Czech, Bosnian, Croatian, and Serbian [BCS]); all five must be taken in the same language). Native speakers, or students with advanced language preparation, must still take at least one language course in the Department, and have the
option of testing out of the other four courses, which they would take in literature instead.

b. **Sophomore Tutorial**: SLAVIC 97 (one term, spring semester) required. Letter-graded.

c. One survey course in Slavic literature and culture. The list of courses that count for the survey requirement is listed on [https://slavic.fas.harvard.edu/pages/basic-requirements](https://slavic.fas.harvard.edu/pages/basic-requirements).

d. One additional course in the Slavic Department.

2. **Thesis**: 99A and 99B courses should be taken in your primary department. However, your thesis has to engage substantially with sources in Russian or another Slavic language. In addition to evaluation of your thesis in your primary department, one reader from the Slavic Department will be assigned to evaluate and grade your thesis.

**ADVISING**
The Director of Undergraduate Studies is responsible for advising the concentrators in all three years. Concentrators meet with the Director individually at the beginning of each term to discuss their Plans of Study and their progress through the concentration, and thereafter as desired. For up-to-date information on advising in Slavic Languages and Literatures, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).

**HOW TO FIND OUT MORE**
Consult Professor Nariman Skakov, Director of Undergraduate Studies, Barker Center, nskakov@fas.harvard.edu.

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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Social Studies

Dr. Anya Bernstein Bassett, Director of Studies

Social Studies was founded in 1960 by a distinguished group of faculty who believed that the study of the social world requires an integration of the disciplines of History, Political Science, Economics, Sociology, and Anthropology. For six decades, Social Studies has brought together outstanding teachers and intellectually engaged students who share a fascination with social science research and theory and a deep interest in applying social science to contemporary social, economic, and political problems.

The common introduction to Social Studies is SOC-STD 10, which introduces students to some of the thinkers who have durably shaped the way we understand modern society. Students examine the development of modern moral, political, and economic ideas and they consider the role of the individual in modern society, studying foundational texts by Rousseau, Smith, Douglass, Marx, Weber, Du Bois, Beauvoir, Foucault, and Fanon. Throughout SOC-STD 10, students are taught to read theoretical arguments carefully and critically and to juxtapose them against historical developments and social experience. SOC-STD 10 is taught both in lecture and in small group tutorials where discussion and writing skills are emphasized.

The purpose of the junior tutorials in Social Studies is to immerse students in a detailed and focused study of an empirical, theoretical, or historical topic in the social sciences. Junior tutorials also teach social science and historical methodology, providing students with instruction on research techniques and offering them experience in conducting primary research in preparation for their senior theses.

Students develop an individualized focus field in consultation with their academic adviser. They identify an area of interest (for example: inequality, development, or modern social theory) and create a Plan of Study. A Social Studies Plan of Study includes a minimum of four courses, normally drawn from at least two social science departments and including at least one historical course. Students may petition to take social science courses taught in non-social science departments or up to two social science courses offered at one of Harvard’s professional schools. A student who is studying inequality might take one course in Sociology, one course in Economics, one course in History, and one course at the Harvard Kennedy School. A student who is studying development might take two courses in Economics, one course in Anthropology, and one course in History. A student of social theory might take one course in Philosophy, two courses in History, and two courses in Government (political theory).

In the senior year, all Social Studies concentrators enroll in a one-on-one tutorial (SOC-STD 99) in preparation for researching and writing a senior thesis. This is a requirement for all concentrators.

All sophomores considering concentrating in Social Studies must take SOC-STD 10A: Introduction to Social Studies, in the fall term. This course is a prerequisite for submitting a Declaration of Intent, which is due in mid-October for students who are planning to declare Social Studies as their concentration in November.

Transfer students and second-semester sophomores seeking to change concentrations can submit a Declaration of Intent to Social Studies on the first day of classes in the spring term (January 24th, 2022). If the Declaration of Intent is approved, those students may become Social Studies concentrators immediately, but will need to wait to start SOC-STD 10 in the fall of
their junior year. First semester juniors can submit a Declaration of Intent by August 24th, 2021 and may also become Social Studies concentrators immediately.

REQUIREMENTS

Basic Requirements: 13 courses (52 credits)

1. Required courses:
   a. SOC-STD 10A and 10B.
   b. SOC-STD 98, the Junior Tutorial. Students must take two Junior Tutorials.
   c. SOC-STD 99A and SOC-STD 99B (off sequence students may take two terms of SOC-STD 99A or two terms of SOC-STD 99B).
   d. One course in Economics. This requirement can be fulfilled by taking ECON 10A and/or 10B, ECON 50, or by taking one course in economics for which ECON 10 is recommended preparation. The Economics requirement must be completed by the end of the junior year.
   e. One course in elementary Statistics. The statistics requirement must be completed by the end of the junior year.
   f. A course in a methodology appropriate to the focus field. This requirement may be fulfilled by taking SOC-STD 50, SOC-STD 60, or by taking an appropriate substitute. Students must complete this requirement by the end of the junior year.
   g. Four to six courses in the student’s focus field. These courses will be selected in consultation with the student’s adviser and must be approved by the Social Studies Board of Instruction. The focus field should be drawn from at least two social science departments and must include at least one historical course. Up to two focus field courses may be taken outside of the Faculty of Arts and Sciences (FAS).

2. Tutorials:
   b. Junior year: SOC-STD 98. Two terms required.


4. General Examination: An oral examination taken at the end of the senior year which includes a defense of the thesis and a general exam, which emphasizes the themes and thinkers taught in SOC-STD 10 discussed in relation to the student’s work in Social Studies.

Joint Concentrations

Social Studies allows joint concentrations with interdisciplinary programs that include social science faculty: generally, African and African American Studies, East Asian Studies, Environmental Science and Public Policy, Near Eastern Languages and Civilizations, Comparative Study of Religion, South Asian Studies, Philosophy, and Studies of Women, Gender, and Sexuality. We do not allow joint concentrations with science or humanities departments or with social science departments that we share faculty with (Anthropology, Economics, Government, History, or Sociology).

ADVISING

Each student entering the concentration is assigned an adviser who sits on the Social Studies Board of Advisers and is responsible for helping the student plan his or her course of study. In
the first semester of concentration, the adviser is that student’s sophomore tutor. Whenever possible, the same adviser continues to serve in this capacity until the student graduates. When this is not possible, another adviser is assigned who, to the extent possible, shares interests with the student. Students must meet with their advisers at least three times a year to discuss course selection, their focus field, and their Plan of Study; more frequent meetings are strongly encouraged. The Director of Studies heads the Board of Advisers. For up-to-date information on advising in Social Studies, please go to www.socialstudies.fas.harvard.edu or visit the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

HOW TO FIND OUT MORE
For more information, contact the Assistant Director of Studies for Freshmen and Sophomores, Dr. Bonnie Talbert, or the Undergraduate Program Administrator, Kate Anable, on the third floor of William James Hall (617-495-2163).

ENROLLMENT STATISTICS
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Sociology

Jocelyn Viterna, Director of Undergraduate Studies

Sociology is the study of society, of the social frameworks within which we live our lives. It is a study of social life at every level, from two-person relationships to the rise and fall of nations and civilizations. It is a meeting place of the social sciences, combining its own ideas and methods with insights from history, anthropology, economics, political science, and psychology in an extended examination of the ways societies work—or fail to work.

Sociology nurtures question formation and critical thinking through its mixed-methods approach, encompassing quantitative analysis, ethnography, interviews, historical and comparative studies, computer-based analysis, and theoretical explorations. Through methodologically diverse coursework, students learn how to apply sociological theories and methods to real-world issues – whether from developmental challenges in the global South to corporate capitalism, or from crime in the streets to crime on Capitol Hill.

Students have many opportunities to gain research experience, through course projects, senior theses, and Research Assistantships with faculty. This focus on data collection, analysis, and write-up offers a ‘hands on’ approach to learning, engages students with the production of sociological knowledge, and prepares students for a wide range of careers in law, medicine, education, business, consulting, finance, public health, journalism, non-profit organizations, and the public sector.

Our faculty includes the world’s foremost experts in race, ethnicity and immigration, inequality, economic sociology and organizations, urban poverty and the city, gender and family, crime and punishment, social movements and social change, politics, work, culture, social networks, and comparative and historical sociology. Deep engagement with central social issues in the American landscape is coupled with expertise in political, economic, social, and cultural issues in other parts of the world such as Latin America, Asia, and Europe. Drawing on these broad areas of faculty expertise, students may take a variety of courses across multiple areas or put together a focused program of study in one or two areas.

The concentration takes pride in its advising system, which allows for personal attention to students. It also affords substantial access to faculty and administrators and flexibility in meeting individual intellectual agendas, allowing students to benefit from Sociology’s broad perspective, which is particularly valuable in our increasingly interdependent world.

REQUIREMENTS

Basic Requirements: 12 courses (48 credits)

1. Required courses:
   a. One course from the introductory series: (SOCIOL 1000-SOCIOL 1089). Normally taken during the first year.
   b. SOCIOL 128: Methods of Social Science Research, a basic introduction to methods (course offered spring term).
   c. SOCIOL 97: Tutorial in Social Theory, a basic introduction to sociological theory and the social construction of knowledge (course offered both terms). Normally taken sophomore year (see item 2.a.).
   d. One quantitative methods course: STAT 100, 101, 102, 104, or SOCIOL 156. Normally taken sophomore year.
   e. SOCIOL 98: Junior Tutorial (course offered both terms) (see item 2.b.).
f. Two courses in related social science fields: African and African American Studies; Anthropology; East Asian Studies; Economics; Government; History; History and Science; Psychology; Social Studies; Studies of Women, Gender, and Sexuality. (The related field requirement can also be met with Sociology courses.)
g. Five courses in Sociology.

2. Tutorials:
   a. Sophomore year: SOCIOL 97 (one term) required. Small seminars made up of eight to twelve students. An intensive introduction to sociological theory and the social production of knowledge.
   b. Junior year: SOCIOL 98 (one term) required. Small seminars made up of eight to ten students who work on original research projects under the direction of a faculty member. The purpose of this tutorial is to give students experience with independent inquiry and in many cases to develop a senior thesis topic.

4. General Examination: None.
5. Other information:
   a. Pass/fail: Up to two of the required twelve courses may be taken pass/fail (but not one of the five specifically required courses: introductory Series, SOCIOL 97, 98, 128, or quantitative methods). Joint concentrators may not take any course pass/fail.
   b. Course Credit: Study abroad, Harvard Summer School, and courses offered by other Harvard faculties may count toward concentration credit in some cases. First-Year Seminars taught by Department faculty may also count. Contact the Undergraduate Program and Advising Administrator with questions about the approval process.

Requirements for Honors Eligibility: 12 courses (48 credits)
1. Required courses:
   a. Same as 1.a.-1.g. in Basic Requirements.
   b. Three elective courses in Sociology.
   c. SOCIOL 99. Senior Tutorial (see item 2.c. below).
2. Tutorials:
   a. Sophomore year: Same as Basic Requirements.
   b. Junior year: Same as Basic Requirements.
   c. Senior year: SOCIOL 99 (two terms). Senior thesis workshop; close supervision of thesis. Graded SAT/UNSAT.
3. Thesis: honors candidates must write a thesis and submit it to the Undergraduate Office in the spring of senior year. Students are urged to choose thesis topics and select an adviser by the end of junior year. Course credit for the thesis work is obtained through enrolling in SOCIOL 99 in the fall and spring of senior year.
4. General Examination: None.
5. Other information: Same as Basic Requirements.

JOINT CONCENTRATIONS
Joint concentrations are permitted with selected fields by application, and always require a thesis. Sociology can serve as either the primary or allied field. For more information, visit http://sociology.fas.harvard.edu/pages/joint-concentration-sociology.

1. Required courses when Sociology is the primary field: 9 courses.
   a. One Sociology course from the introductory series: (SOCIOL 1000-1089).
   b. SOCIOL 97: Tutorial in Social Theory (course offered both fall and spring term).
c. SOCIOL 98: Junior Tutorial (course offered both fall and spring term).
d. SOCIOL 128: Models of Social Science Research (course offered spring term).
e. One quantitative methods course: STAT 100, 101, 102, 104, or SOCIOL 156.
f. Two courses in Sociology.
g. SOCIOL 99: Senior Tutorial (two terms).

2. **Required courses when Sociology is the allied field: 6 courses.**
   a. One Sociology course from the introductory series (SOCIOL 1000-1089).
   b. SOCIOL 97: Tutorial in Social Theory (course offered both fall and spring term).
   c. SOCIOL 128: Models of Social Science Research (course offered fall term).
   d. One quantitative methods course: STAT 100, 101, 102, 104, or SOCIOL 156.
   e. Two courses in Sociology.

**ADVISING**

Academic Advisors - Danilo Mandic (last names beginning A-L), mandic@fas.harvard.edu; Shai Dromi (last names beginning M-Z), shai.dromi@g.harvard.edu - are responsible for advising Sociology concentrators, in cooperation with Jocelyn Viterna (jviterna@wjh.harvard.edu), Director of Undergraduate Studies. Questions about program requirements and related administrative matters may be directed to Laura Thomas (lthomas@wjh.harvard.edu), the Undergraduate Program and Advising Administrator. Concentration advisers, who are graduate students in the Sociology Department, are available to students in the Houses.

Students writing a thesis select a thesis adviser by the end of the junior year. Students may choose from among current Sociology faculty, Department affiliates, and eligible graduate students. The Director of Undergraduate Studies is available to meet with juniors thinking of writing a senior thesis.

For up-to-date information on advising in Sociology and a current list of concentration advisers, please visit [http://sociology.fas.harvard.edu/pages/advising](http://sociology.fas.harvard.edu/pages/advising). You may also visit the Advising Programs Office website at [https://advising.college.harvard.edu/](https://advising.college.harvard.edu/).

**HOW TO FIND OUT MORE**

Further information may be obtained from the Undergraduate Advising and Program Administrator in William James Hall 650 (Laura Thomas, lthomas@wjh.harvard.edu, 617-495-3713). Additional information is also available on the department's website at [http://sociology.fas.harvard.edu/pages/undergraduate](http://sociology.fas.harvard.edu/pages/undergraduate).

**ENROLLMENT STATISTICS**

**Number of Concentrators as of December**

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South Asian Studies

Richard Delacy, Director of Undergraduate Studies

A concentration in South Asian Studies enables students to develop a critical understanding of the diverse cultures, histories, languages and literatures of South Asia, which includes Bangladesh, India, Nepal, Pakistan, Sri Lanka, and Tibet. South Asia is home to more than a billion people and some of the world’s most fascinating and important civilizations. Its influence has extended historically from Central, East, and Southeast Asia to Europe and North America, which today have vibrant South Asian diasporas. The study of South Asia is an increasingly important area of academic inquiry, especially in recent decades as the region emerges as a global cultural, economic, and political power.

The concentration offers a range of possibilities for students interested in studying South Asia. Students interested in the arts and humanities may choose to study modern and/or pre-modern South Asia from the disciplinary perspectives of History, History of Art, Literature, Music, Philosophy, and/or Religion. Students interested in the social sciences may create academic programs which combine the study of languages, literatures, and cultures with course work in Anthropology, Economics, Government, Public Health, Sociology, and/or Urban Planning.

In addition, joint concentrations with South Asian Studies and another department are possible with the approval of both departments. The Department also offers a secondary field in South Asian Studies, as well as language citations in Hindi-Urdu, Sanskrit, Tamil, and Tibetan.

There are two concentration options.

Option A: South Asian Languages, Literatures, and Cultures [11 courses (44 credits), 13 courses for honors (52 credits)] is for students who wish to focus intensively on learning a major South Asian language, its textual traditions, and broad socio-cultural contexts. The most common choices here are Hindi-Urdu, Sanskrit, Tamil, or Tibetan.

Students who choose Hindi-Urdu as their primary focus should take a full year of HIND-URD 101 no later than their sophomore year. In subsequent years, they will continue their study of Hindi-Urdu and work out a Plan of Study, with the Director of Undergraduate Studies or a designated adviser, which draws upon a range of courses in South Asian Studies and related fields.

Students who choose Sanskrit as their primary focus should take introductory Sanskrit (SANSKRIT 101A and 101B) no later than their sophomore year. Beyond the study of Sanskrit, students will work out a Plan of Study, with the Director of Undergraduate Studies or a designated adviser, which draws upon a range of courses in South Asian Studies and related fields.

Students who choose Tamil as their primary focus should take TAM 101A and 101B no later than their sophomore year. In subsequent years, they will continue their study of Tamil and work out a program of study, with the Director of Undergraduate Studies or a designated adviser, which draws upon a range of courses in South Asian Studies and related fields.

Students who choose Tibetan as their primary focus should take TIBET 101A and 101B no later than the sophomore year. In subsequent years, they will continue their study of Tibetan and work out a Plan of Study, with the Director of Undergraduate Studies or a designated adviser, which draws upon a range of courses in South Asian Studies and related fields.
**Option B: South Asian Studies** [11 courses (44 credits), 13 for honors (52 credits)] is for students who wish to gain a broad understanding of South Asia. While students may develop a particular area of focus or expertise, the emphasis in this option is on wide-ranging and interdisciplinary studies that are essential to understanding this increasingly important part of our contemporary world.

In this option, language study in Hindi-Urdu, Sanskrit, Tamil, or Tibetan is required. In special cases, another language may be substituted if it is directly related to South Asian Studies and offered by an academic program approved by the Department. In addition to the study of a South Asian language, students will work out a Plan of Study, with the Director of Undergraduate Studies or a designated adviser, drawing upon courses in South Asian Studies offered by various departments within the Faculty of Arts and Sciences.

**A Joint Concentration** [9 courses (36 credits)] allows students to combine training in South Asian languages and cultures with a particular discipline in another department. The Plan of Study is jointly agreed upon by both departments.

**The Secondary Field in South Asian Studies** [5 courses (20 credits)] is a more flexible way for students to study South Asia. It maintains the structure of the concentration, with an emphasis on South Asian Languages, Literatures, and Cultures or South Asian Studies, without the obligation of a joint thesis or culminating project.

**Language Citations** are awarded in Hindu-Urdu, Sanskrit, Tamil, and Tibetan, upon completion of four (16 credits) courses beyond the introductory year.

**REQUIREMENTS**

**South Asian Languages, Literatures, and Cultures**

**Basic Requirements: 11 courses (44 credits)**

1. **Required courses:**
   a. Six courses in Hindi-Urdu, Sanskrit, Tamil, or Tibetan, including at least two courses beyond the second year.
   b. Four additional courses in South Asian Studies, of which at least two must be 100-level non-language courses. Courses for this requirement may include departmental offerings and courses with a South Asia emphasis offered in other departments or as General Education courses, with the approval of the Director of Undergraduate Studies.

2. **Tutorial:** SAS 98R (Junior Tutorial, one term), individual or group tutorial. Letter-graded.
3. **Thesis:** None.
4. **General Examination:** None.
5. **Other information:** One course taken pass/fail or SAT/UNSAT may be counted for concentration credit, with the approval of the Director of Undergraduate Studies.

**Requirements for Honors Eligibility: 13 courses (52 credits)**

1. **Required courses:** Same as Basic Requirements, with the addition of a year-long senior tutorial (SAS 99) leading to a thesis.
2. **Thesis:** Required of all senior honors candidates.
3. **General Examination:** Honors candidates must take an oral examination based on the work in the concentration and on the thesis.
4. **Other information:** Same as Basic Requirements.
South Asian Studies
Basic Requirements: 11 courses (44 credits)

1. **Required courses:**
   a. Four courses in Hindi-Urdu, Sanskrit, Tamil, or Tibetan.
   b. Six additional courses in South Asian Studies, of which at least two must be 100-level non-language courses. Courses for this requirement may include departmental offerings and courses with a South Asia emphasis offered in other departments or as General Education courses, with the approval of the Director of Undergraduate Studies.

2. **Tutorial:** SAS 98R (Junior Tutorial, one term), individual or group tutorial. Letter-graded.
3. **Thesis:** None.
4. **General Examination:** None.
5. **Other information:** One course taken pass/fail or SAT/UNSAT may be counted for concentration credit with the approval of the Director of Undergraduate Studies.

Requirements for Honors Eligibility: 13 courses (52 credits)

1. **Required courses:** Same as Basic Requirements, with the addition of a year-long senior tutorial (SAS 99R) leading to a thesis.
2. **Thesis:** Required of all senior honors candidates.
3. **General Examination:** Honors candidates must take an oral examination based on the work in the concentration and on the thesis.
4. **Other information:** Same as Basic Requirements.

Joint Concentration Requirements: 9 courses (36 credits)

1. **Required courses:**
   a. Four courses in Hindi-Urdu, Sanskrit, Tamil, or Tibetan.
   b. Two 100-level non-language courses in South Asian Studies. This requirement may be satisfied by departmental offerings and by courses with a South Asia emphasis offered in other departments, with the approval of the Director of Undergraduate Studies.

2. **Tutorials:**
   a. **Junior year:** SAS 98R (one term), or other tutorial as jointly arranged between the two departments.
   b. **Senior year:** SAS 99R (two terms) if South Asian Studies is the primary field, or two terms of tutorial in the other concentration if South Asian Studies is not the primary field.

3. **Thesis:** Required.
4. **General Examination:** Honors candidates must take an oral examination based on the work in the concentration and on the thesis.

**ADVISING**

Students are assigned a faculty adviser based on their area of study. Students continue with the same adviser throughout their three years, unless there is a reason for making a change. Students meet with their adviser at least twice a term and at other times as needed. For up-to-date information on advising in South Asian Studies, please see the Advising Programs Office website at [https://advising.college.harvard.edu/concentrations](https://advising.college.harvard.edu/concentrations).
RESOURCES
The University-wide South Asia Institute (SAI) facilitates scholarly exchanges among Harvard faculty and students, specialists in South Asian studies from the US and abroad, and visiting academics and prominent public figures from South Asia. Encouraging the work of Harvard faculty and students, the SAI also provides grants for language study and thesis research.

Harvard College Library contains one of the largest collections of Sanskrit manuscripts and printed texts in the West, and strong collections in Urdu and Sindhi literatures and South Asian studies in general. Together with the Harvard-Yenching Library, its holdings of Buddhist texts are perhaps the finest in the world.

STUDY ABROAD
The Department strongly encourages concentrators to spend either a summer or term in South Asia as part of their studies. For advice on study abroad programs eligible for concentration credit, please see the Director of Undergraduate Studies.

HOW TO FIND OUT MORE
Questions about the concentration should be discussed with the Director of Undergraduate Studies, Richard Delacy, rdelacy@fas.harvard.edu, (617) 496-4749.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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* Prior to the 2011-12 academic year, this concentration was named Sanskrit and Indian Studies.
Special Concentrations

Dr. Lisa Laskin, Director of Studies

The option of petitioning for a Special Concentration was established by the Faculty in 1971 for the serious student whose academic interests cross departmental lines. Special Concentrations offers students the opportunity to design their own program of concentration with the advice and consent of the various members of the faculty and administration. With this option the Faculty addressed special educational objectives not accommodated by existing concentrations. Special Concentrations is not intended to encourage students either to avoid particular departmental requirements or to create a broad, unfocused concentration that could be described as "general studies."

The Standing Committee on Special Concentrations, which is composed of faculty from a wide range of disciplines, sets the general policies and educational guidelines for the program, and considers individually each petition submitted. The detailed administration of each student’s program is supervised by the student's faculty adviser and by the Director of Studies.

Although most special concentration proposals include a full tutorial program culminating in a senior thesis for honors candidates, Special Concentrations is also open to students who prefer a basic course of study. Basic concentrators submit a 14 course program (56 credits); 16 courses (64 credits) are required of honors candidates. To the extent that there are similar requirements in the existing concentrations most closely related to the proposed special concentration, an honors-eligible Plan of Study must ordinarily include provision for tutorial in both the junior and senior years, and completion and evaluation of a senior thesis or equivalent. A written or oral general examination, administered by the faculty adviser plus one other faculty member, is required.

Seniors completing the basic program are expected to enroll in SPC-CONC 96R during their final or pre-final term. This course focuses on the production of a substantial piece of writing or special project related to issues or themes of the student’s Special Concentration. The form of the composition is not prescribed and can range from an interpretative essay, to a critical review of the bibliography in the field, to a research paper on a particular topic. The Director of Studies and faculty adviser must approve the project. A written or oral general examination, administered by the faculty adviser plus one other faculty member, is required.

There are no a priori minimum grade averages that an applicant must achieve to qualify for Special Concentrations or to obtain approval of a Plan of Study. It is necessary, however, that the standing committee be convinced not only of the quality, rigor, and legitimacy of the topic, but also of the applicant’s high level of self-motivation, perseverance, and conscientiousness, since the success of each Special Concentration depends on the drive and determination of the student more than in a regular departmental concentration. From time to time the committee has rejected applications for concentrations that were unquestionably valid areas of academic inquiry but could not be accommodated within existing resources of the University.

The process of development from interest and idea to a detailed and approved special concentration may seem long and complicated, but most students have found it constructive and illuminating. Seeking out a faculty adviser and tutors provides the occasion to meet and talk with a number of faculty members, and not infrequently it turns out that a student discovers that their plan can be accommodated within an existing department. In other cases, it is clear that Special Concentrations is an appropriate vehicle to assist a student to pursue some interdisciplinary interest in depth. The role of the faculty adviser in a special concentration is
crucial. The principal faculty adviser must ordinarily be a member of the Faculty of Arts and Sciences and must agree to supervise and oversee the student’s entire program of concentration from the development of the initial course structure through any necessary revisions of the Plan of Study to the general examination required of all senior concentrators.

Each approved Special Concentration exists as a small committee within our program. Plans of Study for the individual concentrations are unique, but all are interdisciplinary. For example, several recent programs have dealt with food and the environment, while others have addressed topics relating to technology and society. There have also recently been concentrations focusing on issues of health and society, and geography and identity.

Special Concentrations represents a small but significant portion of undergraduate concentrators. It seems best for those students who have not only an unusual interest, but who also have a clear grasp of the direction in which they are heading. Although there are exceptions, most successful Special Concentrations applications have been submitted by upperclassmen who have spent one or two terms studying in one of the College’s established concentrations.

REQUIREMENTS

Basic Requirements: 14 courses (56 credits)

1. **Required courses**: Each concentrator’s individual Plan of Study is approved as part of the process of admission to the concentration. If there is a substitution of courses for more than 25 percent of the original courses proposed, the program must be reviewed by the Standing Committee on Special Concentrations. All individual substitutions or changes in courses to be counted for the concentration must be approved by the individual’s faculty adviser and by the Director of Studies of Special Concentrations. Any special requirement for a Special Concentration is established at the time the original Plan of Study petition is approved.

2. **Tutorials**:
   a. **Sophomore year**: SPC-CONC 97R (one or two terms) optional. Letter-graded.
   b. **Senior year**: SPC-CONC 96R (one term) required. Letter-graded.

3. **Thesis**: None.

4. **General Examination**: Required of all seniors.

5. **Other information**:
   a. **Pass/fail**: No courses counted for concentration may be taken pass/fail with the following exceptions:
      i. One Freshman Seminar may be counted for concentration credit if permission to do so is obtained from the Director of Studies and if the student receives a positive evaluation.
      ii. Courses at other Harvard schools that are offered pass/fail may be counted for concentration credit with the approval of the Director of Studies and if the student receives a positive evaluation.
   b. Each letter-graded course for concentration must be passed with a grade of C or higher.

Requirements for Honors Eligibility: 16 courses (64 credits)

1. **Required courses**: Same as Basic Requirements.

2. **Tutorials**:
   a. **Sophomore year**: Same as Basic Requirements.
   b. **Junior year**: SPC-CONC 98R (two terms) ordinarily required. Letter-graded.
c. Senior year: SPC-CONC 99 (two terms) required. Graded SAT/UNSAT.

3. Thesis: A thesis or its equivalent is required of all honors candidates.
4. General Examination: Required of all seniors.
5. Other information: Same as Basic Requirements.

ADVISING
Because of the nature of this program, advising is highly personalized. Students ordinarily have frequent meetings with their faculty adviser during the academic year and discuss their programs with the Director of Studies at least once at the beginning of each term. The Director of Studies also offers guidance to students interested in preparing a Special Concentration proposal for review by our faculty committee. For up-to-date information on advising in Special Concentrations, please see the Special Concentrations website at https://specialconcentrations.fas.harvard.edu/.

RESOURCES
Although in one sense students in Special Concentrations have no particular resources reserved for them such as special libraries or laboratories, in another and very real sense all the resources of the University are available for the support of special concentrators in completing their programs. Since faculty advisers and tutors in Special Concentrations may come from different Harvard faculties, it may be the case that special concentrators in health and society would have the facilities of that school available to them, for example, or those with a focus on urban studies might have the facilities of the Graduate School of Design or the Kennedy School.

HOW TO FIND OUT MORE
All inquiries should be addressed to the Director of Studies at specialconc@fas.harvard.edu. Once each term, Special Concentrations hosts an information session for prospective students. Contact specialconc@fas.harvard.edu for the date and time of the next information session.

For more information or to download an application form, please visit our website: https://specialconcentrations.fas.harvard.edu/. The Director of Studies also maintains a current list of concentrators with the titles of their programs and the address and name of their faculty advisers. This list is available to prospective concentrators for the purpose of seeking advice from the students currently in the program.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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*Special Concentrations does not participate in joint concentrations.
Statistics

Professor Joseph Blitzstein, Director of Undergraduate Studies
Professor Kevin Rader, Associate Director of Undergraduate Studies

Statistics is a relatively young discipline, focusing on principled methods for collecting and learning from data, in order to describe a phenomenon, make predictions, or draw causal conclusions. Statistics has a theoretical core surrounded by a large number of domains of application in fields such as anthropology, astronomy, biology, business, chemistry, computer science, economics, education, engineering, environmental sciences, epidemiology, finance, forensic science, geophysical sciences, government, law, linguistics, medicine, physics, psychology, sociology, and many others. A basic goal of the concentration in Statistics is to help students acquire the conceptual, computational, and mathematical tools for quantifying uncertainty and making sense of complex data arising from many applications. The mathematical preparation required includes multivariable calculus and linear algebra. The computational preparation required includes COMPSCI 50, or equivalent or above.

A basic introduction to the field is provided by any of STAT 100 through 104, which introduce statistical principles (without any mathematical or statistical prerequisite), with different areas of application emphasized as indicated in the descriptions. STAT 100, 102, 104, and 111 fulfill the College's Quantitative Reasoning with Data (QRD) requirement, as do several other Statistics courses. (See https://oue.fas.harvard.edu/quantitative-reasoning-data for additional information about the QRD requirement.) A theoretical introduction is provided by STAT 110: Introduction to Probability, together with STAT 111: Introduction to Statistical Inference. These courses provide grounding in traditional and modern approaches to statistical modeling and inference. They are prerequisites for most of the Department’s more advanced courses, which study specific methods, models, and applications.

The Statistics concentration is a flexible program that permits as many as half of the 14 courses required for honors eligibility to be taken in departments other than Statistics. A concentration in Statistics prepares a student for many careers in industry (in technology companies, finance, and elsewhere) and government, for graduate study in a very broad collection of engineering, social and natural sciences, and for professional study in law, medicine, business, or public administration. The demand for people with statistical training is rising in most areas.

The Statistics concentration requirements can be fulfilled via any of four tracks: a general track in core statistical principles and methods, a track in Data Science, a track in Bioinformatics and Computational Biology (BCB), and a track in Quantitative Finance. These tracks all lead to a degree in Statistics. The Data Science, BCB, and Quantitative Finance tracks provide interdisciplinary education combining Statistics with computer science, biology, and finance, respectively.

The general track is the most flexible track, and provides a foundation for statistical theory, methods, and applications. Aside from the required theoretical courses STAT 110 and STAT 111 and the required applied course STAT 139, the general track allows many options in how theoretical or applied one makes the course of study, and which aspects of statistics and areas of application one focuses on.
The Data Science track explores the interface of statistics, computer science, and application areas, emphasizing topics such as prediction, machine learning, and analysis of massive data sets. By placing the generation and analysis of data at the center of modern analytics, data science is having a major impact in a vast array of areas, including business, government and politics, science and engineering, medicine and public health, journalism, sports, law, and education.

The Bioinformatics and Computational Biology track is aimed at undergraduates with interest in quantitative methods and modeling applied to data from the biological, medical, and life sciences. The recent explosion of size and complexity of data in the biological and life sciences, such as the human/animal/plants genome projects with gene and protein sequences, has motivated the development of new statistical methodologies and models, such as models for gene and protein motifs search, phylogenetic reconstruction, and gene expression analysis. Core requirements in Statistics emphasize statistical modeling, especially as it relates to biological systems. Additional courses in Biology allow students to obtain a strong foundation in molecular and cellular biology, evolutionary biology, or ecology.

The Quantitative Finance track is designed as a specialization for concentrators in Statistics with interest in quantitative issues that arise in financial and insurance modeling. The focus is on the stochastic analysis that is relevant in these fields. The specific topics addressed include statistical inference of stochastic models that arise in financial/insurance modeling, computational techniques that have become standard in pricing, risk assessment of complex financial/insurance instruments, and analysis and predication for time series.

The Department of Statistics welcomes students interested in pursuing a joint concentration with any other concentration that allows joint concentrations. A joint concentration can provide strong preparation for drawing conclusions from data and quantifying uncertainty to address relevant questions for the other field. Concentrators have frequently pursued joint degrees with fields in the sciences and social sciences, most commonly Computer Science and Mathematics. Joint concentrations with fields in the arts and humanities have also been successful, with especially careful planning needed. A joint degree culminates in a senior thesis that integrates the two fields. Students should consult the Directors of Undergraduate Studies of both fields to ensure all requirements are met.

The Department of Statistics also offers a secondary field. With its strong methodological and applications focus, Statistics has consequently attracted students with a primary focus in another discipline, such as Psychology, Economics, Sociology, Government, Earth and Planetary Sciences, and Life Sciences. The secondary field in Statistics will provide students with a solid background in statistics that they can apply in their primary field or fields of interest. For more information on the secondary field in Statistics, please see the secondary fields section of this handbook.


**REQUIREMENTS**

**Basic Requirements:** 12 courses (48 credits)
1. **Required courses:** Students must fulfill the requirements from one of the following four tracks.

   a. **General Track:**
      i. STAT 110, 111, and 139.
      ii. Four additional Statistics courses numbered between 100 and 299 (inclusive). STAT 98 and COMPSCI 181 may also be counted toward this requirement. Only one Statistics courses numbered between 100 and 109 (inclusive) can be counted for concentration credit.
      v. One Computer Science course: COMPSCI 32, 50, 51, or 61.
      vi. Two additional related courses, chosen from item 5.a. below.

   b. **Data Science Track:**
      i. STAT 110, 111, and 139.
      ii. COMPSCI 109A/STAT 121A or APCOMP 209A.
      v. Two additional Statistics courses, chosen from STAT 115, 117, 120, 121B (or APCOMP 209B), 131, 140, 149, 171, 183, 185, 186, 195, 201, 210, 211, 212, 213, 220, 221, 230, 240, 244.
      vii. One additional related course, chosen from item 5.a. below.

   c. **Bioinformatics and Computational Biology (BCB) Track:**
      i. STAT 110, 111, and 139.
      ii. Two of the four courses STAT 115, 117, 171, and MCB 112.
      iii. One additional Statistics course numbered between 100 and 299 (inclusive). STAT 98 or COMPSCI 181 may also be counted toward this requirement. Only one Statistics course numbered between 100 and 109 (inclusive) can be counted for concentration credit.
      vi. One Computer Science course: COMPSCI 32, 50, 51, or 61.
      vii. Two Life Sciences courses: LS 1A (or LPS A), LS 1B.
      viii. One additional related course, chosen from item 5.a. below.

   d. **Quantitative Finance Track**
      i. STAT 110, 111, and 139.
      ii. Three additional Statistics courses, chosen from STAT 123, 131, 149, 170, 171.

v. One Computer Science course: COMPSCI 32, 50, 51, or 61.

vi. Two Economics courses: Either ECON 1010A or ECON 1011A, and one of the courses ECON 980Z, 1530, 1723, or 1745.

vii. One additional related course, chosen from item 5.a. below.

2. Tutorial:
   b. Senior year: STAT 99R. Optional; SAT/UNSAT.

3. Thesis: None.

4. General Examination: None.

5. Other information:
   a. Related courses:
      i. APCOMP 209A, 209B, 221, 295.
      iii. APPHY 286.
      iv. ASTRON 100, 193.
      v. BST 232, 233, 234, 235, 238, 244, 245, 249, 250, 251.
      vii. E-PSCI 139, 168.
      viii. ECON 50, 980Z, 1011A, 1011B, 1030, 1034, 1036, 1042, 1051, 1052, 1057, 1078, 1123, 1126, 1152, 1460, 1820, 2057, 2110, 2120, 2140, 2142, 2144, 2146, 2150, 2355, 2723, 2725, 2728.
      ix. ENG-SCI 157, 201, 202, 203, 250.
      xii. MCB 111, 112, 131, 198, 199.
      xiii. NEURO 140.
      xiv. OEB 152, 242.
      xv. PHIL 150.
      xvi. PHYSICS 131, 181, 262.
      xviii. HGSE EDU A164.
      xx. STAT 91R (may be taken at most once for concentration credit; graded SAT/UNSAT), STAT 98, any 100-level or 200-level Statistics courses. Only one Statistics course numbered between 100 and 109 (inclusive) can be counted for concentration credit.
      xxi. Other relevant courses if approved by the Directors of Undergraduate Studies.
   b. Pass/fail and SAT/UNSAT: One course other than STAT 99R, 110, 111, and 139 may be taken pass/fail or SAT/UNSAT and counted for concentration credit. Note that STAT 91R is graded SAT/UNSAT and, if taken for concentration credit, would be the one allowed pass/fail or SAT/UNSAT course for concentration credit.
   c. STAT 110 and 111 must be completed by the end of the junior year.
d. The graduate-level courses STAT 210, 211, and 244 can substitute for STAT 110, 111, and 139, respectively.
e. MIT 6.0001+6.0002 (if both of these half-courses are taken) can substitute for COMPSCI 50, and MIT 6.036 can substitute for COMPSCI 181.

Requirements for Honors Eligibility (except for Joint Concentrations): 14 courses (56 credits)

1. Required courses: Same as Basic Requirements for all tracks.
2. Related courses: Two additional courses, which may be from the list of related courses (see item 5.a. above). For students writing a senior thesis, STAT 99R can count as one of the two additional courses for honors eligibility.
3. Tutorial: Same as Basic Requirements.
4. Note: Eligibility for honors requires either a senior thesis (see item 5 below) or following the advanced course option (see item 6 below). Eligibility for high honors or highest honors requires a senior thesis.
5. Thesis: A substantial statistical analysis of a real-life problem, a critical review of statistical methods in some problem areas, or the solution of an open statistical research problem are equally acceptable. There must be a thesis adviser or co-adviser from the Statistics Department, unless approved otherwise by the Directors of Undergraduate Study.
6. Advanced course option: Statistics coursework that includes a set of at least 7 letter-graded Statistics courses numbered between 110 and 299 (inclusive), with STAT 110 (or 210), STAT 111 (or 211), and STAT 139 (or 244) in this set. At least one of STAT 210, 211, 220, 230, or 244 must be in the set, and a GPA of at least 3.5 in the set is required.
7. General Examination: None.
8. Other information: Same as Basic Requirements.

Requirements for Joint Concentrations

Students interested in a joint concentration should consult the Directors of Undergraduate Studies in both concentrations at an early date.

1. Statistics as the Primary Field: 12 courses (48 credits)
   A. Same as Basic Requirements for all tracks, except that a senior thesis is also required. The senior thesis must strongly relate to both fields. There must be a co-adviser or secondary adviser from the Statistics Department, unless approved otherwise by the Directors of Undergraduate Study.
2. Another concentration as the Primary Field: 10-11 courses (40-44 credits)
   A. Same as Basic Requirements for all tracks, except that a senior thesis is also required, and the “two additional related courses” (for the general track) or “one additional related course” (for the other tracks) are not required. The senior thesis must strongly relate to both fields. There must be a co-adviser or secondary adviser from the Statistics Department, unless approved otherwise by the Directors of Undergraduate Study.
ADVISING
Concentrators are assigned an individual concentration adviser and are also welcome to discuss the program and their progress with the Directors of Undergraduate Study or any of the concentration advisers in the Department. It is expected that concentrators will meet with their adviser at least once per semester. For additional information related to advising see also the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

HOW TO FIND OUT MORE
For more information, please consult with the Student Programs Administrator, Kathleen Cloutier, Science Center 400E (617-496-1402, cloutier@fas.harvard.edu), the Director of Undergraduate Studies, Professor Joseph Blitzstein, Science Center 713 (617-496-2985, blitzstein@stat.harvard.edu), or the Associate Director of Undergraduate Studies, Professor Kevin Rader, Science Center 300D (617-495-5204, krader@fas.harvard.edu), and read through the concentration webpage at http://statistics.fas.harvard.edu/pages/undergraduate-statistics-general-information.

ENROLLMENT STATISTICS
Number of Concentrators as of December

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Theater, Dance, & Media

Debra Levine, Director of Undergraduate Studies

Theater, Dance & Media (TDM) combines historical and theoretical study of live and digital arts with the practice of those arts. Taught by Faculty of Arts and Sciences (FAS) faculty, and by practitioners from the American Repertory Theater (A.R.T.) and the Dance Center, as well as numerous visiting artists/scholars each year, students are introduced to the rigor and discipline required to participate in professional theater, dance, and media practices. The goal of the concentration is to foster the imagination and intellect using a broad range of arts-based research and practice techniques that offer strong training in creating expressive culture. Students are strongly encouraged to work across art forms, including literature, music, and the visual arts, and beyond the humanities, in order to incorporate new ideas and forms of knowledge into their work in the performing arts.

TDM emphasizes collaboration. The concentration explores the many ways to act, design, direct, compose, choreograph, dance, write, produce and organize live art and digital media. Our studio courses model and study the many forms of arts collaboration; similarly, scholarly courses look to the history and theory of culture as a complement to the skills gained in studio practice.

In addition to the required coursework, students pursuing the Theater, Dance & Media concentration are required to meaningfully participate in at least two TDM concentration production studio courses led by professional directors, choreographers, and designers. Concentrators will also obtain valuable technical skills through both working on the crew for at least one concentration show, as well as supporting the work of their peers.

REQUIREMENTS

Elective Program: 12 courses (48 credits)

1. Required Courses:
   a. Four courses focused on critical and scholarly approaches to theater offered through the Standing Committee on Degrees in Theater, Dance, and Media or by faculty in allied fields, including, but not limited to, the departments of Comparative Literature, English, Music, History of Art and Architecture, Art, Film, and Visual Studies, and Folklore and Mythology. These courses should not all be taken in a single discipline, for example dramatic literature, but rather should give the student a range of experience in the various aspects of theater making. At least one of these courses must focus on pre-20th century performance and include various genres and forms of theater, dance, and media. The student will consult with the Director of Undergraduate Studies (DUS) for course approval and to compile a sound Plan of Study to meet this requirement. (Note: one of the eight courses in either scholarly or practiced-based approaches must be in non-U.S. theater/dance or non-traditional performance.)
   b. Four courses that are practice-based or studio. Courses can include directing, design, acting, dance, choreography, playwriting, dramaturgy, and work in newer media. The student should take courses in more than one discipline. The choice of courses will require the approval of the Director of Undergraduate Studies
(DUS). (Note: one of the eight courses in either scholarly or practiced-based approaches must be in non-U.S. theater/dance or non-traditional performance.)

c. Two TDM production studios (TDM 90AR/BR/CR/DR). These studio courses frame and focus on TDM professionally directed, choreographed, and designed productions each term. Students are expected to assume major artistic roles, such as actors, dancers, apprentice directors, choreographers, designers, dramaturges, or producers.

2. Tutorials:
   b. Junior year: TDM 98 (one term) required. Letter-graded.
      i. Note: The goal of the junior tutorial is to test insights generated from critical reading in the context of studio practice. The result of the Junior tutorial can be a final performance combined with a written account of the relation between reading, research, and studio practice that has occurred over the course of the semester, or a written project that includes reflections on studio work.

3. Thesis: None.
4. General Examination: None.
5. Other Information: The following additional requirements will be graded SAT/UNSAT and must be approved by the DUS.
   a. The Samuel Becket Crew Assignment: Students must complete one production crew assignment by working on one TDM production.
   b. A workshop in theater safety, completed by the end of senior first semester.

Requirements for Honors Eligibility: 14 courses (56 credits)

1. Required courses: Same as Basic Requirements.
2. Tutorials: Same as Basic Requirements, plus two terms of TDM 99: Senior Tutorial (year-long 8-credit course) required. Graded SAT/UNSAT.
3. Thesis: honors candidates may complete a performance-based or critical thesis. Theses are proposed in the second semester of junior year and must be approved by the Executive Committee on Theater, Dance & Media and the DUS.
4. General Examination: None.
5. Other Information: Same as Basic Requirements. In addition, if students plan on doing a production as part of their thesis requirements, they must complete a crew assignment on another student’s thesis production, ideally before their senior year.

Requirements for Joint-Concentration: Consult Director of Undergraduate Studies and see TDM website at https://tdm.fas.harvard.edu/ for further information.

ADVISING
The Director of Undergraduate Studies (DUS) advises all students when they enter the concentration, eventually assigning to them additional faculty and professional advisers, based on the students’ particular interests and their work in or on specific productions. Together with the DUS, these advisers will support students in developing a coherent course of study and a solid body of artistic work that is suited to each student’s goals and interests.
HOW TO FIND OUT MORE
For more information about the concentration, please visit the department website at https://tdm.fas.harvard.edu/.

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Theater, Dance, and Media was a new concentration in 2015-16
The Study of Women, Gender and Sexuality has long constituted a vibrant and engaging arena for interdisciplinary work and intellectual inquiry. At the heart of this field is the assertion that gender and sexuality are fundamental categories of social organization and power that are inseparable from race, ethnicity, class, nationality, and other categories of difference.

The concentration in Studies of Women, Gender, and Sexuality (WGS) brings together a wide range of academic fields in the humanities, social sciences, and sciences (including History, Literature, Visual Studies, Anthropology, Sociology, Ethnic Studies, Political Science, Psychology, and Biology, to name just a few). As an interdisciplinary field of study, WGS pays close attention to how social norms have changed over time and how they vary across cultures. The concentration also actively investigates the ways in which ideas about gender and sexuality have shaped public policy, civil rights, health care, religion, education and the law, as well as the depiction of women and men in art, literature, and the popular media. WGS courses are characterized by a strong commitment to critical thinking, as well as a spirit of open and sustained intellectual inquiry.

WGS prides itself on the intense intellectual engagement of its students and its close collaboration between students and faculty. Beginning with the small-group sophomore tutorial (WOMGEN 97), WGS provides students with a rigorous grounding in the theory and methodology of gender and sexuality studies, helping students hone their skills in critical analysis, close reading, and effective research and writing. All full concentrators must enroll in the two foundation courses numbered WOMGEN 1200 (Historical Approaches) and WOMGEN 1210 (Theories of Gender and Sexuality), and two WGS or WGS-related 1400+ level seminars. Joint concentrators may choose one of the foundation courses. Concentrators may also fulfill concentration requirements by taking courses on WGS-related topics in other programs and departments. (A list of pre-approved courses from other departments is available on the WGS website at http://wgs.fas.harvard.edu/.)

Requirements: 12 courses (48 credits), including WOMGEN 97 (sophomore tutorial), WOMGEN 1200 (Historical Approaches), and WOMGEN 1210 (Theories of Gender and Sexuality), seven electives, and two WGS courses at the 1400+ level. Students may opt to take an approved “engaged scholarship” course (https://publicservice.fas.harvard.edu/courses-0) in place of one of the 1400+ level courses.

Thesis Track: 13 courses (52 credits). Students interested in pursuing honors recognition will apply to enter the thesis track during the first semester of junior year (https://wgs.fas.harvard.edu/undergrad-forms). The Director and Associate Director of Undergraduate Studies will review applicants’ previous academic records and may also elect to interview students before admission to the thesis track. In the spring, students selected for the thesis track will enroll in WOMGEN 98R (Junior tutorial - Research and Methods), a semester-long seminar designed to help them understand the craft of WGS research and writing. Students meet weekly in seminar to develop their methodological skills and workshop their research projects. Over the course of the semester, students collaboratively develop a syllabus, identify a research topic, create a proposal, and research and write a 20 to 25-page paper.

During senior year, thesis track students enroll in WOMGEN 99A/99B, where they design, research, and write senior theses. Thesis track students work individually with a thesis adviser and participate in a group senior tutorial. In keeping with the interdisciplinary character of WGS,
senior theses may draw upon a wide range of approaches, including literary analysis, ethnography, scientific investigation, archival research, visual analysis, and cultural or political critique. Honors-eligible students also take an oral examination.

**Joint Concentrations:** A joint concentration is an excellent choice for honors-eligible students who want to integrate their studies in WGS with deeper exploration of another field, building toward a final integrated thesis project. Students can pursue a joint concentration with WGS and a range of other concentrations including African and African American Studies, Anthropology, English, History and Literature, History and Science, Literature, Music, Philosophy, Comparative Study of Religion, Romance Languages and Literatures, Social Studies, Sociology, and Statistics. Since course requirements vary among the individual programs, students planning to concentrate jointly are responsible for meeting with advisers in both concentrations to obtain specific guidelines.

**Secondary Fields:** Students take one foundation course (either WOMGEN 1200 or WOMGEN 1210), which grounds them in the history or theory of gender and sexuality studies. The flexibility of the remaining four course requirements allows students to sample the rich course offerings in WGS while developing core areas of interest.

We advise interested first-year students and sophomores to take a WGS course at the 1100 or 1200 level, a Freshman Seminar on WGS issues, or one of the General Education courses offered by WGS faculty. Students interested in WGS as a concentration or a secondary field should meet with either the Director or Assistant Director of Undergraduate Studies.

Further information is available on the WGS website (http://wgs.fas.harvard.edu/), including a list of courses outside WGS that count for concentration credit. Students may also wish to consult the list of resources and opportunities in Gender and Sexuality Studies available online at http://wgs.fas.harvard.edu/resources.

**REQUIREMENTS**

**12 courses (48 credits)**

*Required courses:*

2. History foundation course: WOMGEN 1200.
3. Theory foundation course: WOMGEN 1210.
4. Two WGS courses numbered 1400+, one of which may be an approved “engaged scholarship” course.
5. Seven courses drawn from WGS offerings or from the list of courses that count for concentration credit (available on the WGS website at http://wgs.fas.harvard.edu/).

**Requirements for the Thesis Track:** 13 courses (52 credits)

2. History foundation course: WOMGEN 1200.
3. Theory foundation course: WOMGEN 1210.
4. Any WGS course numbered 1400+, one of which may be an approved “engaged scholarship” course.
5. Six courses drawn from WGS offerings or from the list of courses that count for concentration credit (available on the WGS website at http://wgs.fas.harvard.edu/).
7. Senior Tutorial: WOMGEN 99A and 99B, the writing of the senior thesis.
Requirements for Joint Concentration (thesis track only):

Women, Gender, and Sexuality as the Primary Concentration: 8 courses (32 credits) (including thesis)

2. Either the history foundation course (WOMGEN 1200) or the theory foundation course (WOMGEN 1210).
3. Three courses drawn from WGS offerings or from the list of courses that count for concentration credit (available on the WGS website at http://wgs.fas.harvard.edu/).
5. Senior Tutorial: WOMGEN 99A and 99B, the writing of the senior thesis.

Women, Gender, and Sexuality as the Allied Concentration: 5 courses (20 credits)

Required courses:

2. Either the history foundation course (WOMGEN 1200) or the theory foundation course (WOMGEN 1210).
3. Two courses drawn from WGS offerings or from the list of courses that count for concentration credit (available on the WGS website at http://wgs.fas.harvard.edu/).

Note: Joint concentrators with WGS as the allied concentration take the senior tutorial (99A and 99B) in their primary concentration.

ADVISING

Whether they are full or joint concentrators, all students receive individual attention and advising from a core group of dedicated and highly-engaged faculty. The Director of Undergraduate Studies is the primary academic adviser for sophomores and juniors, and the Associate Director of Undergraduate Studies is the primary academic adviser for seniors. In consultation with their faculty advisers, students develop individual, cohesive Plans of Study tailored to their specific intellectual interests. Faculty members are closely involved with students’ academic development at every stage of the concentration. Many of the courses offered by WGS are seminars, allowing for an exciting and productive exchange of ideas between students and faculty.

For up-to-date information on advising in Studies of Women, Gender, and Sexuality, please see the Advising Programs Office website at https://advising.college.harvard.edu/concentrations.

RESOURCES

The Arthur and Elizabeth Schlesinger Library on the History of Women in America is the leading research library in the field. The library holds more than 35,000 volumes, 800 collections of personal and organizational papers, 50,000 photographs, oral histories, videotapes, and other historical materials. The library collects information on women’s rights, suffrage, social welfare and reform, pioneers in the professions, and the family. Carol J. Pforzheimer Student Fellowships are awarded annually to undergraduates to use the resources of the library.

The Henry A. Murray Research Archive is a multidisciplinary research center whose focus is the study of lives over time. It is also a national archive for social science data on human
development and social change, especially data that illuminate women's lives and issues of concern to women. Students and researchers at all levels, from undergraduates to scholars, use the center's resources. These include studies of family life, careers, psychological development, political participation, and mental health.

The Open Gate Foundation, "A Fund for Gay and Lesbian Life at Harvard University," is a private charitable foundation established by members of the Harvard Gay and Lesbian Caucus, which gives grants to student groups and faculty to help finance a variety of events and activities, including speakers, symposia, and film festivals. Further information may be obtained from the Open Gate website at http://www.hgsc.org/article.html?aid=109.

STUDY ABROAD
With good planning, a term abroad or out of residence can be a very meaningful educational experience. In the past our concentrators have spent terms in countries such as South Africa, Kenya, Chile, Australia, Spain, and France. Most concentrators who study abroad do so in the fall term of junior year, which allows them to return to campus in time to take the Junior Tutorial (WOMGEN 98) the following spring. Thesis track concentrators who wish to study abroad during the spring term of junior year must make special arrangements to complete the junior tutorial. If you are a concentrator considering a term abroad, please consult your concentration adviser as well as the Office of International Education as soon as possible. Plans for study out of residence must be approved by the University significantly in advance of the term in which a student plans to be away.

HOW TO FIND OUT MORE
For further information, contact the main office at 617-495-9199 or via email at wgs@fas.harvard.edu. The office of the Committee on Degrees in Studies of Women, Gender, and Sexuality is located on the ground floor of Boylston Hall. A description of WGS concentration options, a list of current course offerings, and thesis track application materials are available from the office and on our website at https://wgs.fas.harvard.edu/concentration.

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SECONDARY FIELDS
Secondary Field

African and African American Studies

The secondary field enables students whose concentration is outside the field of African and African American Studies to gain a basic understanding of the history, cultures, politics, and social problems of Africans and peoples of African descent. Africans and peoples of African descent have developed cultural forms and traditions that are worthy of study in their own right and that also have profoundly shaped the fine arts and popular culture in the Americas and all around the planet. Black struggles for freedom, both on the continent of Africa and throughout the Western hemisphere, have served as a model for other oppressed groups throughout the world. Comparative and cross-cultural studies of Africa and its diaspora contribute enormously to our understanding of race and ethnicity; and in addressing the ethical, social, and political consequences of racial and ethnic antagonism, the field of African and African American Studies raises questions relevant to the experiences of all peoples. The Department of African and African American Studies (AAAS) offers two secondary field pathways.

REQUIREMENTS: 5 courses (20 credits)

African Studies

1. One introductory course in African Studies.
2. One course in African history.
3. Three additional courses in African Studies, two of which may primarily be focused on language study.
4. At least one of the five courses must be at the 100-level.

African American Studies

1. One introductory course in African American Studies.
2. One course in African American history.
3. Three additional courses in African American Studies.
4. At least one of the five courses must be at the 100-level.

OTHER INFORMATION

With the exceptions of Freshmen Seminars and courses taken abroad, only one course can be taken pass/fail or SAT/UNSAT. All grades must be passing grades.

Students may petition the Director of Undergraduate Studies to have a relevant course taken in another Faculty of Arts and Sciences (FAS) department or in General Education count toward the secondary field requirements. (Note: Courses cross-listed with AAAS automatically count toward the secondary field requirements.) Students may also petition to have a Freshman Seminar, a course taken abroad, a Harvard Summer School course, or a Harvard course outside of FAS count toward the secondary field requirements. However, at least three of the five courses must be drawn from regular AAAS course offerings.

After concentrators, students who are signed up for the secondary field will receive priority in limited enrollment courses.
ADVISING RESOURCES AND EXPECTATIONS

Students considering a secondary field in AAAS should contact the Director of Undergraduate Studies, Glenda Carpio (carpio@fas.harvard.edu), or Faton Limani, the Graduate and Undergraduate Studies Coordinator at faton_limani@fas.harvard.edu /617-384-7767, for further information or advising.
Secondary Field

Anthropology

Social Anthropology is concerned with the social and cultural diversity of contemporary human communities and groups. Social anthropologists study topics, including gender, race and ethnicity; religion and belief; economic development; illness, healing and global health; human rights and political violence; popular culture and the role of media in society; food and consumption; and the impact of globalization. Ethnographic research methods emphasize intensive participant observation of community life over an extended period of time in settings such as urban neighborhoods, college campuses, global markets, refugee camps, hospitals, government offices, and courtrooms, as well as in rural towns and backcountry settlements.

A secondary field in Social Anthropology can be a valuable complement to many concentrations, especially for students who are interested in an international career or simply wish to become informed citizens of a globalized world. Social Anthropology courses emphasize skills that enable students to operate in different cultural environments, skills that can be transferred to careers in education, journalism, law, business, medicine, politics and public service, as well as in humanitarian and development fields.

There are several options to consider in planning a secondary field in Social Anthropology. You might wish to explore the wide range of departmental offerings in order to gain a general sense of the field. Or you may prefer to focus on a particular world region, such as Asia, Latin America, or Africa and the African diaspora, or specialize in a particular topic or approach. Some popular areas of specialization include:

- **Medical Anthropology**, which concerns the social dimensions of healing and illness, issues of global and community health care, and the culture of biomedicine.
- **Anthropology of Human Rights**, which focuses on issues of conflict and violence, economic and political inequality, indigenous rights, truth and reconciliation, humanitarianism and social justice. Related topics of inquiry also include social stratification and distinction, race, ethnicity, inequality, and gender.
- **Political Ecology and Development**, which examines human social relationships with the natural and built environment, including social, political and economic dimensions of resource utilization and control; the politics of environmental conservation and degradation; the impact of economic and technological interventions on local social worlds.
- **Media Anthropology**, which covers both training in the use of documentary media such as film, photography, and sound recordings in ethnographic settings; and the study of art, mass media, and, more broadly, the sensuous elements of human experience – sight and images; sound; taste; tactility; dance; and movement.

Whether you choose a general or a focused approach, the Social Anthropology advising team (Director of Undergraduate Studies, Assistant Director of Undergraduate Studies, and Undergraduate Program Coordinator) can help with planning and course selection for the secondary field. In some cases, students may also wish to discuss their plans for a focused secondary field with an appropriate member of the Department faculty. You can find more information about the Secondary Field in Anthropology as well as some model study plans on our Department website.
Whichever approach you choose, your transcript will indicate that you have taken a Secondary Field in Anthropology.

REQUIREMENTS: 4 courses (16 credits)

Four courses in Social Anthropology are required to complete the secondary field. There is no fixed sequence in which these courses must be taken, but students are strongly encouraged to enroll in ANTHRO 1610: Ethnographic Research Methods or another course that provides a broad overview of the discipline of Social Anthropology. Consult the Director of Undergraduate Studies or Assistant Director of Undergraduate Studies for appropriate courses.

Courses can be drawn from any departmental or formally cross-listed courses offered by regular Social Anthropology faculty. One of these may be a Freshman Seminar. Graduate courses offered by Social Anthropology faculty may, with instructor's permission, be taken for secondary field credit. One course in Archaeology taught by a member of the Department faculty can be counted for credit toward the Social Anthropology secondary field.

OTHER INFORMATION

All four courses must be taken for a letter grade, with the exception of the Freshman Seminar, which must receive a grade of SAT. Letter-graded courses must receive a grade of C or better to count for the secondary field.

Under ordinary circumstances, courses taken abroad or in the Harvard Summer School will not be counted towards a secondary field unless they are taught by a regular member of the Social Anthropology Faculty.

ADVISING RESOURCES AND EXPECTATIONS

To discuss the secondary field in Social Anthropology or for specific questions about secondary field requirements, contact the Department of Anthropology Director of Undergraduate Studies (DUS) or Assistant Director of Undergraduate Studies (ADUS). For general information, please contact the Anthropology Department's Undergraduate Program Coordinator at anthrouc@fas.harvard.edu, or stop by the Undergraduate Office, Room 103B, Tozzer Anthropology Building, 21 Divinity Avenue.
Secondary Field

Archaeology

Archaeology explains when, how, and why things happened in the past. Archaeologists document patterns of change and variability through time and space and relate these changes to the world around us today. In broader terms, archaeological research involves the discovery, description, and analysis of technological adaptation, social organization, artistic production, ideology, and other forms of human expression through the study of material remains recovered from the excavation of sites that were used or settled by past peoples. Analyses may be peculiarly archaeological in nature – the classification of broken pieces of pottery is an example – or they may involve the use of methods, analytical techniques, and information from fields as diverse as art history, astronomy, biological anthropology, botany, chemistry, genetics, history, linguistics, materials science, philology, physics, social anthropology, and zoology.

The formal study of Archaeology prepares students to evaluate critically the record of human material production and to develop informed perspectives on the ways the past is presented, interpreted, and dealt with by a wide range of actors – from interested individuals to nation-states – in societies around the world today. Archaeologists carry out basic research in the field and in museum collections and increasingly deal with such topics as cultural resource management (including the recovery, documentation, conservation, and restoration of ancient artifacts); cultural tourism; nationalistic uses and abuses of the past; the depiction of the past in the media (including film, television, and the internet); the illegal trade in antiquities; repatriation of cultural patrimony; and environmental and climatic change.

REQUIREMENTS: 5 courses (20 credits)

1. One introductory course selected from:
   a. GENED 1105: Can We Know Our Past?
   d. Introductory course in the Archaeology of Ancient Greece and/or Rome or in Medieval Archaeology, as available.
   e. In addition to the required introductory course, a student may count only one additional introductory course from the above list for the secondary field.

2. Four additional courses selected from those listed under the course search “Archaeology” in courses.my.harvard.edu and approved by the Secondary Field Adviser.

OTHER INFORMATION

Up to three approved courses in General Education may be counted toward fulfillment of the requirements for the secondary field. In addition, one approved course in the student’s concentration and a maximum of two ancient language courses may be counted toward secondary field credit. All course work must be taken for a letter grade and must be passed with a grade of B- or better.

Students pursuing a secondary field in Archaeology are strongly encouraged to participate in an archaeological field school in the U.S. or abroad. Students who complete a Harvard-sponsored
or a pre-approved off-campus archaeological field school may count one course credit from that field school experience toward completion of the secondary field.

ADVISING RESOURCES AND EXPECTATIONS

For more information, please contact the Secondary Field Adviser in Archaeology, Professor Jason Ur, jasonur@fas.harvard.edu. Students interested in or intending to pursue a secondary field in Archaeology should first review their programs of study with the Standing Committee on Archaeology Coordinator by emailing sca@fas.harvard.edu before the beginning of their next to last semester. Whether considering or having decided on a Secondary Field in Archaeology, students are strongly encouraged to use the Secondary Fields Web tool (courses.my.harvard.edu/) to work out a proposed Plan of Study and to notify the secondary field adviser early on in the process.
Secondary Field

Art, Film, and Visual Studies

The principal educational goal of the Department of Art, Film, and Visual Studies (AFVS) is to provide students in a liberal arts college with an opportunity to gain an understanding of visual quality and expression through both study and practice. The aim is to achieve an understanding of the structure and meaning of the visual arts and culture through practical and theoretical explorations of media such as drawing, film, painting, performance, photography, printmaking, sculpture, sound, video, and writing. In addition to offering a regular concentration in these areas, the Department also offers students the opportunity to explore AFVS as a secondary field. Specifically, the secondary field offerings reflect the Department's diversity by providing students with four distinct areas of focus. In each area a total of six courses are required; however, each area has its own set of requirements and students may choose only one area when filing for a secondary field. Ordinarily, secondary field credit is only granted for courses taken in residence. To count courses from outside of AFVS, students must petition the Department prior to taking the course.

REQUIREMENTS: 6 courses (24 credits)

Film/Video:

Art, Film, and Visual Studies offers a secondary field in film/video production. Courses in film, video, and animation may be arranged in any combination to maximize each student's interests. This field is imagined to be of particular value as a complement to disciplines that include the study of culture—such as Anthropology or area studies—where the moving image can be used as a tool for observation and research.

Requirements:

1. Four AFVS courses in film or video making; at least one course should be introductory-level and at least one should be intermediate-level.
2. Two courses in the history or theory of the moving image offered in the AFVS Department.

Film and Visual Studies:

Art, Film, and Visual Studies offers a secondary field in Film and Visual Studies for students wishing to explore the history and aesthetics of moving image media in conjunction with other disciplines in the arts and humanities.

Resolutely interdisciplinary in its impetus, this track offers rigorous training in Film and Visual Studies with a blend of theoretical, analytical, and historical perspectives. It is designed to cultivate critical awareness and analytical understanding regarding the place of moving images within larger histories and their connections both to traditional and emerging arts, disciplines, and fields of endeavor. To this end, Film and Visual studies draws on the unique strengths of AFVS and Faculty of Arts and Sciences (FAS) faculty, the Harvard Film Archive’s vast holdings of films and documents, and the rich resources of the Carpenter Center for the Visual Arts and the Harvard Art Museums.
Requirements:

1. **Introductory Courses**: Two courses comprising AFVS 70: The Art of Film and one other double-digit seminar or lecture course in Film and Visual Studies. *Students may petition to count an appropriate triple-digit course towards this requirement, per the discretion of the DUS.*

2. Four additional courses in Film and Visual Studies offered in the AFVS Department. Courses in film theory and other approved Film and Visual Studies courses may be obtained from the Manager of Academic Programs.

**Studio:**

Four studio courses (of the student's choosing) in drawing, mixed media, painting, photography, printmaking, sculpture, and video/installation art; at least one course should be introductory-level, and one should be intermediate-level.

Requirements:

1. Two lectures or seminars in art history or theory, ordinarily offered by the Department of Art, Film, and Visual Studies.

2. One art history or theory course offered in the Department of History of Art and Architecture may also be counted with AFVS Department approval.

Students can review the AFVS secondary field requirements checklist on the AFVS Department website ([https://afvs.fas.harvard.edu/](https://afvs.fas.harvard.edu/)) under the "Forms" section in the "Undergraduates" menu.

**OTHER INFORMATION**

Courses in the studio arts and film/video production are, of necessity, small and intensive, and priority is given to concentrators. Additionally, some courses in Environmental Studies and Film and Visual Studies also have an enrollment limit. Students wishing to pursue any of these areas as a secondary field are welcome to apply to limited-enrollment classes, but will not be given preferential access to them.

All secondary field courses must be taken for a letter grade with the exception of a Freshman Seminar given by a AFVS faculty member. There is no minimum grade for counting courses for the secondary field.

Harvard Summer School and study abroad courses taught by Department faculty may count towards the secondary field. Students may petition the Department to count, at most, one related study abroad or summer school course taught by non-Department faculty by submitting a course requirement substitution form, available from the Manager of Academic Programs or on the Department’s website ([https://afvs.fas.harvard.edu/](https://afvs.fas.harvard.edu/)). Approval occurs after the course is completed and the syllabus and work are reviewed by the Director of Undergraduate Studies. It is therefore advisable to check with the Director of Undergraduate Studies before making plans. Up to one related cross-listed course may count toward the secondary field.

**ADVISING RESOURCES AND EXPECTATIONS**

Both the Director of Undergraduate Studies, Matt Saunders ([msaunders@fas.harvard.edu](mailto:msaunders@fas.harvard.edu)) and the Manager of Academic Programs, Paula Soares ([soares@fas.harvard.edu](mailto:soares@fas.harvard.edu)), advise students pursuing a secondary field in AFVS. Students do not declare a secondary field through the Department as they do when applying for a concentration, but it is recommended that the
students use the secondary fields web tool (http://handbook.fas.harvard.edu/book/web-tool) to indicate their interest in the AFVS secondary field. To be added to the Department's mailing list and to receive information about courses and events in the Department, students should also inform the Manager of Academic Programs of their interest in the AFVS secondary field.
Secondary Field

**Astrophysics**

The secondary field in Astrophysics builds the foundation from which students may consider some of the deepest questions of the physical universe. What was the state and composition of the Universe at the moment of the Big Bang? What is the nature of the force that currently dominates the expansion of the Universe? How do space and time behave in the vicinity of a black hole? How do galaxies form, and how do stars and planets form within those galaxies? Are there habitable worlds other than our own?

The goal of the secondary field in Astrophysics is to provide students with an understanding of the physical universe beyond the Earth that emphasizes the interplay between the remote observation of astrophysical phenomena and the construction and testing of mathematical models to interpret those observations. The heart of the secondary field consists of two courses, ASTRON 16 and 17, that together provide a survey of Astrophysics that is firmly rooted in single-variable calculus and freshman mechanics. These courses may be taken in either order, and each course includes the hands-on use of various astronomical observatories located on the Harvard campus.

In order to encourage students to pursue the secondary field while maintaining a rich schedule of other academic interests and extra-curricular activities, the requirements number only 4 courses including the prerequisite Physics. The secondary field is intended to serve a broad audience: since there are no requirements other than single-variable calculus, any student can undertake the secondary field in Astrophysics, and it will benefit a wide range of careers including science education, public outreach, policy, or journalism. Many of the questions listed in the first paragraph lie at the interface of Astronomy with Physics, Earth and Planetary Sciences, Applied Mathematics, Computer Science, and Engineering Sciences; and so concentrators in those departments may wish to consider the secondary field in Astrophysics closely. The structure of the requirements below is the same as the foundation for the Astrophysics concentration, so that students who develop a strong interest in the field and wish to concentrate in it may do so easily.

**REQUIREMENTS: 4 courses (16 credits)**

1. PHYSCI 12A, PHYSICS 15A, or PHYSICS 16, providing an introduction to mechanics. This serves as the co-requisite for ASTRON 16 and ASTRON 17.
2. ASTRON 16, providing an introduction to stellar and planetary astronomy.
3. ASTRON 17, providing an introduction to galactic and extragalactic astronomy.
4. One additional course in Astronomy, either ASTRON 98, or any course in Astronomy at the 100-level.

**OTHER INFORMATION**

Together ASTRON 16 and 17 provide a complete introductory survey of Astrophysics using single-variable calculus and freshman mechanics. These courses are not sequential and thus may be taken in either order.

Study abroad and summer courses taken at other institutions may be substituted for substantially equivalent Harvard courses with the permission of the Director of Undergraduate Studies.
No course counted for secondary field credit may be taken pass/fail.

**ADVISING RESOURCES AND EXPECTATIONS**

Students pursuing the secondary field in Astrophysics enjoy many of the benefits afforded concentrators in Astrophysics: they choose a faculty adviser, are encouraged to participate in all departmental events and activities, and have access to several on-campus observatories. Students are also encouraged to consider research in Astrophysics conducted either during the semester or the summer. The Department of Astronomy ([https://www.cfa.harvard.edu/](https://www.cfa.harvard.edu/)) is located within the Harvard-Smithsonian Center for Astrophysics (CfA; [http://www.cfa.harvard.edu](http://www.cfa.harvard.edu)), which is home to over 300 scientists and thus offers significant opportunities for undergraduate research. Astronomers at the CfA make regular use of observatories located across the globe and thus there are numerous opportunities for research-related travel for undergraduates.

Students who are considering the secondary field in Astrophysics are encouraged to contact the Director of Undergraduate Studies, Professor Karin Öberg, at 617-496-9062 or koberg@cfa.harvard.edu.
Secondary Field

Celtic Languages and Literatures

The Celtic languages – now spoken mainly in Ireland, the British Isles, and Brittany – were once spoken over much of Europe and in Asia Minor. Speakers of Celtic languages are passionate about the survival of their languages, and many people in Ireland, Wales, Scotland, and Brittany choose to live their lives in the Celtic languages native to their countries, despite the dominance of English or French. In addition to preserving a strong sense of cultural community, the Celtic languages are treasure troves of story, poetry, and song ranging from the medieval to the contemporary. The languages are fascinating in themselves, quite different in their syntax from the Germanic and Romance languages that underlie English, and extraordinarily rich in idiom. They offer a direct link to the literary traditions of early medieval Europe, while at the same time holding an important position in the growing cultural pride and economic vibrancy of their societies. The speakers of Celtic languages have an important place in the history of European culture, and the splendid medieval literatures of Ireland and Wales constitute a hugely rewarding field of study. The languages are of great linguistic interest, and can boast some of the finest contemporary writers in the Celtic countries. The Department of Celtic Languages and Literatures offers courses in the medieval as well as the modern Celtic languages, and in the literature, folklore, and mythology of the Celtic-speaking peoples.

Classes in the Celtic Department are small, and there is a strong sense of community among undergraduates, graduate students, and faculty, enhanced by social gatherings, talks, and an annual colloquium to which undergraduates are most welcome.

The Department offers a secondary field that is flexible enough to cater to students with a broad interest in the Celtic cultures or in Celtic folklore and mythology, and for those who are more particularly interested in the Celtic languages and literatures of Ireland, Scotland, and Wales.

Students who complete a secondary field in Celtic may expect, not only to become familiar with the origins of the Celtic peoples and the growth of their cultural traditions, but also to understand better the foundations of ethnicity in any people that understands itself as possessing a distinct identity; to develop a keen critical awareness of the nature and vitality of oral traditions in their vibrant interrelationships with literary traditions; and to be aware of the precarious state of many of the world’s seven thousand languages, and why it matters.

**REQUIREMENTS: 5 courses (20 credits)**

Any General Education course, and one Freshman Seminar, offered by members of the Celtic Department may count towards the secondary field. At least one 100-level course offered within the Celtic Department is required. One Harvard Summer School course or study abroad course may be counted upon the approval of the department's Secondary Field Coordinator. All other courses should be selected from the offerings of the Department.

**OTHER INFORMATION**

With the exception of the Freshman Seminar, all courses must be taken for a letter grade, with a minimum grade of C.
ADVISING RESOURCES AND EXPECTATIONS

For more information on the secondary field, contact the Department Administrator, Mary Violette (617-495-1206, violette@fas.harvard.edu) or the Secondary Field Coordinator, Professor Natasha Sumner (nsumner@fas.harvard.edu).
Secondary Field

Chemistry

A secondary field in Chemistry gives students a well-rounded experience of the discipline. This secondary field is appropriate for anyone who has an inherent interest in the subject or would like to gain a deeper knowledge of science to use in their professional lives.

REQUIREMENTS: 6 courses (24 credits)

Six letter-graded courses in Chemistry that include at least one upper-level course in Chemistry. Upper-level, letter-graded courses in Chemistry include CHEM 40, 60, and any 100- or 200-level Chemistry course.

OTHER INFORMATION

Students completing a secondary field in Chemistry must earn a C- or better in each of these courses, with the exception of designated Freshman Seminars, which are graded SAT/UNSAT.

Most students interested in the secondary field will take four or five of the following introductory courses: LPS A, LS 1A, PHYSCI 1, CHEM 17, CHEM 20, CHEM 27, and CHEM 30. However, students choosing to complete a secondary field in Chemistry will be free to choose any six courses in Chemistry as long as one of these courses is an upper-level course in Chemistry.

One term of research for credit via the courses CHEM 91R, 98R, or 99R may be counted towards the secondary field requirements. These courses do not satisfy the upper-level course requirement.

The Harvard Summer School courses CHEM S-1 A, B and CHEM S-20 A, B can be used to complete secondary field requirements with each counted as one year-long course (two 4-credit courses) in Chemistry.

Any Freshman Seminar or General Education course offered by a member of the Department of Chemistry and Chemical Biology (e.g., FS 22J) may be used to count towards a secondary field in Chemistry, if at least two upper-level courses in Chemistry are included as a part of the six required courses.

One course taken abroad may count toward a secondary field in Chemistry if successfully approved by petition to either the Director of Undergraduate Studies.

The sophomore tutorial in Chemistry, offered in the spring term, is optional and cannot be taken for credit by any student. Secondary field students may participate in the sophomore tutorial regardless of class year.

ADVISING RESOURCES AND EXPECTATIONS

Students who notify the Department of their intent to pursue a secondary field will be included on the Chemistry concentrator email list and will be welcome at all undergraduate social and
academic events including the sophomore tutorial. Once a student has chosen a secondary field in Chemistry, the student should contact the Director of Undergraduate Studies (DUS), Dr. Gregg Tucci (tucci@fas.harvard.edu), for advising. Priority for appointments with the DUS will be given to concentrators during Shopping Period.
Secondary Field

Classics

The Department of the Classics offers a secondary field in Classical Civilizations for students wishing to explore an interest in Greco-Roman antiquity and its reception in the medieval and modern periods. The Classical Civilizations secondary field provides both a general introduction to the Greek and/or Roman world and the opportunity to pursue particular interests in greater depth.

REQUIREMENTS: 5 courses (20 credits)

1. One semester of either CLS-STDY 97A or CLS-STDY 97B.
2. Four additional courses from among those listed under Classics in the course search in courses.my.harvard.edu (including cross-listed courses). Other courses may be counted with approval of the Director of Undergraduate Studies.

OTHER INFORMATION
No more than two courses in Modern Greek may count toward the secondary field in Classical Civilizations. Note that Modern GREEK A and B are full-year courses and thus each count as two such courses. One course may be taken pass/fail.

ADVISING RESOURCES AND EXPECTATIONS
Students interested in pursuing a secondary field in Classical Civilizations should contact the Director of Undergraduate Studies, Professor Jared M. Hudson (classicsDUS@fas.harvard.edu).
Secondary Field

Comparative Literature

Comparative Literature offers a secondary field for students who wish to work across languages, cultures, and media in a comparative and interdisciplinary context.

REQUIREMENTS: 5 courses (20 credits)

1. COMPLIT 97 (sophomore tutorial) to be taken as early as possible in the student’s program of study.
2. Two courses from offerings in Comparative Literature at the 100-level or above.
3. Two courses that examine the following:
   a. A literature other than English, with readings of primary texts in that language - and/or-
   b. Works in a non-verbal medium, e.g., painting, film, music.

*Note: 3.a. can include courses from a national literature or area studies department, or any course in which works are read in a language other than English (e.g., HIST 1324: French Social Thought from Durkheim to Foucault).*

OTHER INFORMATION

All courses must be letter-graded and must be passed with a grade of B or above. Freshman Seminars may not be counted towards the fulfillment of the above requirements. However, students may count toward secondary field requirements courses taken while studying abroad, as well as courses taken at the Harvard Summer School. Students pursuing a secondary field in Comparative Literature will receive preferential access to Comparative Literature courses with limited enrollment.

ADVISING RESOURCES AND EXPECTATIONS

All students interested in pursuing a secondary field in Comparative Literature should contact the Director of Undergraduate Studies (DUS), Dr. Sandra Naddaff (617-495-5650, snaddaff@fas.harvard.edu), as soon as possible to discuss their Plan of Study. Since only Comparative Literature students are allowed to enroll in COMPLIT 97, students pursuing a secondary field in Comparative Literature should contact the Director of Undergraduate Studies before the first meeting of the sophomore tutorial. The DUS will be responsible for advising these students, although the expectation will be that students working toward a secondary field in Comparative Literature will monitor their own progress toward fulfillment of the requirements.
Secondary Field

Computer Science

Information technology and computation has had a profound impact on many aspects of society, health care, and the scientific disciplines. As such, a foundation of formal training in Computer Science can benefit undergraduate concentrators in many fields of the natural sciences, social sciences, and humanities. To provide this training, a secondary field in Computer Science requires that students with primary interests in other fields take four courses in Computer Science.

REQUIREMENTS: 4 courses (16 credits)

Any four Computer Science courses satisfying:
1. At most two courses from the set COMPSCI 20, COMPSCI 32 or COMPSCI 50, COMPSCI 51, and COMPSCI 61.
2. All other courses must be numbered COMPSCI 96 or higher.

COMPSCI 32 or 50 will count for secondary credit if taken for a grade of SAT, but all other courses must be taken for a letter grade, and the student must achieve a grade of C- or better in each of these courses.

Only courses with a Harvard Computer Science course number may be counted for secondary field credit. In particular no courses from other Harvard programs/departments, no MIT courses, no study abroad courses and no Freshman Seminars may be counted toward secondary requirements. Computer Science courses offered by the Harvard Summer School may be used for a Secondary Field in Computer Science only if they would count for concentration credit in Computer Science. A course from another Harvard program/department counts only if it also has an appropriate Harvard Computer Science course number (e.g., a Statistics course that also has a Computer Science course number 100 or greater). Only one course may double count for a secondary field and concentration.

ADVISING RESOURCES AND EXPECTATIONS

Questions concerning this secondary field should be addressed to the Directors and Assistant Director of Undergraduate Studies in Computer Science (cs-dus@seas.harvard.edu). The Directors and Assistant Director of Undergraduate Studies are available to help students choose Computer Science courses that best meet their interests and objectives. Transfer students who wish to use some of their coursework in their prior institution towards secondary credit should contact the Computer Science Directors and Assistant Director of Undergraduate Studies.
Secondary Field

Earth and Planetary Sciences

Almost every practical aspect of society—population, environment, economics, politics—is and will be increasingly impacted by our relationship with the Earth. Students with a natural curiosity about the Earth’s or another planet’s dynamic systems should consider studying in the Department of Earth and Planetary Sciences (EPS).

The EPS secondary field is intended to allow students to sample broadly across the offerings, or for students who have sufficient preparation in Physics, Chemistry, and Mathematics to provide a strong foundation in a subfield of Earth science (atmospheric and ocean science, energy and climate, environmental geoscience, geobiology, geochemistry, geology, planetary sciences, and solid earth geophysics). The EPS Department covers a wide range of pure and applied scientific topics, and therefore consultation with a faculty adviser will be required for secondary field students. Secondary field students will be required to take the departmental tutorial, an ongoing series of lectures by faculty scheduled periodically through the academic year. The tutorial exposes concentrators and secondary fielders to the breadth of Earth and Planetary Sciences and provides a setting for students to get acquainted with one another and with members of the faculty.

REQUIREMENTS: 5 courses (20 credits) and department tutorial

1. Required courses: A total of five EPS courses.
   a. A minimum of two foundational courses from either E-PSCI 10 or GENED 1018, 1070, 1085, 1094, 1098, 1137, 1158, and 1167, and all 50-level EPS courses. Note: No more than one of these from E-PSCI 10 or GENED 1018, 1070, 1085, 1094, 1098, 1137, 1158, and 1167. In order for a General Education course to count toward concentration credit, a student should take it prior to enrolling in any EPS courses.
   b. Three additional courses in EPS.

OTHER INFORMATION

Freshman Seminars do not count toward secondary field credit.

All courses must be taken for a letter grade in order to count toward secondary field concentration credit, and normally C- is the minimum acceptable grade.

An important aspect of the EPS concentration is participation in field trips and/or summer and January field camps, supported by the Department. These opportunities will be available to secondary field students on a space-available basis, after placement of concentrators.

ADVISING RESOURCES AND EXPECTATIONS

Students will submit an EPS form to become a secondary field student as early as possible, but no later than the course enrollment deadline of their penultimate term; the Department will then assign a faculty member to be an adviser. This form can be found on Department’s website (https://www.eps.harvard.edu/); paper copies are available from the Academic Programs Manager. The Academic Programs Manager will also provide guidance on course selection, as well as review student records to certify completion of requirements. Once the course
requirements have been fulfilled, students will follow the Faculty of Arts and Sciences (FAS) procedures to confirm in my.harvard that requirements have been met.

The Department of Earth and Planetary Sciences wants to encourage students who are pursuing a secondary field in EPS to become full Department community members. Secondary field students will be invited to all events and activities currently open to concentrators.

Students interested in pursuing a secondary field in Earth and Planetary Sciences should contact one of the following:

- **Co-Head Tutor**: Professor Roger Fu, Geo Museum 204B, 617-384-6991, rogerfu@fas.harvard.edu.
- **Co-Head Tutor**: Professor Zhiming Kuang, Geo Museum 455, 617-495-2354, kuang@fas.harvard.edu.
- **Academic Programs Manager**: Campbell Halligan, Hoffman Labs 403, 627-384-9760, campbellhalligan@fas.harvard.edu.
Secondary Field

East Asian Studies

The East Asian Studies (EAS) secondary field allows students whose primary concentration is not EAS to obtain an in-depth knowledge of one or more aspects of the culture and societies of East Asia (China, Korea, Japan). Students will select, in consultation with an academic adviser, a coherent set of classes from the rich offerings of the Department of East Asian Languages and Civilizations (EALC) and other departments at Harvard that offer classes on East Asian topics.

Students are not required to focus on a specific area, but suggested paths within the secondary field of East Asian Studies include: Modern and Contemporary East Asian Studies, Chinese Studies, Japanese Studies, Korean Studies, Chinese History, Japanese History, Korean History, Chinese Literature and Arts, Japanese Literature and Arts, Korean Literature and Arts, and East Asian Buddhism.

REQUIREMENTS: 6 courses (24 credits)

1. EASTD 97AB: Introduction to East Asian Civilizations (sophomore tutorial, spring).
2. One introductory course from the list below:
   a. Aesthetic and Interpretive Understanding 35: Korea Indigenous
   b. Aesthetic and Interpretive Understanding 36: Buddhism and Japanese Culture
   c. Aesthetic and Interpretive Understanding 39: Old Tales for New Times: The Appropriation of Folklore in Modern and Contemporary China
   d. Culture and Belief 11: Medicine and the Body in East Asia and in Europe
   e. Culture and Belief 33: Introduction to the Study of East Asian Religions
   f. Culture and Belief 40: Popular Culture in Modern China
   g. Ethical Reasoning 25: Confucian Humanism: Self-Cultivation and Moral Community
   h. Ethical Reasoning 18: Classical Chinese Ethical and Political Theory
   i. GENED 1136: Power and Civilization: China (formerly SW 12).
   j. HIST 1023: Japan in Asia and the World (formerly SW 13).
   k. GENED 1100: The Two Koreas in the Modern World (formerly SW 27).
   l. Societies of the World 37: The Chinese Overseas
   m. Societies of the World 45: Beyond the Great Wall: China and its Nomadic Frontier
   n. Or another general survey course concerning East Asian history with the written permission of the Director of Undergraduate Studies.
3. At least one, but preferably two, 100-level courses offered by EALC. 100-level language courses do not satisfy this requirement, but students may apply to substitute a 100-level class with an East Asia emphasis offered by another department at Harvard.
4. The remaining courses can be selected from any subjects related to East Asia to make a total of six courses for secondary field credit.
5. Please note: Up to two classes in an East Asian language may count toward the required six courses. The secondary field does not, however, require any language courses.

OTHER INFORMATION

Courses for the secondary field may be offered by EALC or by other departments at Harvard, as long as the emphasis of the course is clearly on an East Asian subject. Courses offered in other
departments that are taught by EALC faculty automatically count for credit for the secondary field, as do courses that are cross-listed in the EALC course search in courses.my.harvard.edu. Others must be approved by the Department.

General Education courses on East Asia can be counted for secondary field credit. Relevant Harvard Summer School courses and study abroad courses may be counted with permission of the Director of Undergraduate Studies.

All courses must be letter-graded, with the exception of one Freshman Seminar related to an East Asian subject and one course that may be taken pass/fail with special written permission from the Director of Undergraduate Studies. EASTD 97AB may not be taken pass/fail.

Students who are primarily interested in enhancing their language skills in one of the East Asian Languages—Chinese, Korean, Japanese, Vietnamese—should consider a language citation (https://handbook.fas.harvard.edu/student-handbook/file:C:/Users/escolas/AppData/Local/Microsoft/Windows/INetCache/Content.Outlook/B24QYB2Z/book/other-academic-opportunities). Information on language citations can be obtained by emailing eal@fas.harvard.edu.

**ADVISING RESOURCES AND EXPECTATIONS**

Those students interested in a secondary field in East Asian Studies should contact the EAS Undergraduate Office at eas@fas.harvard.edu or by calling 617-495-8365.
Economics is a social science that covers a broad subject matter in seeking to understand the social world. An economic analysis begins from the premise that individuals have goals and that they pursue those goals as best they can. Economics studies the behavior of social systems—such as markets, corporations, legislatures, and families—as the outcome of interactions through institutions between goal-directed individuals. Ultimately, economists make recommendations that they believe will make people better off.

Traditionally, economics has focused on understanding prices, competitive markets, and the interactions between markets. Important topics such as monopolies and antitrust, income inequality, economic growth, and the business cycle continue to be central areas of inquiry in economics. Recently, though, the subject matter of economics has broadened so that economists today address a remarkable variety of social science questions: Will school vouchers improve the quality of education? Do politicians manipulate the business cycle? What sort of legal regime best promotes economic development? Why do cities have ghettos? What can be done about grade inflation? Why do people procrastinate in saving for retirement—or in doing their homework?

Economics today is a scientific discipline. Bringing their particular perspective to social science questions, economists formulate theories and collect evidence to test these theories against alternative ideas. Doing economic research involves asking questions about the social world and addressing those questions with data and models, employing mathematical and statistical tools whenever possible to aid the analysis.

An undergraduate education in Economics focuses on learning to analyze the world in terms of tradeoffs and incentives—that is, to think like an economist.

**REQUIREMENTS: 6 courses (24 credits)**

1. **ECON 10A and 10B: Principles of Economics (2 courses).**
   a. *Note:* All students are required to take ECON 10A and 10B, the introduction to current economic issues and to basic economic principles and methods.
   b. *Note:* Students with Economics AP scores of 5, or A levels or IB scores of 7, may choose to skip either/both parts of ECON 10. However, they must replace each semester of ECON 10 that is skipped with one elective course in Economics. Consult the Economics Concentrator Handbook or a concentration adviser for details.

2. One course from:
   a. **ECON 1010A/1011A: Intermediate Microeconomic Theory.**
   b. **ECON 1010B/1011B: Intermediate Macroeconomic Theory.**
      i. *Note:* These intermediate theory courses teach the analytical tools that economists use. The 1011 courses assume a background in multivariate calculus whereas the 1010 courses have a prerequisite of single variable calculus. A minimum grade of B- is required.

3. Three courses from the Economics course catalog, available on courses.my.harvard.edu.

4. *Note:* All Economics courses and cross-listed courses in the Department are eligible, except for ECON 910R: Supervised Reading and Research; ECON 970: Sophomore Tutorial; ECON 985 and ECON 990 senior thesis seminars; and some graduate-level research workshops and seminars. In particular, taking both...
1010A/1011A and 1010B/1011B meets requirement 2 above, as well as one of the three courses in requirement 3.

5. *Note:* In contrast to students who are concentrating in Economics, there is no requirement to take Economics courses that fulfill a writing requirement or that have intermediate theory as a prerequisite.

**OTHER INFORMATION**

All courses counting for secondary field credit must be taken for a letter grade.

Courses given in other Faculty of Arts and Sciences (FAS) departments or other Harvard faculties may not be used for credit in the secondary field, unless they are explicitly cross-listed or jointly offered in the Economics course catalog on courses.my.harvard.edu. The only exception is that one of STAT 100, 104, 109, 110, APMTH 101, or MATH 154 qualifies as one of the three courses under requirement 3.

Students may take either one approved Harvard Summer School class listed on the Economics Summer School webpage (http://economics.harvard.edu/summer-school) or one approved study abroad course or one approved cross-registered course at MIT to meet a course requirement for the secondary field. Courses from study abroad and at MIT are approved at the Department's discretion as outlined on the Economics Study Abroad webpage (http://economics.harvard.edu/study-abroad). Please note: Due to COVID-19, the Economics Department is allowing secondary field students in the Classes of 2021, 2022, and 2023 to count more Harvard Summer School Classes towards the Economics concentration. Please see the Economics Summer School webpage for details.

Freshman Seminars may not be used for credit in the secondary field.

Students pursuing a secondary field in Economics are not given preferential access to limited enrollment courses.

Only one course may double-count towards both your concentration and your secondary field. This is a Harvard College policy.


**ADVISING RESOURCES AND EXPECTATIONS**

Students may visit the concentration advisers in the Economics Undergraduate Advising Offices in Littauer 109-116 from 10am-4pm, Monday-Friday for advice about the program, course selection, and more. The Undergraduate Program Coordinator (econundergrad@fas.harvard.edu) is also available for general inquiries. One of the concentration advisers must sign the final form for secondary field credit. The secondary field form and more information are available on the Department’s Secondary Field webpage at https://economics.harvard.edu/secondary-field.
Secondary Field

Educational Studies

The Educational Studies secondary field offers students an opportunity to examine education from multiple disciplinary perspectives. Education is an intentional intervention in human development. For as long as we know, human beings have been interested in how to shape children into adults who understand cultural values and can contribute to the needs of the community. In modern societies, education is seen as a prime lever for a number of key (and sometimes conflicting) goals, such as increasing national economic competitiveness, supporting upward mobility, improving public health, increasing civic engagement, and achieving global understanding. In addition, defining features of contemporary life, such as the proliferation of digital technologies and global migration, have significant implications for education. As a result, questions about education are central to number of academic disciplines, including Psychology, Sociology, Economics and Government. The Education Studies Secondary leverages this multidisciplinary interest in education and allows students to create a coherent program of study from courses offered across the University.

Students pursuing the secondary field may explore a broad overview including course work related to individual learning, schools as organizations, the role of education in society and educational policy. Alternatively, students may choose to focus in depth on a particular aspect of education such as social stratification, literacy, childhood and adolescence, or policy. Students are encouraged to be in touch with the Director of the secondary field for help developing a Plan of Study.

REQUIREMENTS: 5 courses (20 credits)

1. One foundational course, from an approved list of courses.
2. Four additional courses related to education from an approved list of courses (or approved through petition).
   a. Note: Three of the five courses must be offered by distinct academic units (departments or schools). A list of approved courses in education is available at Educational Studies secondary field website.
3. A capstone project related to education. This can include:
   a. Writing a senior thesis on a topic related to education.
   b. Taking a course on education that requires a significant research project.
   c. Writing a research paper related to education while enrolled in a supervised reading and research course.
   d. Working in a laboratory or as a research assistant on a study related to education.
   e. Completing an extracurricular project that involves significant learning and reflection.

Note: The capstone project must be approved by the Director of the secondary field before the project is undertaken. It can be undertaken in one of the five courses satisfying requirements for the secondary field or in another course not counting toward the secondary field. The Director of the secondary field can help identify and arrange opportunities for the capstone project.

OTHER INFORMATION

Students will be encouraged to declare their interest in the Secondary Field in Educational Studies during their junior year and may not declare after November 1 of their senior year.
Due to Faculty of Arts and Sciences (FAS) regulations, students may double count only one course toward both their secondary field and their concentration.

Although it is possible to fulfill the program requirements solely with FAS courses, most students will likely take one or two courses from professional schools. Consistent with the FAS regulations on cross-registration, students will be able to count no more than 2 courses (8 credits) towards their degree.

ADVISING RESOURCES AND EXPECTATIONS

For additional information and advice about the program and course selection, students may contact the Faculty Director, Professor Julie Reuben (julie_reuben@harvard.edu) or the Program Administrator, Matt Tallon (matthew_tallon@gse.harvard.edu). Additional information can be found on the Educational Studies secondary website (https://edsecondary.fas.harvard.edu/).
Secondary Field

Energy and Environment

The energy-environment challenge is a defining issue of our time, and one of Harvard’s greatest contributions to meeting that challenge will be the education of a new generation of leaders in science, business, law, design, and public service. To this end, the Environmental Science and Public Policy (ESPP) program (http://www.espp.fas.harvard.edu/), in coordination with the Harvard University Center for the Environment (HUCE), is pleased to offer the secondary field in Energy and Environment (E&E). Through coursework and a colloquium, students engaged in the E&E secondary field will increase their exposure to, and literacy in, the interdisciplinary nature of issues related to Energy and the Environment.

In the context of the E&E secondary field, ‘Energy’ refers to the production, distribution, and use of energy by individuals and society for a variety of purposes. This includes the various technologies, policies, and challenges associated with meeting increasing global energy demands. ‘Environment’ refers to the understanding of the relationships and balances of the natural and constructed world at multiple scales, including how anthropogenic activities and policies affect the relationships between energy demand, environmental quality, and climate change.

Students from a wide range of concentrations, including the humanities, are invited to participate in the program to explore how different disciplinary perspectives on energy and environment intersect and inform one another. For example, a student concentrating in English may wish to increase their knowledge of the environment and energy in the context of environmental literature or history. A student studying global health may want to better understand the impacts of climate change on water resources, nutrition, and human health. Or, a student in the physical sciences may want to expand their training by improving their understanding of climate dynamics and energy production to support their interest in materials science and energy storage. All participating students share exposure to the core issues related to climate change, the consequences of energy choices, and changes in our physical and biological environment, preparing them to make informed professional and personal decisions about some of the most pressing societal challenges of the 21st century.

REQUIREMENTS: 4 courses (16 credits) and colloquium participation

The E&E secondary field requires the successful completion of 4 courses, including one foundational course and three upper-level courses. Students must also participate in a program colloquium, as outlined below.

Students choose one of the following foundational courses, all of which include content related to both Energy and Environment:

2. GENED 1094: The Climate-Energy Challenge.
3. GENED 1137: The Challenge of Human Induced Climate Change: Transitioning to a Post Fossil Fuel Future.
5. ESE 6: Introduction to Environmental Science and Engineering.

Students must choose three additional upper-level courses.
At least one course must be chosen from each of two elective categories: Social Sciences and
Humanities, and Natural Sciences and Engineering. The complete list of course options can be found on the ESPP website at http://espp.fas.harvard.edu/secondary-field-courses.

Colloquium
During each semester there are several opportunities for E&E secondary field students to come together to explore various energy and environmental topics through facilitated discussions. Some colloquia will require preparatory readings and others will require prior attendance at a public lecture on campus. Students are required to attend at least one colloquium each semester, beginning at the time of their acceptance into the program.

OTHER INFORMATION
Students must declare their engagement in this secondary field no later than course enrollment deadline of their sixth term and are required to complete an application form. Students may petition the ESPP Head Tutor, in advance, for the approval of any exceptions to the course options for the secondary field, including courses offered in Study Abroad programs, at the Harvard Summer School, or any of Harvard’s other schools. Freshmen seminars do not count toward secondary field requirements. All courses counting towards the E&E secondary field must be taken for a letter grade. A grade of “C” or better is required for secondary field credit.

ADVISING RESOURCES AND EXPECTATIONS
The ESPP Head Tutor, Professor N. Michele Holbrook (holbrook@oeb.harvard.edu), or the Secondary Field Administrator, Lorraine Maffeo (maffeo@fas.harvard.edu), are available for advice about the secondary field. Students will be assigned an adviser following their submission of an anticipated Plan of Study.
Secondary Field

English

The Department of English offers one secondary field for non-concentrators. It is designed to be flexible enough to accommodate every kind of interest in this broad field.

The requirements detailed below apply to students declaring a secondary field in English beginning in academic year 2020-21. Students declaring the secondary field prior to 2020-21 should consult the relevant archived version of the Handbook for Students at https://registrar.fas.harvard.edu/archived-handbooks and contact the Department for further information.

REQUIREMENTS: 6 courses (24 credits)

English 20: Literary Forms. This course introduces students to genre and to how genres respond to changes in the world.

Five Electives: Five more courses taught by English Department faculty complete the requirements. Three of these courses are guided electives, courses on any subject that introduce students to the variety of writers and genres that make up the 1300-year tradition of literature in English:

1. One must primarily address texts written before 1700.
2. One must primarily address texts written between 1700 and 1900.
3. One must primarily address texts written between 1900 and 2000.
4. Two courses are open electives and may be creative writing workshops.

OTHER INFORMATION

The six courses may be taken in any sequence. With the exception of Freshman Seminars taught by English Department faculty, each course must be taken for a letter grade, with a minimum grade of C-. The six required courses must be completed by the end of the senior year.

ADVISING RESOURCES AND EXPECTATIONS

Students pursuing a secondary field are urged to seek out members of the English Department faculty for advice on their specific course choices. For general information about the Department, its faculty, and its courses, please visit the department website at https://english.fas.harvard.edu/.

For more information on the secondary field and for advising, please speak to the Undergraduate Program Assistant/Secondary Field Coordinator, Henry Vega Ortiz.
Environmental Science and Public Policy

The Environmental Science and Public Policy (ESPP) secondary field (www.espp.fas.harvard.edu) provides students with a multi-disciplinary introduction to the complex environmental challenges confronting society today. These challenges require an understanding of the underlying scientific and technical issues, as well as an appreciation for the relevant economic, political, legal, historical, and ethical dimensions.

Students become well-versed in the broad, interconnected issues of environment and public policy through course work and a colloquium. Students choose courses in Biology, Chemistry, Earth and Environmental Sciences, Economics, Government, Engineering, and Mathematics, complementing their primary studies with courses that will provide balanced exposure to Environmental Science and Policy perspectives.

**REQUIREMENTS: 5 courses (20 credits) and colloquium participation**

The ESPP secondary field requires the successful completion of 5 courses, including one foundational course and four upper-level courses. Students must also participate in a program colloquium, as outlined below.

**Students choose one of the following foundational courses:**

2. ESE 6: Introduction to Environmental Science and Engineering.
5. GENED 1137: The Challenge of Human Induced Climate Change: Transitioning to a Post Fossil Fuel Future.

**Students must choose at least four additional upper-level courses.**

At least two courses must be chosen from each of two elective categories: Social Sciences and Public Policy, and Natural Sciences and Engineering. The complete list of course options can be found on the ESPP website at http://espp.fas.harvard.edu/pages/secondary-field-requirements-new.

**Colloquium**

During each semester there will be several evening discussion sessions that are intended specifically to engage ESPP secondary field students in discussion with Harvard faculty. Some will require preparatory readings and others will require prior attendance at a public lecture on campus. Students will be required to attend at least one session for each semester once they have been accepted into the program.
Other Information

Students must declare their engagement in this secondary field no later than course enrollment deadline of their sixth term and are required to complete an application form.

Students may petition the ESPP Head Tutor, in advance, for the approval of any exceptions to the course options for the secondary field. Substitutions with courses offered in Study Abroad programs, at the Harvard Summer School or any of Harvard’s other schools may with prior permission count toward the secondary field requirements.

Freshmen seminars do not count toward secondary field requirements. All courses counting towards the secondary field must be taken for a letter grade. A grade of “C” or better is required for secondary field credit.

ADVISING RESOURCES AND EXPECTATIONS

The ESPP Head Tutor, Professor N. Michele Holbrook (holbrook@oeb.harvard.edu), or Lorraine Maffeo, Program Administrator, (maffeo@fas.harvard.edu), are available for advice about the secondary field. Students will be assigned an adviser following their submission of an anticipated Plan of Study.
Secondary Field

Ethnicity, Migration, Rights

The secondary field in Ethnicity, Migration, Rights (EMR) offers students an opportunity to pursue sustained, interdisciplinary study of ethnicity, migration, Indigeneity, and human rights, with special attention to Asian American and Pacific Islander, Latinx, Muslim American, Native American, and Migration and Border Studies. Courses in EMR are taught by faculty from humanities and social science disciplines across the Faculty of Arts and Sciences (FAS) and other Harvard schools.

Study in EMR allows students to explore our core areas from a variety of disciplinary and interdisciplinary perspectives. Students who decide to pursue the secondary field can choose from a wide range of courses under the guidance of the Administrative and Program Director and members of the Faculty Advisory Committee. Given the relevance of EMR topics to both local and global issues, the secondary field both encourages and provides opportunities for interacting directly with local communities and working outside the traditional classroom.

The secondary field in EMR offers opportunities to focus in a meaningful way in the areas of ethnicity, migration, Indigeneity, and human rights. Students may take courses in several of these areas, and choose between two tracks: Latinx Studies and EMR.

REQUIREMENTS: 5 courses (20 credits)

The Committee offers two secondary field pathways. Students must complete five courses from the approved course list, which can be found in the course search in courses.my.harvard.edu and on the EMR website at http://emr.fas.harvard.edu/.

Ethnicity, Migration, Rights

The general pathway in EMR requires five courses (20 credits):

1. One portal course: Courses designated as portal courses are meant to give students an overview of one or more of our core areas. On occasion, a student may be granted permission to use another course from the list as a portal course. Students wishing to discuss this option should do so with the Administrative and Program Director.

2. Four additional courses must be taken, two of which must be above the introductory level.

3. At least one course must have a transnational, comparative, or global focus.

Latinx Studies

The goal of this secondary pathway is to support study of the experiences, cultures, and traditions of knowledge of Latinx communities in the United States with attention to history, language, demographics, legal rights, and immigration.

Five courses (20 credits) are required:

1. One portal course in Latinx Studies. Courses designated as portal courses are meant to give students an overview of one or more of our core areas. On occasion, a student may be granted permission to use another course from the list as a portal course. Students
wishing to discuss this option should do so with the Administrative and Program Director.

2. Three elective courses in Latinx Studies. Two of these electives must be above the introductory level.

3. One comparative course. Comparative courses should consider study of ethnicity and culture from another perspective, which may include the study of another ethnic group within the United States or another globally comparative framework.

Note: A maximum of two courses in Latin American Studies may count towards the secondary field.

OTHER INFORMATION

Four of the five courses must be taken for a letter grade and passed with a B- or higher. One course, including approved Freshman Seminars, may be taken pass/fail or SAT/UNSAT.

Courses related to the fields of EMR from study abroad, Harvard Summer School, and other Harvard schools may count toward the secondary field with approval by the Administrative and Program Director.

Harvard College policy states that only one course may be double-counted for concentration credit and secondary field credit. There is no limit to the number of courses that can be double-counted for secondary field credit and General Education credit.

Students should consult with the Administrative and Program Director for guidance in choosing appropriate courses or to request approval for course exceptions.

ADVISING RESOURCES AND EXPECTATIONS

To declare your interest in pursuing the secondary field in EMR, please go online and follow the prompts of the Secondary Field Web Tool at https://emr.fas.harvard.edu/secondary. Students considering the secondary field should consult with the Administrative and Program Director Eleanor Craig at eleanor_craig@fas.harvard.edu as soon as possible. Students working towards a secondary field in EMR can reach out to members of the Faculty Advisory Committee for guidance on course path, extracurricular options, and other questions. See the EMR website (https://emr.fas.harvard.edu/) for a list of affiliated faculty members and course catalog archives.
European History, Politics, and Societies

The Secondary Field in European History, Politics, and Societies (EHPS) offers students the opportunity to pursue an interdisciplinary course of study focused on modern Europe, in particular its politics, economics, history, and social and cultural developments.

While the EHPS rests mainly on courses from the social science disciplines, it also includes those considering Europe in a comparative context as well as courses covering a specific period or region of Europe. In addition, it provides for a humanistic inquiry of Europe reflecting its diverse cultural and linguistic heritage through a broad array of courses from the humanities departments.

This interdisciplinary structure allows for multiple paths of research and specialization, and accommodates a variety of approaches in a study of Europe. The Secondary Field is based at the Minda de Gunzburg Center for European Studies (CES), the locus of innovative research on European history and contemporary affairs. As members of the EHPS cohort, students also are integrated into CES programming such as the lectures, conferences and seminar series, the Europe in Washington Workshop, the CES Student Society, etc.

**REQUIREMENTS: 6 courses (24 credits)**

1. A minimum of three courses must be in social science disciplines (Anthropology, Economics, Government, History, Sociology, or Social Studies).
2. The six courses must come from at least two different departments/disciplines.
3. A minimum of three courses must be regular departmental courses (i.e., not General Education courses, Freshman Seminars, or House Seminars).
4. One course of relevant language study on intermediate or advanced level may count towards the secondary field.

**OTHER INFORMATION**

For more information, visit the EHPS website of the Minda de Gunzburg Center for European Studies (CES) ([https://ces.fas.harvard.edu/opportunities/undergraduates/secondary-field-in-european-history-politics-and-societies-ehps](https://ces.fas.harvard.edu/opportunities/undergraduates/secondary-field-in-european-history-politics-and-societies-ehps)). All courses must be taken for a letter grade and completed with a grade of B- or above, with the exception of Freshman Seminars, which may be applied toward the secondary field with a grade of SAT. Students may petition the EHPS Coordinator to potentially receive credit for courses which may be relevant to the program of study but are not listed as part of the approved courses, including one course of credit taken through Harvard’s Summer Study Abroad Program. (*Please note: Relevant courses taken during spring 2020 term under the Emergency Grading System will qualify for the EHPS with a grade of SAT*).

**ADVISING RESOURCES AND EXPECTATIONS**

To declare your interest in pursuing the secondary field in European History, Politics, and Societies (EHPS), please follow the prompts of the Secondary Field Web Tool at [https://ces.fas.harvard.edu/opportunities/undergraduates/secondary-field-in-european-history-politics-and-societies-ehps](https://ces.fas.harvard.edu/opportunities/undergraduates/secondary-field-in-european-history-politics-and-societies-ehps). We recommend that students register for the field as early as possible in order to take advantage of the rich program of lectures offered by
the Minda de Gunzburg Center for European Studies (CES) as well as internships, thesis workshop, and funding. Students considering this specialization should consult with the CES Program Coordinator Laura Falloon (laurafalloon@fas.harvard.edu) to discuss a selection of courses and interests, and to connect with the relevant faculty members.
Folklore and Mythology

“Folklore is a body of traditional belief, custom, and expression, handed down largely by word of mouth and circulating chiefly outside of commercial and academic means of communication and instruction. Every group bound together by common interests and purposes, whether educated or uneducated, rural or urban, possesses a body of traditions which may be called its folklore. Into these traditions enter many elements, individual, popular, and even "literary," but all are absorbed and assimilated through repetition and variation into a pattern which has value and continuity for the group as a whole.”

-Benjamin A. Botkin, 1938.

Folklore and Mythology as a discipline focuses on the study of society, past or present, through its cultural documents and artifacts—its folklore—and uses a variety of methodologies drawn from the humanities and social sciences to understand them. To concentrate on a society's folklore and mythology (on sub-national as well as national levels) is to understand its traditional self-definition through its myths, epics, ballads, folktales, legends, beliefs, and other cultural phenomena, including music, song, and dance. Studying a group's folklore shows how it identifies itself in relation to other groups.

Inherently interdisciplinary, the study of Folklore and Mythology often draws resources from several disciplines, while maintaining its own methodological lens. Students wishing to meet the requirements for a secondary field in Folklore and Mythology must take GENED 1097: Tradition, Performance, and Culture, one of the F&M topical seminars in the field, and three other courses chosen from Folklore and Mythology and/or cross-listed courses as listed in courses.my.harvard.edu and on the Folklore and Mythology website.

To guarantee a focused and coherent program of study in Folklore and Mythology as a secondary field, interested students should make an appointment with the Head Tutor as soon as possible. Students who notify the Head Tutor early on of their intention to pursue a secondary field in Folklore and Mythology will ensure that they are invited to special lectures, film showings, lunches, excursions, and receptions.

REQUIREMENTS: 5 courses (20 credits)

1. GENED 1097: Tradition, Performance, and Culture. Explores major forms of folklore (e.g., myths, legends, beliefs, rituals, festivals), as well as the theoretical approaches (e.g., performance theory, the ethnography of communication) used to interpret cultural documents drawn from the world of traditional expression and ritualized behavior (Mitchell).
2. One Folklore and Mythology seminar, each of which examines a specific topic in the field.
3. Three courses from among those offered in Folklore & Mythology or the cross-listings.
OTHER INFORMATION

With the exception of approved Freshman Seminars, all courses must be taken for a letter grade. Grades should be B- or above. Harvard Summer School courses and study abroad courses taught by Department faculty may count towards the secondary field. Students may petition the program to count, at most, one study abroad course taught by non-Department faculty by presenting the syllabus and papers from the course to the Head Tutor or Chair.

Secondary field students, who have officially recorded their intention, are often granted preferential access to limited enrollment courses. Individual faculty members will determine the priority of enrollment.

ADVISING RESOURCES AND EXPECTATIONS

Students are encouraged to meet with the Head Tutor, Dr. Lowell Brower (labrower@fas.harvard.edu) or the Chair, Professor Stephen Mitchell (samitch@fas.harvard.edu). By doing so and by notifying the program using the secondary fields web tool, they will not only receive advice on courses, they will also be invited to concentration activities and events. Students may also contact Department Administrator Holly Hutchison at hhutchis@fas.harvard.edu for information.
Secondary Field

Germanic and Scandinavian Studies

German is the second most spoken language in all of Europe, the most prevalent native language in the European Union, and the third most-taught foreign language worldwide. The rich cultural, intellectual, and scientific tradition of the German-speaking nations makes this a popular secondary field for students concentrating in History of Art and Architecture, History of Science, Linguistics, Comparative Literature, Music, Philosophy, Psychology, Comparative Study of Religion, Social Studies, Sociology, and the other language and literature fields. The role of the German-speaking nations in world history, their economic significance, and their crucial role in the politics and economics of the European Union give German particular relevance for students concentrating in History, Government, or Economics. Present-day Germany offers important perspectives on such issues as globalization and multi-culturalism. For these reasons, students in any undergraduate concentration who have attained a good working knowledge of German may wish to explore German cultural and intellectual history in greater depth, while also achieving greater fluency in the language.

Spoken by some twenty-five million inhabitants of northern Europe, the Scandinavian languages are official national languages in five countries (Denmark, Finland, Iceland, Norway, and Sweden), as well as three autonomous regions (the Åland Islands, the Faroe Islands, and Greenland). Famed for the Icelandic sagas and other heroic legacies of the Viking Age, medieval Scandinavian literature is among the most renowned of the European Middle Ages, while modern Nordic culture boasts many world-class writers, artists, designers, and filmmakers—e.g., Henrik Ibsen, August Strindberg, Edvard Munch, Alvar Aalto, Ingmar Bergman, Lars von Trier. Known for their leadership in international development issues, peace negotiations, and sustainability initiatives, as well as their domestic social experiments, the Nordic countries often have held a prominent place on the modern world stage and offer students excellent opportunities for cross-cultural perspectives and research.

The Department of Germanic Languages and Literatures offers courses in German, Nordic languages, and English on topics of cultural and historical interest. Important figures such as Marx, Freud, Nietzsche, and Kafka are the subject of regular lecture courses, as are such topics as the Vikings and the Nordic heroic period, the German colonial imagination, Nazi film, Nordic cinema, and Germanic folklore. Smaller, discussion-type courses cover the age of Goethe, nineteenth-century Realism, the relationship between Germany and the European Union, America in the German mind, German music, German and Scandinavian drama, and much more.

This secondary field is designed to be as flexible as possible so that individual students, with the help of the Director of Undergraduate Studies, can construct the most meaningful program for their needs.

REQUIREMENTS: 5 numbered courses (20 credits)

1. Two of the five courses must be at the 100 level or above.
2. Three of the five courses must be ones in which all texts are read in the original language.
OTHER INFORMATION

Up to two General Education courses regularly offered by faculty in the Department may count toward the secondary field. However, only one class can count towards both General Education and the secondary field. Freshman seminars taught by members of the Department count toward the secondary field. Courses should be selected from those listed and cross-listed under Germanic Languages and Literatures in the course search in the Courses of Instruction. Appropriate substitutions may be made with permission of the Director of Undergraduate Studies (DUS).

In consultation with the DUS, all levels of less commonly taught Germanic and Nordic languages (e.g., Swedish, Danish, Norwegian, Yiddish, Icelandic, or Finnish) may be counted towards the secondary field.

With the exception of one approved Freshman Seminar (which must receive the grade of SAT), all courses must be taken for a letter grade and cannot be taken pass/fail; a grade of B- or better is required for these courses to count towards the secondary field.

Harvard Summer School courses and study abroad courses may be counted upon approval of the Director of Undergraduate Studies.

ADVISING RESOURCES AND EXPECTATIONS

Students interested in pursuing a secondary field should contact the Director of Undergraduate Studies for German, Dr. Lisa Parkes (lparkes@fas.harvard.edu, 617-495-3548); or the Director of Undergraduate Studies for Scandinavian, Dr. Agnes Broomé (agnesbroome@fas.harvard.edu, 617-496-4158).
Global Health and Health Policy

The incidence and meaning of disease and injury, the quality and cost of health care services to prevent and treat those diseases and injuries, the variable access of citizens to those services, the role of government and politics in the provision and regulation of health care – these fundamental issues and many more are central concerns of health policy in the United States and abroad. Indeed, health care affects the life of every individual, whether through the financing of health insurance, both public and private, the treatment of illness, the care of the frail elderly, the dissemination of information about the health risks of smoking and benefits of exercise and other behaviors that affect health, or the adoption of regulations to reduce human exposure to toxic chemicals in the environment.

A secondary field in Global Health and Health Policy (GHHP) could explore any of these topics within the United States or across the world, moving into such themes as: accountability and governance – the role of the state versus transnational organizations and corporations in global health; the relevance and morality of global socioeconomic inequality in health; the risk of pandemic diseases and their economic and psychological impact on populations; the consequences of political change in a country’s health; and the challenges resulting from complex emergencies and vulnerable populations in fragile states.

The natural sciences, the social sciences, and the humanities all contribute to the study of global health and health policy. Harvard offers many different perspectives and programs concerning health. Students may explore all aspects of health care, health policy, and health science through many perspectives, approaches and subject matters in the health domains that attract students with potentially quite different interests and that provide them with complementary forms of knowledge. Upon completion of the secondary field, GHHP students will know how to actively engage with complex themes from a variety of perspectives, conduct health-related research, and critically think about a spectrum of health issues, both domestic and global.

REQUIREMENTS: 5 courses (20 credits)

1. One foundational course, chosen from the following options:
   a. GENED 1063: World Health: Challenges and Opportunities.
   b. GENED 1079: Why Is There No Cure for Health Care?

2. Three additional courses, one course in three of the following eight categories:
   a. Health Policy:
      i. Economics of Health.
      ii. Ethics of Health.
      iii. Health and Demography.
      v. History and Practice of Medicine.
   b. Science of Health and Disease:
      i. Engineering Sciences and Statistics.
      ii. Science Health and Disease.
   c. Note: A list of courses in each category is available at the GHHP web site (http://ghhp.fas.harvard.edu/). Note that the eight categories are divided into two
areas, Health Policy and Science of Disease. Students are encouraged to take at least one course from both thematic areas.

3. One course to fulfill the research component of the secondary field in Global Health and Health Policy. The research component must be on an approved topic. For information on the approval process and deadlines, please consult the GHHP web site (http://ghhp.fas.harvard.edu/). The research requirement may be fulfilled in one of four ways:
   a. Writing a senior thesis pertaining to Global Health or Health Policy in one’s concentration. One term of the Senior Thesis Tutorial will double count for the concentration and secondary field.
   b. Adding a thesis chapter on the global health or health policy implications of a hard science, Engineering, or Computer Science thesis. One term of the Senior Thesis Tutorial will double count for the concentration and secondary field.
   c. Writing a research paper related to Global Health or Health Policy in GHHP 99: Research in Global Health and Health Policy.
   d. Writing a research paper related to Global Health or Health Policy while enrolled in a supervised reading and research course (GHHP 91, or a 91R or 910R course in another department; prior approval is required).

OTHER INFORMATION

No more than one of the five courses may be non-letter-graded. (Exception: Two courses may be taken non-letter-graded if one is the required research component.) Due to FAS regulations, only one course may double count for a secondary field and concentration.

ADVISING RESOURCES AND EXPECTATIONS

We encourage students to notify the program as soon as they have decided to pursue the secondary field in Global Health and Health Policy, so that we may keep them informed of important deadlines and policies, events, and research, internship, and employment opportunities.

For additional information and advice about the program and course selection, students may contact:

- Christy Colburn, Associate Director, Global Health and Health Policy Undergraduate Program (christy_colburn@harvard.edu).
- Debbie Whitney, Executive Director, Interfaculty Initiative in Health Policy (deborah_whitney@harvard.edu).
Secondary Field

Government

The Department of Government is an umbrella for a remarkable range of political subjects and approaches to studying them. The Department is an umbrella, in part, because political science is not a unified discipline. It stands at the cross-roads of history, law, economics, sociology, philosophy, and ethics. It borrows from these disciplines and constructs theories and methods of its own. Government Department faculty teach about China and statistical methods, civic virtue (and corruption), and the logic of congressional committee structures. Like our students, our research is inspired by many things: by the personal experience of participation; by moral outrage; by commitment to exploring a political problem; or by fascination with a model for explaining, measuring, or predicting political outcomes.

Against this background, a secondary field in Government is not one single thing. We encourage students with either specific or eclectic political interests to explore our courses and faculty. There are good reasons to range across areas, institutions, ages, and countries. For students with a focused interest, it may be best to assemble courses that cohere around a single subject or approach. For some students that may mean taking all their courses in a single subfield, such as American politics. Others with a focused interest may construct a program that includes courses from several subfields that are united by subject: perhaps Africa, or international political economy, or political ethics. Models of study for the secondary field are available on the Department website.

REQUIREMENTS: 5 courses (20 credits)

Students must take 5 courses in the Government Department:

1. All courses must be taken for a letter grade and passed with a grade of B- or better, except for courses graded SAT/UNSAT (such as GOV 92R or a Freshman Seminar offered by a Government Department faculty member).
2. Only one course grade SAT/UNSAT may be counted towards the secondary.
3. No courses taken pass/fail may count towards the secondary.
4. No more than two foundational courses (GOV 10, 20, 30, and GOV 40) will be counted toward a secondary field; three courses must be 50 or above.
5. GOV 91R (Supervised Reading and Research) cannot be used to fulfill Government secondary field requirements.

Most courses outside the Government Department do not count for the secondary field. For instance, no HKS classes can be used toward the secondary field requirement.

OTHER INFORMATION

Unlike the requirements for Government primary concentrators, all courses taken for the Government secondary field must have a “GOV” number (except for GOV 91R, which counts for neither the primary nor the secondary field). In addition, there are a small number of outside courses taught by Government Department faculty that may count towards the secondary field; see the Government Secondary Field webpage (https://undergrad.gov.harvard.edu/secondary-field) for an updated list. Please note that this list is different than the list of courses available to concentrators for concentration credit.
The following classes are no longer offered but count for the secondary field if previously taken: EMR 13, ER 22, ER 39, ER 44, FS 30V, SOC-STD 98OA, SOC-STD 98OF, SW 15, SW 50, USW 15, USW 20, USW 31.

Petitions of any kind for exceptions to Government secondary field requirements will not be accepted.

Secondary concentrators can count only one Harvard Summer School Government course, taught on campus by a Harvard Government Department faculty member, towards their secondary concentration in Government.

*Please note that these secondary field requirements differ from those for Government primary concentrators.*

**ADVISING RESOURCES AND EXPECTATIONS**

Advising for those with a secondary field in Government will be done through the Undergraduate Program Office and our regular undergraduate advising staff including the Director of Undergraduate Studies, the Concentration Advisers, and administrators. Students interested in pursuing a secondary field in Government or those who have any questions or concerns regarding the secondary field should contact the Government Undergraduate Program Office ([govtutorial@gov.harvard.edu](mailto:govtutorial@gov.harvard.edu); 617-495-3249). The office, located at CGIS Knafel Building, Room K151, 1737 Cambridge St., is open for drop-in advising M-F, 10am-5pm.
Secondary Field

History

The History Department is pleased to offer a robust secondary field in History. The secondary field in History encourages students in other concentrations to learn about the practice of history and engage in it themselves through tutorials and other departmental courses. Students will undertake an individualized plan of study to develop a base of historical knowledge and the essential skills of the field. The historical perspective and tools acquired through the secondary field will give students a richer appreciation for everything they experience in the College and beyond. History informs our understanding of literature, art, politics, and the world around us. While exposing us to the variety of human behavior and achievements of the past, the study of history also provides insights for the analysis of current issues, including questions of what may be fleeting and what may be enduring.

REQUIREMENTS: 5 courses (20 credits)

1. *One seminar:* Ordinarily taken in the junior or senior year, the seminar will serve as a capstone to the secondary field by providing faculty-led instruction in a small group and requiring students to follow the stages of a research project that reflect the principles of the department’s tutorial program. A conference course or graduate seminar may be taken in lieu of an undergraduate seminar to meet this requirement.

2. *Four additional courses in history:* Students will be free to take any four courses in history to fulfill the bulk of the secondary field’s course requirements. One of the four courses may be a historical related field course (by petition).

OTHER INFORMATION

All courses for the secondary field in History must be taken for a letter grade, except for Freshman Seminars (graded SAT/UNSAT) taken with history department faculty. A minimum letter grade of D- is required in all courses for the secondary field.

*Two types of courses count automatically toward History secondary field requirements:*

1. courses listed under “History” in the course search in courses.my.harvard.edu (including cross-listed courses); and

2. all courses taught by full members of the History Department faculty through the Program in General Education and/or Freshman Seminar programs or through other departments.

The secondary field offers an opportunity to study a particular historical interest or to explore a range of eras, regions, and themes. There may be circumstances in which it would be appropriate to petition for a non-departmental course to count (known in History concentration parlance as a “related field”); students must consult the History undergraduate office about this possibility.

Students may also apply to do an independent study, or History 91r, with a member of the department; the History 91r can be used to fulfill one of the three elective course requirements.
ADVISING RESOURCES AND EXPECTATIONS

To discuss whether a secondary field in History is right for you, or for specific program-policy questions, contact the Director of Undergraduate Studies (DUS) or the Assistant DUS. For general inquiries, please contact Staff Assistant Laura Johnson (lmjohns@fas.harvard.edu) or visit the undergraduate office in Robinson 100.
Secondary Field

History of Art and Architecture

The Department of History of Art and Architecture at Harvard University offers the broadest range of courses available in North America today. The faculty offer courses covering the diverse historical and cultural geographies of the world—as well as their points of intersection, dialogue, and exchange—in the fields of African, African-American, American, ancient (Near East, Greek, and Roman), architectural history and theory, Baroque and Rococo, Byzantine, Chinese, European 18th and 19th centuries, South Asian, Islamic, Japanese, Latin American/Pre-Columbian, Medieval, Modern and Contemporary, Photography, and the Renaissance (Northern and Southern). The scope of art and architecture studied is matched in variety by both approaches and methods of study. The secondary field is structured to provide students with a balance between introductory and advanced courses of instruction and to promote understanding of the world's art traditions present and past. The secondary field offers students an opportunity to explore their interest in the History of Art and Architecture in the broadest of possible terms, or equally to pursue a focused academic interest for its own sake or that complements a course of study in their primary concentration. Courses of study are enhanced by direct access to the collections of the Harvard Art Museums and the Peabody Museum.

REQUIREMENTS: 6 courses (24 credits)

Three courses from the lower level of Department offerings, selected from the catalogue range HAA 1 to 89 (these may include Freshman Seminars and General Education courses offered by our faculty, and cross-listed courses).

Three courses from the upper level of Department offerings, selected from the catalogue numbers of the HAA 100-200 range. (Students wishing to enroll in a 200-level seminar must request the instructor's permission.)

Of the 6 courses, a balance must be achieved chronologically before or after the year 1700 C.E. by a ratio of 2:4 or 4:2.

OTHER INFORMATION

In addition to Freshman Seminars and General Education courses taught by History of Art and Architecture faculty, Harvard Summer School courses in the History of Art and Architecture may also count towards secondary field credit. Those courses credited for the secondary in History of Art and Architecture must be led by faculty holding teaching appointments in the HAA Department. There is no grade minimum for courses to count towards the secondary field, but, with the exception of Freshman Seminars, courses must be taken for a letter grade. Students pursuing a secondary field will not be given preferential access to limited enrollment courses, which in our concentration are generally undergraduate pro-seminars and seminars for graduate students. In limited enrollment courses, instructors will decide whether or not a secondary field student is admitted to the course based on such factors as level of preparation, stated interest, and/or need.
ADVISING RESOURCES AND EXPECTATIONS

Students pursuing the secondary field in History of Art and Architecture are strongly advised to inform the Department using the secondary fields web tool ([https://handbook.fas.harvard.edu/book/web-tool](https://handbook.fas.harvard.edu/book/web-tool)) and to seek academic advising from the Director of Undergraduate Studies before embarking upon this course of study. Students should contact the Director of Undergraduate Studies by email and meet to discuss their academic interest and objectives. The initial meeting could occur at any stage after the concentration choice has been made, but ideally in the student's fourth or fifth semester. Academic advising and general mentoring in the course of secondary field study will also be provided by the Director of Undergraduate Studies and the Undergraduate Coordinator at the student's request. The Director of Undergraduate Studies is Prof. Jennifer Roberts; the Coordinator of Undergraduate Studies is TBA (617-495-2310).
Secondary Field

History of Science

The Department of the History of Science offers a secondary field in the History of Science, Technology, and Medicine. This field gives students concentrating in other departments the opportunity to take a coherent cluster of courses in the history of science, technology, and medicine. The program is designed to give students, first, a foundational sense of the field, then, permit them to do more advanced work, including courses that will allow them to focus on particular interests and to do original research and other projects.

REQUIREMENTS: 5 courses (20 credits)

1. HISTSCI 100: Knowing the World: Introduction to the History of Science.
   a. Four elective courses in the History of Science, ordinarily chosen from the 100-level courses in the History of Science course search in courses.my.harvard.edu.
2. 200-level courses may be taken only with the permission of the instructor.
3. One Freshman Seminar taught by a Department faculty member may be counted as one of the four elective courses.
4. Students will be permitted to take one (but no more) of their four elective courses outside of the Department (cross-listed courses in the History of Science course search in courses.my.harvard.edu count in this category).

OTHER INFORMATION

With the exception of Freshman Seminars taught by Department faculty members, all courses must be letter-graded. There is no minimum passing grade for courses to count towards the secondary field.

Decisions about whether courses from study abroad, Harvard Summer School, or other Harvard schools will count for the secondary field will be made on a case-by-case basis by the Director of Undergraduate Studies.

In Department courses with limited enrollment, first priority will be given to History and Science concentrators; students affirming that they are doing the secondary field in History of Science will have next priority.

ADVISING RESOURCES AND EXPECTATIONS

Secondary field advising is offered by Alice Belser, Manager of Student Programs (ajbelser@fas.harvard.edu), and by Professor Anne Harrington, Director of Undergraduate Studies (aharring@fas.harvard.edu).
Human Evolutionary Biology

Human Evolutionary Biology (HEB) uses an evolutionary framework to investigate why humans are the way they are. In addition to providing a general foundation in human biology, HEB focuses on questions such as what selective forces acted on humans during their evolution; how genotypes and phenotypes are related; how environmental forces, such as infectious disease and climate, influenced human biology and evolution; how natural selection has affected social cognition and behavior; and what role culture has played in human evolution.

REQUIREMENTS: 5 courses (20 credits)

1. LS 1B.
2. Four additional HEB courses, including GENED 1027, plus three Human Evolutionary Biology courses, found at courses.my.harvard.edu.

OTHER INFORMATION

One Freshman Seminar may be counted for the secondary field in HEB if taught by an HEB faculty member. All courses must be taken for a letter grade, except relevant Freshman Seminars, which are graded SAT/UNSAT. Only courses for which a satisfactory grade is received will receive secondary field credit.

ADVISING RESOURCES AND EXPECTATIONS

Students interested in pursuing a secondary field in Human Evolutionary Biology should contact Secondary Field Adviser Dr. Neil Roach (ntroach@fas.harvard.edu) for more information.
Secondary Field

Integrative Biology

The faculty of the Department of Organismic and Evolutionary Biology (OEB) study biological systems at all levels from molecules to ecosystems, united by a shared foundation in evolutionary biology. Our department offers courses in a broad range of topics, including: anatomy, behavior, biomechanics, development, ecology, entomology, evolution, forestry, genetics, genomics, marine biology, microbiology, molecular evolution, mycology, paleontology, physiology, plant sciences, oceanography, systematics, and zoology.

The secondary field in Integrative Biology (IB) reflects this breadth. Students may have an interest in pursuing a secondary field of study in a particular sub-discipline or may prefer to sample broadly across the offerings of the Department. Rather than draft a set of requirements for each possible field of study, the Department chose a flexible set of requirements that should maximize students’ freedom to craft their own programs in consultation with an academic adviser.

REQUIREMENTS: 5 courses (20 credits)

A secondary field requires the completion of five courses offered by members of the OEB Department (for a full listing, see https://masthead.fas.harvard.edu). For this purpose, all courses listed in the OEB course search on my.harvard.edu, including cross-listed courses, as well as LS 1B and LS 2, will count.

OTHER INFORMATION

All courses must be taken for a letter grade, with the exception of one approved Freshman Seminar. The grade minimum for a course to count toward the secondary field shall be C-.

Courses taught by members of the Department at Harvard Summer School will count toward the secondary field. One Freshman Seminar or one course in General Education may count toward the secondary field (in each case the course must be taught by a member of the Department). One course taken while studying abroad may count toward the secondary field if approved in advance by the Head Tutor.

ADVISING RESOURCES AND EXPECTATIONS

Questions about the secondary field should be addressed to the IB Concentration Adviser (Dr. Andrew Berry; 617-495-0684; berry@oeb.harvard.edu) or IB Head Tutor (Dr. David Haig; dhaig@oeb.harvard.edu).
Linguistics

Linguistics at Harvard is counted among the humanities. Much research in linguistics, however, lies in the area of linguistic theory, which seeks to develop a theory of language that accounts for interlanguage variation while uncovering the general laws and principles that govern all languages. Such work resembles research in the social and behavioral sciences. Recently, advances in biology and neuroscience have led to the emergence of a kind of linguistic scholarship that closely parallels research in the life sciences. Thanks to its unique field- and methodology-straddling quality, Linguistics is able to offer three distinctively contoured secondary field pathways (https://linguistics.fas.harvard.edu/pages/secondary-field/linguistics):

- Language History and Language Structure.
- Language and Linguistic Theory.
- Language, Mind and Brain.

Requirements: 5 courses (20 credits)

Language History and Language Structure

The pathway in Language History and Language Structure is designed for students whose curiosity about Linguistics is an outgrowth of their interest in specific languages or their "love of languages" in general. Such students may also have considered concentrating or taking courses in an ancient or modern language field (Classics, Romance, Slavic, Near Eastern languages, East Asian languages, etc.); or they may simply be looking for ways to learn more about the history and structure of English.

1. Two foundational courses, consisting of:
2. Three more courses, chosen from among:
   a. LING 117R: Linguistic Field Methods; LING 107: Introduction to Indo-European; or LING 108: Introduction to Historical Linguistics.
   b. Any more specialized course in historical Linguistics, e.g.
      i. LING 118: Historical and Comparative Linguistics;
      ii. LING 168: Introduction to Germanic Linguistics;
      iii. LING 176: History and Pre-History of the Japanese Language; or
      iv. GREEK 134: The Language of Homer.
   c. Any more specialized course in descriptive Linguistics:
      i. LING 171: Structure of Chinese;
      ii. LING 174: Tense and Aspect in Japanese;
      iii. SLAVIC 126A: Structure of Modern Russian.
Language and Linguistic Theory

The pathway in Language and Linguistic Theory is designed for students whose love of languages (with a final -s) is less important to them than their love of Language (with a capital L). Such students may have been attracted to Linguistics from a variety of fields—a foreign language, English, Anthropology, Mathematics, Computer Science, even Physics. What unites them is an interest in the common formal and representational system that underlies all human languages.

1. Two foundational courses:
   b. A core Linguistics course to be chosen from among LING 102, 104, 105, 106 or a Freshman Seminar in Linguistics (e.g. 34X: Language and Prehistory; 39X: Human, Animal and Artificial Languages; 61Q: The Origins of Meaning).

2. Three more advanced courses, chosen from among:
   a. LING 102: Sentence Structure;
   b. LING 104: Word Structure;
   c. LING 105: Sounds of Language;
   d. LING 106: Knowledge of Meaning;
   e. LING 107: Introduction to Indo-European;
   f. LING 108: Introduction to Historical Linguistics; or
   g. Any more advanced course in syntax, morphology, phonetics/phonology, semantics, acquisition, language processing or computational linguistics.

Language, Mind and Brain

The pathway in Language, Mind and Brain was created for students with an interest in the areas of inquiry addressed by Harvard's Mind/Brain/Behavior Initiative. Such students will be less interested in language-particular facts than those in the other two groups; they will be correspondingly more interested in the evolution of language, the linguistic abilities of non-human primates, the mechanisms used by the brain to access and store linguistic information, and similar questions.

1. Two foundational courses, consisting of:
   b. A core Linguistics course to be chosen among LING 102, 104, 105, 106 or a Freshman Seminar in Linguistics (e.g. 39X: Human, Animal and Artificial Languages; 61Q: The Origins of Meaning).

2. Three more courses, chosen from among the following groups:
   a. LING 102: Sentence Structure;
   b. LING 111: Language Acquisition;
   c. LING 130: Psycholinguistics;
   d. LING 132: Psychosemantics;
   e. LING 146: Syntax and Processing;
   f. Or any similar course approved by the Head Tutor; or
   g. Any Linguistics-related MBB course, e.g.:
      i. MCB 80 or NEURO 80: Neurobiology of Behavior.
iii. PHIL 147: Philosophy of Language;
iv. Or an MBB interdisciplinary seminar.

OTHER INFORMATION

Subject to the Head Tutor’s approval, Linguistics summer school courses and Linguistics study abroad courses will be allowed to count towards the secondary field requirements. One course may be taken pass/fail towards the course requirements; this may be, but need not be, one of the designated Freshman Seminars.

ADVISING RESOURCES AND EXPECTATIONS

The primary adviser and contact person for the secondary fields in Linguistics is the Head Tutor, Professor Isabelle Charnavel (icharnavel@fas.harvard.edu).
Secondary Field

Mathematical Sciences

The secondary field in Mathematical Sciences is jointly sponsored by the Mathematics Department and the Applied Mathematics concentration.

REQUIREMENTS: 4 courses (16 credits)

Four courses in either Mathematics, Applied Mathematics, or Statistics of which at most two can be in Statistics. The Mathematics and Applied Mathematics courses must be numbered 104 or higher; and Statistics courses must be numbered 110 or higher.

OTHER INFORMATION

Courses must be taken for a letter grade and cannot be taken pass/fail. Only courses with a grade of C- or above can be counted.

Students who study abroad or take courses within Harvard Summer School can count course credits toward the secondary field by petitioning for such course to be counted as the equivalent to an approved Harvard course.

Note that courses in other departments that are only cross listed in the course catalog, under Mathematics, Applied Mathematics, or Statistics, will count towards secondary field.

ADVISING RESOURCES AND EXPECTATIONS

If students have questions about course selection, they should contact the Director of Undergraduate Studies for Mathematics, Cliff Taubes (chtaubes@math.harvard.edu) or the Applied Math Advising Team (am-advising@seas.harvard.edu).
Secondary Field

Medieval Studies

The "Middle Ages" is the name given to a thousand-year long period of European, Eurasian, and African history and culture spanning the period between "Antiquity" (c. 1000 BCE to 500 CE) and “Modernity” (c. 1600 CE onward). Those who defined themselves as "modern" came to view the medieval period condescendingly, associating it with basic themes and images such as heroism and chivalry, “feudal” society, and religious fervor. All of these are stereotypes that say far more about “modernity” than they do about a period whose innovations are essential parts of Western as well as global culture as we know it today. Learning about the vast and varied period known as the Middle Ages offers a unique and valuable perspective on modern history and culture. It also allows you to see the many different ways in which human societies function, invent, create, believe, and interact. From the viewpoint of its cultural descendants in the New World as well as the Old, the Middle Ages is both “us” and “not us,” at once part of our collective heritage and something very, very different.

The secondary field in Medieval Studies examines the Middle Ages from many different angles and through many different disciplinary perspectives. It draws on the wealth of medieval teaching and scholarship at Harvard, where there are faculty medievalists in at least twenty departments, programs, and schools. The secondary field consists of one foundational course in any discipline, plus four more advanced courses that expose students to the wide range of disciplines that make up Medieval Studies. While some of these courses teach or require specialist skills, most are intended to be accessible to any interested student, whatever their field of specialization.

REQUIREMENTS: 5 courses (20 credits)

1. One foundational course chosen from among any of the courses listed on the program's website at https://medieval.fas.harvard.edu/.

2. Three courses among those listed on the program's website or in the Medieval Studies course search in courses.my.harvard.edu. These courses should cover three of the four core disciplinary areas of Arts, History, Literature & Language, and Thought & Religion. Each of these advanced courses must be offered by a different department, except for Medieval Studies itself (i.e. all three courses can have a Medieval Studies number). Students are encouraged to take at least one Medieval Studies-numbered course (e.g. MEDVLSTD 106, 107, 111, 117, or 119).

3. One elective course at any level, chosen from any of the offerings listed on the program's website (https://medieval.fas.harvard.edu/); this may include a Freshman Seminar dealing substantially with the medieval period.

OTHER INFORMATION

All five courses must be taken for a letter grade and passed with a B- or better, except for approved Freshman Seminars, which are graded SAT/UNSAT.

Courses offered through the Harvard Summer School, and course credits gained through study abroad programs, will only be accepted for secondary field credit if they are on medieval topics and taught by members of the Medieval Studies faculty (e.g. SCAND S-150, "Study Abroad in Scandinavia"). Normally, only one such course should be used to fulfill the requirements of the
secondary field. Any inquiries about such courses should be addressed to the Director of Undergraduate Studies (DUS) of Medieval Studies, Sean Gilsdorf.

Courses offered in Harvard schools other than the Faculty of Arts and Sciences (FAS) must be jointly offered in FAS to count toward the secondary field.

Courses counting for a secondary field in Medieval Studies are updated periodically. If students find other courses that could count, they should contact the Medieval Studies Program at medieval@fas.harvard.edu.

ADVISING RESOURCES AND EXPECTATIONS

For more information on the secondary field, or for advice on how to devise your program within the field, please contact the Director of Undergraduate Studies, Sean Gilsdorf, at gilsdorf@fas.harvard.edu or 617-496-5857.
Secondary Field

Microbial Sciences

Microbial Sciences is an interdisciplinary approach to studying the impact of microbes at scales from global ecosystems down to single-celled microenvironments. The academic program emphasizes the joint study of species diversity, metabolic function, geochemical impact, and medical and pharmaceutical applications of microbial sciences. Faculty affiliated with the Microbial Sciences Initiative (MSI) include members from Molecular and Cellular Biology, Organismic and Evolutionary Biology, Earth and Planetary Sciences, Chemistry and Chemical Biology, the School of Engineering and Applied Sciences, Harvard Medical School, Harvard School of Public Health, and the Forsyth Institute.

The MSI secondary field is intended to provide a strong foundation in interdisciplinary Microbial Sciences to students who have sufficient preparation in other natural sciences, Mathematics, or Engineering. In particular, the MSI curriculum is intended to (1) be interdisciplinary, (2) not be specifically biomedical, and (3) incorporate elements from physical sciences as well as life sciences. An important aspect of the MSI secondary field is the laboratory component, which provides hands-on experiential learning to all students.

**REQUIREMENTS: 5 courses (20 credits)**

1. **Two MSI cornerstone courses.** All secondary field students will take MICROBI 210: A Microbial Planet, and LS 100R: Experimental Research in Life Sciences. Other research project courses, such as those numbered 91R or 99R, may be allowed to substitute for LS 100R if they have the appropriate microbial emphasis. No substitutions will be accepted for MICROBI 210.

2. **One introductory course.** All secondary field students will take one approved introductory course below the 100-level. The eligible courses will be selected from departmental offerings in the Faculty of Arts and Sciences (FAS) that contain material relevant to providing a foundation in microbial sciences. Examples of such courses can be found on the MSI website at [https://msi.harvard.edu/harvard-undergraduate-secondary](https://msi.harvard.edu/harvard-undergraduate-secondary).

3. **Two additional Microbial Science courses at the 100-level or above.** These are available across a variety of departments. A list of such courses is available on the MSI website at [https://msi.harvard.edu/harvard-undergraduate-secondary](https://msi.harvard.edu/harvard-undergraduate-secondary).

4. **MSI tutorial: Non-credit.** Students are strongly encouraged, but not required, to attend additional MSI programming, including weekly chalk talks, monthly seminars, and the annual symposium. If conducting research, students are also invited to apply for the MSI Summer Undergraduate Fellowship, which (if awarded) provides a stipend to support the student conducting research with an MSI faculty affiliate over a 10-week summer period.

**OTHER INFORMATION**

All courses must be taken for a letter grade in order to count toward secondary field credit, and normally C is the minimum acceptable grade. The only exception is approved Freshman Seminars, which are graded SAT/UNSAT.

Of the one introductory course and two additional Microbial Sciences courses, two must be significantly outside the student's primary area of concentration, providing each student substantial interdisciplinary experience.
Some courses for Microbial Sciences credit may have hidden prerequisites. Students should plan appropriately, as a prerequisite cannot be counted for Microbial Sciences credit unless it satisfies requirement 2. above.

Students may receive credit for LS 100R twice. Students electing to do this may count one semester towards the Microbial Sciences secondary field and one towards their concentration, or they may count the second semester as one of their two 100-level electives in the secondary field. A single semester of LS 100R may not be double-counted.

Courses from study abroad or Harvard Summer School could count toward secondary field credit if approved by the MSI Steering Committee prior to the student's enrollment in these courses. The student must petition the MSI Steering Committee in the semester prior to their intended enrollment in such courses and must provide a syllabus or detailed course summary to the committee. A petition to retroactively consider substituting one relevant Freshman Seminar for one of the two 100-level elective courses also will be considered.

ADVISING RESOURCES AND EXPECTATIONS

Students will submit an application to MSI for the secondary field no later than the course enrollment due date of their penultimate term. This application is available on the MSI website at https://msi.harvard.edu/harvard-undergraduate-secondary. Additionally, students must file online with the Registrar's Office through the Secondary Fields Web Tool at https://handbook.fas.harvard.edu/book/web-tool.

Students are encouraged to be active participants in the MSI community. Secondary field students will be invited to all MSI events and activities. Undergraduate participation will provide opportunities to get acquainted with graduate students, post-docs, and members of the faculty.

Students interested in pursuing a secondary field in Microbial Sciences should contact MSI leadership using the MSI email address: MSI@fas.harvard.edu.
Mind Brain Behavior

Mind Brain Behavior (MBB) introduces students to the interdisciplinary study of the mind, the brain, and behavior. As a secondary field, it offers students the opportunity to confront the significant findings that have arisen from the traditional disciplines in the MBB area of inquiry and emphasizes the intellectual innovations that stem from crossing traditional disciplinary lines. Students will learn how past and current researchers have brought the perspectives of neuroscience into dialogue with those of other natural sciences, the social sciences, and the humanities, and will develop habits of interdisciplinary thinking themselves. In particular, the secondary field provides opportunities to learn about computational, neurobiological, evolutionary, psychological, linguistic, philosophical, and historical approaches and their interactions.

These goals reflect the state of knowledge about mind, brain, and behavior, knowledge that is growing exponentially. The traditional disciplines have proven remarkably successful at expanding this knowledge and have been enhanced by interdisciplinary links that have foregrounded new technologies and theories. MBB has brought together a diverse group of faculty from Harvard’s different schools and disciplines, and students may take courses from them, work in their laboratories and research projects, and hear them speak at MBB events.

REQUIREMENTS: 5 courses (20 credits)

2. NEURO 80: Neurobiology of Behavior, also listed as MCB 80 (recommended sophomore year).
3. Interdisciplinary Seminar (recommended junior year), selected from a list that varies each year (http://mbb.harvard.edu/seminars).

Two Mind Brain Behavior courses, selected from a list that varies each year (http://mbb.harvard.edu/electives).

OTHER INFORMATION

All courses must be taken for a letter grade. Students are also encouraged to attend the MBB junior symposium and are welcome to join the student organization Harvard Society for Mind Brain and Behavior (HSMBB) (http://hsmbb.org).

ADVISING RESOURCES AND EXPECTATIONS

Students considering a secondary field in MBB should familiarize themselves with the MBB website: http://mbb.harvard.edu/. Students should also introduce themselves by emailing Education Program Coordinator Shawn Harriman (shawn_harriman@harvard.edu) as early as possible to allow MBB to keep them informed of important policies, events, and other opportunities. Shawn is also happy to answer general questions about Mind Brain Behavior and its secondary field.
Students are also strongly encouraged to meet with MBB faculty to discuss their academic and career interests, course options, and research opportunities. Contact information for MBB Faculty Advisers is available on the MBB website at http://mbb.harvard.edu/advising.
Secondary Field

Molecular and Cellular Biology

The secondary field in Molecular and Cellular Biology (MCB) is intended for students with an interest in the life sciences, particularly in the study of biological processes based on the investigation of molecules and their interactions in the context of cells and tissues. The cell is the fundamental unit of all living things and is therefore an ideal framework for integrating one's understanding of the structure and chemistry of macromolecules with their higher-order organization and behavior in a living context. Students pursuing the MCB secondary field gain a solid foundation by completing a set of three courses within introductory life sciences courses and intermediate courses in the MCB Department. To deepen their understanding of the discipline, students will then enroll in two additional MCB courses of their choosing. The choice of these courses, which should be made with the guidance of a concentration advisers, will allow students to explore specific sub-fields in MCB, such as biochemistry, microbiology, immunology, virology, neurobiology, and molecular medicine. Students are also encouraged to get involved in research. The secondary field is designed for students who desire a broad yet rigorous introduction to the field and may be appropriate for students with diverse career interests, including (but certainly not limited to) Applied Mathematics, Statistics, Computer Science, Economics, Government, Health Policy, Business, and Journalism.

REQUIREMENTS: 5 courses (20 credits)

1. Three or four introductory or intermediate courses as follows:
   a. One or two integrated introductory courses in the life sciences:
      i. LS 1A: Chemistry, Molecular Biology, and Cell Biology (or LPS A).
      ii. LS 1B: Genetics, Genomics, and Evolution.
   b. One or two intermediate courses in molecular and cellular biology:
      i. MCB 60, MCB 63, MCB 64, MCB 65, MCB 68, or MCB 80.

2. Complete the remainder of requirements from advanced courses in MCB.
   a. MCB>100-level courses.
   b. One of these courses can be a research course (MCB 91 or MCB 100/LS 100).

Notes:
- LS 1A and LS 1B (or LS 50AB), as well as MCB 60, are foundational courses highly recommended for all students.
- Students should consult the concentration advisers for advice on MCB >100-level course selection. Research courses are encouraged for students interested in integrating a research experience into their Plan of Study.
- Students who take LS 50AB will be credited for LS 1A, LS 1B, and a research course. They can thus fulfill the secondary field requirements by completing two intermediate courses, or one intermediate course and one MCB 100-level course.

OTHER INFORMATION

To count for credit towards the secondary field, the five courses must be taken for a letter grade. Freshman Seminars will not count towards the secondary field. Students working in a research laboratory as part of a study abroad program can petition to have that research experience count as an advanced course towards the secondary field, and some Harvard Summer School Courses can count for credit towards the secondary field with preapproval. Students should contact the MCB concentration adviser Dr. Dominic Mao (dominicmao@fas.harvard.edu) for more information on counting Harvard Summer School courses and research conducted as part
of a study abroad program for the secondary field in MCB. Students pursuing a secondary field in MCB will not be given preferential access to limited enrollment courses. We do not anticipate that courses required for the secondary field will be over-enrolled.

The MCB secondary field is not open to students concentrating in Chemical and Physical Biology, Human Developmental and Regenerative Biology, or Neurobiology, given similarities in the content and skills developed within these concentrations and current policy with respect to counting courses for concentration and secondary fields.

ADVISING RESOURCES AND EXPECTATIONS

For additional information, students interested in pursuing the MCB secondary field may contact the MCB concentration advisers, Dr. Dominic Mao (dominicmao@fas.harvard.edu) and Dr. Monique Brewster (mbrewst@g.harvard.edu). Students are encouraged to meet with the concentration advisers as needed, particularly upon completion of the introductory and intermediate courses to select appropriate advanced courses. Students intending to pursue the MCB secondary field in should notify the Department using the secondary fields web tool at https://handbook.fas.harvard.edu/book/web-tool. Upon completion of the secondary field requirements, students need to meet with the concentration advisers to confirm that the courses they have taken count for credit towards the MCB secondary field.
Secondary Field

Music

The Department of Music offers one secondary field designed to be flexible enough to accommodate a broad range of interests. Students are free to explore the field by selecting a variety of courses, or they may focus on a specific aspect of the larger field.

**REQUIREMENTS: 5 courses (20 credits)**

Any five courses selected from among the courses offered in Music (including General Education courses and Freshman Seminars taught by Music Department faculty), with the exceptions noted below:

1. No more than two courses may be selected from General Education Courses, Freshman Seminars, MUSIC 1 through 9, and 20 through 49.
2. A repeatable course may count only once under a given number (repeatable courses are labeled ‘R’ after their course number, so you can take 190R and 191R but not 190R twice).
3. No more than one course may be selected from MUSIC 10 through 18 (which may be graded SAT/UNSAT).
4. Courses counting for secondary field credit may not be taken pass/fail, other than one Freshman Seminar (graded SAT/UNSAT) and one ensemble (MUSIC 10 through 18).

**OTHER INFORMATION**

Courses taken abroad or in the summer school can be counted in the secondary field only with the permission of the Department, normally granted only after the course has been completed.

**ADVISING RESOURCES AND EXPECTATIONS**

Students pursuing a secondary field are urged to seek out members of the Music Department faculty for advice on their specific course choices. For general information about the Department, its faculty, and courses visit the Department website at [http://music.fas.harvard.edu/undergraduate.shtml](http://music.fas.harvard.edu/undergraduate.shtml).

For more information on the secondary field and for advising, please speak to the Director of Undergraduate Studies (Professor Richard K. Wolf, rwolf@fas.harvard.edu), or the current Undergraduate Coordinator in the Music Building (617-384-9507).
Secondary Field

Near Eastern Languages and Civilizations

Interest in the Near/Middle East and its cultures will likely grow as the region continues to play key role in contemporary international affairs. Knowledge of its languages, histories and cultures is urgently needed for an understanding of current events and the discourses that envelop them. For students wanting to pursue a limited number of targeted courses to as an introduction to the region, the Department offers four secondary field pathways:

- The Middle East in Antiquity.
- Histories and Cultures of Muslim Societies (Islamic Studies).
- Jewish Studies.
- Modern Middle Eastern Studies.

REQUIREMENTS: 5 half-courses (total 20 credits)

Each of the four pathways require five courses, which must be approved by the Director of Undergraduate Studies of the Department of Near Eastern Languages and Civilizations or the adviser designated for the field by the Department.

THE MIDDLE EAST IN ANTIQUITY

The secondary field pathway in The Middle East in Antiquity focuses attention on the rich and diverse history of the civilizations of the Ancient Near East, which witnessed the first complex societies and the first major developments in social and political organization, literacy, technology, religious institutions, and many other arenas, whose consequences remain a critical force in subsequent Middle Eastern, and world, history. The goal of this pathway is to give students an articulate acquaintance with the history and culture of the principal civilizations of the Ancient Near East, and to provide instruction in how such history and culture can be reconstructed through the critical analysis and synthesis of linguistic, textual, artistic, and archaeological evidence.

Harvard is an ideal place to pursue this field given the richness of its resources in libraries (Widener, History of Art, Tozzer, Law, Andover-Harvard), museums (Semitic, Peabody, and Sackler), and faculty (Near Eastern Languages and Civilizations [NELC], but also Anthropology, History of Art and Architecture, Linguistics, and the Divinity School).

Course Requirements:

1. At least two "gateway courses," found at https://nelc.fas.harvard.edu/gateway-courses.
2. Three additional half-courses (total 12 credits) in the area of Middle East in Antiquity, with the approval of the Director of Undergraduate Studies (DUS) of NELC or his/her designee; at least two of which must be at the 100-level or above.

The electives allow the students to pursue study of one or several of the civilizations and arenas that are introduced in the two gateway courses. Qualified students are encouraged to consider taking their elective courses in languages important to the study of the ancient Near East (e.g., Classical Hebrew, Aramaic, Akkadian, Egyptian, either as language or as literature courses).
However, no more than two of these courses may be courses whose primary focus is language instruction.

**HISTORIES AND CULTURES OF MUSLIM SOCIETIES (ISLAMIC STUDIES)**

The goal of this secondary field pathway is to provide a basic exposure to the literary, philosophical and religious traditions of the Islamic world from the rise of Islam to the present day. The language-areas covered are Arabic, Persian, Turkish and Urdu. The program in Histories and Cultures of Muslim Societies is structured to allow students flexibility in their approach to the field, and students are encouraged to incorporate disciplinary perspectives currently available in the Harvard curriculum (for example, Anthropology, Comparative Literature, Philosophy, Politics, Religious Studies, and Sociology).

**Course Requirements:**

1. At least two "gateway" courses, found at [https://nelc.fas.harvard.edu/gateway-courses](https://nelc.fas.harvard.edu/gateway-courses) and either:
   a. Three additional half-courses (total 12 credits) in Histories and Cultures of Muslim Societies (Islamic Studies), at least two of which must be at the 100-level or above. Students are free to pick from any three courses in Histories and Cultures of Muslim Societies (Islamic Studies) offered in NELC or elsewhere, these courses to be approved by the DUS or his/her designee. Qualified students are encouraged to consider taking their elective courses in languages important to the study of the Muslim world (Arabic, Persian, Swahili, Turkish or Urdu; these can be either language or literature courses). However, no more than two of these courses may be courses whose primary focus is language instruction, or:
   b. Three additional half-courses (total 12 credits) in Islamic Studies, at least two of which must be at the 100-level or above. Students are free to pick from any three courses in Islamic Studies offered in NELC or elsewhere, these courses to be approved by the Director of Undergraduate Studies (DUS) or his/her designee.

Qualified students are encouraged to consider taking their elective courses in languages important to the study of the Muslim world (Arabic, Persian, Turkish or Urdu; these can be either language or literature courses). However, no more than two of these courses may be courses whose primary focus is language instruction.

**JEWISH STUDIES**

The goal of this secondary field pathway is to provide a basic exposure to fundamental elements of the history, literature, religious thought, and legal institutions of Jewish civilization. As in other areas of undergraduate liberal arts education, and even more so in a secondary field of five courses, our goal is not to impart comprehensive knowledge of an entire academic field, but rather to ensure that students will have a basic framework for asking questions and tools for seeking answers. A combination of a historical survey focusing heavily on the pre-modern experiences of the Jews, with a course about modern Jewish history or literature and additional courses in different specific areas provide secondary field students with an exposure to Jewish culture through the ages, equipping them with a basic familiarity with Jewish culture, history, and literature.
Course Requirements:

2. Two "gateway" courses, found at https://nelc.fas.harvard.edu/gateway-courses.
3. Three additional half-courses (total 12 credits) in Jewish Studies, at least two of which must be at the 100-level or above.

Students are free to pick from any three half-courses (total 12 credits) in Jewish Studies offered in NELC or elsewhere, these courses to be approved by the DUS or his/her designee. Qualified students are encouraged to consider taking their elective courses in languages important to the study of Jewish cultures (Hebrew, Yiddish, Aramaic; these can be either language or literature courses). However, no more than two of these courses may be courses whose primary focus is language instruction.

MODERN MIDDLE EASTERN STUDIES

This secondary field provides Harvard undergraduates, whose concentration is outside the field of Near Eastern Languages and Civilizations, the opportunity to engage in foundational study of the cultures, history and politics of modern Middle Eastern societies. It encourages such study through a combination of courses in the humanities and interpretive social sciences.

The five half-courses selected by the secondary concentrator must be approved by the DUS and the secondary concentration adviser.

The requirements are designed with sufficient flexibility so that students may pursue the field as an introduction to the region as a whole, or as a more narrowly focused exploration of a particular country or theme, depending on their interests. The five half-courses must, however, follow the following simple guidelines:

Course Requirements:

1. One half-course (4 credits): MODMDEST 100 (formerly NEC 100): Approaches to Middle Eastern Studies. All students must enroll in this course, which serves as the gateway course to the secondary field.
2. Four additional half-courses (total 16 credits) related to the study of Middle Eastern societies, at least two of which must be at the 100-level or above. These courses are to be approved by the DUS or his/her designee and may be chosen from those offered in NELC or elsewhere, including the Program in General Education. For a list of possible courses, please consult the NELC web site.

Qualified students are strongly encouraged to consider taking some of these elective courses in languages important to the study of the Middle East (Arabic, Hebrew, Persian, or Turkish; these can be either language or literature courses). However, no more than two of these courses may be courses whose primary focus is language instruction.

All courses must be taken for a letter grade and must be completed with a grade of B- or above, with the exception of approved Freshman Seminars, which may be applied toward the field with a grade of SAT. Credit for courses from Harvard Summer School and other Harvard faculties may be granted upon petition. Study abroad in the region is encouraged, and one half-course of study abroad credit may be applied toward the field with prior approval of the Middle Eastern Studies academic adviser.
OTHER INFORMATION

One course taken abroad for Harvard College credit (either over the summer, a semester, or a year; the DUS or the designee will advise students on approved programs) may count towards the requirements, as may a Freshman Seminar. Other than Freshman Seminars, all courses must be letter-graded. Courses taken in other departments that fit into the intellectual focus of the chosen track may also be counted.

At least two courses should be at the 100-level or above. No more than two of the courses may be language courses. Students seeking to focus primarily on language should consider pursuing a language citation.

ADVISING RESOURCES AND EXPECTATIONS

For more information, students should contact the Director of Undergraduate Studies, Gojko Barjamovic (barjamovic@fas.harvard.edu).
Neuroscience

Neuroscience, the study of the nervous system, is a field that investigates the biological mechanisms of behavior and how brains processes information. To develop a comprehensive understanding, we study the nervous system at every level from the macroscopic (behavior and cognition) to the microscopic (cells and molecules). Thus, the study of Neuroscience provides both a broad scientific training and a deep understanding of the biology of the nervous system.

The Neuroscience secondary curriculum begins with a fundamental course requirement that reflects the diversity of approaches in Neuroscience: biological, cognitive, and quantitative. Students also take an introductory Neurobiology course (NEURO 80), which lays out the body of knowledge in the field. Next students choose a foundational course in a sub-field of Neuroscience ranging from molecules to animal behavior. Finally, in advanced elective courses, students explore specific areas of neuroscience more deeply based on their interests. We now list over 40 advanced courses on a range of topics: cells and circuits, physiology, learning and memory, cognitive science, development, genetics, and disease and therapeutics.

REQUIREMENTS: 5 courses (20 credits)

1. One of the following courses:
   a. LS 1A or LPS A.
   b. COMPSCI 50.
   c. Math at the level of MATH 1A or above.
   d. An additional advanced course in Neuroscience (as described in note 4 below).
2. NEURO 80.
3. One foundational course chosen from the following:
   e. NEURO 57: Animal Behavior.
   f. NEURO 105: Systems Neuroscience.
   g. NEURO 115: Cellular Basis of Neuronal Function.
   h. NEURO 120: Computational Neuroscience.
   i. NEURO 125: Molecular Basis of Behavior.
4. Two advanced courses in Neuroscience. These courses must be chosen from a list of approved courses maintained on the concentration website at https://www.mcb.harvard.edu/undergraduate/neuroscience/neuro-courses/. Courses listed as MBB electives do not count toward the secondary field in Neuroscience.

OTHER INFORMATION

Students must take either NEURO 80 (formerly MCB 80) before enrolling in the advanced Neuroscience courses. Neuroscience tutorials designated as NEURO 101-level are considered advanced Neuroscience courses. Ordinarily, only one tutorial course may be counted toward the secondary field. Students enrolling in LS 100 must complete the Neuroscience project and may only take the course once for secondary field credit.

All courses in the secondary field must be taken for a letter grade, and students must earn a grade of C- or better in each course. Freshman Seminars may not be included for credit. Ordinarily, Harvard Summer School courses may not count towards secondary field credit. Courses taken through study abroad programs may be counted for credit in the secondary field.
by petition. Courses taken at other Harvard faculties (e.g., Harvard Medical School) may count for the secondary field by petition or if the course is one of the approved advanced Neuroscience courses.

ADVISING RESOURCES AND EXPECTATIONS

Prior to completing the required courses, students are welcome to meet with the concentration advisers as needed, and students are encouraged to meet with them upon completing the introductory courses in order to select appropriate advanced courses. After completing the requirements for the secondary field, students are required to meet with one of the concentration advisers, in order to confirm that the courses they have taken count for credit towards the Neuroscience secondary field.

Questions about the secondary field in Neuroscience should be addressed to Dr. Ryan Draft, the Neuroscience Concentration Adviser (BioLabs Room 1082A, 16 Divinity Ave., 617-496-9908, draft@fas.harvard.edu). Either Dr. Draft or Dr. Magnotti may sign the final form for secondary field credit.
Secondary Field

Philosophy

Philosophy studies many of humanity’s fundamental questions: how should we live, what kind of society should we strive towards, what are the limits of human knowledge? What is truth? Justice? Beauty? These questions are central to our lives, because in much of what we do, we at least implicitly assume answers to them.

Philosophy seeks to reflect on these questions and answer them in a systematic, explicit, and rigorous way—relying on careful argumentation, and drawing from outside fields as diverse as economics, literature, religion, law, mathematics, the physical sciences, and psychology. And while most of the tradition of philosophy is Western, we seek to connect with non-Western traditions like Islam and Buddhism, as well.

Philosophy doesn’t just operate at this most abstract of planes. We often investigate more specific issues in our classes.

- What is race, and what does justice require when it comes to race?
- What is gender?
- What are the ethical issues raised by technology in society?
- When and why is punishment justified?
- How should we interpret quantum mechanics?
- How does language play into the constitution of our selves and our society?
- In what sense are various kinds of facts, like natural and social facts, objective?
- Is the mind best thought of as a computer?
- What are the ethical challenges of climate change?

Philosophical questions are everywhere. If you find yourself drawn to them, studying Philosophy in college is likely the best opportunity in your life to deeply engage with them. In fact, many concentrators find their way into Philosophy from other disciplines, where they encounter interdisciplinary or foundational questions that can only be addressed through philosophical reflection. And given the small size of the Department, concentrators have the rare opportunity to closely engage with dedicated faculty at the top of their fields.

Whether they take just a course or two or end up concentrating, students find studying Philosophy to be among the most rewarding intellectual experiences of their college careers. The Department offers a rich array of classes to choose from, and students develop their own responses to the philosophical problems that attract them in conjunction with their study of philosophical writing. The Department’s introductory courses help students to develop their reading, writing, and reasoning skills while acquainting them with broad surveys of major areas and historical periods. The Department’s more advanced courses focus on more specific topics and allow students to explore their interests in the context of the broad foundation they acquired in the introductory courses.

Harvard Philosophy concentrators have gone on to pursue diverse and fulfilling careers in law, finance and consulting, business, internet start-ups, medicine, journalism, the arts, non-profit work, education, and academia. The skills that Philosophy teaches students will always be in high demand: the ability to think and write clearly, the ability to bring to light unnoticed presuppositions, to explain complex ideas clearly, to tease out connections and implications, to
see things in a broader context, to challenge orthodoxy. In short, Philosophy gives you skills that you can apply to any line of work.

The secondary field in Philosophy is designed to offer students both a general introduction to philosophical skills and a more focused exploration of some particular domain of philosophy. The secondaries below make reference to different areas of Philosophy. Students can find a complete list of which courses count towards which of these areas on the Philosophy Department website (https://philosophy.fas.harvard.edu/concentration).

We offer four different pathways, all of which will appear as “Philosophy” on the transcript:

- General Philosophy.
- Value Theory.
- Contemporary Metaphysics and Epistemology.
- History of Philosophy.

Each consists of six courses (24 credits): (1) a recommended introductory level course, (2) a tutorial, and (3) four additional courses, one of which can be a related course outside the Department. In all cases, the structure is designed to ensure that students have a basic introduction to the subject matter and methodology of philosophy; an intensive discussion-based tutorial in which they have close contact with the instructor and work intensively on their writing; and a selection of upper-level courses that develop the student’s skills in the area of their interest.

**REQUIREMENTS: 6 courses (24 credits)**

**General Philosophy**

A selection of courses from across the discipline.

1. PHIL 97: Tutorial I.
2. Three courses covering three of the four areas, as categorized on the Philosophy Department website:
   a. History of Philosophy.
   b. Moral and Political Philosophy and Aesthetics.
   c. Contemporary Metaphysics and Epistemology, broadly construed.
   d. Logic.
3. One other course in Philosophy. An introductory course in the Department (numbered below 91) is preferred, but in consultation with the Director of Undergraduate Studies, students may elect to forego taking an introductory course.
4. One other Philosophy course, or a related course outside the Department that has been approved by the Director of Undergraduate Studies.

**Value Theory**

Examination of historical and contemporary theories about the basis and content of such moral and political concepts as the good, obligation, justice, equality, rights, and freedom. This also includes issues in aesthetics.

1. PHIL 97: Tutorial I.
2. Three courses in moral and political philosophy and aesthetics, as categorized on the Philosophy Department website.
3. One other course in Philosophy. An introductory course in the Department in moral and political philosophy or aesthetics (numbered below 91) is preferred, but in consultation with the Director of Undergraduate Studies, students may elect to forego taking an introductory course.
4. One other Philosophy course, or a related course outside the Department that has been approved by the Director of Undergraduate Studies.

Contemporary Metaphysics and Epistemology

Examination of issues in Metaphysics and Epistemology, broadly construed, so as to also include philosophy of language, science, and mind.

1. PHIL 97: Tutorial I.
2. One course in logic.
3. Two courses in metaphysics and epistemology, broadly construed, as categorized on the philosophy department website.
4. One other course in philosophy. An introductory course in the Department in metaphysics and epistemology, broadly construed (numbered below 91) is preferred, but in consultation with the Director of Undergraduate Studies, students may elect to forego taking an introductory course.
5. One other Philosophy course, or a related course outside the Department that has been approved by the Director of Undergraduate Studies.

History of Philosophy

A close study of elements of the history of philosophy.

1. PHIL 97: Tutorial I.
2. Three courses in the history of philosophy, as categorized on the Philosophy Department website.
3. One other course in Philosophy. An introductory course in the Department in the history of philosophy (numbered below 91) is preferred, but in consultation with the Director of Undergraduate Studies, students may elect to forego taking an introductory course.
4. One other Philosophy course, or a related course outside the Department that has been approved by the Director of Undergraduate Studies.

OTHER INFORMATION

All courses must be taken for a letter grade and students must earn a C or higher for the course to count toward the secondary field. No more than two courses may be introductory level (numbered below 97). Typically, all courses but one will be taken in the Philosophy Department. Approval for “related” courses must be obtained from the Director of Undergraduate Studies.

ADVISING RESOURCES AND EXPECTATIONS

The Director of Undergraduate Studies, Cheryl Chen (ckchen@fas.harvard.edu), is available for advice about the program and course selection. The Undergraduate Coordinator, Nyasha Bovell (nyashabovell@fas.harvard.edu), is also available for information about the program. All students interested in a secondary field are expected to register their interest with the
Department early on, and have an initial advising conversation with the Director of Undergraduate Studies.
Secondary Field

Physics

The goal of the Physics secondary field is to provide students with a quantitative introduction to the workings of the physical world, including the mind-bending but increasingly technologically important mysteries of quantum mechanics. The hierarchical structure of the field of Physics makes it difficult for secondary field students to explore with the breadth and depth required for further work in physics; but the applications of Newtonian mechanics, electricity and magnetism, and waves/optics are so ubiquitous and important, and the concepts of special relativity and quantum mechanics so strange and wonderful, that these courses are far more than simply "consumption" of knowledge. They are designed to transform the way students understand and interact with the physical world.

REQUIREMENTS: 4 courses (16 credits)

1. One course in electricity and magnetism – an introduction to electricity and magnetism, at the level of PHYSICS 15B, PHYSCI 12B, APPHY 50B, or higher.
2. One course in wave phenomena and/or optics – an introduction to the physics and mathematics of wave phenomena from coupled oscillators to physical optics at the level of PHYSICS 15C or higher.
3. One course in quantum mechanics – a serious introduction to quantum mechanics at the level of PHYSICS 143A or higher – including wave and matrix mechanics, Dirac notation, the operator treatment of angular momentum, the hydrogen atom, and time-independent perturbation theory.
4. One additional Physics course at the 100 level or higher, exploring an important field in Physics. For this purpose, Applied Physics courses, and other 100-level courses that count as Physics courses for the Physics concentration may also be applied to the secondary field. Suggested courses include: PHYSICS 181, PHYSICS 125, PHYSICS 143B, and PHYSICS 195.

OTHER INFORMATION

Physics courses taken at other institutions may be substituted for substantially equivalent Harvard courses with the permission of the Director of Undergraduate Studies.

Students who substitute more advanced courses for PHYSICS 15B and/or 15C must complete the lab component of these courses, on a pass/fail basis. See the Co-Director of Undergraduate Studies for further information.

Pass/fail: No more than one course may be taken pass/fail.

Mathematics background at least at the level of MATH 21A and 21B are prerequisites for many of the courses in this program.

The prerequisite for the course in electricity and magnetism (PHYSICS 15B, 12B, or 50B) is a mechanics course (PHYSICS 15A, 16, 19, 12A, or 50A), or the permission of the Director of Undergraduate Studies.

ADVISING RESOURCES AND EXPECTATIONS
Secondary field students should meet with the Co-Director of Undergraduate Studies, David Morin (djmorin@fas.harvard.edu) to make sure that they can satisfy the secondary field requirements. Students will be included with Physics and Chemistry & Physics concentrators in appropriate department meetings and social events if they are making satisfactory progress. Upon completion of the secondary field requirements, the Co-Director of Undergraduate Studies will review and approve the final form printed from the secondary field web tool, confirming that the requirements have been met. This signed form must be submitted to the Registrar’s office.

We encourage students interested in Physics as a secondary field to submit their secondary fields course plan to the Department as soon as possible after they have chosen a primary concentration. We will make every effort to encourage students interested in the secondary field to contact us for advising conversations in their freshman year.
Secondary Field

Psychology

Psychology, as a science of the mind, connects naturally to other fields in the humanities, social sciences, and life sciences. Completion of a secondary field in Psychology can serve as a complement to other concentrations or allow students to explore an independent interest in psychology. The secondary field provides a basic foundation in psychology and its research methods while also permitting a general overview of the field, or a more focused exploration of one subfield or several subfields of Psychology, including experimental psychopathology, social psychology, cognition/brain/behavior, and developmental psychology.

REQUIREMENTS: 6 courses (24 credits)

All courses must be taken for a letter grade unless that option is not available.

1. **Introductory Course**: PSY 1: Introduction to Psychological Science (formerly SLS 20), or an approved substitute:
   a. PSY S-1, offered in the Harvard Summer School.
   b. It may be possible to substitute a Psychology AP score of 5 or IB score of 7, in which case an extra advanced course will be required. Please contact the Psychology Undergraduate Office at psychology@wjh.harvard.edu to learn more.

2. **Statistics**: PSY 1900 or STAT 100, 102 or 104, passed with a grade of C- or higher. Petitions to substitute other quantitative methods courses taken as part of a student's concentration will be considered on a case-by-case basis and are approved only if there is substantial overlap in content with PSY 1900. These petitions should be submitted as early as possible, ideally before enrolling in the alternate course.
   a. Note: Harvard Summer School courses or study abroad courses cannot fulfill this requirement.

3. **Foundational Course**: At least one foundational course from: PSY 14, 15, 16, 18; SLS 15; or NEURO 80 (formerly MCB 80) or MCB 81.
   a. Note: Harvard Summer School courses or study abroad courses cannot fulfill this requirement.

4. **Advanced Courses**: Three advanced courses in Psychology of the student's choosing, which reflect the student's area(s) of interest, including:
   a. Most courses listed under Psychology as the Department in course search in courses.my.harvard.edu, with the following conditions:
      i. Any of the following courses that are not taken to meet the foundational course requirement may count as advanced courses: PSY 14, 15, 16, 18, SLS 15, NEURO 80 (formerly MCB 80), and MCB 81 (NEURO 80/MB 80 and MCB 81 may not both be taken).
      ii. Only one Lab Course (from a list on the concentration website at http://wjh.harvard.edu/psych/ug/requirements/charts/Req_LabMeth.htm) or PSY 910R may count toward this requirement.
      iii. Psychology courses that will not meet this requirement are marked in the course description found in courses.my.harvard.edu as not counting toward concentration course credit.
      iv. Psychology counts only a very small number of courses that are from other departments, specifically only counting those that are cross-listed.
as being in the Psychology Department in course search in courses.my.harvard.edu and listed on the Psychology undergraduate website under Departmental Advanced Courses at https://undergrad.psychology.fas.harvard.edu/advanced-courses. These courses are often taught by Harvard Psychology Faculty but are from other departments (e.g., specified Freshman Seminars, General Education courses).

b. Regarding courses from other departments, students completing the secondary field may not count any of the "Expedited Non-departmental Courses" that are only approved to count as advanced courses for concentrators (see list for courses that do not count at https://undergrad.psychology.fas.harvard.edu/non-departmental-advanced-courses). Please note that petitions for advanced course credit will not be accepted for the secondary field. Beginning in 2011-12, the secondary field in Psychology will only count a Non-departmental Course if it is cross-listed as being in the Psychology Department using course search in courses.my.harvard.edu (see 4.a.iv. for details).

c. Harvard Summer School Psychology courses may only count toward this requirement if taught by regular Harvard Psychology Department faculty and listed on the concentration website at http://wjh.harvard.edu/psych/ug/requirements/charts/electives.departmental.html as an approved departmental course. No other summer school courses may count.

d. Only one Freshman Seminar, which must be taught by a regular Harvard Psychology Department faculty member and listed as an approved departmental advanced course at https://undergrad.psychology.fas.harvard.edu/departmental-advanced-courses, may count toward this requirement. Freshman seminars not on the approved list may not count for the secondary field.

e. Courses taken during study abroad may not count for the secondary field unless they are offered through the Harvard Summer School and are on the list of approved departmental advanced courses at https://undergrad.psychology.fas.harvard.edu/departmental-advanced-courses.

OTHER INFORMATION

Students are encouraged to take PSY 1: Introduction to Psychological Science (formerly SLS 20: Psychological Science) as early as possible. Ideally, PSY 1900 or STAT 100, 102, 104 should be taken before Advanced Courses as well, because the courses provide grounding in the analytic tools central to psychology as a science. Foundational Courses should be taken after taking Introduction to Psychological Science but prior to any other Advanced Courses, because these courses provide a solid foundation required in upper-level courses and are often prerequisites for these courses.

All courses must be taken for a letter grade unless that option is not available, and PSY 1900 or STAT 100, 102, or 104 must be passed with a grade of C- or higher.

Enrollment in Psychology advanced courses is often limited and students pursuing a secondary field in Psychology will ordinarily not be given preferential access to limited enrollment courses.

ADVISING RESOURCES AND EXPECTATIONS
Students should notify the Department as early as possible of their intent to pursue a secondary field so that they will be informed of Department policies and deadlines. The College deadline for declaring a secondary field in my.harvard is in the student's final term.

Students should review the Frequently Asked Questions (https://undergrad.psychology.fas.harvard.edu/secondary-field) as early as possible to be aware of specific guidelines that apply to the secondary field requirements. General information requests and questions can be sent to the Psychology Undergraduate Office at psychology@wjh.harvard.edu. Students requiring additional advice about the program and course selection may meet with someone in the Psychology Undergraduate Office, William James Hall 218, during walk-in hours posted online at https://undergrad.psychology.fas.harvard.edu/pre-concentrators.
Secondary Field

Comparative Study of Religion

Recent global and national political events reinforce the fact that the study of religions is vital to understanding the world. Central problems in a wide range of fields—economics, government, sociology, ethics, history, and many others—can be adequately addressed only by taking religion into account. Competency in religious studies indicates the ability to think critically and with historical and cultural learning about the complicated place of religious motivation, memory and ritual meaning in national and international affairs. Such skills have become one marker of an educated person, who is appropriately prepared for the responsibilities and pleasures of democratic citizenship and leadership.

The Committee on the Study of Religion offers courses on religious traditions from around the world and across history, from ancient to contemporary periods. We also offer a wide range of approaches to the study of religion, including ethnographic studies of contemporary communities, philosophy of religion, historical studies, and close examination of classic texts from major religious traditions. Additionally, courses from other departments can sometimes count for credit toward a secondary field.

Students have the option of focusing their course work on a particular religious tradition (such as Judaism, Buddhism or Islam), historical complex (such as religion in the Modern West or South Asian Religion) or approved thematic approaches (such as Religion and Social Science, Religion, Gender and Sexuality, or Religion and the Arts). Approved thematic areas depend on available faculty and course offerings.

REQUIREMENTS: 6 courses (24 credits)

1. Two general, methodological or comparative courses. At least one of these must be an approved introductory or comparative course, or the sophomore tutorial (RELIGION 97).
2. Four other courses approved by the Director of Undergraduate Studies.

OTHER INFORMATION

Students may count one non-letter-graded course taken at Harvard for secondary field credit. Courses from study abroad, Harvard Summer School, or other Harvard schools may be counted toward the secondary field, with the advanced approval of the Director of Undergraduate Studies. The decision whether to grant students pursuing a secondary field in Religion preference in access to seminars will be left to individual professors.

ADVISING RESOURCES AND EXPECTATIONS

Students interested in pursuing a secondary field should contact the Director of Undergraduate Studies to schedule an advising conversation, which is expected of all secondary field students. Please contact Courtney Bickel Lamberth (617-495-2085; lamberth@fas.harvard.edu).
Undergraduates who choose a secondary field in Romance Languages and Literatures (RLL) discover the literatures, cultures, and critical approaches of societies worldwide where French, Italian, Portuguese, Spanish, and Catalan are spoken. RLL offers language courses from the beginning to advanced levels, as well as opportunities for accelerated work and study abroad. The heart of the secondary field consists of courses about literature and society taught in French, Italian, Portuguese, and Spanish. Faculty also offer advanced courses in English on special topics that involve more than one language tradition. These are listed as Romance Studies and count toward the secondary field.

RLL offers the secondary field in four major areas of study:

1. French.
2. Italian.
3. Portuguese.
4. Spanish.

Each of these options requires 5 courses (20 credits). The requirements for the four options are similar, except that in Italian and Portuguese two advanced language courses may count instead of one in French and Spanish. This difference takes into account the fact that students in Italian and Portuguese are more likely to have started their language study in college.

While RLL requires certain levels of courses, the Department does not impose any thematic limits within each special field. Students may focus on a particular period, genre, or cultural issue, or they may explore a variety of areas their field. They may also fulfill one of the requirements for the secondary field with one course in a related field offered in another program or department (e.g., a course on the history of Latin America or on Italian Renaissance art).

REQUIREMENTS: 5 courses (20 credits)

French:

1. A maximum of one French course at the 40-60-level.
2. A maximum of two French courses at the 70-80-level.
3. At least two French courses at the 100-level or above. One of these two courses can be replaced by a Romance Studies course at the 70-level or above.
4. At least three courses must be taught in French.

Students who plan to pursue a secondary field in French are required to meet at least once to discuss their choice of courses with the Undergraduate Adviser in French, Kathy Richman (richman@fas.harvard.edu), or with the Undergraduate Program Coordinator, Cathy Downey (cdowney@fas.harvard.edu).

Italian:

1. A maximum of two Italian courses at the 40-60-level.
2. At least three Italian courses at the 70-level or above. One of these three courses can be replaced by a Romance Studies course at the 70-level or above.
3. At least three courses must be taught in Italian.

Students who plan to pursue a secondary field in Italian are required to meet at least once to discuss their choice of courses with the Undergraduate Adviser in Italian, Ambrogio Camozzi Pistoja (acpistoja@fas.harvard.edu), or with the Undergraduate Program Coordinator, Cathy Downey (cdowney@fas.harvard.edu).

**Portuguese:**

1. A maximum of two Portuguese courses at the 40-60-level.
2. At least three Portuguese courses at the 70-level or above. One of these three courses can be replaced by a Romance Studies course at the 70-level or above.
3. At least three courses must be taught in Portuguese.

Students who plan to pursue a secondary field in Portuguese are required to meet at least once to discuss their choice of courses with the Undergraduate Adviser in Portuguese, Prof. Josiah Blackmore (jblackmore@fas.harvard.edu) or with the Undergraduate Program Coordinator, Cathy Downey (cdowney@fas.harvard.edu).

**Spanish**

1. A maximum of one Spanish course at the 40-60-level.
2. A maximum of two Spanish courses at the 70-80-level.
3. At least two Spanish courses at the 100-level or above. One of these two courses can be replaced by a Romance Studies course at the 70-level or above.
4. At least three courses must be taught in Spanish.

Students who plan to pursue a secondary field in Spanish are required to meet at least once to discuss their choice of courses with the Undergraduate Adviser in Spanish, María Luisa Parra (parra@fas.harvard.edu), or with the Undergraduate Program Coordinator, Cathy Downey (cdowney@fas.harvard.edu).

**OTHER INFORMATION**

Secondary field students can take any RLL course offered in their chosen track (from levels 40 to 200) except for the senior tutorial (99). Students in Italian, Portuguese, and Catalan may enroll in Supervised Reading and Research (91R), as needed.

All courses must be taken for a letter grade, with the exception of an approved Freshman Seminar. Of the 5 required courses, one may be in a related field offered in another department; 2 courses may be taken abroad when approved by both the Office of International Education and RLL for Harvard credit; and courses may be taken at the Harvard Summer School. Students will need their RLL adviser's permission for these three options.

**ADVISING RESOURCES AND EXPECTATIONS**

Students who plan to pursue a secondary field in Romance Languages and Literatures are required to meet at least once for an advising session with the Undergraduate Adviser in their chosen track before they have taken all of their courses. That Undergraduate Adviser, Director
of Undergraduate Studies, or the Undergraduate Program Coordinator must approve the final application for secondary field credit. For more information, students may also contact the Undergraduate Program Coordinator, Cathy Downey (cdowney@fas.harvard.edu).
Secondary Field

Russia, Eastern Europe, and Central Asia

The secondary field in Regional Studies: Russia, Eastern Europe, and Central Asia (REECA) offers students the opportunity to pursue interdisciplinary work on the history and society of this world region. The field requirements are based on the premise that when studying society and culture, the integration of various academic disciplines allows insights unobtainable within the confines of a single discipline. While the field may integrate the study of language, literature, and culture, the primary emphasis here is on the social sciences, including history.

REQUIREMENTS: 5 courses (20 credits)

1. A minimum of three courses (12 credits) must be in the social sciences (e.g., Anthropology, Economics, Government, History).
2. A minimum of three courses (12 credits) must be taught by Davis Center Faculty Associates (https://daviscenter.fas.harvard.edu/about/people).
3. A minimum of three (12 credits) courses must be regular departmental courses (i.e., not General Education courses or Freshman Seminars).
4. The five courses must be distributed across at least two different disciplines or departments.
5. One course (4 credits) of relevant language study may count towards the secondary field. For Russian, students may count any course at the level of RUSS 103 or higher. For non-Russian languages of the region, students who complete at least one full year (8 credits) of study may count 4 credits towards the secondary field.

OTHER INFORMATION
To browse region-related courses that may be eligible for secondary field credit, enter “reeca” in the course search field on courses.my.harvard.edu.

All courses must be taken for a letter grade and must be completed with a grade of B- or above, with the exception of Freshman Seminars, which may be applied toward the secondary field with a grade of SAT. Credit for courses from Harvard Summer School and other Harvard faculties may be granted upon petition. Study abroad is encouraged, and 4 units of study abroad credit may be applied toward the secondary field, with prior approval of the REECA academic adviser. Please note: The Davis Center cannot guarantee students pursuing a secondary field preferential access to limited-enrollment courses.

ADVISING RESOURCES AND EXPECTATIONS
Donna Griesenbeck (griesenb@fas.harvard.edu; 617-495-1194), Davis Center Student Programs Officer and REECA Coordinator, is available to advise students on the program and course selection and refer students to individual faculty as needed. Students are encouraged to register their interest with the REECA Coordinator so they can begin the advising process and be added to Davis Center mailing lists.
Secondary Field

**Slavic Languages and Literatures**

The Department of Slavic Languages and Literatures provides a broad array of courses in the languages, literatures, and cultures of Russia, Ukraine, Poland, the Czech Republic, Bosnia, Croatia, and Serbia. For a secondary field, we offer two options: Central European Studies or Russian Studies. Both require students to take 5 related courses and offer ample scope for interdisciplinary and comparative work. We offer students the chance to work closely with Slavic faculty in order to develop a program of study suited to their own interests, rather than just an accumulation of five loosely related courses. For this reason, we ask that interested students notify the Director of Undergraduate Studies as soon as possible, so that we can begin to work with you to plan your program.

**REQUIREMENTS: 5 courses (20 credits)**

**Central European Studies:**

1. At least three courses in Central European literature and culture (broadly speaking, Bosnian-Croatian-Serbian, Czech, Polish, or Ukrainian) in the Slavic Department.
2. Up to two thematically relevant courses offered by departments such as History, German, Government, Literature, Jewish Studies/NELC, Social Studies, and VES may be counted with the approval of the Slavic Director of Undergraduate Studies.
3. One language course in Czech, Polish, Ukrainian, or Bosnian-Serbian-Croatian may be counted instead of one of the courses in item 2.

**Russian Studies**

1. At least three courses in Russian literature and culture from the Slavic Department, including at least one survey course in Russian literature.
2. Up to two thematically relevant courses offered by departments such as History, German, Government, Literature, Jewish Studies/NELC, Social Studies, and VES may be counted with the approval of the Slavic Department’s Director of Undergraduate Studies.
3. One language course in Russian may be counted instead of one of the courses in item 2.

**OTHER INFORMATION**

All courses (except for Freshman Seminars) must be letter-graded. Slavic-related General Education courses and Freshman Seminars are permitted. Any number of relevant General Education courses and one Freshman Seminar may be counted. Students may use Harvard-approved study abroad credit to count for up to two courses toward the secondary field; they should consult with the Director of Undergraduate Studies before going abroad to make sure their proposed courses will be eligible for their secondary field program. Students are required to take a minimum of two 100-level courses.
ADVISING RESOURCES AND EXPECTATIONS

All students interested in pursuing a secondary field from the Slavic Department should contact the Director of Undergraduate Studies, Professor Aleksandra Kremer (akremer@fas.harvard.edu), as soon as possible to discuss their program of study. She will serve as the primary adviser for students in the secondary field, although they will also be welcome to consult with other Slavic faculty, and the expectation will be that students will monitor their own progress towards fulfillment of the requirements.
Secondary Field

Sociology

The secondary field in Sociology ([http://sociology.fas.harvard.edu/](http://sociology.fas.harvard.edu/)) exposes students to the bedrock theoretical ideas and empirical strategies of Sociology while also allowing for a diverse, flexible Plan of Study.

Sociology emphasizes the successful integration of theory and empiricism, teaching the importance of both elegant thinking and analytical rigor. It is a broad, multi-paradigmatic field that concerns itself with the entire range of human social interaction. Sociology also embraces a wide variety of "strategies of knowing," from quantitative analysis to archival and ethnographic research.

Students concentrating in other fields may well find this a useful supplement to their primary field of instruction. Sociology is an inter-disciplinary field that bridges topics that are often studied in isolation elsewhere in the social sciences. Concentrators in other fields may find it illuminating to see their "home" topic from a sociological perspective.

Sociology teaches analytical and methodological skills relevant to a wide range of professions.

REQUIREMENTS: 5 courses (20 credits)

1. SOCIOL 97: Tutorial in Social Theory, an introduction to sociological theory and the social construction of knowledge. Offered both terms.
2. SOCIOL 128: Methods of Social Science Research, a basic introduction to methods. Offered spring term.
3. Three concentration electives, one of which must be an advanced-level course (SOCIOL 1100 or above). An introductory-level course (SOCIOL 1000-1089) is recommended but not required as part of this sequence.

OTHER INFORMATION

One of the three "concentration electives" may be taken pass/fail or SAT/UNSAT; SOCIOL 97 and 128 must both be taken for letter grades. SOCIOL 97 will ordinarily be taken in the sophomore year. Letter-graded courses must be passed with a grade of C+ or higher in order to receive credit toward completion of the secondary field. Courses taken abroad will not be counted towards a secondary field.

SOCIOL 97: Tutorial in Social Theory will be open to all enrolled undergraduates, including but not limited to secondary field students. Though Junior Tutorials are normally only open to concentrators, secondary field students may be allowed to enroll in Junior Tutorials for credit as electives but are not obligated to do so. Special permission from the Director of Undergraduate Studies is required for secondary field students to enroll in Junior Tutorials.

ADVISING RESOURCES AND EXPECTATIONS

For information about the secondary field, please contact Laura Thomas (lthomas@wjh.harvard.edu). For advising, please see the Academic Advisers in Sociology,
Danilo Mandic (last names beginning A-L), mandic@fas.harvard.edu, and Shai Dromi (last names beginning M-Z), shai.dromi@g.harvard.edu.
Secondary Field

South Asian Studies

The secondary field in South Asian Languages, Literatures, and Cultures or South Asian Studies requires five courses.

REQUIREMENTS: 5 courses (20 credits)

1. Up to two courses at any level in a South Asian language, and up to one additional language course on special topics taught by faculty in the Department of South Asian Studies. Note: The secondary field does not require any language courses.
2. One 100-level non-language course in South Asian Studies. This requirement may be satisfied by a Departmental course or a course with a South Asia emphasis offered in another department, with the approval of the Director of Undergraduate Studies.
3. Additional non-language courses in South Asian Studies to complete a total of five courses. These courses may include departmental offerings and courses with a South Asia emphasis offered in other departments or as General Education courses, with the approval of the Director of Undergraduate Studies.

Note: Courses may not be double counted towards a secondary field in South Asian Studies and a language citation in a South Asian language.

OTHER INFORMATION

Study abroad programs of a summer, a semester, or a year may be approved for credit toward the secondary field. Freshman Seminars may be counted for the secondary field. Other courses for the secondary field should be letter-graded.

ADVISING RESOURCES

The Director of Undergraduate Studies, Richard Delacy (rdelacy@fas.harvard.edu; (617) 496-4749) is available for advising and information.
Secondary Field

Statistics

The Harvard Statistics Department has always had a strong methodological and application-oriented focus, and it has consequently attracted students with their primary focus in another discipline, such as Psychology, Economics, Sociology, Government, Earth and Planetary Sciences, or Life Sciences. These students aim to gain a solid background in Statistics so that they can apply it in their primary field or fields of interest.

REQUIREMENTS: 4 courses (16 credits)

1. STAT 110: Introduction to Probability.
2. STAT 111: Introduction to Theoretical Statistics.
3. Two additional courses in Statistics, with course numbers above 111. STAT 109, COMPSCI 109A, COMPSCI 109B, COMPSCI 181 (or MIT 6.036), and MCB 112 can also be counted toward this requirement.

OTHER INFORMATION

All courses must be letter-graded. Harvard Summer School courses and study abroad courses do not ordinarily count toward the requirements. A minimum grade of C- is required in all secondary field courses.

Calculus (at the level of MATH 1B), and for some courses multivariable calculus and/or linear algebra (at the levels of MATH 21A and 21B, respectively), is a prerequisite for many Statistics courses numbered 110 and above.

ADVISING RESOURCES AND EXPECTATIONS

Interested students should contact the Director of Undergraduate Studies, Professor Joseph Blitzstein (blitzstein@stat.harvard.edu) or the Associate Director of Undergraduate Studies, Professor Kevin Rader (krader@fas.harvard.edu), who serve as advisers for the secondary field in Statistics, and the Student Programs Administrator, Kathleen Cloutier, Science Center 400E (617-496-1402, cloutier@fas.harvard.edu). Further information is available on the Statistics concentration webpage at http://statistics.fas.harvard.edu/pages/undergraduate-statistics-general-information.
Secondary Field

Theater, Dance & Media

Theater, Dance & Media (TDM) at Harvard includes the study and practice of theater, dance, and media (media is taught primarily in so far as they relate to the performing arts). The goal of this secondary field is to encourage and make possible a mix of studio training and text-based academic course work. Many departments and degree programs offer courses centered on theater, dance, and media and these courses represent a variety of approaches and emphases for the study of the history and aesthetics of these performing arts. Students electing a secondary field in Theater, Dance & Media are urged to choose complementary offerings that make a coherent unit of their combined scholarly and practical studies.

REQUIREMENTS: 5 courses (20 credits)

1. At least two practice-based or studio courses (acting, directing, dance, choreography, dramaturgy, design, etc.), most of which are offered under TDM in courses.my.harvard.edu.
2. At least two courses focused on critical and scholarly approaches from either the courses sponsored by TDM or from the list of cross-listed courses.
3. One additional course from either list.

OTHER INFORMATION

Pass/fail: With the exception of approved Freshman Seminars, all courses must be taken for a letter grade. Grades should be B- or above.

Summer School/Study Abroad: Students may petition the Committee on Degrees in Theater, Dance, and Media to have Harvard Summer School courses or study abroad courses count towards the secondary field by submitting full descriptions of these courses to the Director of Undergraduate Studies (DUS) of TDM for approval.

Limited Enrollment Courses: Secondary field students will not be granted preferential access to limited enrollment courses. Individual faculty members will determine the priority of enrollment.

ADVISING RESOURCES AND EXPECTATIONS

Students pursuing a secondary field are urged to seek out faculty members of the Committee on Degrees in Theater, Dance, and Media for advice on their specific course choices.

For more information on the secondary field and for advising, please see the TDM website (https://tdm.fas.harvard.edu/) or contact the Director of Undergraduate Studies.
Secondary Field

Translation Studies

The secondary field in Translation Studies offers students the opportunity to undertake a sustained study of the theory and practice of translation. More than simply examining how meaning is transferred from one language to another, Translation Studies opens up a space to examine linguistic encounter and exchange across languages, as well as across multiple cultures and disciplines. Students who pursue a secondary field in Translation Studies will root their translation work within language study, but they will be able to expand their engagement with the art and craft of translation to encompass questions raised by different genres, media, and disciplinary questions and practices.

Housed in the Department of Comparative Literature, the secondary field in Translation Studies allows students to deepen their interaction with a non-English language, to take courses across departments which consider a range of theoretical issues raised by the process of translation (e.g., problems of language and style, issues of power dynamics in the uneven global landscape, and strategies for reinscribing elements of a non-English text within an American or Anglophone context), and to engage in a capstone translation project.

Students who pursue a secondary field in Translation Studies must be sufficiently proficient in a non-English language to translate a non-English work into English. This proficiency can be demonstrated through 1) the completion of one upper-level language course (see attached list); or 2) an hour-long translation exam administered by the Department of Comparative Literature. If a student wishes to work in a non-English language not offered at Harvard, every effort will be made to find local resources to support the interest.

The secondary field in Translation Studies will likely be of particular interest to students concentrating in the Humanities; but the participation of students from outside of the Humanities who are interested in translation and intercultural communication is strongly encouraged as well.

**REQUIREMENTS: 5 courses (20 credits)**

1. 1-2 foundational courses offered in the Department of Comparative Literature on the history and/or theory of translation or the transnational intersection of languages and literatures (e.g., COMPLIT 108: Translating World Literature; COMPLIT 109: On Translation; COMPLIT 264: Thinking and Writing Transculturally; COMPLIT 281: Rhetoric, Imitation, Translation).
2. 1-2 upper-level language courses focusing on translation into and/or from a non-English language. See list of recommended courses.
3. 1-2 courses that consider translational issues from a variety of subjects or disciplines (e.g., COMPSCI 287R: Machine Learning for Natural Language; Freshman Seminar 36G: The Creative Work of Translating; SP 150: Understanding Migration through Film and Photography; TDM 183M: From History to Hamilton: Contemporary Non-Fiction Theater and How to Make it).
4. One capstone project involving the translation of a non-English work into English, with critical commentary and introduction. Students will participate in a 4-credit semester-long workshop led by members of the Comparative Literature faculty in which they will develop their project and present their work in progress.
In addition to the required coursework, students pursuing a secondary field in Translation Studies will be encouraged to participate in various local co-curricular seminars, workshops, and presentations addressing issues in the field (e.g., the Re-thinking Translation Seminar at the Mahindra Humanities Center, the Boston University lecture series on translation, Woodberry Poetry room events, etc.).

OTHER INFORMATION

All courses, with the exception of Freshman Seminars, which are graded SAT/UNSAT, must be taken for a letter grade and passed with a B- or better. Students pursuing a secondary field in Translation Studies may take one Freshman Seminar for credit.

Harvard approved study abroad courses taken either during term time or through a Harvard Summer School study abroad program may count towards the secondary field in Translation Studies with approval from the Director of Undergraduate Studies.

Students may double-count one course for concentration credit and for secondary field credit.

ADVISING RESOURCES AND EXPECTATIONS

The Director of Undergraduate Studies (snaddaff@fas.harvard.edu) will oversee the secondary field in Translation Studies, and students are encouraged to consult her for advice and information. They should also consult the Translation Studies link on the Comparative Literature Department website which lists relevant courses and other information and events of interest.

Students should declare a secondary field in Translation Studies through the "My Program" section of my.harvard.edu as soon as possible, but no later than the course registration deadline of the first semester of senior year.
Secondary Field

Studies of Women, Gender, and Sexuality

The Study of Gender and Sexuality has long constituted a vibrant and engaging arena for interdisciplinary work and intellectual inquiry. At the heart of this field is the assertion that gender and sexuality are fundamental categories of social organization and power that are inseparable from race, ethnicity, class, nationality, and other categories of difference.

The concentration in Studies of Women, Gender, and Sexuality (WGS) brings together a wide range of academic fields in the humanities, social sciences, and sciences (including History, Literature, Visual Studies, Anthropology, Sociology, Ethnic Studies, Political Science, Psychology, and Biology, to name just a few). As an interdisciplinary field of study, WGS pays close attention to how social norms have changed over time and how they vary across cultures. The concentration also actively investigates the ways in which ideas about gender and sexuality have shaped public policy, civil rights, health care, religion, education, and the law, as well as the depiction of women and men in art, literature, and the popular media. WGS courses are characterized by a strong commitment to critical thinking, as well as a spirit of open and sustained intellectual inquiry. Students take one foundation course in the history, methodology, or theory of Gender and Sexuality Studies. The flexibility of the four remaining course requirements allows students to sample from the rich course offerings in WGS while developing core areas of interest.

REQUIREMENTS

5 courses (20 credits)

1. One of the following: history foundation course (WOMGEN 1200) or theory foundation course (WOMGEN 1210).
2. Four other courses drawn from WGS offerings or from the list of courses that count for concentration credit.

OTHER INFORMATION

Students may petition to have one course from another Department count toward the secondary field. Petition forms are available in the WGS office.

Students may petition to have a Freshman Seminar, a course from study abroad, or a course from Harvard Summer School count for the secondary field. If the Freshman Seminar or the Summer School course is taught by a faculty member with an appointment in WGS, the course would count as a “WGS course.” If the course is not taught by a WGS faculty member, it would count as the student's one non-WGS course; other courses would need to be drawn from WGS course offerings.

No more than one course can be taken pass/fail or SAT/UNSAT. There is no grade minimum (as long as it is a passing grade) for the courses taken for secondary field credit.

Students pursuing a secondary field in WGS will receive preferential access to limited-enrollment courses. Concentrators will be admitted first, but secondary field students will be the next preferred group.
ADVISING RESOURCES AND EXPECTATIONS

Students who are considering a secondary field in Studies of Women, Gender, and Sexuality should meet with Director of Undergraduate Studies Caroline Light (617-495-1964, clight@fas.harvard.edu) or Associate Director of Undergraduate Studies Linda Schlossberg (617-496-9853, schloss@fas.harvard.edu), as soon as possible. Students should also inform the program using the Secondary Fields Web Tool in order to receive preferential access to limited-enrollment courses. Secondary field students are required to have an advising meeting with the Director or Assistant Director of Undergraduate Studies by the end of their junior year to discuss their Plans of Study.

Please note: Students are responsible for observing the registrar's deadlines for filing secondary field forms in order to receive institutional acknowledgment of their completion of a secondary field. See the calendar (https://registrar.fas.harvard.edu/topic/calendar) to determine appropriate deadlines.
LANGUAGE CITATIONS
LANGUAGE CITATIONS

Advanced training in a language is a valuable component of a liberal arts education; it allows students to employ another language in cultural exchange, research, and work. To foster such training, many of the “language and literature” and “language and civilization” departments offer programs in which undergraduates may earn a citation in a modern or ancient language. Those languages in which citations are offered and the specific requirements for each are listed below. The award of a language citation will be noted on the transcript at the time degrees are voted, and will be included in the Commencement program. Students will also receive printed citations along with their diplomas.

Each language citation program consists of four courses (4 credits per course or equivalent) of language instruction beyond the first-year level and/or courses taught primarily in the language. At least two of these courses must be at the third-year level or beyond. Appropriate courses taken in approved programs of study out of residence for which the student receives Harvard degree credit may be counted toward a citation. Courses that satisfy the requirements for a citation may also be counted toward the distribution requirement, secondary field, and/or concentration requirements, as appropriate.

Students must complete all courses to count toward the citation with letter grades of B– or better. Regardless of the level at which a student enters a language program at Harvard, all citations require the completion of four courses (4 credits per course or equivalent) taken at Harvard or counted for Harvard degree credit. Language courses that meet these criteria but are bracketed on the transcript may be counted toward a language citation. Some programs require that courses be taken in a particular sequence; students should consult the relevant language advisers for more information.

Students who plan to satisfy the requirements for a language citation must complete a Language Citation Study Plan (https://registrar.fas.harvard.edu/files/fas-registrar/files/flc_e-signature_3.pdf) with the Head Tutor or Director of Undergraduate Studies of the relevant department and file this form with the Registrar no later than the deadline for degree applications in their final term in the College. Students are encouraged to file their intentions to satisfy the requirements for a language citation as early as the declaration of a concentration so that they may benefit from advising by the department that will provide the recognition. Students will benefit from planning ahead and taking courses in consecutive terms, so as not to lose ground between language courses; this is especially important at the early stages of language study. Students planning their courses around study undertaken while abroad must consult with relevant advisers and obtain pre-approval of all courses they hope to count towards the citation, as such courses must be taken for Harvard degree credit. Those students who later decide not to complete the requirements for a language citation are asked to complete a new Plan of Study indicating this fact in order to inform the relevant department and the Registrar.

Concentrators, including joint concentrators, in African and African American Studies, the Classics, East Asian Studies, Germanic Languages and Literatures, Near Eastern Languages and Civilizations, Romance Languages and Literatures, Slavic Languages and Literatures, or South Asian Studies, whose concentration work is built on a particular language or set of languages, are not also eligible for citations in those languages.
American Sign Language (ASL)

A citation in ASL requires four courses: LING 73C, LING 73D, LING 90A, and LING 90B. Language courses at or above this level of ASL taken out of residence for Harvard degree credit may be substituted for these courses only after assessment via consultation with the ASL Language Coordinator.

Classical Arabic

Four of the following courses: ARABIC BA, 130A, 130B, 140, 141, 160R, 240R, 245R, 248R.

Other courses taught primarily in Arabic or courses taken out of residence for Harvard degree credit may be substituted for the above courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

Modern Standard Arabic

Four of the following courses, including at least two from the third-year or beyond list:

1. Second-year level: ARABIC 110, BB.
2. Third-year or beyond: ARABIC 131A, 131B, 241A, 241B.

Other courses taught primarily in Arabic or courses taken out of residence for Harvard degree credit may be substituted for the above courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

Bosnian, Croatian, and Serbian (BCS)

Four courses beyond the Elementary level (beyond the A-level courses BCS AA-AB). Typically the citation consists of two semesters of Intermediate BCS (BCS BA-BB) and two semesters of Advanced BCS (BCS CR).

Courses taken out of residence (language study abroad) for Harvard degree credit or SLAVIC 91R (if conducted in BCS) may be substituted for these courses with the permission of the Director of the Slavic Language Program or the Director of Undergraduate Studies for the Slavic Languages and Literatures concentration.

Catalan

Consult the Director of Language Programs in Romance Languages and Literatures for information on a citation in Catalan.

Chinese

Four courses beyond the first-year level. Choose courses from the following, of which at least two must be at the third-year level or beyond:

1. Second-year level: CHNSE 120A, 120B, 123XB.

CHNSE BA, BB, and BX do not count for a language citation.
Other courses taught primarily in Mandarin Chinese or language courses taken out of residence for Harvard degree credit may be substituted for the above courses only after assessment via a Chinese placement test and with the permission of the East Asian Language Coordinator (eal@fas.harvard.edu).

Students who plan to satisfy the requirements for a foreign language citation in Chinese must complete a Foreign Language Citation Study Plan with the Language Program Coordinator in EALC (5 Bryant St., Room 205, eal@fas.harvard.edu).

**Literary Chinese**

CHNSE 106A, 106B, 107A, and 107B.

More advanced courses taken out of residence for Harvard degree credit may be substituted for these courses with the permission of the East Asian Language Coordinator (eal@fas.harvard.edu).

Students who plan to satisfy the requirements for a foreign language citation in Literary Chinese must complete a Foreign Language Citation Study Plan with the Language Program Coordinator in EALC (5 Bryant St., Room 205, eal@fas.harvard.edu).

**Czech**

Four courses beyond the Elementary level (beyond the A-level courses CZCH AA-AB). Typically the citation consists of two semesters of Intermediate Czech (CZCH BA-BB) and two semesters of Advanced Czech (CZCH CR).

Courses taken out of residence (language study abroad) for Harvard degree credit or SLAVIC 91R (if conducted in Czech) may be substituted for these courses with the permission of the Director of the Slavic Language Program or the Director of Undergraduate Studies for the Slavic Languages and Literatures concentration.

**Danish**

Two courses beyond beginning Danish (SCAND 90R A-C) and two further courses conducted in Danish. These may consist of any tutorial in Danish, Supervised Reading and Research conducted on Danish (SCAND 91R), or courses taken out of residence for Harvard degree credit and approved by the Director of Undergraduate Studies in Scandinavian.

**Finnish**

Two courses beyond beginning Finnish (SCAND 90R A-C) and two further courses conducted in Finnish. These may consist of any tutorial in Finnish, Supervised Reading and Research conducted on Finnish (SCAND 91R), or courses taken out of residence for Harvard degree credit and approved by the Director of Undergraduate Studies in Scandinavian.

**French**

Four of the following courses: FRENCH 20, 30, 40, 50, and/or any French course at levels 60 or 79, 80, 100, or 200 conducted in French. Note: courses 20-50 must be taken in numerical order; courses 60-200 may be taken in any order.
Other courses taught primarily in French or a maximum of two courses taken out of residence and approved for Harvard degree credit may be substituted for the above courses with the permission of the undergraduate adviser in French or the Director of Language Programs for RLL.

Students who plan to satisfy the requirements for a foreign language citation in French must complete a Foreign Language Citation Study Plan by fall of their senior year and submit it to the office of Language Programs in Romance Languages and Literatures (Boylston Hall 436, 617-495-2524).

**German**

Four of the following courses: GERMAN 20A, 20B, any 60-level course, 101, 102, or any 100-level or 200-level course conducted in German. GERMAN 20AB earns 8 credits.

Other courses taught primarily in German or courses taken out of residence for Harvard degree credit may be substituted for the above courses with the permission of the Director of Undergraduate Studies in German.

**Gikuyu**

The equivalent of four half courses in Gikuyu above the introductory level, the courses include selected from among the following: BA, GIKUYU BB, GIKUYU 101AR, and GIKUYU 101BR.

Other advanced courses in Gikuyu taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Gikuyu) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.

**Greek**

Four courses chosen from the following: GREEK 2X, 3, H, K, or any 10-level or 100-level Greek course, including those in Byzantine Greek. At least two of the courses must be 100-level, GREEK H, or GREEK K.

Other advanced courses or courses taken out of residence for Harvard degree credit may be substituted for one or more of the above with the permission of the Preceptor in Ancient Greek and Classical Latin, Dr. Ivy Livingston (livings@fas.harvard.edu).

**Modern Greek**

Four courses (or equivalent) chosen from the following: MODGRK BA, BB, 10, 100, or any other 100-level course in which the reading is done in Modern Greek. Two of these courses must be at the 100-level.

Other advanced courses or courses taken out of residence for Harvard degree credit may be substituted for one or more of the above with the permission of the Preceptor in Modern Greek, Dr. Calliope Dourou (dourou@fas.harvard.edu).
Classical Hebrew

Four of the following courses: CLAS-HEB 120A, 120B, 130AR, 130BR; HEBREW 150A, 150B, 153, 165, 168, 171, 174, 176.

More advanced courses or courses taken out of residence for Harvard degree credit may be substituted for these courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

Modern Hebrew

Four of the following courses: MOD-HEB 120A, 120B, 130R, 131R, or NEC 91R if focused on contemporary Israeli literature and culture and conducted in modern Hebrew at the third-year level or beyond.

Courses taken out of residence for Harvard degree credit may be substituted for two of these four courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

Hindi-Urdu

The equivalent of four terms selected from among the following: HIND-URD 102 (a full course), 103A, 103B, 104, 105R, 106.

Courses taken out of residence for Harvard degree credit or other advanced courses may be substituted with the permission of the Director of Undergraduate Studies for South Asian Studies.

Icelandic

Two courses beyond beginning Icelandic (SCAND 90R A-C) and two further courses conducted in Icelandic. These may consist of any tutorial in Icelandic, Supervised Reading and Research conducted on Icelandic (SCAND 91R), or courses taken out of residence for Harvard degree credit and approved by the Director of Undergraduate Studies in Scandinavian.

Igbo

The equivalent of four half courses in Igbo above the introductory level, the courses include the following: IGBO BA, IGBO BB, IGBO 101AR, and IGBO 101BR.

Other advanced Igbo courses taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Igbo) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.

Italian

Four of the following courses: ITAL 20, 30, 40, 50, and/or any Italian course at levels 60, 70, 80, 100, or 200 conducted in Italian. (Note: courses 20-50 must be taken in numerical order; courses 60-200 may be taken in any order.)
Other courses taught primarily in Italian or a maximum of two courses taken out of residence and approved for Harvard credit (i.e. study abroad courses) may be substituted for the above courses with the permission of the undergraduate adviser in Italian or the Director of Language Programs for RLL.

Students who plan to satisfy the requirements for a foreign language citation in Italian must complete a Foreign Language Citation Study Plan by fall of their senior year and submit it to the office of the Director of Language Programs in Romance Languages and Literatures (killough@fas.harvard.edu, Boylston Hall 436, 617-495-2524).

**Japanese**

Four courses from the following: JAPAN 120A, 120B, 130A, 130B, 140A, 140B, 150A, 150B.

Language courses taken out of residence for Harvard degree credit may be substituted for these courses only after assessment via a Japanese placement test and with the permission of the East Asian Language Coordinator (eal@fas.harvard.edu).

Students who plan to satisfy the requirements for a foreign language citation in Japanese must complete a Foreign Language Citation Study Plan with the Language Program Coordinator in EALC (5 Bryant St., Room 205, eal@fas.harvard.edu).

**Korean**

Four courses from the following: KOREAN 120A, 120B, 123XB, 130A, 130B, 130XA, 140A, 140B, 150A, 150B.

Language courses taken out of residence for Harvard degree credit may be substituted for these courses only after assessment via a Korean placement test and with the permission of the East Asian Language Coordinator (eal@fas.harvard.edu).

Students who plan to satisfy the requirements for a foreign language citation in Korean must complete a Foreign Language Citation Study Plan with the Language Program Coordinator in EALC (5 Bryant St., Room 205, eal@fas.harvard.edu).

**Latin**

Four courses chosen from the following: LATIN 2X, 3, H, K, or any 10-level or 100-level Latin course, including those in Medieval Latin. At least two of the courses must be 100-level, LATIN H, or LATIN K.

Other advanced courses or courses taken out of residence for Harvard degree credit may be substituted for one or more of the above courses with the permission of the Preceptor in Ancient Greek and Classical Latin, Dr. Ivy Livingston (livings@fas.harvard.edu).

**Norwegian**

Two courses beyond beginning Norwegian (SCAND 90R A-C) and two further courses conducted in Norwegian. These may consist of any tutorial in Norwegian, Supervised Reading and Research conducted on Norwegian (SCAND 91R), or courses taken out of residence for Harvard degree credit and approved by the Director of Undergraduate Studies in Scandinavian.
Persian

PERSIAN 120A, 120B, 140AR, 140BR.

More advanced courses or courses taken out of residence for Harvard degree credit may be substituted for these courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

Polish

Four courses beyond the Elementary level (beyond the A-level courses PLSH AA-AB). Typically the citation consists of two semesters of Intermediate Polish (PLSH BA-BB) and two semesters of Advanced Polish (PLSH CR).

Courses taken out of residence (language study abroad) for Harvard degree credit or SLAVIC 91R (if conducted in Polish) may be substituted for these courses with the permission of the Director of the Slavic Language Program or the Director of Undergraduate Studies for the Slavic Languages and Literatures concentration.

Portuguese

Four of the following courses: PORTUG 20, 30, 40, 50, and/or any Portuguese course at levels 60, 70, 80, 100, or 200 conducted in Portuguese. (Note: courses 20-50 must be taken in numerical order; courses 60-200 may be taken in any order.)

Other courses taught primarily in Portuguese or a maximum of two courses taken out of residence and approved for Harvard credit (i.e. study abroad courses) may be substituted for the above courses with the permission of the undergraduate adviser in Portuguese or the Director of Language Programs for RLL.

Students who plan to satisfy the requirements for a foreign language citation in Portuguese must complete a Foreign Language Citation Study Plan by fall of their senior year and submit it to the office of the Director of Language Programs in Romance Languages and Literatures (killough@fas.harvard.edu, Boylston Hall 436, 617-495-2524).

Russian

Four courses beyond the RUSS A-level courses selected from among the following: RUSS BA-BB, RUSS BTA-BTB, or RUSS BAB (the equivalent of two semesters), RUSS 101, RUSS 103, RUSS 102, or any advanced Russian language courses (RUSS 111, 112, 113, 114, 115).

Other courses taken out of residence (language study abroad) for Harvard degree credit or SLAVIC 91R (if conducted in Russian) may be substituted for these courses with the permission of the Director of the Slavic Language Program or the Director of Undergraduate Studies for the Slavic Languages and Literatures concentration.

Sanskrit

SANSKRIT 102AR, 102BR, and any two courses in Sanskrit beyond 102BR.
Courses taken out of residence for Harvard degree credit or SANSKRIT 91R may be substituted for these courses with the permission of the Director of Undergraduate Studies for South Asian Studies.

**Spanish**

Four of the following courses: SPANSH 20, 30, 40, 50, and/or any Spanish course at levels 60, 70, 80, 100, or 200 conducted in Spanish. (Note: courses 20-50 must be taken in numerical order; courses 60-200 may be taken in any order.)

Other courses taught primarily in Spanish or a maximum of two courses taken out of residence and approved for Harvard credit (i.e. study abroad courses) may be substituted for the above courses with the permission of the undergraduate adviser in Spanish or the Director of Language Programs for RLL.

Students who plan to satisfy the requirements for a foreign language citation in Spanish must complete a Foreign Language Citation Study Plan by fall of their senior year and submit it to the office of the Director of Language Programs in Romance Languages and Literatures (killough@fas.harvard.edu, Boylston Hall 436, 617-495-2524).

**Swahili**

The equivalent of four half courses in Swahili above the introductory level, the courses include the following: SWAHILI BA, SWAHILI BB, SWAHILI 101AR, and SWAHILI 101BR.

Other advanced courses in Swahili taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Swahili) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.

**Swedish**

Four courses beyond the first-year level, including SWEDISH 20 and two courses in Swedish language and culture at the third-year level or above. These may consist of any tutorial or 100-level course conducted in Swedish, Supervised Reading and Research courses conducted in Swedish (SCAND 91R), or courses taken out of residence for Harvard degree credit and approved by the Director of Undergraduate Studies in Scandinavian.

**Tamil**

TAM 102A, 102B, and any two courses beyond 102B.

Courses taken out of residence for Harvard degree credit or other advanced courses may be substituted with the permission of the Director of Undergraduate Studies for South Asian Studies.

**Classical Tibetan**

TIBET 102A, 102B, and any two 200-level courses in Tibetan.
Courses taken out of residence for Harvard degree credit or other advanced courses may be substituted with the permission of the Director of Undergraduate Studies for South Asian Studies.

**Turkish**

Four of the following courses: TURKISH 120A, 120B, 130A, 130B, 149.

More advanced courses or courses taken out of residence for Harvard degree credit may be substituted for these courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

**Twi**

The equivalent of four half courses in Swahili above the introductory level, the courses include the following: TWI BA, TWI BB, TWI 101AR, and TWI 101BR.

Other advanced courses in Twi taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Twi) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.

**Ukrainian**

Four courses beyond the Elementary level (beyond the A-level courses UKRA AA-AB). Typically the citation consists of two semesters of Intermediate Ukrainian (UKRA BR) and two semesters of Advanced Ukrainian (UKRA CR).

Courses taken out of residence (language study abroad) for Harvard degree credit or SLAVIC 91R (if conducted in Ukrainian) may be substituted for these courses with the permission of the Director of the Slavic Language Program or the Director of Undergraduate Studies for the Slavic Languages and Literatures concentration.

**Urdu (see Hindi-Urdu)**

**Vietnamese**

Four courses from the following: VIETNAM 120A, 120B, 130A, 130B, 140, and 140B.

Language courses taken out of residence for Harvard degree credit may be substituted for these courses only after assessment via a Vietnamese placement test and with the permission of the East Asian Language Coordinator (eal@fas.harvard.edu).

Students who plan to satisfy the requirements for a foreign language citation in Vietnamese must complete a Foreign Language Citation Study Plan with the Language Program Coordinator in EALC (5 Bryant St., Room 205, eal@fas.harvard.edu).

**Yiddish**

The equivalent of four terms selected from among the following: YIDDISH B, CA, CB, 102R, 103R, 105, 200R, 202R, 204.
Other courses taught primarily in Yiddish or courses taken out of residence for Harvard degree credit may be substituted for the above courses with the permission of the Director of Undergraduate Studies for the Near Eastern Languages and Civilizations concentration.

**Yoruba**

The equivalent of four half courses in Yoruba above the introductory level, the courses include the following: YORUBA BA, YORUBA BB, YORUBA 101AR, and YORUBA 101BR.

Other advanced courses in Yoruba taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Yoruba) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.

**Zulu**

The equivalent of four half courses in Swahili above the introductory level, the courses include the following: ZULU BA, ZULU BB, ZULU 101AR, and ZULU 101BR.

Other advanced Zulu courses taken out of residence for Harvard degree credit or AFRAMER 91R (if conducted in Zulu) may be substituted for these courses with permission of the Director of the Language Program for the Department of African and African American Studies. In the case of summer study, the course must last six weeks or consist of at least 50 class hours; in addition, students must submit some graded written work done for the course.