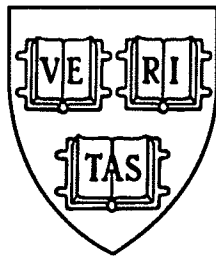


HARVARD UNIVERSITY  
FACULTY OF ARTS AND SCIENCES



*Preliminary Report*  
*Task Force on General Education*

OCTOBER 2006



**Preliminary Report**  
**Task Force on General Education**  
October 3, 2006



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## Preface

This report describes a new program of general education at Harvard College—the set of requirements, outside the concentration, that all students must meet before they can receive a Harvard degree. We believe that the program meshes well with ongoing initiatives in undergraduate education: with changes in the concentrations and the creation of secondary fields; with the mounting of new courses in the sciences and humanities; with improvements in the teaching of writing, speaking, foreign languages, and analytical reasoning; with efforts to renew and reward faculty commitments to teaching and pedagogical improvement; and with the many opportunities Harvard offers for extracurricular experiences that can be linked to learning in the formal curriculum. The ambition of the program of general education we describe in this report is to enable undergraduates to put *all* the learning they are doing at Harvard, outside as well as inside the classroom, in the context of the people they will be and the lives they will lead after college.

In the pages that follow, we propose:

- a new rationale for general education at Harvard, one that is distinct from the rationale for the present Core curriculum;
- major subject matter and critical skills areas for courses in general education;
- new guidelines for determining which courses may be used for general education, allowing students more choice in finding ways to satisfy their requirements;
- wider adoption of effective pedagogical techniques in general education courses and throughout the curriculum;
- greater engagement of faculty from Harvard’s professional schools in general education courses;
- procedures for linking extracurricular activities to the classroom experience, including an activity-based learning initiative.

General education works only when the other components of the undergraduate experience are working effectively in concert with it, and we hope that the reform of general education can be an engine for renewal and innovation throughout the curriculum. In

conjunction with our proposals for general education, we therefore enthusiastically support ongoing efforts by our faculty to promote:

- a broader commitment by concentrations to instruction in written and oral communication;
- the development of more departmental electives that meet the needs and interests of non-concentrators;
- the further development of interdisciplinary and divisional “portal” courses;
- opportunities for increased contact between undergraduates and ladder faculty.

Our committee has had the advantage of looking back over the three-year history of the Harvard College Curricular Review; we have also observed the many fresh initiatives in teaching and learning that are currently underway in Harvard College. The Faculty is making great progress in revitalizing the undergraduate experience. We have undertaken our work in a spirit of partnership with these enterprises, and we hope that our proposals will make some contribution toward bringing all of this good work into focus.<sup>1</sup>

## **I. The Reason for General Education**

Harvard faces the challenge of preparing its students to lead flourishing and productive lives in a world that is dramatically different from the world in which most of its faculty grew up. The world today is interconnected in ways almost inconceivable thirty or forty years ago. It is also a world in which the United States exercises unprecedented influence economically, politically, culturally, and scientifically. In spite of those

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<sup>1</sup> Many of the elements of our proposal echo specific recommendations made by colleagues and published in the booklet “Essays on General Education in Harvard College” (2004), available online at [http://www.fas.harvard.edu/curriculum-review/gened\\_essays.html](http://www.fas.harvard.edu/curriculum-review/gened_essays.html). In particular, our goals for general education and the way we have sought to realize them in a curriculum follow closely ideas expressed in the essays by Peter Bol, Peter Galison, Jennifer Hochschild, Charles Maier, and George Whitesides. We also took note of the forceful (and, we hope, premature) critique of the review of general education requirements by Harry Lewis, in *Excellence Without a Soul: How Great University Forgot Education* (New York: PublicAffairs, 2006). We have also benefited from President Bok’s most recent book, *Our Underachieving Colleges: A Candid Look at How Much Students Learn and Why They Should be Learning More* (Princeton: Princeton University Press, 2006).



circumstances, as the experience of the last five years has shown, it is a highly unstable and uncertain world. By virtue of their gifts, their hard work, and their good fortune, Harvard's students will enjoy exceptional opportunities. But they will need to make their way in an environment complex in new and incompletely understood ways; and they will also be responsible for more than themselves. They will lead lives that affect the lives of others. It is our mission to help them to find their way and to meet their responsibilities by providing a curriculum that is responsive to the conditions of the twenty-first century.

A Harvard education has many dimensions: student organizations, athletics, the arts, and the life of the residential houses all contribute to the intellectual, ethical, and personal growth of undergraduates. The academic experience, though, is the centerpiece. It has three components: the concentration, electives, and general education. The concentration enables students to pursue an interest in depth; electives enable them to explore subjects outside their main academic focus and to broaden their interests and enthusiasms. This coursework, both concentration courses and electives, is designed in the spirit of liberal learning—that is, of free inquiry undertaken without concern for topical relevance or vocational utility. This kind of knowledge is not only one of the enrichments of existence; it is one of the achievements of civilization. Liberal learning heightens our awareness of the human and natural worlds we inhabit. College is an opportunity to learn and reflect in an environment free from most of the constraints on time and energy that operate in the rest of life.

But college is also a preparation for the rest of life. The subjects that undergraduates study, and, as importantly, the skills and habits of mind they acquire in the process, can be profoundly relevant to the lives they will lead after they leave the academy. Concentrations are designed to ground students in a scholarly discipline, but less than four percent of our entering freshmen name college teaching as a career goal, and only five percent of seniors say that they intend to pursue doctoral study in the arts and sciences in the fall after graduation. (Eighteen percent say that they plan to pursue a Ph.D. some time in the future.) On the other hand, close to thirty percent of entering freshmen say that they plan to become a physician or a lawyer, and last year, fifty-three percent of our seniors said that they were expecting to enter a professional school—business, medicine, or law. We have tried to design a general education curriculum with these facts in mind. The role of general education, as we conceive it, is to connect what students learn at Harvard to life beyond Harvard, and to help

them understand and appreciate the complexities of the world and their role in it. The mission of general education is *not* utilitarian or pre-professional. The material that is taught in general education courses is continuous with the material taught in the rest of the curriculum. But it is taught in a distinctive way and in the service of distinctive goals. General education is the place where students are brought to understand how *everything* that we teach in the liberal arts and sciences relates to their lives and to the world that they will confront. General education is the public face of liberal education.

## II. The Goals of the General Education Curriculum

The general education curriculum we have designed aims at four overarching goals in linking the college experience to the world its graduates will confront. These goals are, in many respects, overlapping, and they are not tied to specific disciplines or departments of knowledge.

***General education prepares students to be citizens of a democracy within a global society.*** Achieving this goal requires, first, that students understand the forces driving national and global change: science and technology; political, economic, and social institutions; and the cultures that have helped to shape communities and identities. Second, students need to appreciate that citizenship today brings responsibilities that are both local and cosmopolitan, national and international. They need to have an understanding of American history, American institutions, and American values; they also need to appreciate the place of those institutions and values in a shifting global context. Finally, citizenship means participation in public life. Civic engagement is the soul of democracy. Harvard should seek, throughout the college experience and in its general education curriculum in particular, to inspire its students to become active and engaged citizens.

***General education teaches students to understand themselves as products of—and participants in—traditions of art, ideas, and values.*** Since the time of the Cold War, much domestic and international conflict has taken the form of “culture wars.” Students need to understand what is at stake in these conflicts. They need to appreciate the considerable difficulties in negotiating across cultural differences; they also need to see how cultures that

seem opposed have often emerged from shared traditions, and can, even in their opposition, have profound effects on each other. Knowledge of the history of art and ideas, those both of their own culture and of other cultures, helps students appreciate the contingent nature of the world of beliefs and practices they inhabit; it helps them see how their identities have been shaped; it helps them to understand their own traditions in relation to other traditions.

***General education prepares students to adapt to change.*** Change is the essential condition of modern life, and students need to know something about the forces that generate it, not only so that they can make informed decisions as citizens, but also so that they can have some degree of control over their own lives. No area of endeavor today exerts more powerful transformative effects than science and technology. Artificial intelligence, stem-cell research, and strategies for extracting energy from the environment are among the fields in which major advances will probably change fundamental aspects of the lives of today's Harvard students. Too many students in liberal arts colleges graduate having only a passing acquaintance with the science and technology that will shape their lives, both personally and as members of a public. General education is one of the means by which all students are introduced to important concepts and issues in this area. Rapid change is also a feature of contemporary political, economic, and cultural life. Our world is not a stable one, and students are ill-served by a curriculum that assumes that the shape of things today is all they need to understand in order to engage with the political, social, and technological landscape of tomorrow. Students need to leave Harvard with skills to match the world's speed.

***General education develops students' understanding of the ethical dimension of what they say and do.*** Liberal education is about more than the acquisition of information, skills, and techniques; it is about the capacity to grasp the ethical consequence of the ways in which those acquisitions are put to use. Ethical awareness is achieved in part by helping students to reflect critically on their own beliefs and values, and to learn how to defend them with reasoned arguments. It is also achieved by exposing students to beliefs and values that have shaped others' lives, historically and internationally, so that they are put in a position from which they can choose for themselves what principles to be guided by. Students may well reaffirm the principles they came to Harvard with, but they should be able to do so self-consciously and deliberately. In addition, they should gain a deeper understanding of other belief systems, even when they do not agree with them. And they should see that conflicts

about values arise not only from cultural differences, but from the impact of developments in science and technology, as well.

### III. The General Education Curriculum

We propose that the Faculty adopt a system of general education with two components:

- **seven half courses in five broad areas of inquiry and experience:**
  - Cultural Traditions and Cultural Change
  - The Ethical Life
  - The United States and the World
  - Reason and Faith
  - Science and Technology
- **three half courses that develop critical skills:**
  - written and oral communication
  - foreign language
  - analytical reasoning

In addition, we strongly recommend that the Faculty launch an **initiative in activity-based learning**, with a view to considering the future creation of an additional component of the general education program.

The total number of requirements in our proposal is ten, which students can satisfy by taking from nine to eleven half courses; the total number of requirements in the present general education program is nine, fulfilled by taking from eight to ten half courses. However, as will become clear below, **we envisage a general education program in which students will be able to choose among a variety of approved courses to satisfy their general education requirements.** Some will be located outside departments and listed at the front of the catalogue, but many will be located in departments. There will not be exemptions from portions of the general education curriculum (as there are in the Core), but there will be many ways for students to double-count courses for general education and concentration credit.

In constructing this curriculum, we have asked ourselves: Given the purpose and goals of general education described in sections I and II of this report, what broad subject areas should all students be exposed to? And what critical skills will they need to learn? We have not made any special effort to map these subjects onto existing departments or divisions within the College. We assume that colleagues well suited to teach in a subject area we propose will do so regardless of their departmental affiliations. The courses are not introductions to disciplines; they are exposures to major arenas of change and influence in the twenty-first century.

Harvard's general education program should take advantage of the university's special resources. Harvard College is part of a large research university that includes many of the country's best professional schools. This represents an extraordinary opportunity, one that can make Harvard's undergraduate program distinctive. Many of our graduates will become businesspersons, lawyers, policy-makers, educators, designers, and health care providers; *all* of our graduates will have to deal with, and will therefore need to understand something about, business, law, public policy, design, education, and health. General education courses can therefore usefully draw on the faculty of the professional schools. It is not that general education should be a form of pre-professional training. That is emphatically not the point. It is, rather, that our students should see how the ideas, facts, and perspectives they are learning in the College come to life in real-world scenarios: how philosophical ideas about justice and equality bear on legal decisions, how economic theory only partly explains the causes of poverty in different parts of the world, how an understanding of neuroscience translates into medical practice; how cultural and religious traditions affect debates over public policy.

We envision several ways in which professional school faculty can contribute to a program in general education: by continuing to offer Freshman Seminars, some of which might be approved for general education credit; by teaching newly-designed courses in general education; and by team-teaching with faculty in FAS, thereby providing an enhancement of a course's ability to link liberal learning with life beyond college.

## A. Areas of inquiry and experience

Most of the objectives of general education are addressed by courses offered in five areas of inquiry and experience: **Cultural Traditions and Cultural Change; The Ethical Life; The United States and the World; Reason and Faith; and Science and Technology.** Students are required to take a total of **seven** courses in these areas: two courses in The United States and the World (one focusing on the United States and one on another society), two in Science and Technology (one in life science and one in physical science), and one course in each of the other three areas.

This curriculum does not pretend to constitute a comprehensive guide to everything that an educated person should know. There is simply too much information to cover. We have therefore tried to identify specific areas of knowledge that all students should be exposed to. General education courses within these areas should present a broad range of material, rather than focus in depth on a single topic or a small number of texts. However, they are not simply surveys. Like the case-based courses used in many professional schools today, they should help students learn how to use general knowledge to address concrete situations.<sup>2</sup> They should make students aware that their coursework is connected to things they will be doing for the rest of their lives: reading science journalism, participating in the political process, being able to understand and cope with the ramifications of technological change, interacting with people from different cultural backgrounds, facing ethical dilemmas in professional life, walking through a museum.

Pedagogy is an integral aspect of the general education program as we envision it.<sup>3</sup> Large lectures can be an effective means of instruction, but we think that general education

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<sup>2</sup> On the success of case-based or problem-based pedagogy, see Bok, 125-27. We note that the Committee on Science and Technology Education similarly recommends that introductory courses in the sciences, both general education courses and departmental courses, be problem oriented and that they stress the “context of the science...prior to the fundamentals.” See “Report of the Committee on Science and Technology Education,” in *Curricular Renewal in Harvard College* (January 2006), 120. (Available online at [http://www.fas.harvard.edu/curriculum-review/cr\\_committees.html](http://www.fas.harvard.edu/curriculum-review/cr_committees.html). Hereafter *CRHC*.) See also *Enhancing Science and Engineering at Harvard: The Preliminary Report from the University Planning Committee for Science and Engineering* (July 2006), 20-22. (Available online at [http://www.provost.harvard.edu/reports/UPCSE\\_Interim\\_Report.pdf](http://www.provost.harvard.edu/reports/UPCSE_Interim_Report.pdf).)

<sup>3</sup> The Standing Committee on Pedagogical Improvement and the Committee on a January Term both make a point of calling for increased engagement in the classroom. See their reports in *CRHC*, 105-111 and 113-118.

courses should aim to create a learning environment in which the relationship between teachers and students, and between students and students, is interactive.<sup>4</sup> Increasing student engagement in the classroom is a desideratum noted by many of our Curricular Review committees, and it is something to which general education courses in particular should aspire. As part of the mission to improve teaching generally at the College, we propose that all general education courses be taught, to the extent practicable, in formats that give students an opportunity to discuss the material with the faculty member teaching the class. In the case of a large class, this may mean simply setting aside a period of the lecture hour for questions and comments. And, because students retain what they learn better when they work through concrete exercises, general education courses should strive to apply the basic concepts and principles they teach to the solution of concrete problems, the accomplishment of specific tasks, and the creation of actual objects and experiences.

In our program, students will be able to use courses in concentrations to fulfill their requirements, provided that those courses meet both the goals of general education described above and the curricular criteria described below. Conversely, we expect that departments may allow appropriate general education courses to be used for concentration credit. Students could, in these cases, “double count” their courses. Many courses might be appropriate for credit in one or more areas, and students should be given a choice of how they wish to count such courses. Such a system has the dual advantage of increasing student freedom and choice and of effectively lowering the number of courses students need to take to meet their concentration and general education requirements.

Normally, students would have to take a course for a letter grade to have it count toward the general education requirement, but we propose that an exception be made for Freshman Seminars that have been approved as meeting the goals and criteria for general education courses. Experience suggests that students in Freshman Seminars are highly motivated learners, and, because enrollment is limited, active participation is virtually

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<sup>4</sup> On the importance of faculty-student interaction, see Ernest T. Pascarella and Patrick T. Terenzini, *How College Affects Students, Volume 2: A Third Decade of Research* (San Francisco: Jossey-Bass, 2005), 122-124, 189-190. Substantive, intellectual interactions have a stronger influence than social interactions do. See also Richard Light, *Making the Most of College: Students Speak Their Minds* (Cambridge, Mass.: Harvard University Press, 2001), 93-98, 108-110. On the effects of class size on learning, see Pascarella and Terenzini, 94-95.

assured. We encourage the awarding of general education credit for courses that students already *want* to take.

We have provided, in each area, possible new courses, as well as a list of a few of the existing courses that, because of their subject matter and possibly with some modifications, might be appropriate for satisfying the general education requirement. These lists are intended only as illustrations of the kind of courses we envision for general education. They are by no means exhaustive.

Finally, we recognize that category descriptions must be subject to change. The distinction we make between life and physical sciences, for example, may become less tenable in the future as scientific inquiry becomes more integrated. As part of its regular review of the general education curriculum, the Faculty will want to consider the possibility of reorganizing and redefining the general education categories.

**To fulfill a general education requirement, a course should be designed with the following desiderata in mind:**

- meets one or more of the four goals for general education;
- meets one or more of the goals for courses in its area;
- offers students a broad scope of knowledge;
- incorporates the study of concrete issues or problems;
- encourages, as appropriate, active student engagement with the material and student-faculty contact.

### ***1. Cultural Traditions and Cultural Change***

Cultural expressions have never been more widely disseminated. Music, images, and texts of all kinds are accessible to an extent unheard of even twenty years ago, and this has altered the way we think about literature and the arts.

First, it makes less sense today than ever to speak of a single list of works as constituting “what every educated person should know.” Cultural traditions—strings of interlocking styles and themes and forms—are multiple and multiplying. It is not that there is no canon; there are many canons, products of diverse combinations of backgrounds, tastes, and experiences.



Second, the practice of categorizing literature and the arts by nationality, region, and ethnicity is increasingly recognized as problematic. The more we become aware of the degree to which cultural traditions feed off one another across national, regional, and ethnic boundaries, the more we realize that it has always been this way. Culture is fluid; traditions are mobile.<sup>5</sup> At the same time, it is often in the name of their culture that national and ethnic groups engage in conflict with other groups. The role of culture in shaping identities and communities is not simple. Giving students a “sense of the past” is crucial to achieving the goals in this area. Students need to know that the culture they have grown up with is a product of long histories of influence, exchange, and conflict.

**Courses in this category expose students to important works from one or more cultural traditions; teach them why these works once mattered and why they continue to matter; and to introduce them to the complexities of culture’s role in identities and communities.** The courses include, where practicable, out-of-classroom experiences, such as visits to exhibitions, performances, and readings.

Possible courses might include:

*Circulating Classics.* The course considers significant works in the classical canon, from Homer through Virgil and Ovid, and examines their crosscutting influences on one another and (using selected examples) on the subsequent development of European, American, and world literature down to the present day. What gives this cultural tradition its enduring importance? How was the transmission of classical literature enabled by, and impeded by, military, political, and demographic forces? To what extent is the notion of a classical “canon” a latter-day construct? How does understanding the influence of classical literature help us think about the way art and ideas can have an enduring effect on sometimes distant cultures?

*The Emergence of World Literature.* The course looks at writing that has won international literary prizes, including the Nobel Prize, and considers the extent to which this work indicates, in the past thirty years, the emergence of a global, rather than a national, standard for literary excellence. Students will study the works themselves, as literary artifacts; they will also examine the cultural, institutional, and commercial forces that help

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<sup>5</sup> See the essay by Stephen Greenblatt in “Essays on General Education in Harvard College.”

determine the kind of work that gets produced and the way in which that work is received. Is “world literature” a recent phenomenon, or has literature always been transnational?

*Art and Censorship.* Many canonical works of art and literature, from Joyce’s *Ulysses* to Picasso’s peace dove and Salman Rushdie’s *The Satanic Verses*, have been subject to censorship, both official and unofficial. Totalitarian states have exercised control over art and literature, but so have democratic societies. The course examines important works of art, literature, and music whose production, performance, and circulation have been inhibited by efforts to prevent people from having access to them. Students will interrogate the rationales behind these efforts, and ask themselves under what circumstances, if any, the suppression of cultural expression might be justified. The course will also discuss whether failed efforts at censorship add cultural value to works that have been subjected to it.

*New York-Paris-Moscow.* In the middle third of the twentieth century, cultural exchange and influence between these cities helped to define high art and literature. The course examines film, painting, music, and literature of the twentieth century in the context of these exchanges. The course includes discussion of patterns of migration—the consequence of the Russian Revolution and of the rise of Nazism. Students also consider the degree to which “national” cultures are the product of an international circulation of artists and styles.

*Representations of the Other.* The representation of non-Western people and societies has been a significant feature of Western art and literature at least since the beginning of the age of expansion, in the sixteenth century. But the representation of Western people is also a feature of non-Western cultures. The course looks at major works of art and literature in which representation of the foreign is part of the subject matter—from the perspective of non-Western cultures. The topic raises questions about the legitimacy of judging the politics of representation of earlier historical periods; the degree to which traditions must define themselves against an “other”; and the implications of contemporary non-Western representations of Europe and America.

The following existing courses might meet, or be adapted to meet, a requirement in Cultural Traditions and Cultural Change: Literature and Arts B-51: First Nights: Five Performance Premieres; Foreign Cultures 79: Historical and Musical Paths on the Silk Road; Literature and Arts B-78: Soundscapes: Exploring Music in a Changing World; English 125:

Shakespeare and Modern Culture; Folklore and Mythology 102: Folklore, Nation-Building, and Nationalism; German 114: From Culture to Nation; French 182: Politics and Poetics; Humanities 22: Global Pathways; History of Art and Architecture 137: Aesthetics in Cross-Cultural Perspective.

## *2. The Ethical Life*

Many of the decisions Harvard students will make in their personal and professional lives will have ethical implications: choosing a political candidate to support; assessing public policies; negotiating professional interactions; resolving family dilemmas; and, ultimately, choosing among different life projects. **The goal of courses in this category is to demonstrate to students that we can reason in a principled way about moral and political beliefs and practices.** Students learn to evaluate arguments for and against particular beliefs and actions; in some cases, they consider how normative claims concerning what we ought to believe and do are different from descriptive claims about, for example, our moral psychology and the ethical practices of societies. These courses examine arguments for competing conceptions of liberty, justice, equality, democracy, rights, obligations, the good life, and related concepts, illustrating how they bear on the sorts of concrete ethical dilemmas students may encounter in their public, professional, and personal lives.

Courses in this category advance many of the purposes of general education. By challenging students to evaluate, and possibly change, the assumptions and values they grew up with, these courses promote our students' personal development and build their capacities for argument and deliberation of the sort that are essential for effective civic agency. They also prepare students to respond to the rapid changes occurring in the world. Advances in science and technology raise many difficult ethical questions, and the impact of globalization is felt perhaps most keenly when ethical convictions of different cultures collide. Students must be equipped to engage with the challenges that these twenty-first-century realities will raise.

**Courses in The Ethical Life engage both concrete ethical problems that our students are likely to face in the course of their lives and the ethical theory that underwrites our claims and practices about them.** Because they explicitly link theory and

practice, some courses in this category might be profitably taught jointly between FAS faculty and professional school faculty.

New courses that might be developed for The Ethical Life include:

*Medical Dilemmas.* The course examines the application of ethical theories to issues that arise in medical practice and research, such as euthanasia, assisted suicide, and quality of life; patients' rights to refuse treatment and physicians' rights to refuse to treat; genes, sex, and gender; abortion, fetal testing, and assisted reproduction; and randomized clinical testing of new treatments. The course introduces students to basic concepts of ethical theory (autonomy, agency, rights, beneficence, harm, choice) and fundamental competing ethical theories (consequentialism, deontology, virtue ethics, relativism), and it explores the implications that the theories have for medical issues. By supplementing the ethics literature with case studies, students learn to apply theory to practice.

*The Ethics of Everyday Life.* Is it ever acceptable to lie, and if so, under what circumstances, and why? Should we stop eating meat, and if so why? Is it morally defensible to treat loved ones differently than strangers, and if so why? This course explores major competing moral theories with an eye toward their application to everyday situations. The focus is not on settling answers to troubling questions, but rather on exploring how different answers are justified through reasoned argument. The course helps students to see that it is possible to give reasons for one's answers to these questions that are grounded in basic moral principles.

*Global Justice.* Are nations ethically distinct entities? As nations become increasingly interconnected economically, socially, and culturally, can they operate with distinct ethical principles? Can the United States trade with China and ignore the political oppression of peaceful religious sects such as the Falun Gong? What responsibilities does one nation have to another? Does the United States have a responsibility to alleviate poverty and disease in Niger? What responsibility does a nation have to its immigrants, legal and illegal? This course explores the ethical status of a nation and its rights and responsibilities internationally, and introduces students to some of the basic concepts of political philosophy and explores their application to ethical dilemmas that arise as nations interact.

Existing courses that might meet, or be adapted to meet, a requirement in The Ethical Life include: Moral Reasoning 22: Justice; Moral Reasoning 66: Moral Reasoning about

Social Protest; Philosophy 175: Ethical Theory; Philosophy 178: Equality and Democracy; Government 90zc: Crime and Punishment; Government 1071: Political Ethics; Freshman Seminar 37z: The Moral Virtues: Socrates and His Critics; Molecular and Cellular Biology 60: Ethics, Biotechnology, and the Future of Human Nature; Anthropology 1635: Human Rights and Social Justice.

### ***3. The United States and the World***

The goal of courses in this area is to give students perspective on issues and themes that citizens grapple with in the twenty-first century. Citizenship in the United States in an increasingly integrated global environment entails knowing about the political, economic and social institutions of the United States, about the institutions of other societies, and about the connections and differences between our society and others. It also calls for awareness of cultural differences, and of the historical, economic, and political forces that drive international cultural conflict, cooperation, and change. Although these courses ultimately help students to understand contemporary issues important to American and global society, many of the courses take an explicitly historical perspective necessary for a sophisticated grasp of current and future events. We divide this general category into two subcategories: **The United States: Historical and Global Perspectives** and **Societies of the World: Historical and Global Perspectives**. Students take one course in each subcategory.

#### ***3a. The United States: Historical and Global Perspectives***

**Courses in this category are designed to give students a fresh perspective on American institutions and practices by understanding their origins and histories, and by using other societies as a lens through which to examine the United States and its relation to the rest of the world.** Courses focus primarily on American institutions, documents, and social and political practices, but because the United States should not be studied in isolation from the rest of the world, the courses aim to provide some perspective on those institutions, documents, and practices through a comparison with either their historical antecedents or their relation to other countries.

Some examples of future courses that might be developed for this category include:

*Health Care in the United States: A Comparative Perspective.* In its approach to the provision of health care the United States differs from most other developed countries in that, with the exception of Medicare and Medicaid, health care is largely a privately, rather than a publicly, funded enterprise. The United States spends significantly more on health care than these other systems. A study of this subject can also help students to identify what is distinctive about the American political system—for example, the weakness of the poor and of organized labor, and the strength of interest groups. At a time of concern throughout these countries about the rising costs of health care, the course reviews possible modifications to the U.S. and other systems, and does so paying careful attention to historical contexts and cultural expectations.

*Pluralist Societies: The United States in Comparative Context.* The United States is one of several multi-ethnic/multi-cultural states. The course reviews similarities and differences between the United States, Brazil, India, and the increasingly complex societies of Western Europe. Within states, how are “local cultures” accommodated both to each other and to the larger society? To what extent are “biological” factors, real or perceived, used in determining cultural, ethnic, or racial identities? Under what circumstances are multi-cultural states more or less stable than monocultures?

*The United States and International Institutions.* Attitudes of both United States governments and citizens towards the wider world are highly variable and have fluctuated considerably since the nation’s founding. Using examples such as the United Nations, the International Criminal Court, population policy, infectious diseases (AIDS, SARS, Bird flu, Ebola), and the Kyoto Protocols, the course examines the historical, political, economic, and social factors underlying these complex and ambivalent attitudes.

Existing courses that might meet, or be adapted to meet, a requirement in The United States: Historical and Global Perspectives include: Historical Study A-35: Democracy in America and Europe; Historical Study A-84: American Constitutional History from the Framing to the Present; Social Analysis 66: Race, Ethnicity, and Politics in the United States; History 1690: The United States and Imperialism; Sociology 129: Education in the United States and Europe; Historical Study B 49: History of American Capitalism; Freshman

Seminar 41e: The American Creed: Exceptionalism and Nationalism in Historical Perspective.

### ***3b. Societies of the World: Historical and Global Perspectives***

Being an informed and responsible citizen requires an appreciation of the different ways in which societies organize themselves. This is important not simply as a matter of intellectual curiosity or personal interest. It is also a means through which we come to understand that the American way is not the only way to organize politics, social life, economic relations, and the relations between individuals and the wider society. Understanding other societies gives students a sense of options and of the potential interconnections that the United States has with the rest of the world. Decisions made by the American government, by American corporations, by non-profit voluntary organizations, and by the American media can and do affect societies around the globe. **Courses in this category focus on societies, past or present, outside the United States, with an eye to how they impact or inform the global society of which the United States is one part.**

Some examples of courses that might be developed for this category include:

*Clashes of Civilizations.* Are “The West” and the Islamic world destined to be violent adversaries? Or can an uneasy truce emerge between opposing ideologies, religions, and political systems? These questions are explored from an historical perspective, including careful review of the centuries-long interaction between Christian Europe and the Islamic Ottoman Empire, and the much briefer history of the Cold War.

*Practices of Citizenship: Ancient and Modern.* Democrats and republicans: what was the theory behind the practice of Athenian *demokratia* and the Roman *res publica*, the two political systems whose stamp on the western tradition persists all the way down to modern American party names? This course studies the evolution of concepts of citizenship and civic organization in a range of texts from Athens and Rome: philosophical dialogues, treatises, lyric poetry, political oratory, and theological writings. Main themes include virtue theory, critiques of democracy, free speech, civic education, and the nature of the good life.

Current courses that might meet, or be adapted to meet, a requirement in Societies of the World: Historical and Global Perspectives include: Historical Study A-13: China: Traditions and Transformations; Historical Study B-11: The Crusades; History 1965:

International History: States, Markets, and the Global Economy; Social Studies 98hp: Is Democracy Possible Everywhere?; Economics 980c: The Economics of World Migration; Social Studies 98gq: The Global Culture Clash; Studies of Women, Gender and Sexuality 1000: Gender and Sexuality in an International Frame; Historical Study A74: Contemporary China: The Peoples Republic and Taiwan in the Modern World; Freshman Seminar 49c: Globalization: Critical Perspectives; Historical Study B-52: Slavery and Slave Trade in Africa and the Americas.

#### ***4. Reason and Faith***

Religion is a fact of twenty-first-century life—around the world and right at home. Ninety-four percent of Harvard’s incoming students report that they discuss religion “frequently” or “occasionally,” and seventy-one percent say that they attend religious services. When they get to college, students often struggle—sometimes for the first time in their lives—to sort out the relationship between their own beliefs and practices, the different beliefs and practices of fellow students, and the profoundly secular and intellectual world of the academy itself.

Beyond these private struggles, religion is *realpolitik*, both nationally and internationally. Wars are fought around the world in the name of religion. Increasingly, policy makers understand that success in international affairs depends on appreciating the role that religion plays in many societies.<sup>6</sup> Here at home, the United States is experiencing a cultural and political tension over religious issues that erupts in debates about the constitutionality of the Pledge of Allegiance, the display of the Ten Commandments on government property, school prayer, and same-sex marriage. Religious beliefs are also shaping vigorous debates concerning issues in science and medicine, such as evolutionary theory, stem-cell research, and abortion. These debates are not simply debates about morality or public policy. They also purport to be debates about the facts. A recent *Science* article reports that one third of American adults firmly reject the idea of human evolution (a number significantly higher than in European countries and Japan), and the rejection appears to be

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<sup>6</sup> See, e.g., Madeleine Albright, *The Mighty and the Almighty: Reflections on America, God, and World Affairs* (New York: Harper Collins, 2006).



tied to religious conservatism.<sup>7</sup> The boundary between the secular and non-secular today is confusing and highly fraught.

Harvard is no longer an institution with a religious mission, but religion is a fact that Harvard's graduates will confront in their lives both in and after college. We therefore require students to take one course in a category entitled Reason and Faith. Let us be clear. Courses in Reason and Faith are not religious apologetics. They are courses that examine the interplay between religion and various aspects of national and/or international culture and society. Moreover, these courses do not center on ethics *per se*. At the conclusion of taking a course in The Ethical Life area, students will appreciate the nature of moral dilemmas and understand principled ways to grapple with them. In contrast, at the conclusion of taking a course in the Reason and Faith area, students will appreciate the role of religion in contemporary, historical, or future events – personal, cultural, national, or international.

Courses in Reason and Faith can vary widely. They may take up the relationships between *politics* and religion, *science* and religion, *culture* and religion, *epistemology* and religious faith, and more. They engage with a wide range of topics, from evolutionary theory and intelligent design to comparative religious cultures. **These courses are not prescriptive: their aim is to help students understand the interplay between religious and secular institutions, practices, and ideas.** They also encourage students to become more self-conscious about their own beliefs and values. By providing them with a fuller understanding of both local and global issues involving religious faith, the courses are intended to help students become more informed and reflective citizens.

Newly developed courses might include:

*Religion in Closed Societies.* In what ways do religious movements inform personal, ethnic, and political identities in closed and secular political societies? How does that contrast to religious movements that form the basis of closed political societies? Examples include: the Falun Gong movement in Communist China, Judaism in the former Soviet Union, Catholic liberation theology in El Salvador, and the Islamic Revolution in Iran.

*Religion and Democracy.* How does religion function in open and democratic societies? What role does religion play in the contemporary American political landscape, and how does it compare to the role religion plays in other Western industrial democracies?

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<sup>7</sup> *Science* 313 (August 11, 2006), 765-766.

The history of immigration, assimilation, secularization, and religious freedom are examined in the context of the United States post-September 11, the “Muslim” riots in Paris in 2005, the changing role of the Catholic Church, and the increasing influence of religious political parties in Middle Eastern democracies.

*Religion and Science.* Since the late nineteenth-century, science and religion in the West have been viewed as unlikely bedfellows and incommensurable epistemologies. At the same time, much natural knowledge has been developed in the service of religious beliefs or institutions, and many scientists profess a belief in God in one form or another. Using contemporary and historical examples (“intelligent design” vs. evolution by natural selection, the origins of life on earth, the Scopes Monkey trial, Einstein’s critique of quantum physics, Galileo’s condemnation, etc.), this course will examine the intellectual and philosophical conflicts between science and religion as a form of a shifting culture war between the spiritual and the secular.

*The Wars of Religion.* From the Hundred-Years War to the contemporary conflicts between militant forms of Islam and the industrialized West, warfare waged on religious grounds has formed the basis of much of world history. This course will examine the modern history of religious warfare, from the end of World War II to the present. Examples include conflicts between Muslims and Jews in the Middle East, Hindu-Muslim tensions in India and Pakistan, the Chinese annexation of Tibet, and the violence in Northern Ireland between Protestants and Catholics.

*Medicine, Spirituality, and Religion in Modern America.* This course examines the intersections and clashes between medicine and spirituality in the contemporary United States. As Western scientific medicine has become more effective, more expensive, and more reductionist, the rise of “alternative” healing practices has grown dramatically. From Christian Science healing, to the scientific study of the efficacy of prayer, to mind-body practices such as yoga and tai chi, spiritual, non-western, and religious healing modalities have flourished in the last two decades. The course examines the philosophical, social, and cultural bases of beliefs about the body, health, and illness in contemporary America in order to understand the apparent contradiction between the parallel growth of scientific medicine and spiritual healing practices.

Reason and Faith is a category unlike any that Harvard has included in its general education curriculum, but even a casual review of the current course catalogue shows that courses in this area already proliferate. To give just a small sample of courses currently on offer that could be, or be modified to become, a general education course in Reason and Faith: History 1491: Religion and Popular Culture in 19th-Century Europe; Religion 1560: Religion and Society in 20th-Century America; Religion 1550: Religion and American Public Life; Government 90jm: Comparative Constitutionalism: Religion and State; African and Afro-American Studies 192x: Religion and Society in Nigeria; Social Studies 98ic: Why Americans Love God and Europeans Don't; Human Evolutionary Biology 1355: Darwin Seminar: Evolution and Religion; Ancient Near East 138: The Bible and Politics; Religion 1820: Islam in South Asia: Religion, Culture, and Identity in South Asian Muslim Societies; Historical Studies A-27: Reason and Faith in the West.

Other topics for courses in this area might include: church and state; history of religion in the United States; the politics of religion in medieval Christendom; religion and the academy; philosophical attempt to reconcile faith and reason; gender and religious practices; global Christianity; the Vatican as a religious and secular institution.

### ***5. Science and Technology***

The exponential growth of scientific knowledge has been accompanied by a corresponding increase in the impact of science and technology on all members of society, scientists and non-scientists alike. Science and technology directly affect our students in many ways, both positive and negative: they have led to life-saving medicines, the internet, more efficient energy storage, and digital entertainment; they also have shepherded nuclear weapons, biological warfare agents, electronic eavesdropping, and damage to the environment. Even a casual glance at the Tuesday New York *Times* science section indicates that such changes are proceeding apace. Learning to cope with the contemporary world requires an appreciation of science and technology, as well as the ways in which they can affect our lives and the very fabric of our society.

Scientific issues also lie at the heart of many of the most vigorously debated and potentially transforming public policy issues today. To understand and contribute meaningfully to a discussion about our reliance on fossil fuels, the legality of embryonic

stem-cell research, personal privacy in the digital age, global warming, the ethics of human cloning, or the importance of space exploration, students need to be equipped with both a knowledge of the underlying scientific and technological concepts and an appreciation of the ways in which science and technology raise and address critical social issues.

Whether they are making personal decisions about medical treatments and diet or public policy decisions about stem-cell research and nuclear energy, our students will benefit from knowing more than a few fundamental scientific concepts. In addition, they should know something about how science works. Although general education does not seek to transform all students into budding scientists, it can and should acquaint our students with the basic assumptions and methodologies that underlie all science. Through the analysis of key experiments or the comparison of technologies that have shaped a topic of discussion, students should come to understand what scientific experimentation can (and cannot) establish, and how. Only then will they be in a position to engage critically and intelligently with the scientific data that they will encounter on a daily basis.

**The goal of general education courses in Science and Technology is to prepare our students for the roles that science and technology will play in their lives. To achieve this goal, courses in this category should: 1) teach key scientific concepts and the principles underlying relevant technologies; 2) frame this material in the context of social issues; and 3) impart an understanding of the methods and process of scientific research, discovery, and invention that enables students to distinguish scientific claims and theories from those that are based on non-scientific foundations.** An ideal Science and Technology course weaves together all three of the above components. General education courses in this category do not strive to train students to become future scientists or to enable students to take more advanced science classes; therefore, they are not expected to survey in depth any specific scientific subdiscipline.<sup>8</sup>

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<sup>8</sup> Our recommendations for general education in the sciences are very much in line with those of the 2006 Committee on Science and Technology Education, and we include the recently developed foundational courses in the life sciences and physical sciences, which the Committee discusses, below, among our examples. What is more, the Committee's proposal for introductory departmental science courses represents ideas very much in concert with our own. The Committee writes of them: "These courses have several unifying principles. First, they are problem oriented, and not restricted to a single subject. Second, the context of the science is stressed prior to the study of the fundamentals. This may result in some topics

Science and Technology courses are divided into two categories: **Life Science** and **Physical Science**. This subdivision ensures student exposure to two very important and distinct areas of science and technology. We expect that the faculty committee overseeing courses in this area will find that most science concentrators can meet one of their general education requirement in Science and Technology by taking Life Sciences 1a or 1b, or the new sequence Physical Sciences 2 and 3, all of which introduce students to fundamentals using concrete case studies. The committee will want to be assured that the courses also touch on the impact that science has on society as a whole. We also note that Harvard offers many courses on technology and society: a number of Freshman Seminars address the relations between science, technology, and society; and courses on technology and society are offered in the School of Education, whose faculty might be available to teach in the general education curriculum.

#### *5a. Life Science*

Understanding life—its origins, its changes over small and large timescales, and the ways in which its span in humans can be extended—continues to be an area of enormous worldwide activity. Past trends strongly suggest that advances in the life sciences over the lifetime of our students will significantly impact virtually every aspect of their lives. These advances will include the introduction of new medicines, will provide new insights into the origins of (and requirements for) life itself, and will raise many legal and ethical issues associated with these and other developments.

**Science and Technology courses in the life sciences convey fundamental concepts, methods, and technologies of life science integrated with the technologies that grow out of, and inspire, the science. These courses also stimulate students to reflect on**

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being taught out of sequence, but we feel it has pedagogical advantages.... We aim to present a sequence of useful tools, by emphasizing where and how these tools are applied. Finally, these courses have a broader sweep, so that our students can see how the various branches of the subject fit together.” (“Report of the Committee on Science and Technology Education” in *CRHC*, 120). We expect that these introductory courses (such as Life Sciences 1a and 1b) will serve as natural departmental “bypasses” for the general education requirements in the sciences. The University Planning Committee for Science and Engineering, in its preliminary report, issued last July, calls for pedagogical reform of teaching in science that are similar to those in our proposals. See *Enhancing Science and Engineering at Harvard*, 5, 20-22, 26.

**the social consequences of the science and technology.** For example, such courses could address the role of evolutionary theory in public education, the possibility and legitimacy of cloning and genetic engineering, the morality of embryonic stem cell research, the feasibility and desirability of inhabiting other planets, the ways in which scientists develop therapies to combat disease, advances in understanding and possibly extending human mental capacities, and even the uniqueness (or commonness) of life itself.

Science and Technology courses in the life sciences might include:

*Molecules, Diseases, and Medicines.* Familiarizes students with the molecules of life and with several diseases that cause these molecules of life to malfunction, to be hijacked, or to be destroyed. Follows several case studies of how molecular medicines to remedy these problems are discovered, both serendipitously and by careful design. Discusses the economic and ethical issues facing drug companies and the pharmaceutical industry from a national and global health perspective. Key concepts include a basic literacy of molecules essential to life (including DNA, RNA, and proteins) and of the strategies to treat disease that arise from an understanding of these molecules. Teaches the evolutionary theory underlying the ubiquitous rise of drug resistance.

*Origins of Life on the Earth and Elsewhere.* Equips students with the astrophysical and chemical framework needed to understand current models for how life may have begun on Earth, and leads them to confront the implications of common assumptions about the uniqueness of human life—assumptions that inform debates about issues ranging from abortion and intelligent design to biodiversity. Highlights possible steps along presumed pathways leading to life that have been successfully demonstrated in laboratories as well as other necessary steps for which no satisfying scientific explanation currently exists.

*Stem Cells and Human Cloning.* Teaches the scientific basis of how stem cells can be obtained, what their unique properties are, and what their potential is for addressing serious human health issues. Equipped with this understanding, students are then asked to consider the ethical implications of using embryonic stem cells for research and therapeutic applications. Students consider technologies that exist or are thought to be achievable within the next decade that promise major medical breakthroughs but that require the use of embryonic stem cells. A second case study on the related scientific and ethical issues facing human cloning is also presented.

*The Human Mind.* Addresses central facts regarding the relationship between brain function and the human mind. In so doing, students grapple with a host of questions, some of which arise only because of advances in recent knowledge and some of which are old chestnuts. For example: What is the relationship between the mind and the brain? Is the mind just the brain? If not, what is it? Is the brain simply a kind of “wet computer,” a machine that can be understood using the language and conceptual apparatus of the life and physical sciences? If so, where does that leave the concepts of “free will” and “personal responsibility”? What are the ethical implications of manipulating the human mind, for example by creating drugs that enhance specific brain functions such as the ability to learn material by rote memorization?

*Evolution, Creationism, and Intelligent Design.* Teaches the scientific evidence, microscopic and macroscopic, that has led the vast majority of scientists to accept the theory of evolution by natural selection. Presents different ways in which scholars have treated the apparent contradictions between some tenets of creationism and some aspects of evolutionary theory. Discusses the recent legal and social activity surrounding “intelligent design,” and the distinctions between scientific theories and non-scientific theories.

Existing courses that might meet, or be adapted to meet, a general education requirement in Science and Technology: Life Science include: Science B-35: How to Build a Habitable Planet; Science B-62. The Human Mind; Science B-64: Feeding the World; Feeding Yourself; Biophysics 101: Genomics, Computing, and Economics; Molecular and Cellular Biology 60: Ethics, Biotechnology, and the Future of Human Nature; Organismic and Evolutionary Biology 10: Foundations of Biological Diversity.

### ***5b. Physical Science***

Advances in the physical sciences have had a profound impact on society. Such discoveries have enabled the storage and harvesting of energy, the development of nuclear weapons, the invention of modern computers, and the current understanding of our environment and its changes in response to the growth of industrial societies. **Courses in this category teach students fundamental principles, concepts, and methods of the physical sciences integrated with relevant technologies and societal issues.**

Science and Technology courses in the physical sciences might include:

*Reality Physics.* Teaches the physical basis of phenomena that affect people in their everyday lives. What is electricity? What are lasers and how have lasers revolutionized data storage, retrieval, and communication? How can energy be extracted from atomic nuclei both for general use and in weapons of mass destruction? How do modern medical imaging techniques (PET, MRI, CT) take pictures within our bodies? What are atomic clocks and how are they used in the Global Positioning System (GPS)? What are the risks, responsibilities, and social and ethical dilemmas associated with the above applications of the physical sciences?

*The Nature of Space and Time.* Examines the great paradigms of physics including those associated with quantum mechanics, relativity, statistical mechanisms, chaos, and cosmology. How does our modern understanding of time and relativity impact nuclear energy? What is the nature of light and how is this nature exploited by technology? What is the uncertainty principle and how does its understanding explain tunneling and make possible modern electronics? How might quantum mechanics be exploited into a future, revolutionary type of computer? What are the implications of these concepts on our immediate and distant futures?

*Information Technology and Privacy.* Familiarizes students with the information technologies (including data gathering, processing, and storage/retrieval) that have dramatically augmented the productivity of virtually all components of society. The speed with which these technologies have become increasingly efficient and sophisticated has outpaced the extent to which lawmakers and citizens have anticipated their intrusiveness and vulnerability to exploitation. Teaches current social issues at the intersection of information technology development and society, including the widespread sharing of commercial information (piracy), the widespread access of sensitive personal data by other individuals and companies (including identity theft), and the capabilities of governments to obtain our communications and personal records for state use.

*Our Present and Future Digital World.* The course explains how a computer works, and how computers communicate over the Internet. Students learn the fundamentals of von Neumann architecture, how computers “process information” (not just “calculate”), the history and development of the internet, the birth of the world wide web, the nature and role of routers and servers, and using the web to create “virtual” supercomputers. The course also



looks to the future, and considers what is necessary to deliver high-definition video-on-demand, the role of the web in personal communication (the impact of true high-resolution, real-time videoconferencing), and the emerging shape of a completely wireless, connected world.

*Energy and the Environment.* The dependence of the United States on petroleum allows other countries to sway not only our economies, but also our foreign policies. Conveys the physical science basis of our energy needs and our ability to harvest energy from fossil fuel, solar, geothermal, nuclear, and other sources. What factors limit the efficiency of energy harvesting from each of these sources, and how do they compare with the efficiency of analogous biological energy-harvesting processes, such as photosynthesis? How is energy stored, and at what costs? What are the environmental and economic consequences of harvesting, storing, and using alternative future sources of energy?

Existing courses that might meet, or be adapted to meet, a general education requirement in Science and Technology: Physical Science include: Science A-43: Environmental Risks and Disasters; Science A-50: Invisible Worlds: Micro- and Nanothings; Science A-52: Energy, Environment, and Industrial Development; Physical Sciences 1: Chemical Bonding, Energy, and Reactivity: An Introduction to the Physical Sciences; Physical Sciences 2: Mechanics, Elasticity, Fluids, and Diffusion; Physical Sciences 3: Electromagnetism, Light, Entropy, and Information; Earth and Planetary Sciences 5: Introduction to Environmental Science: Atmosphere, Ocean, and Biosphere; Engineering Sciences 6: Environmental Science and Technology; Environmental Science and Public Policy 90a: Energy, Technology, and the Environment; Science A-41: The Einstein Revolution; Quantitative Reasoning 48: Bits.

Other topics for courses in this area might include: the physics and politics of energy; the atmosphere; bombs and rockets: the physics of mass destruction; how physics constrains music; exploiting the nanoscale world; cyborg: mixing human and machine.

## **B. Critical skills**

Education is not just about acquiring facts: students do not become engaged citizens or self-aware individuals by filling their heads with information. Moreover, the information our students learn today is changing at such a rapid pace that much of it will have been

replaced by new information within a few years after graduation. *How* people learn is, in the long run, often the most valuable part of *what* they learn. The sociology concentrator who does not go on to become a sociology professor will acquire skills and habits of mind that will remain part of his or her intellectual arsenal long after the facts and the figures are forgotten. These general education courses in critical skills are intended to equip students with aptitudes useful for twenty-first-century life.

### ***1. Written and oral communication***

There is no more valuable skill, not only for engaged citizenship, but for effective leadership, as well, than the ability to express oneself clearly and persuasively, both in writing and orally. No matter how competent they may be when they arrive at Harvard, all students need instruction in expository writing and public speaking. There are many forms of communication people need to have competence in today, from legal briefs and research papers to extemporaneous speaking and effective use of electronic aids. The academic article is not the only, nor is it the most privileged, expository genre.

We propose that Expository Writing be considered part of the general education requirement in order to make it clear that instruction in writing is an integral part of undergraduate education. In addition, because students cannot learn everything they need to know about writing and speaking from a single course taken in the first year, we enthusiastically support the suggestions of the Committee to Review the Teaching of Writing and Speaking that the College find additional ways of teaching communications skills: by ensuring that required writing courses train students in a variety of forms of writing and speaking, by helping concentrations take on additional responsibility for helping students with their writing and other communication skills, and by making writing a significant component of courses across the curriculum.<sup>9</sup> As the Committee to Review the Teaching of Writing and Speaking aptly writes, the Expository Writing course “is a crucial beginning but only a beginning.”<sup>10</sup>

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<sup>9</sup> Richard Light’s work has shown that students learn more from courses that include significant and well-structured writing assignments, and that students find these courses the most engaging and valuable. See Light, 54-69.

<sup>10</sup> “Report of the Committee to Review the Teaching of Writing and Speaking,” in *CHRC*, 123.

## *2. Foreign language*

We propose retaining the present foreign language requirement, which, we believe, plays a role in attaining the goals of general education.

As the world grows increasingly integrated and interdependent, knowledge of a foreign language is an important component of citizenship. It expands personal horizons as well as professional ones. The impression that many Americans may have that the world today is, for all intents and purposes, English-speaking is superficial. Exposure to a foreign culture through its language is one of the ways in which students can prepare themselves for the increasingly international character of life in the twenty-first century. It can also give them a livelier appreciation of the similarities and differences between their own culture and those of other people. Students typically report that courses in a foreign language are among the most rewarding in their college experience.<sup>11</sup>

More than two-thirds of Harvard students place out of the foreign language requirement; the rest must complete a year of language study here, completed during the first year. **We recommend that consideration be given to the possibility of satisfying this requirement any time during the four years.** We do not address the question (most recently studied by the Educational Policy Committee, in 1997) of whether the existing requirement might be fine-tuned—by, for example, establishing benchmarks for the level of competence that students must achieve. Although students are not likely to achieve fluency after just one year, we agree with our colleagues on the Committee on Education Abroad that even relatively short but intensive exposure to the language and ideas of another culture, during the semester or over the summer, will have a positive effect on our students' intellectual, moral, and cultural development.<sup>12</sup> Students should be encouraged to build on the language skills they already possess by taking higher-level language courses that may culminate in a foreign language citation, by taking courses in the literature or history of the country whose language they are studying, and by embarking on some form of international experience. In any case, a meaningful foreign language requirement is an indispensable element of a general education system.

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<sup>11</sup> See Light, 11, 77-80.

<sup>12</sup> See the reports of those committees in *CRHC*, 99 and 106-107.

### *3. Analytical reasoning*

After they graduate, our students will be making important decisions, for themselves and others, under conditions of uncertainty. They may have to decide which medical treatment to undergo, whether a defendant in a court of law is guilty, whether to support a policy proposal. To make these decisions they will need to gather and assess information, weigh evidence, estimate probabilities, construct and evaluate arguments, solve problems, and draw inferences from the data available. They will, in other words, have to engage in analytical reasoning of various forms. Good analytical reasoning is guided by such conceptual tools as logic, statistics, probability theory, and rational decision theory. Because they are crucial to well-informed decision-making, these skills are essential to being an effective citizen, to adapting successfully to changing conditions, and even to making the choices one makes in one's daily life.

We propose that all students be required to take one half course in analytical reasoning. Analytical reasoning is not a discrete body of knowledge. It is a set of related conceptual skills that guide valid reasoning. To take just a few examples, these skills might include understanding the statistical principle that exceptional cases will regress to the mean; that relaxing the standards for reporting an uncertain event will increase both hits and false alarms; that a person with the typical symptoms of a rare condition probably does not have the condition; that in certain interactions the best option for each individual can bring about the worse outcome for all of them. These skills can and should be taught in the context of a variety of subjects.

Analytical reasoning overlaps with but is different from quantitative reasoning. Mathematics provides one way to improve one's analytical reasoning skills—the construction of mathematical proofs is one way of learning how to draw valid inferences—but it is not the only way. Moreover, it is often not obvious how to apply to real-world situations the sort of analytical reasoning used in mathematical proofs. Indeed, in most of the reasoning students will engage in during and after college, they will need to construct not proofs for known conclusions, but chains of inferences that lead them to the best or most likely conclusion given the evidence at hand. Many forms of representation are employed in analytical reasoning; in addition to mathematics there is sentential logic and graphic representations ranging from Venn diagrams to the Peircean molecular diagrams used in computer science.

Finally, there are many subject matters that have designed analytic tools tailored to decision-making problems in their domains, including economics, philosophy, biomedicine, public health, and the social sciences. For this reason, the Analytical Reasoning requirement should include courses drawn from across the curriculum.

Students may satisfy the Analytical Reasoning requirement by taking a departmental course that has been approved for general education credit by a Standing Committee on General Education, or by taking a specially-designed general education course in analytical reasoning. (Simply taking a course in mathematics will not satisfy the requirement, unless the course is designed to help students see the relation between quantitative methods and the kinds of problems and challenges they may face in their broad academic pursuits and their future lives.)

As an illustration of the sort of courses that might satisfy the requirement, we offer the following suggestions:

*Statistics for Life.* The notion of statistical significance pervades daily life. We read about the “margin of error” in a poll comparing two political candidates, and we hear about how many years exercise can add to a person's life. But what, exactly, are these concepts? This course reviews the history of inferential statistics and teaches the basic concepts that apply to real-world experience.

*Reasoning in the Courtroom.* How do people weigh evidence, and how *should* they weigh evidence? This course uses the courtroom as a vehicle for examining the nature of decision-making, with special emphasis on mathematical models of decision-making and ways in which actual human decision-making deviates from those prescriptions.

*Competition and Cooperation.* Game theory offers a rigorous way of examining the tradeoffs that underlie many dilemmas in the real-world. This course reviews the essential ideas underlying game theory and their application to real-world situations.

Existing courses that may meet, or might be adapted to meet, a requirement in analytical reasoning include: Statistics 100: Introduction to Quantitative Methods; Statistics 155: Spatial Statistics for Social Inquiry and Health Research; Psychology 1900: Introduction to Statistics for the Behavioral Sciences; Sociology 156: Quantitative Methods in Sociology; Economics 1030: Psychology and Economics; Government 1001: Introduction to Quantitative Methods in Political Science; Engineering Sciences 103: Spatial Analysis of

Environmental and Social Systems; Biostatistics 230: Probability Theory and Applications; Quantitative Reasoning 22: Deductive Logic.

### **C. Activity-based learning: an initiative**

Extracurricular activity is a Harvard success story. The College offers literally hundreds of activities and programs, from the *Crimson* and a multitude of undergraduate musical and theatrical productions to the Phillips Brooks House Association and the Institute of Politics. Sixty percent of our undergraduates report that they engage in some type of public service while they are here. Last year, almost twelve hundred students—one fifth of the entire student body—participated in a Harvard-sponsored international experience. Students participate in the visual and performing arts, they work on political campaigns and in campus government, and they do internships of all kinds. Many students work in research laboratories: concentrators in the life sciences may soon be doing faculty-supervised laboratory research under the Program for Undergraduate Research in Life Sciences.

Few formal procedures exist for encouraging students to see the connection between what we are teaching them in the classroom and the activities that absorb so much of their energy and that, in many cases, will launch them in the direction of their life's work. Yet connections do exist. We propose that the Faculty appoint a committee to develop an initiative in activity-based learning. The goal would be to help students see how what they learn in class informs what they do in the "real world," and vice versa. It would make manifest the overarching purpose of general education, which is to make the connection between learning and life. We do not seek to bureaucratize extracurricular life at Harvard, only to provide means for students to deepen and enrich both their classroom and their extracurricular experiences by forging an intellectual link between them.

The pedagogical merits of this idea seem clear to us. The ability to apply abstract knowledge to concrete cases—and vice versa—is an essential skill, and one that cannot be acquired without direct experience. On the one hand, classroom material can illuminate the student's experience in an activity; on the other hand, an activity fleshes out and contextualizes what is learned in the classroom. And having to forge a relationship between coursework and activity, and participating in the activity itself, helps students to define their

personal and professional goals.<sup>13</sup> For example, learning biochemistry can prepare students to work on original research in a laboratory; learning French can prepare students to study the French economic system in Paris; studying the philosophy of the seventeenth-century might inform the production of a classic play by Molière; working on a political campaign can bring to life material in a course on democracy.

We offer several possible mechanisms for activity-based learning. One, more formal, is for instructors in some courses to ask, as an *optional* course requirement, that a student write a paper (or perform some other exercise) explaining how the course informed an activity, or how an activity, performed earlier or concurrently, helped the student understand the material in the course. The onus for choosing the activity would be on the student, who would be required to forge the connection between the abstract information acquired in the classroom and the concrete context and mission of an activity. In these cases, we think it would be important that the choice of the activity-based learning requirement lead to contact between the student and the faculty member teaching the course. Undergraduates value faculty engagement enormously, and this is one way of enabling that engagement. Moreover, several students might engage in the same activity associated with a course, which could help them to learn to work in teams. A second mechanism could involve activities that are not formally associated with a particular course. In this case, the student would submit a one-page summary of the perceived connection between the course and a specific activity. Once approved, the student would engage in the activity, and at its conclusion write a short paper describing how the coursework illuminated—and was illuminated by—the activity. With a third possibility, the course could come after the activity, in which case the student would submit a one-page summary of the perceived connection at the outset of the course and, at the conclusion of the course, write a paper explicating the ways in which the activity informed the course, and vice versa.

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<sup>13</sup> Activity-based learning needs to be distinguished from “active learning,” which we also encourage (but which is something different). Active learning is a pedagogical tool to help teach material in the context of a course. It involves applying knowledge to a well-defined, previously formulated exercise (such as dissecting a fish after learning about vertebrate anatomy). This “learning by doing” is important, but does not involve synthesizing material from a course with what is learned during an out-of-classroom experience.

There are many details yet to be worked out for such program. **We therefore propose establishing a committee (composed of FAS faculty, relevant College administrators, members of the professional schools, and students) to formulate an activity-based learning program, and to bring a proposal to the Faculty.** The committee would establish standards and would consider other important intellectual, pedagogical, and implementation issues. For example: Who will manage the individual projects? How will they be evaluated? Should the requirement be graded or ungraded? How should it be monitored and recorded? Should all students be encouraged to participate? What will be role of faculty in the professional schools? The committee would make formal recommendations, with an eye toward launching a three-year pilot program. If approved by the FAS faculty, the program would be launched as an experiment, and the committee would evaluate its success and recommend changes to the Faculty three years after its inception.

We recognize that the logistical issues that confront mounting a program in activity-based learning are serious. But there is a tendency on the part of many students to regard their extracurricular life as separate from their academic experience. We should find ways of bringing those aspects of undergraduate life closer together. If part of the purposes of a Harvard education is using liberal learning to prepare students for life, activity-based learning makes a natural piece of it.

## **IV. Implementation**

### **A. Administration**

We propose that the Faculty create a new Standing Committee on General Education to replace the Standing Committee on the Core Program. The committee would be composed of the chairs of subcommittees charged with oversight of one or more of the general education requirements and the chair of the Standing Committee on Speaking and Writing. The committee would also include the Dean of the College, the Dean of the Graduate School, and the Dean of the Faculty of Arts and Science. The committee (and its subcommittees) would be charged with the following responsibilities:



- develop a timetable for the efficient implementation of this proposal, and generate, in coordination with departments, specific goals for the short- and long-term changes needed to meet its goals;
- enlist faculty to develop and offer general education courses
- recommend that instructors make use of opportunities for pedagogical innovation, and petition the dean to make funds available for this purpose;
- identify existing courses suitable for general education and, when necessary, assist faculty in modifying those courses to meet the criteria for general education courses;
- appoint a separate committee to administer a regular five-year review of all general education requirements and offerings, including the definition of the areas of inquiry and experience and the courses offered in those areas.

We strongly urge the committee not to impose a one-size-fits-all standard (amount of reading, number of exams, and so on) on general education courses. The committee should be flexible about approving *appropriate* courses anywhere in the catalogue—indeed, anywhere in the university—to meet the general education requirements. It is extremely important to maintain a robust set of attractive courses in a general education section of the catalogue, so that students can know where to find courses that satisfy the requirements. Because the categories of general education do not map onto disciplinary boundaries, it is a very different system from the Core, and there will be no “exemptions” based on a student’s concentration. It is therefore important that we find ways of supporting departments in their efforts to provide courses for general education, for their own concentrators and for others. Our goal is to ensure that by the time they leave Harvard, students will have acquired the knowledge and skills defined in our program. It does not matter where they acquire those things.

We believe that changes on the order we are proposing are desirable if we are to maintain the excellence of a Harvard education, but we are aware that we will have to find ways of implementing them that do not overburden an already strained faculty. Many departments in the Faculty of Arts and Sciences already struggle to meet their responsibility to concentrators, and many professors are under a heavy workload. Reducing class size, increasing the training of teaching fellows, and adding active learning components all

involve committing additional resources. Courses approved for general education credit should receive the same extra resources now available to courses in the Core. In order to launch a curriculum that excites the Faculty, it will be necessary to devote new resources to curricular development. Funding for equipment, the development of new pedagogical materials and approaches, and for the modernization of our classroom spaces should also be made available.

The creation of fresh general education categories should provide inspiration for the development of new courses. In particular, colleagues will want to explore the possibility of teaming with faculty members from other schools at Harvard. We do not believe that the issue of how Harvard's different schools relate to each other financially should impede an improvement in the education of our undergraduates, or an enhancement of opportunities to do new kinds of teaching. We call on the leadership of the university and of the individual schools at Harvard to lower the barriers for interested professional school faculty to teach in the general education curriculum.

## **B. Requirements**

Currently, students must satisfy nine requirements outside of their concentration for graduation (between eight to ten half courses): Expository Writing, one year of a foreign language (or equivalent), and seven Core courses. Under the system we propose, there would be ten requirements (nine to eleven half courses): Expository Writing, one year of a foreign language (or equivalent), analytical reasoning, and seven courses in the five areas of inquiry and experience. However, as we have insisted throughout this report, there should be many courses that achieve the goals of general education as we have defined them, so that students would not be obliged to take only courses listed in a general education category to meet the requirements. We believe that, as long as they meet the criteria we propose, courses in concentrations, Freshman Seminars, and departmental electives should be eligible to satisfy general education requirements. We also recommend that departments be encouraged to allow students to double-count qualified courses for concentration and general education credit. As examples, we expect that the existing statistics requirement in a number of concentrations would be likely to satisfy the general education requirement in analytical reasoning, and that Life Science 1A or 1B would satisfy a requirement in Science and

Technology. Our proposal seeks to highlight existing strengths in the undergraduate curriculum, not to add an overlay of new courses and requirements.

### **C. Courses**

Harvard already offers many courses that, with some modification, seem likely to meet the criteria we specify for general education credit. We have listed only a few, and strictly by way of illustration, in our report. The intellectual orientation and pedagogical methods we recommend are already features of many undergraduate courses. The challenge is to offer courses in which student-faculty exchange can take place. It should not be necessary to mandate class size to achieve this. Moral Reasoning 22: Justice, for example, has enrolled up to one thousand students, but is taught interactively. The important thing is to free undergraduates from the received wisdom that it is normal to go through Harvard without ever speaking with a professor. If some contact can be made in lecture, students are more likely to pursue other means of meeting and engaging with faculty. We think that faculty teaching in the general education curriculum will understand the importance of fostering this kind of teaching situation.

Ideally, there will be a sufficient number of general education courses in all areas to optimize the classroom experiences of both non-concentrators and concentrators. Meeting this ambitious goal would ensure that students can fulfill their general education requirements while taking courses commensurate with their preparation, regardless of concentration. Departmental courses must meet the same criteria as general education courses, however, in order to qualify as satisfying a general education requirement.

### **D. Graduate teaching**

A new curriculum naturally demands consideration of its impact on the ability of our graduate students to find teaching opportunities. Because the system we propose is not geared to departments or divisions within the College, it may seem to create a condition of uncertainty in this regard. However, we urge the Faculty to undertake to decouple graduate student compensation from any particular kind of teaching. We need to train graduate students and to enlist them as partners in all kinds of teaching, including new pedagogies that stress activities and hands-on group and laboratory experiences. We should realize that our

promises to support third- and fourth-year graduate students in the social sciences and humanities through teaching experience, training, and related forms of professional development will be kept, but we should develop a richer array of opportunities, based on the needs of the undergraduate curriculum, and not rely on rigid standard types of teaching, such as sections in large lecture courses. The more varied their teaching experience is during graduate school, the more resourceful and effective our Ph.D. students will be when they develop courses of their own as professors.

The Graduate Policy Committee is already thinking along these lines, and the implementation of undergraduate curricular reform, across the board, should be tied to a revamping of graduate student teacher-training and the more creative deployment of graduate students in team efforts. We also stress that the general education curriculum should be complemented by an adequate set of departmental electives for non-concentrators. If these courses are successful, they should provide additional teaching opportunities for graduate teaching fellows.

#### **E. The whole curriculum**

We believe that, in order to make a new program of general education effective, the Faculty should continue to support curricular innovations outside of general education. Specifically, we should find ways to develop more electives for non-concentrators; we should create more portal and divisional courses, on the model of the new Life Sciences and Physical Sciences courses and the new courses in the Humanities; and we should make space in the catalogue for interdisciplinary offerings. We encourage the Educational Policy Committee, in formulating guidelines for concentrations and for the new secondary fields, to help departments to create menus of broadly focused courses suitable for both concentrators and non-concentrators. We should aspire to realize a vision of the overall curriculum in which each and every department is committed to mounting a balanced mixture of general education courses, broad departmental electives, specialized courses for the concentration, and skills courses, particularly in writing and, where appropriate, analytical reasoning. A new set of general education requirements alone is by no means adequate to satisfy all of our curricular needs. We need to pursue our current initiatives all across the curricular board.

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