

Curricular Reviews: Harvard, Yale & Princeton

DUE Meeting
3 March 2006

Some Numbers for Comparison

- Undergraduates
 - MIT: 4,066
 - 1,745 engineering majors (plus 169 Course 6 MEng)
 - 876 science majors
 - 128 humanities, arts, and social science majors
 - Harvard: 6,543
 - 290 engineering majors
 - 919 science majors
 - 3,821 humanities and social sciences majors
 - Yale: 5,242
 - 96 engineering majors
 - 370 science majors
 - 2,218 humanities and social science majors

Some Numbers for Comparison

- Princeton: 4,678
 - 721 engineering majors (527 declared)
 - 394 junior and senior science majors
 - 1,584 junior and senior humanities and social science majors
 - Remaining 2,173: Princeton AB students declare at end of sophomore year, whereas BSE students declare at end of first year.

Common Themes

- Strengthen advising;
- Writing;
- “International Experiences”
- Foreign language competency;
- Role of science in general education;
- Development of teaching centers (Yale and Princeton).

Harvard College Curricular Review

- Launched in 2001
- Sixty final recommendations to the Faculty of Arts and Sciences in the April 2004 report:
- Guiding principle:
 - “We seek to broaden the scope of a liberal education and to expand choices for Harvard...students, crafting an undergraduate curriculum that is less defined by the requirements that it places on students and more by the commitments that the Faculty makes to undergraduate education in the liberal tradition.”

Harvard College Curricular Review

- Current requirements:
 - All students must complete 7 courses within 11 different areas to fulfill the Core Curriculum Requirement
 - All students must take a one semester subject in Expository Writing and demonstrate (by an exam or a subject) an ability to do Quantitative Reasoning;
 - All students must satisfy a foreign language requirement;
 - These subjects comprise about one quarter of a student's undergraduate program;
 - Students select from among 40 concentration fields at end of their first year.

Recommendations from 9 Area Committees

- General Education
 - Replace the core program (introduced in the 1970's and emphasized approaches to knowledge) with a series of new, integrative courses -- "at once broad and deep"
 - "Empower departments to craft curricula for broader audiences;" [that is, non-majors]
 - "Summon Faculty to mount a new set of foundational courses;"
 - Educate students in the sciences as deeply and broadly as has traditionally been the case in the humanities and social sciences.

Harvard Recommendations (cont)

- New recommendations identify three distributional areas to be taught by departments (3 from each area)
 - Science and Technology
 - Arts and Humanities
 - Study of Societies
- Freshman writing course is reaffirmed, as is proficiency in a foreign language (fulfilled by end of 2d year)
- Students be expected to participate in a “significant international experience.”

Harvard Recommendations (cont)

- Educational Policy
 - Later choice of concentration and creation of secondary fields;
 - Freshman Year “time of true exploration”
 - Four years “meaningful student-faculty engagement”
- Committee on Writing and Speaking
 - Skills must be better integrated into departments and degree programs

Harvard Recommendations (cont)

- Committee on Science and Technology
 - New introductory courses in natural and applied sciences (e.g., Life Sciences 1a and 1b)
- Committee on Advising and Counseling
 - Notes “severe deficiencies in academic advising” & makes 16 recommendations;
 - “Multiple paths to improvement”, including a new “dean of advising” plus an advisory board;
 - Recommend creation of Office of Advising to improve the consistency and coordination of all aspects of freshman, house, and concentration advising

Committee on Education Abroad

- All Harvard students should have a “significant international experience”
 - Completion noted on transcript
 - Should reflect Harvard’s commitment to “understanding of and respect for the culture and values of other societies and for different educational objectives and pedagogies”
- Well resourced Office of International Programs
- Emphasis on expanding summer programs
- Role of alumni around the world
- Expand financial aid to include summer grants and loans

Harvard Recommendations (cont)

- Committee on Pedagogical Improvement
- Committee on a January Term
 - IAP anyone?

- Footnote: Harvard has a Division of Engineering and Applied Sciences (awards AB and an ABET-accredited SB)

Status of Harvard Recommendations

- Well-publicized controversies, including number of G.E. course requirements; “thin gruel” quote from S. Pinker
- Student call for “moral reasoning requirement”
- Official status summarized in a January 20 2006 letter from William Kirby to FAS colleagues:
 - Faculty deliberation is underway;
 - Expansion of Freshman Seminar Program to offer to all first year students;
 - Swift expansion of opportunities and assistance for international study;
 - Introduction of new science courses (“portal courses”);
 - Overhauling academic advising structures.

Committee on Yale College Education

- Committee charged to examine four areas:
 - How research affects the teaching and learning of Yale undergraduates;
 - Crossovers between sciences and liberal arts;
 - Further integration of fine arts programs into the college;
 - “Globalization” effect on the University.
- Draft report issued in April 2003

Yale Requirements Prior to Changes

- 36 subjects required for graduation;
- Demonstrated competence in foreign language prior to graduation;
- 14-subject distribution requirement to be chosen from 4 groups (12 subjects from outside the group that includes the major):
 - Language and literature;
 - Art, history, and philosophy;
 - Social sciences;
 - Physical sciences.

Committee on Yale College Education

- “The central recommendation of this report is that Yale work to maintain and, where needed, to strengthen its commitment to undergraduate education as an inseparable part of its mission as a research university.”
- Major recommendations:

Major Recommendations (Yale)

- Revise distribution requirements so that students take
 - No fewer than two courses in Humanities and Arts, two in Social Sciences, two in Natural Sciences;
 - Two courses to develop writing skills;
 - Two courses that strengthen skills in quantitative reasoning and analysis;
 - Work....to attain competence in a foreign language at the intermediate level or....to build their skills further.
 - Recommendations about establishment of new centers to support these requirements

Major Recommendations (Yale)

- Small classes in the first two years
 - To strengthen culture of “close intellectual contact between teachers and students”
 - Housing program at least in part within the residential college system;
 - Designating a member of the Yale Dean’s Office to coordinate small-group learning before entry to major.
- Science Education
 - Yale “bend every effort to make teaching in the sciences as compelling and richly available as any other form of study on this campus” -- for all students, not just science majors.
 - Development of courses similar in rigor to intro courses for science majors
 - More first-year contact with science faculty

Major Recommendations (Yale)

- Science Education (cont)
 - Enriching and expanding opportunities for undergraduate research;
 - Science and technology in social context, health and society;
 - Establish a Science Teaching Center;
 - “Join...the call for a reassessment of medical school admissions requirements”
 - Redeploy staff to strengthen premed advising;
 - Improve shuttle service to Science Hill, etc.

Major Recommendations (Yale)

- International Education
“Academic study of the international world and first-hand experience of foreign cultures are crucial training for citizens of the global future...affirms that Yale undergraduates should be expected to gain experience of the larger world and to plan their time abroad as an integral part of their Yale education.”
- Four recommendations in this area, including funding the financial need of any student pursuing an approved opportunity abroad, credit for supervised research, teaching in international fields, and greatly expanding opportunities available to students.

Major Recommendations (Yale)

- Arts Education
- Relationship between the College and Professional Schools
- Calls for expansion of size of FAS faculty, on regular reviews of departmental programs, and on interdisciplinary teaching in the Humanities
- Advising
 - Lengthening freshman orientation with priority to academic orientation;
 - Residential college deans principal responsibility for first year advising;
 - Academic fairs;
 - Each freshman to be assigned a “teaching member of the Yale College faculty as a faculty adviser;”
 - Good representation from all academic fields;
 - Appoint a ‘coordinator of advising’ in the Yale College Dean’s Office.

Status of Recommendations

- Yale has enacted nearly all of the recommendations, at least in spirit;
- Class of 2009 are required to follow the new distribution requirements;
- Foreign language component and study abroad requirement are also in place for Class of 2009;
- Science Teaching Center has been created, although permanent building not yet up (center is staffed and beginning the duties outlined in the report);

Yale: Status of Recommendations

- New committees drafting a proposal to call for reassessment of medical school entrance requirements and to create secondary concentrations in the sciences for Yale students;
- Science classes are now being integrated throughout the college (to foster integration between different majors and schools);
- Commitment to new opportunities in undergraduate research;
- Freshman seminar program for all Yale freshmen entering with the Class of 2009

Princeton: 1995 Committee on the Course of Study

- General Education requirements changed starting with the Class of 2000;
- AB students(30 courses required)
 - One writing subject;
 - Proficiency in a foreign language;
 - 10 subjects from among 7 distribution areas:

Princeton: 1995 Committee on the Course of Study

- 10 subjects from among 7 distribution areas:
 - Epistemology and cognition;
 - Ethical thought and moral values;
 - Historical analysis;
 - Literature and arts;
 - Quantitative reasoning
 - Science and technology with laboratory;
 - Social analysis.

Princeton: 1995 Committee on the Course of Study

- BSE students
 - Writing subject;
 - Exempt from foreign language requirement;
 - 4 math subjects;
 - 2 physics subjects;
 - 1 chemistry subject;
 - 1 computer science subject;
 - Minimum of 7 subjects in humanities and social sciences, including at least one from 4 of 6 distribution areas (including foreign languages).

Princeton Writing Requirement

- Committee on the Course of Study: 2000
- Introduction of freshman writing requirement; removal of “w” designations from courses that earlier fulfilled the university requirement;
- System needed to engage students early on in an “intensive writing pedagogy;”
- Taught by faculty well-trained in writing;
- Creation of a “writing director” and writing center has been improved;
- AB students now required to graduate with no fewer than 31 subjects.

Princeton: School of Engineering and Applied Sciences

- May 2004 report: “Engineering for a Better World: The Princeton Vision”
- SEAS: six academic departments
- “A solid majority of BA students enroll in SEAS courses that introduce them to technology”
- “New paradigm for engineering in the modern world”
- Moving toward “immersing SEAS within the broader enterprise of the University...”

SEAS Foundational Initiatives

- Including: Leadership in Engineering Education
 - Exposing students to ‘pressing problems’ with solutions requiring integrative approaches across multiple disciplines....”
 - Five objectives for SEAS in education and creation of new entity to spearhead and focus efforts:
 - The Princeton Center for Engineering and Technology Education
 - New courses
 - Pilot educational initiatives
 - Expose students to real-world experiences.

Princeton's Center for Engineering & Technology Education

- A new entity to “spearhead and focus” establishment of a new standard of excellence in engineering education.
 - “Interdisciplinary learning and societal context”
 - Innovative first year curriculum integrating engineering with math and physics;
 - Develop AB programs as alternative to BSE;
 - Create biology tracks in engineering;
 - Establish more teaching resources related to new areas of “high impact” interdisciplinary research
 - Diversity
 - SEAS outreach to target junior and high school students;
 - Establish closer ties with schools with colleges and universities having significant populations of women and under-represented minorities
 - Real World Experience and Impact:

Princeton's CETE

- Real World Experience and Impact
 - Expand visitor program to expose students to a wide range of scholars, researchers and practitioners;
 - SEAS Student Entrepreneurial Initiative
 - Summer Internships for real-world experience
 - Seed funding and support for internships, fellowships in government, study abroad or field research

Princeton's CETE

- Center opened in February 2005
- Creation of first year courses, “EMP” -- Engineering/Math/Physics
- Introduction of first year labs to provide students ‘first hand experience’ in their first year at Princeton

Footnote: General Education Requirements for AB and BSE students are different. BSE students must take 4 terms of mathematics; 2 terms of physics; one term each of chemistry and computer sciences, plus a writing seminar and a minimum of 7 subjects in humanities and social sciences (in 4 of 6 areas).

Handy Websites

- **Yale**
- <http://www.yale.edu/opa/v33.n5/story3.html> --article on Yale College Dean Peter Salovey

- **Princeton**
- http://www.princeton.edu/%7Eseasweb/P_strategic.htm --Engineering for a Better World: The Princeton Vision
- <http://www.princeton.edu/main/news/archive/S12/90/51A39/index.xml?section=featured> -- article about new Center for Innovation in Engineering Education at Princeton

MIT OpenCourseWare
<http://ocw.mit.edu>

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