

Undergraduate Enrollments in Science and Engineering

Considerable trend information is available on undergraduates' academic majors and career objectives. Such data are helpful in providing insights into the expected supply of scientific and technological manpower and into the impact of various factors on career choices. There have been little or no data available, however, on the exposure of all students—science and nonscience majors—to science and engineering education. This type of information has now become available for the first time as a result of a study conducted by the American Council on Education (ACE) under the sponsorship of the National Science Foundation.

In December 1969, information on course enrollments was obtained from a sample of undergraduates who registered as full-time students in 1966, 1967, 1968, or 1969. The students were asked to indicate the number of courses they took in the most recent college term in each of 50 designated fields. The analysis by the ACE assumes that the respondents in the sample survey population are representative of the 6.3 million full- and part-time undergraduates enrolled as candidates for a bachelor's or first-professional degree in 1969 with respect to enrollment patterns.

Only one-third, or about two million undergraduates, were majoring in a science or engineering field, as measured by data on baccalaureate degrees and on expected majors of entering freshmen. In contrast, the ACE survey revealed that a much larger segment of the undergraduate

student population is enrolled in science or engineering courses, including many students whose career plans lie in other directions. It is estimated that 5.4 million, or 86 percent, out of the 6.3 million undergraduates were enrolled in one or more science or engineering courses in the 1969-70 school year. Almost one-half were enrolled in three or more courses in a science or engineering field.

	Estimated number taking one or more courses in a field (millions)	Percent of students taking one or more courses in a field
Physical sciences	2.1	33
Engineering	0.4	7
Mathematical sciences	2.8	44
Biological sciences	1.9	30
Social sciences	3.8	60
Total	5.4	86

While almost equal proportions of men and women—88 percent and 84 percent, respectively—were taking courses in some science or engineering field in fall 1969, there were significant differences by sex in individual fields. One out of three women, but only one of four men, was taking at least one course in the biological sciences. As would be expected, the greatest percentage difference between men and women occurred in engineering.

	Percent of men taking one or more courses in a field	Percent of women taking one or more courses in a field
Physical sciences	38	27
Engineering	12	1
Mathematical sciences	50	35
Biological sciences	27	34
Social sciences	59	63
Total	88	84

The proportions of black students and white students taking at least one science or engineering course were almost the same, but the types of courses in which they were enrolled differ; a much higher proportion of black students than of white students were enrolled in mathematical or biological sciences courses.

	Percent of black students taking one or more courses in a field	Percent of white students taking one or more courses in a field
Physical sciences	32	33
Engineering	3	7
Mathematical sciences	62	42
Biological sciences	41	29
Social sciences	58	60
Total	87	86

There were no large differences in the proportions enrolled in the various science or engineering courses in public and private institutions. Science or engineering study is more widespread in universities than in other types of institutions, though the differences are not very large between universities and four-year colleges.

Three-fourths of the majors in the arts or humanities were enrolled in one or more science or engineering courses; one-half of these majors were taking a social science course. At least four out of five business and education majors reported that they were in a science or engineering course; about two-thirds of each were in social science courses. Many of the business and education majors were taking mathematics courses (business, 53 percent; education, 39 percent), and 40 percent of the education majors were in biology classes.

Percent of College Students Taking One or More Courses in Selected Fields in Fall 1969, by Major

Field of Courses	Major										
	Physical Science	Engineering	Mathematical Science	Life Science	Social Science	Health Fields	Arts & Humanities	Business	Education	All Other Majors	Total All Majors
Science or Engineering	98	98	98	99	97	85	72	80	86	84	86
Physical Sciences	88	66	41	59	22	43	22	18	29	37	33
Chemistry	59	41	19	51	8	37	5	6	7	24	17
Physics	43	46	22	19	5	8	5	5	5	14	12
Other Physical Sciences	19	10	8	8	13	8	14	10	20	10	13
Engineering	7	71	5	3	1	0	3	1	0	8	7
Mathematical Sciences	73	76	92	47	34	25	26	53	39	39	44
Mathematics	70	70	85	44	27	22	25	43	37	38	39
Statistics	6	8	9	5	11	4	1	17	4	3	7
Computer Science	9	28	30	3	3	1	1	11	1	3	7
Agriculture and Forestry	1	1	0	20	1	0	0	0	1	1	2
Biological Sciences	20	3	15	76	77	53	22	21	40	29	30
Social Sciences	40	38	47	50	90	60	51	62	64	56	60
Health Fields	4	1	6	5	5	57	5	4	12	12	9
Arts and Humanities	81	67	83	77	85	73	98	75	86	80	84
Business	3	8	17	6	11	7	5	84	5	13	18
Education	5	1	11	8	13	7	16	4	55	13	16
Other Fields	5	14	6	4	10	8	5	11	10	59	12

Source: American Council on Education survey sponsored by NSF.