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ABSTRACT

Continuing progress in science and engineering is essential to meeting the Nation's goals of improved international competitiveness and enhanced economic and social well-being for all citizens. The full utilization of human resources is a vital factor in the realization of this objective. Participation in science and engineering in the United States has not reflected the diversity of the Nation's population. This report documents the different rates at which groups in the population are represented in science and engineering. The traditionally underrepresented groups of racial and ethnic minorities, persons with disabilities, and women, hav_ made progress but in different degrees. It also documents factors important to choice of study and to success in pursuing science and engineering. Chapter titles include: "Representation in Science and Engineering: Issues and Perspectives"; "Elementary/Secondary Mathematics and Science Education"; "Transition to Higher Education"; "Undergraduate Education: The Role of 2-Year Institutions"; "Undergraduate Education: The Role of 4-Year Institutions"; "Graduate Education: Enrollment"; "Graduate Education: Outcomes"; and "Employment Levels and Trends." This volume, the seventh in a series of biennial reports to the Congress, the administration, and others who direct public policy, describes the status of groups traditionally underrepresented in science engineering. Appendices contain technical notes and statistical tables. (MVL)

WOMEN, MINORITIES, AND PERSONS WITH DISABILITIES IN SCIENCE AND ENGINEERING: 1994

NATIONAL SCIENCE FOUNDATION

November 1994
NSF 94-333

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

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FOREWORD

Continuing progress in science and engineering is essential to meeting the Nation's goals of improved international competitiveness and enhanced economic and social well-being for all citizens. The full utilization of our human resources is a vital factor in the realization of this objective.

For a variety of historical and cultural reasons, participation in science and engineering in the United States has not reflected the diversity of the Nation's population. This report documents the different rates at which groups in the population are represented in science and engineering. Traditionally underrepresented groups—racial/ethnic minorities, persons with disabilities, and women—have made progress, but in different degrees.

This volume, the seventh in a series of biennial reports to the Congress, the administration, and others who direct public policy, describes the status of groups traditionally underrepresented in science and engineering. It also documents factors important to choice of study and to success in pursuing science and engineering. Encouragement of *all* the Nation's people to participate in science and engineering at each stage of the educational process and in the workforce must be a paramount concern if we are to broaden representation in these fields. The data and analyses presented here can help inform both the continued formulation of policies to increase participation and the evaluation of their effects.

Neal Lane

Neal Lane
Director

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ABBREVIATIONS

ACT	American College Testing
ADA	Americans with Disabilities Act of 1990
AP	Advanced Placement
BIA	Bureau of Indian Affairs
CAS	Curriculum Assessment Service
CIRP	Cooperative Institutional Research Program
CNSTAT	Committee on National Statistics
EWC	Engineering Workforce Commission
GRE	Graduate Record Examination
HACU	Hispanic Association of Colleges and Universities
HBCU	Historically Black College or University
HEGIS	Higher Education General Information Survey
HES	Higher Education Survey
IPEDS	Integrated Postsecondary Education Data System
NAEP	National Assessment of Educational Progress
NCES	National Center for Education Statistics, U.S. Department of Education
NIH	National Institutes of Health
NPSAS	National Postsecondary Student Aid Study
NSF	National Science Foundation
PUMS	Public Use Microdata Samples
R&D	research and development
S&E	science and engineering
SAT	Scholastic Aptitude Test
SDR	Survey of Doctorate Recipients
SED	Survey of Earned Doctorates
SIPP	Survey of Income and Program Participation
SME	science, mathematics, and engineering
SRS	Division of Science Resources Studies, National Science Foundation
STPDS	Scientific and Technical Personnel Data System

HIGHLIGHTS

This report presents a comprehensive statistical overview of the participation of women, minorities, and persons with disabilities in science and engineering. The full report first includes summary information on the demographic composition of the population and on changes that are expected to occur as a result of current population trends. It then follows the chronological sequence of the educational system from elementary school through workforce participation. It refers to research results that contribute to our understanding of these issues and identifies factors that appear to have been responsible for, or to influence, the underrepresentation of population subgroups.

The **Highlights** present selected findings for the report, organized according to a different principle. For each of the underrepresented groups, highlights are included that address first their opportunities to study science, mathematics, and engineering (SME) and second their achievement and accomplishments.[1]

At the end of this **Highlights** section, a guide to the appendix tables identifies tables for each chapter that include data for the population group(s) described.

Women

Opportunities to Learn and Decisions to Study Science, Mathematics, and Engineering

Course-taking in Elementary/Secondary Education

A discrepancy in course-taking between males and females who intend to go to college begins following the geometry course. Although 93 percent of both college-bound females and males reported taking a geometry course, trigonometry was taken by 56 percent of the males and 52 percent of females. Calculus was taken by 23 percent of the males but only 18 percent of the females.

There are overall similarities in high school coursework and grades for males and females taking the Scholastic Aptitude Test (SAT). However, a larger proportion of males took intensive concentrations of coursework: 15 percent of males took more than 4 years of mathematics compared with 11 percent of females.

Attitudes Toward Science and Mathematics

The most striking differences between girls and boys during elementary and secondary school are in attitudes toward science and mathematics. Even with similar exposure to courses and similar achievement levels, girls are less confident of their ability and less interested in science and engineering careers. High school seniors asked why they decided not to take certain courses in their senior year responded that they did not like mathematics (40 percent of females and 27 percent of males) or did not like science (35 percent of females and 22 percent of males).

Influences of Counselors and Parents

Higher percentages of females than males reported having been advised not to take senior mathematics (34 percent of females, 26 percent of males) or science (32 percent of females, 26 percent of males). In addition, in 1990, there was a 16 percentage point difference between male and female 10th grade students who reported ever talking to their parents about science and technology issues (54 percent of males, 38 percent of females).

Career Expectations

In 1990, only 6 percent of public high school seniors overall reported that they expected to pursue a career in science, mathematics, or engineering, with males more than three times as likely to choose a career in these fields (10 percent compared with 3 percent).

Higher Education Role Models

Faculty teaching undergraduates were overwhelmingly male in six science and engineering disciplines examined in a study of undergraduate education: civil, mechanical, and electrical engineering, and sociology, geology, and physics. Sociology had the highest proportion of women (30 percent) and mechanical engineering the lowest (4 percent).

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[1] The organizing principles used here to summarize findings are drawn from Oakes, Jeannie. 1990. *Lost Talent: The Underrepresentation of Women, Minorities, and Disabled Persons in Science.* Santa Monica: The RAND Corporation.

Choices to Leave Science, Engineering, and Mathematics

Studies of why women and men leave science, mathematics, and engineering at the undergraduate level identify similar reasons, although the relative importance of particular factors varies by gender. For women the most important issue was the choice of field (women believed their reasons for choosing the field were inappropriate) while for men the top issue dealt with the educational environment (perceptions of poor teaching). Men more often chose science, mathematics, and engineering majors out of intrinsic interest or for pragmatic reasons; women showed concern that their education, career goals, and personal priorities fit together.

Graduate Education

In 1992, 35 percent of graduate students enrolled in science and engineering fields were women, up from less than 31 percent in 1981. In science fields, women comprised 43 percent of the total number of graduate students; in engineering, about 15 percent. Within science fields, women were a substantial majority of graduate enrollments in psychology (over two-thirds) and more than half the total in biometry/epidemiology, genetics, nutrition, and several social science fields (anthropology, linguistics, and sociology).

Achievement and Accomplishments

Elementary/Secondary Education

Since 1973, there has not been a gap in the mathematics proficiency scores of boys and girls at ages 9 and 13, according to the National Assessment of Educational Progress tests. Since 1986, a slight gap between the scores of 17-year-old boys and girls has virtually disappeared.

In science proficiency, the 1990 average score of 9-year-old girls and boys was virtually the same. A gap between girls' and boys' scores appears at age 13 and becomes larger by age 17; these gaps have persisted since the 1970's and are found primarily at the highest levels of science proficiency.

Transition to Higher Education

On the mathematics component of the SAT, scores for both sexes have increased since 1983. Nevertheless, in 1993, females continued to score considerably below males in mathematics, although the gap is narrowing slightly. Females' scores increased 12 points to 457 in 1993, while males' scores increased 9 points to 502.

Undergraduate Education Grades

Women tend to graduate from college with higher grades than men, regardless of their major field of study. Fifty-nine percent of women compared with 47 percent of men receiving bachelor's degrees in 1991 had a grade point average of B or better. The pattern of higher grades for women prevailed in science and engineering as well; in engineering, for example, 63 percent of women compared with 49 percent of men had a grade point average of B or better.

Bachelor's Degrees

Women earned a smaller proportion of total science and engineering degrees (44 percent in 1991) than they did non-science and engineering degrees (54 percent). Women have earned the majority of degrees in all fields combined since 1982.

- For science as a whole (excluding engineering), women earned 50 percent of the bachelor's degrees in 1991. Within the sciences, the field with the highest share of bachelor's degrees awarded to women was psychology (73 percent) Women also earned more than half the baccalaureates in biological sciences (51 percent).
- Engineering continued to be one of the least popular fields for women; in 1991, they earned 15 percent of all baccalaureates in engineering.

Master's Degrees

Women have earned more than half of the master's degrees in non-science and engineering fields since 1975. Both the number and the proportion of women earning master's degrees in science and engineering fields have risen steadily, increasing in the last 10 years to 36 percent of the total. By 1991, women had increased their share of master's degrees in science fields to 45 percent, up from 37 percent a decade earlier. Women remained underrepresented in engineering, although the percentage of master's degrees earned by women increased from 8 to 14 percent.

Doctorates

Women earned 29 percent of the science and engineering doctorates awarded in 1992, up from 24 percent of the total in 1982. Their proportions varied considerably by field: 59 percent in psychology; 38 percent in biological sciences; 35 percent in social sciences; 19 percent in mathematical sciences; 14 percent in computer science; and 9 percent in engineering.

Employment Levels and Trends

In 1990, women constituted 52 percent of the U.S. population and 46 percent of the labor force in all occupations, but only 22 percent of the science and engineering labor force.

Doctoral female scientists and engineers are less well off than men with respect to unemployment, underemployment, median salary, academic rank, and tenure. Women in the science and engineering labor force have, on average, less work experience than men. Even so, when women and men with similar years of professional experience are compared, differences between the sexes narrow but are not eliminated.

Within science and engineering, women tend to be more highly represented in fields with lower average salaries. While this distribution may help explain differences in salary, it does not explain why women experience higher unemployment and underemployment than men.

Minorities[2]

Demographic Shifts

Population Composition

The diversity of the U.S. population is increasing. Different fertility rates, immigration patterns, and age distributions (and thus death rates) of population subgroups suggest that the 21st century population profile will contrast sharply with that of the 20th.[3] Around the year 2030 the total elementary school-aged cohort of the United States could be about equally divided between whites and all other racial/ethnic groups combined. Over the following 20 years, blacks, Asians, Hispanics of all races, and American Indians would together outnumber the total white population of elementary school children.

Opportunities to Learn and Decisions to Study Science, Mathematics, and Engineering

Elementary/Secondary Education

Racial/ethnic group membership is less closely related to student achievement than factors related to family resources/support, school characteristics, and student opportunity to learn. Examination of several variables at the secondary school level identified factors correlated with student achievement. For eighth grade student populations, factors making the greatest difference were:

- parents' expectations about student educational attainment;
- learning materials made available by parents;
- the socioeconomic status of students in the school;
- whether students place a priority on learning;
- teacher ability to motivate students;
- students' educational aspirations; and
- courses students take in school.

Career Expectations

Educational expectations differ across racial/ethnic groups: In 1990, 31 percent of white and 30 percent of Asian 10th graders expected to graduate from college—a requirement for almost any science or mathematics career. Only 26 percent of black, 23 percent of Hispanic, and 19 percent of American Indian students expected to complete a college education. Almost 11 percent of Asian eighth grade students in 1988 said they expected to be a science or engineering professional when they were 30 years old. In comparison, 7 percent of whites and 5 percent of Hispanic and black students said they thought they would have a career in science or engineering.

Course-taking

Advanced science and mathematics courses are essential to preparation for collegiate science and mathematics. Among 12th grade students in 1992, there were substantial differences in the proportions of students who had taken 8 or more semesters of mathematics classes in high school: 44 percent of whites; 32 percent of blacks; 30 percent of Hispanics; 28 percent of American Indians; and 64 percent of Asians.

Differences in course-taking also characterized students planning to attend college. Among those students who took the SAT, in 1993, more than 88 percent of Asians and 84 percent of whites took chemistry in high school; roughly three-quarters of each of the underrepresented groups took chemistry. The biggest difference was in physics: 64 percent of Asians took physics, compared with 45 percent of whites, 43 percent of Latin Americans, and less than 40 percent of all other groups.

Tracking

Tracking of students in advanced science and mathematics classes may make participation in these fields more difficult. A study of courses taken and

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[2] Topics covered in this report are presented for five racial/ethnic groups: white, black, Hispanic, Asian, and American Indian. The term "minority" includes all groups other than white. "*underrepresented* minorities" includes three groups whose representation in science and engineering is less than their representation in the population: blacks, Hispanics, and American Indians.

[3] Using "middle series" population projections from the Bureau of the Census. See Day, Jennifer Cheeseman. 1993. *Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2050*. Bureau of the Census, Current Population Reports, P25-1104. Washington, DC: U.S. Department of Commerce.

placements for students with high expectations for themselves regarding college attendance and career goals revealed that half of the underrepresented minorities, compared with 20 percent of whites and Asians, were *not* enrolled in courses that would permit them to complete the expected sequence of courses needed to enter college.

Two-Year Institutions

Two-year institutions have been particularly important in providing access to higher education for traditionally underrepresented groups of students. Two-year colleges enroll almost half of the students entering higher education as first-year students; they enroll slightly more than half (52 percent) of students from underrepresented minority groups entering college.

Although the number of students enrolled full-time at 2-year institutions rose by 22 percent from 1980 to 1991, the number of students from underrepresented minority groups enrolled as full-time students increased 29 percent. The differences for part-time students were more dramatic: part-time enrollment overall rose 30 percent between 1980 and 1991, while part-time enrollment of underrepresented minorities rose 54 percent.

Four-Year Institutions

Enrollment of minorities in 4-year institutions has increased. For underrepresented minorities, the increase in full-time enrollment between 1981 and 1991 was 30 percent. Among first-year students, enrollment of whites decreased; enrollment of blacks and American Indians fluctuated, ending slightly higher in 1991 than in 1980; and enrollment of Asians and Hispanics increased.

Higher Education Role Models

Low proportions of faculty teaching undergraduates are from underrepresented minorities in six science and engineering fields included in a study of undergraduate education: civil, mechanical, and electrical engineering; and sociology, geology, and physics. Proportions varied from a high of 8 percent for black faculty in sociology, to a low of less than one-half of 1 percent in any of the six fields for American Indians.

Graduate Education

Sixteen percent of U.S. citizens enrolled in graduate science and engineering programs in 1992 were minorities. Blacks, Hispanics, and American Indians continued to be seriously underrepresented, comprising 9 percent of the total enrollment in graduate science and engineering programs.

Achievement and Accomplishments

Elementary/Secondary Education

Asian students' levels of achievement in mathematics and science are higher than those of students from any other racial/ethnic group, including whites. In mathematics, Asian students had higher average proficiency levels than whites and other minorities at grades 4, 8, and 12. On a scale rating proficiency levels between a basic level of 200 and the most advanced level of 350, at the 12th grade level Asians averaged 315; whites, 305; Hispanics, 283; American Indians 281; and blacks, 275. In science, proficiency levels at grade 12 were distributed in similar fashion: Asians averaged 308; whites, 303; American Indians, 286; Hispanics, 273; and blacks, 256.

Transition to Higher Education

On the mathematics component of the SAT, the scores of every racial/ethnic group improved over the decade from 1983 to 1993. The relative standing of the racial/ethnic groups did not change. In 1993, Asians continued to have the highest average mathematics SAT scores, followed by whites and American Indians, Latin Americans, Mexican Americans, Puerto Ricans, and blacks. During the decade, American Indians achieved the highest increase in mathematics scores of any racial/ethnic group, rising 22 points. Asians' scores increased by 21 points and blacks' increased by 19 points.

Attrition From Higher Education

Attrition from higher education appears to be greater for minority students. Comparison of enrollment profiles for cohorts enrolled in lower division and upper division[4] show differential declines in the size of cohorts enrolled from different racial/ethnic groups. Comparing across a 2-year period, the losses in numbers of students enrolled were approximately 40 percent of blacks, 25 percent of Hispanics, and 20 percent of American Indians, compared with 13 percent of whites and 1 percent of Asians.

Bachelor's Degrees

Minorities earned 17 percent of bachelor's degrees in science and engineering in 1991. Underrepresented minorities—blacks, Hispanics, and American Indians—earned the same proportion of science and engineering degrees that they earned of non-science and engineering degrees, 11 percent, in 1991. These proportions were virtually unchanged from 10 years earlier.

[4] Placement in a division depends on numbers of credits earned toward the baccalaureate, lower division students generally have fewer than half the number needed to graduate, upper division students, one half or more

Between 1981 and 1991, the number of bachelor's degrees earned by underrepresented minorities in non-science and engineering fields increased 34 percent, compared with an increase in science and engineering of 8 percent.

Historically Black Colleges and Universities (HBCU's) continue to play an important role in the undergraduate education of blacks, despite the growing diversity of the Nation's campuses. Twenty-eight percent of the black students receiving bachelor's degrees in science and engineering in 1991 received their degrees from an HBCU. Half of the 26 institutions that awarded the largest number of science bachelor's degrees to black men were HBCU's; 15 of the top 25 institutions awarding science bachelor's degrees to black women were HBCU's. In engineering, HBCU's comprised 12 of the top 26 institutions for black men and 8 of the top 25 institutions for black women.

Master's Degrees

Minorities earned 12 percent of master's degrees in science and engineering in 1991, compared with 11 percent in 1981. The increase was primarily due to substantial increases in the number of awards to Asians, with only slight increases in awards to underrepresented minorities.

Doctorates

Minorities who were U.S. citizens earned 10 percent of the total doctorates awarded to U.S. citizens in 1992, up from 9 percent of the total in 1982. Within racial/ethnic groups, there were gender differences. Increases occurred in numbers of awards to both men and women except for whites and American Indians; doctorates in science and engineering to men decreased and awards to women increased for these groups. For all of the *underrepresented* minorities, the numbers of science and engineering doctorate recipients in 1992 were very small: 300 blacks, 414 Hispanics, and 69 American Indians.

Employment Levels and Trends

Racial/ethnic minorities constituted 22 percent of the total civilian labor force in 1990; they were 14 percent of the science and engineering labor force in 1990. Underrepresented minorities were 19 percent of the total labor force and 8 percent of the science and engineering labor force. Asians were 3 percent of the labor force and 6 percent of the science and engineering labor force.

- Asians are well represented in the science and engineering labor force and there is little difference in terms of unemployment, underemployment, median salary, academic rank, and tenure career success between Asian and white doctoral scientists and engineers with similar degree fields and years of professional work experience.
- Hispanics remain underrepresented in the science and engineering labor force, with limited progress during the last decade. While Hispanic and white doctoral scientists and engineers were similar on unemployment and underemployment, Hispanics were not comparable to whites in terms of salary, academic rank, and tenure.
- Blacks continue to be underrepresented in the science and engineering labor force, although they demonstrated significant progress during the decade from 1980 to 1990. However, black doctoral scientists and engineers do not share equally with whites in terms of salary, academic rank, and tenure.
- Limited statistics available on American Indians in the labor force suggest that they are underrepresented in science and engineering and that American Indian doctoral scientists and engineers have salaries somewhat below those of whites.

Persons With Disabilities

Opportunities to Learn and Decisions to Study Science, Mathematics, and Engineering

Elementary/Secondary Education

Approximately 12 percent of all students receive special services in federally supported special education programs. By far the largest group of these students, 45 percent, have specific learning disabilities. The next largest group, 20 percent of the total with disabilities, have speech or language impairments, and about 1 percent each have orthopedic, hearing, other impairments, or multiple disabilities.

Instructional settings may require special equipment or environments for science education. Thus the instructional settings for students with disabilities are of particular importance. Students with speech or language impairments are most likely to be served in regular classrooms, with nearly 80 percent receiving their instruction in these settings, and an additional 14 percent receiving assistance in resource rooms, so that a total of 94 percent of these students have access to science instruction similar to that of their classmates. Similar combinations of instructional environments are available to 86 percent of students with learning disabilities; 67 percent with visual impairments; 52 percent with orthopedic impairments; and 47 percent with hearing impairments.

Transition to Higher Education

The percentage of full-time students entering college who report having disabilities has increased, from 7 percent in 1985 to 9 percent in 1991. Most of this increase occurred in the category "learning disabilities." Percentages of students with other disabilities stayed relatively constant.

Two-Year Institutions

Two-year institutions serve many students with disabilities. More than half (59 percent) of the students beginning their first year of study in higher education in 1991 who reported a learning disability were studying at 2-year institutions.

Undergraduate Education Choice of Field

Field of study varied for students with disabilities. Students with disabilities constituted a higher proportion of planned majors in physical sciences (14 percent), computer science, and civil engineering (12 percent in each) than they did in mathematics and economics (5 percent and 4 percent, respectively).

Achievement and Accomplishments

Transition to Higher Education

The performance of students who reported a disability was slightly lower than that of those who reported no disability. The average SAT score in mathematics for students who reported having a disability was 434, compared with 482 for students reporting no disability.

Doctorates

The number of science and engineering doctorates earned by people who reported that they had disabilities was 280 in 1992, barely more than 1 percent of the total science and engineering doctoral degrees awarded.

Employment Levels and Trends

About 20 percent of the population have some disability.[5] These disabilities may or may not require accommodation or limit an individual's ability to participate in educational experiences or to be productive in an occupation. Approximately 10 percent of the total labor force, and 3 percent of the science and engineering labor force, have some disability.

Doctoral scientists and engineers with disabilities, overall, appear to be equivalent to those without disabilities in terms of unemployment and underemployment rates, median salaries, academic rank, and tenure. However, because of the usual later onset of a disability, doctoral scientists and engineers with disabilities have more work experience than their colleagues without disabilities. In comparing persons with disabilities and those without disabilities, while holding constant years of experience, persons with disabilities have median salaries somewhat lower than those without disabilities.

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[5] Estimates of the proportion of the population with disabilities vary. See Technical Notes for discussions of the measurement issues related to this group.

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CHAPTER 1

REPRESENTATION IN SCIENCE AND ENGINEERING: ISSUES AND PERSPECTIVES

The Science and Engineering Equal Opportunities Act, passed in December 1980, declares that

> ...it is the policy of the United States to encourage men and women, equally, of all ethnic, racial, and economic backgrounds to acquire skills in science, engineering and mathematics, to have equal opportunity in education, training, and employment in scientific and engineering fields, and thereby to promote scientific and engineering literacy and the full use of the human resources of the Nation in science and engineering. (Sec. 32(b))

Under this act, the National Science Foundation (NSF) is required to report to Congress on the status of women and minorities in science and engineering on a biennial basis. This report is the seventh in the series. Like its predecessors, it provides a comprehensive overview of the participation of women and minorities and, with this report, persons with disabilities in science and engineering education and employment.

Organization and Scope of the Report

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994 is organized differently from earlier reports. It follows the chronological sequence of the educational system, then analyzes workforce participation. Credentialing and training play a visible and inescapably important role in providing access to later stages of education and to science and engineering careers. Differences across the populations of interest are examined at important levels and points of transition.

Since the first statistical report in this series was published in 1982, data from additional sources have become available. In many cases existing data series have become more useful for studying issues because of additional detail in data collected or improvements in data quality. Changes in data availability are reflected in the presentations of data. The greatest detail possible is used in presenting science and engineering field descriptions and in racial/ethnic classifications. Tabulations for geographic areas and for institutions both demonstrate the importance of these variables to examining substantive topics addressed here and illustrate the availability of data for study beyond the scope of this report.

This report also introduces research results where they contribute to understanding aspects of underrepresentation. The studies address particular problems or situations, and thus lack generalizability to all science and engineering, but they nonetheless contribute to the information base available for addressing complex issues.

Data Focus

In keeping with congressional requirements, this report presents data that focus attention on women, on racial/ethnic minorities, and on persons with disabilities. Persons in each of these groups have historically been underrepresented in science and engineering. However, these groups are not defined and counted with equal precision or ease. Hence, data considerations limit the analysis. For notes on primary factors affecting data and their impact on the interpretation of the information presented here, refer to the Technical Notes.

Issues

This statistical report appears at a time when participation, access, and quality have become critically important issues.

Since this series of biennial reports began in 1982, the focus of discussions of underrepresentation of particular population subgroups has shifted. In 1982, efforts to improve representation in science and engineering were intended to promote access and equity. Specific, targeted efforts to improve the numbers and percentages of these groups who study and work in technical fields made a difference and continue to do so. There are still areas of concern, however, and underrepresentation continues to be a problem in science and engineering. This report documents areas where progress has been made and where problems remain.

Equity has not been the only concern. In the last decade, the Nation's educational system has received

Text table 1-1.
Selected characteristics, by sex: 1990, 1991, and 1992

[Percentage distribution]

Characteristic	Total	Male	Female
Total population, 1990 census	100.0	48.7	51.2
Persons 5-18 years old, October 1992	100.0	51.2	48.8
Persons 5-18 years old enrolled in school, October 1992	100.0	51.4	48.6
Undergraduate enrollment, fall 1991	100.0	44.5	55.5
Bachelor's degrees, 1991	100.0	45.5	54.5
Science	100.0	49.7	50.3
Engineering	100.0	84.0	16.0
Other	100.0	40.0	60.0
Graduate enrollment, fall 1992[1]	100.0	46.4	53.6
Science	100.0	57.5	42.5
Engineering	100.0	85.5	14.5
Other	100.0	39.9	60.1
Master's degrees, 1991	100.0	43.8	56.2
Science	100.0	45.2	54.8
Engineering	100.0	84.8	15.2
Other	100.0	40.3	59.7
Doctoral degrees, 1992	100.0	56.5	43.4
Science	100.0	61.0	39.0
Engineering	100.0	87.0	12.9
Other	100.0	45.4	54.6
Civilian labor force, 1990	100.0	54.2	45.7
Scientists	100.0	63.1	36.9
Natural scientists	100.0	73.5	26.4
Math & computer scientists	100.0	64.6	35.4
Social scientists	100.0	49.1	50.9
Engineers	100.0	90.9	9.1

[1] Includes nonresident aliens.

NOTE: Because of rounding, percentages may not add to 100.

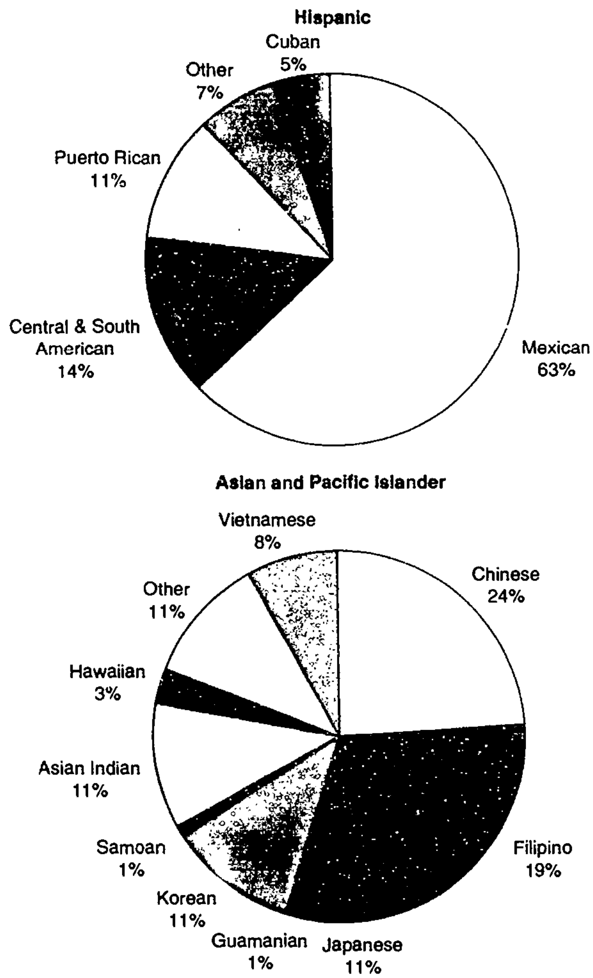
See appendix table 1-2.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

scrutiny and criticism because the quality of education it provides for all groups has been too low. A wide variety of efforts are now under way to improve quality and to ensure that progress towards articulated goals can be measured. Improving quality has focused attention not only on the content of education and training and the means by which they are delivered, but on the setting as well: the infrastructure supporting the research that is both responsible for our technological advances and ensures that our educational system meets world standards.

Equity and quality are now also viewed within the compelling context of national needs. The ability of the Nation's workforce to compete effectively in a global economy that is changing rapidly due to technology and shifting labor markets has been of growing concern. To establish and maintain such capability, the population must be educated in at least the basic concepts of science, mathematics, and engineering and be able to make reasonable judgments about the care and use of scarce resources. An adequately trained workforce must be equipped with technical skills and a cadre of researchers must be able to pursue research and development (R&D) in a wide range of fields. Full participation in effective science and engineering education is essential to the realization of these objectives for the population as a whole and to the preparation of a portion of that population for careers in science and engineering disciplines.

Figure 1-1.
Composition of Hispanic and Asian populations in the United States: 1990



SOURCE: U.S. Department of Commerce, Bureau of the Census. 1990. Census Questionnaire Content, CQC-4.7.

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The prudent use of resources to accomplish these aims requires that educational opportunities of high quality be available to all. Clearly, the Nation cannot completely achieve equity, improve quality, or sustain international competitiveness if most of our human resources—women, blacks, Hispanics, American Indians, and persons with disabilities—continue to be underrepresented in science and engineering.

In the near term, as intense scrutiny is directed at the resources allotted to science and engineering, some national goals may be in competition. How best can improved education in science and technology fields be provided to larger numbers of underrepresented groups? Which levels of instruction most require renewed attention and additional resources? Should there be efforts to increase the numbers of underrepresented groups in the science and engineering workforce at times of rising unemployment or underemployment for scientists and engineers in some disciplines?

These difficult questions of distribution of resources and more equal participation in science and engineering provide the context for this report. The report presents statistical evidence intended to help inform debate and discussion.

Population Groups

Where data permit, topics of educational and workforce participation and achievement are addressed by gender, race/ethnicity, and type of disability. These partitions are of different types: the number of variables describing each group differs, as do their relative sizes and changing sizes over time. However, they are similar in a critically important way—they divide the total population into groups that map historic underrepresentation in science and engineering.

Gender

Women constitute approximately half of the population and about 46 percent of the labor force in all occupations, 22 percent in science and engineering occupations. They are 9 percent of the engineers, but about 50 percent of the social scientists. (See text table 1-1.) Their participation in employment reflects, in part, participation in levels and subject fields in the educational system.

Race/Ethnicity

Racial/ethnic minorities currently constitute 20 percent of the total population.[1] Blacks are 12 percent of the total population; American Indians, less than 1 percent; Asians, almost 3 percent; and Hispanics, about 9 percent. These minorities make up 22 percent of the total labor force; they were 14 percent of the science and engineering labor force in 1990. Underrepresented minorities—blacks, Hispanics, and American Indians—are 19 percent of the total labor force, 8 percent of the science and engineering labor force. Asians are 3 percent of the labor force, 6 percent of the science and engineering labor force.

The racial and ethnic diversity of the population is increasing through births and immigration. Each racial/ethnic group itself is composed of many distinct populations. For example, the Hispanic and Asian populations each include many population subgroups. (See figure 1-1.) Most data sources do not collect information at this level of detail.

[1] In the total population, the Hispanic population is counted by the Bureau of the Census both under the ethnicity category of Hispanic and under the applicable racial/ethnic group. Other data collections used in this report include all Hispanic persons in only that category, regardless of their racial identification.

Of the four population groups that constitute minorities in the population,[2] three—black, Hispanic, and American Indian—are underrepresented in science and engineering. The term "underrepresented minorities" is used in this report to signify these groups. The fourth minority group—Asian/Pacific Islander—has representation in most science and engineering fields that exceeds its proportion in the population. An examination of the population overall and of the participation of different groups in different stages of the educational process and workforce points out areas where some groups are significantly underrepresented. (See text table 1-2.)

A descriptive variable of considerable significance in discussing race/ethnicity is geography. The minority population is unevenly distributed across the Nation. (See figure 1-2.) Although high numbers of minority groups may simply reflect the concentrations

[2] In accordance with Office of Management and Budget guidelines, the racial/ethnic groups described in this report will be identified as white, non-Hispanic; black, non-Hispanic; Hispanic; Asian or Pacific Islander; and American Indian or Alaskan Native. In text and figure references, these groups will be referred to as white, black, Hispanic, Asian, and American Indian. In instances where data collection permits, subgroups of the Hispanic population will be identified by subgroup name.

Text table 1-2.
Selected characteristics, by race/ethnicity: 1990, 1991, and 1992

[Percentage distribution]

Characteristic	Total U.S. citizens & perm. res.	White, non-Hispanic	Black, non-Hispanic	American Indian/ Alaskan Native	Asian/ Pacific Is.	Hispanic
Total population, 1990 census[1]	100.0	80.3	12.1	0.8	2.9	9.0
Persons 5-18 years old, October 1992[1]	100.0	79.6	15.6	NA	NA	11.5
Persons 5-18 years old enrolled in school, October 1992[1]	100.0	79.6	15.5	NA	NA	11.6
Undergraduate enrollment, fall 1991	100.0	76.9	10.0	.9	4.6	7.7
Bachelor's degrees, 1991	100.0	82.7	6.0	.4	3.9	4.5
Science	100.0	81.2	6.5	.5	4.7	4.5
Engineering	100.0	78.4	3.9	.3	10.8	4.4
Other	100.0	83.9	5.9	.4	2.8	4.6
Graduate enrollment, fall 1992	100.0	81.8	5.2	.3	8.3	4.4
Science	100.0	80.0	5.3	.4	5.5	4.0
Engineering	100.0	74.6	3.1	.2	11.2	3.2
Other	100.0	82.6	5.3	.3	8.7	4.5
Master's degrees, 1991	100.0	82.3	5.3	.4	3.7	3.2
Science	100.0	81.0	5.9	.4	4.5	3.5
Engineering	100.0	76.6	2.4	.2	12.2	2.8
Other	100.0	83.1	5.3	.4	2.8	3.2
Doctoral degrees, 1992	100.0	84.5	3.9	.5	6.2	3.2
Science	100.0	85.4	2.6	.4	6.6	3.2
Engineering	100.0	74.7	1.9	.4	17.8	2.9
Other	100.0	85.6	5.9	.7	3.4	3.2
Civilian labor force, 1990	100.0	77.9	10.4	.6	2.8	8.1
Scientists	100.0	85.5	5.6	.3	5.3	3.2
Natural scientists	100.0	85.6	4.2	.4	6.7	3.0
Math & computer scientists	100.0	83.9	6.2	.3	6.0	3.2
Social scientists	100.0	88.4	5.7	.4	2.3	3.3
Engineers	100.0	86.0	3.5	.3	7.0	3.2
Professional occupations	100.0	84.5	7.3	.4	3.7	3.9
Other	100.0	76.6	11.1	.7	2.6	8.9

[1] In the Bureau of the Census statistics, Hispanics are double-counted, both as "Hispanic" and under the applicable racial/ethnic category. Other data sources include Hispanic persons in only that category, regardless of their racial identification.

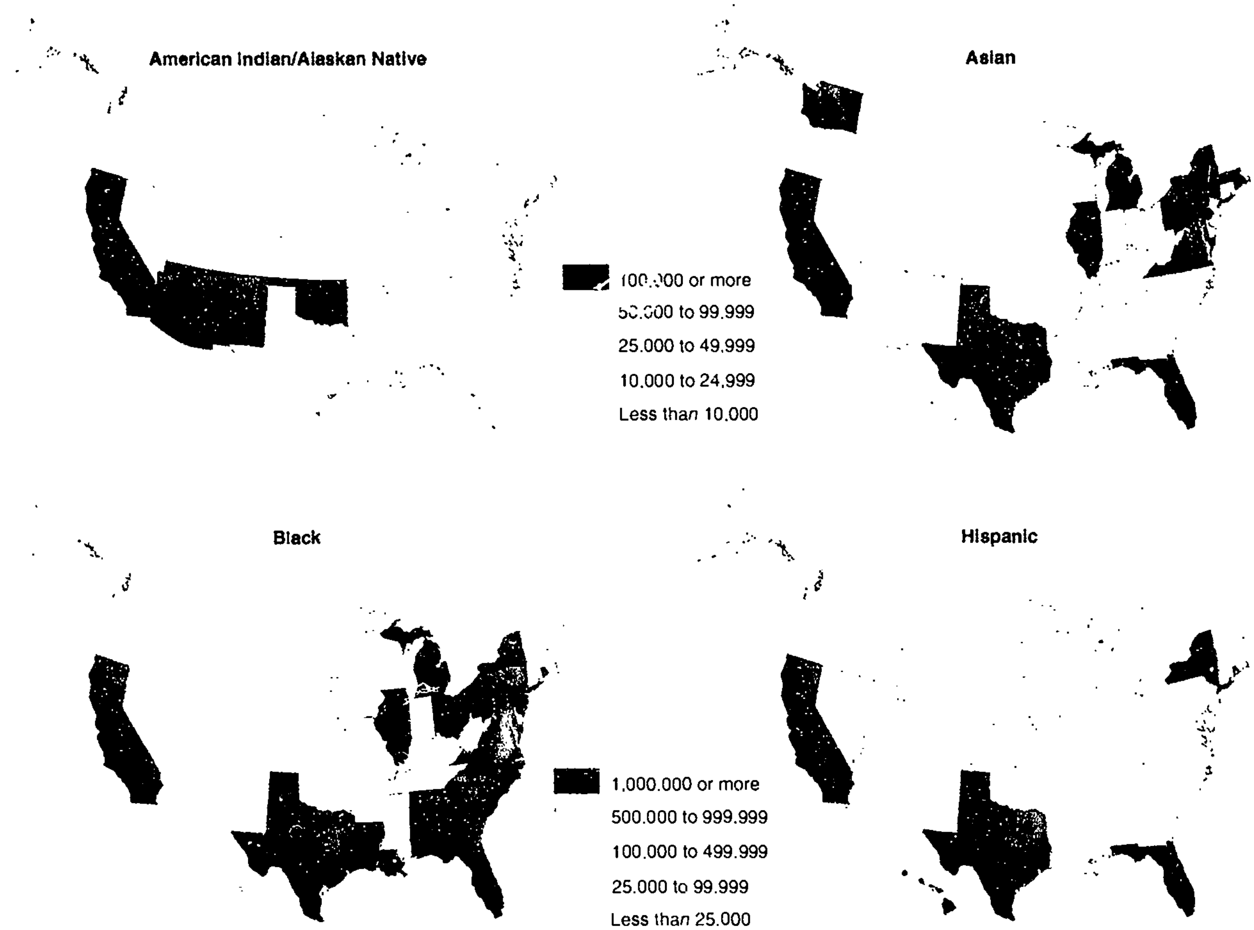
NOTE: Because of nonresponse and rounding, percentages may not add to 100.

KEY: NA = not available

See appendix table 1-3.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 1-2.
Minority populations, by State: 1990



See appendix table 1-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

of total populations in certain States, variation also occurs in *proportions* of the populations of minorities within particular States. Individual States have minority populations that vary from less than 5 percent to more than 60 percent. (See figure 1-3.)

Another important variable to consider in examining racial/ethnic populations is their distribution by type of metropolitan area. (See figure 1-4.) Asians and Hispanics are more likely to live in urban areas; American Indians, in rural areas.

Persons With Disabilities

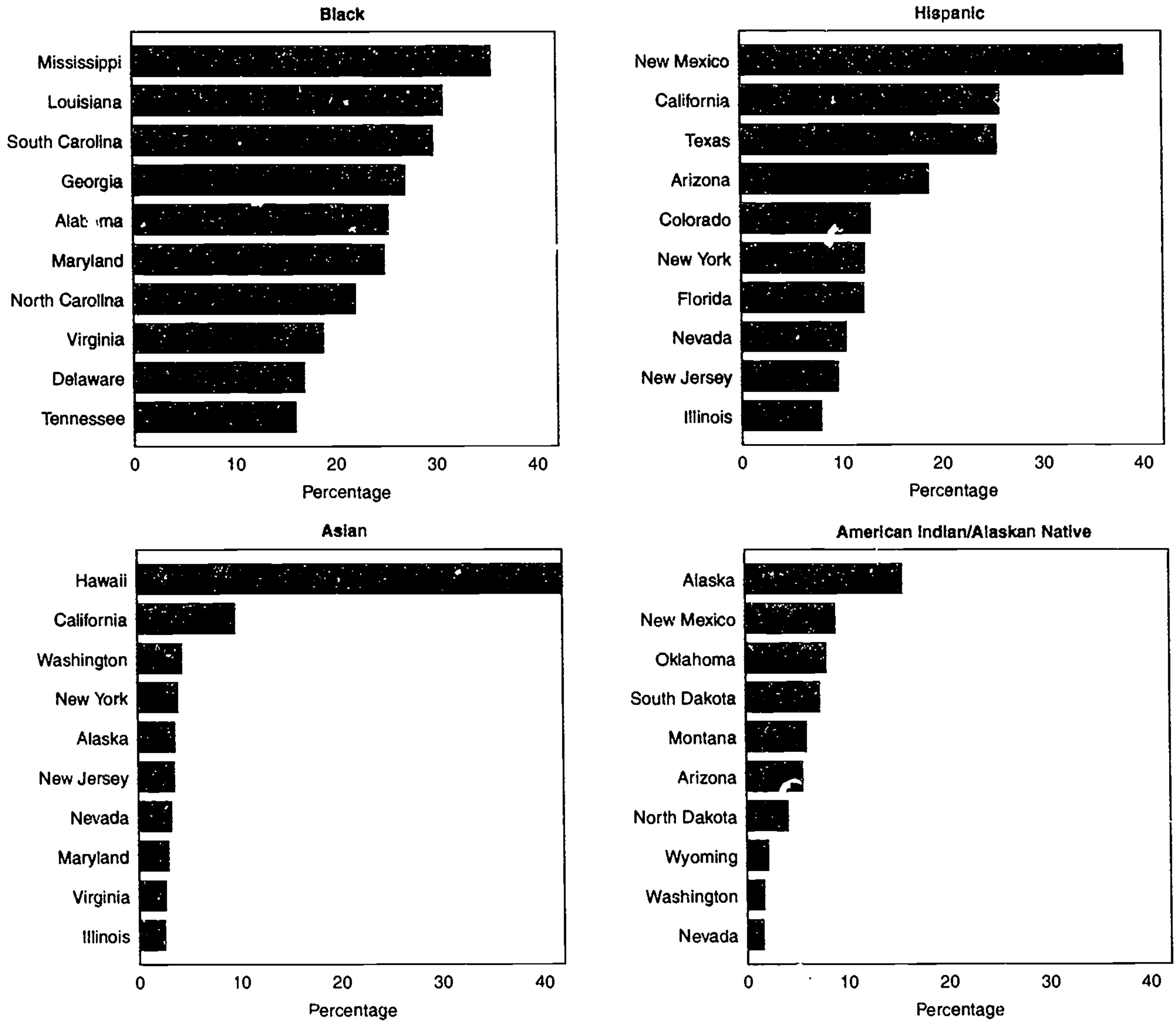
Estimates of the proportion of the population with disabilities vary greatly. About 20 percent of the population have disabilities, including severe and not severe disabilities. (See text table 1-3.) These disabilities may or may not require accommodation or limit an individual's ability to participate in educational experiences or to be productive in an occupation; these factors account for some of the variability in estimates of the size of this population.[3]

Even using conservative estimates, persons with disabilities are underrepresented in the workforce. Approximately 10 percent of the total labor force, and 3 percent of the science and engineering labor force, have some disability.

Work disability affects participation in the labor force, which includes employed persons and those who are unemployed and looking for work (U.S. Department of Commerce, Bureau of the Census 1988, table F). In 1988, in all occupations combined, science and engineering plus other fields, only 36 percent of men and 28 percent of women with a work disability were in the labor force, compared with 89 and 70 percent of men

[3] For a discussion of the data problems in describing the population with disabilities, see McNeil 1993a, 1993b.

Figure 1-3.
States with highest percentage minority populations: 1990



NOTES: Asians comprise 62 percent of the population of Hawaii.
Hispanics may be of any race.

See appendix table 1-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

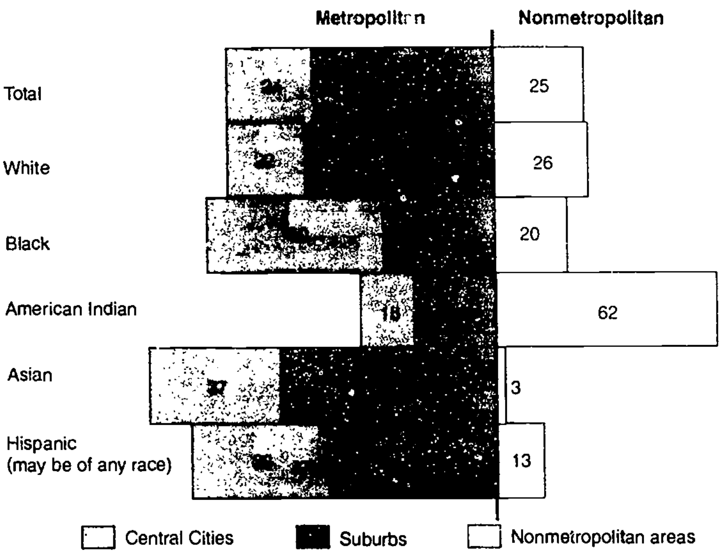
and women, respectively, with no work disability. Those with a work disability were much more likely to be unemployed, with unemployment rates for men and women of 14 percent each, compared with rates of 6 and 5 percent for those without disabilities. This underrepresentation probably also reflects underrepresentation in the educational system.

Examination of the population of persons with disabilities is complicated by factors beyond the data limitations described in the Technical Notes. Efforts have been made in many data collections to include an indication of the range of disabilities. (See text tables 1-3 and 1-4.) This factor is probably responsible to some extent for the variation in estimates of percentages of the population in science and engineering who have disabilities (National Science Foundation 1990, p. vii).

The three demographic categories—gender, race/ethnicity, and disability—also interact. Questions have arisen as to whether membership in more than one of the underrepresented groups places a person in a situation of double jeopardy. This report, therefore, offers some data on how well people who are both female and members of underrepresented racial/ethnic minorities are faring in the educational system and the workplace. It also includes some data on gender

Figure 1-4.
Distribution of householders, by metropolitan and nonmetropolitan areas: 1991

(In percentages)



SOURCE: U.S. Department of Commerce, Bureau of the Census, 1991 American Housing Survey.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

and race/ethnicity for the population of persons with disabilities.

This report examines many variables that are related to underrepresentation. These variables include societal and institutional factors that can be changed. The data, therefore, in some cases identify factors that could be instrumental in reducing underrepresentation.

Context

Trends in Education

An important aspect of the context for reviewing underrepresentation in science and engineering is the educational system. Following a rapid rise in enrollments in the 19th century and the first half of the 20th, participation in formal education has continued to grow since 1950, not only in absolute numbers but also in the proportion of the population enrolled. The enrollment rate of 5- to 17-year-olds wert from 85 percent in 1960 to 89 percent in 1990. The rise in the percentage of 18- to 24-year-olds enrolled in higher education was dramatic, from 24 to 54 percent (U.S. Department of Education/NCES 1993, pp. 34, 77).

Text table 1-3.
Persons with a disability, by sex and age: 1991–92

[In thousands]

Sex and age	Total population	Total with a disability: Number	Total with a disability: Percentage of total population	Severity of disability: Not severe: Number	Not severe: Percentage of total population	Severe: Number	Severe: Percentage of total population
Both sexes:							
Total	251,796	48,936	19.4	24,819	9.9	24,117	9.6
Less than 15 years	56,067	2,913	5.2	2,384	4.3	529	.9
15 to 64 years	165,040	29,482	17.9	16,311	9.9	13,171	8.0
Males:							
Total	122,692	22,916	18.7	12,987	10.6	9,929	8.1
Less than 15 years	28,707	1,876	6.5	1,540	5.4	336	1.2
15 to 64 years	81,154	14,504	17.9	8,642	10.6	5,862	7.2
Females:							
Total	129,104	26,020	20.2	11,833	9.2	14,187	11.0
Less than 15 years	27,360	1,038	3.8	846	3.1	192	.7
15 to 64 years	83,886	14,978	17.9	7,669	9.1	7,309	8.7

NOTE: See appendix table 1-1 for definitions.

See appendix table 1-6.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Text table 1-4.
Persons with a disability, by race/ethnicity: 1991–92

[In thousands]

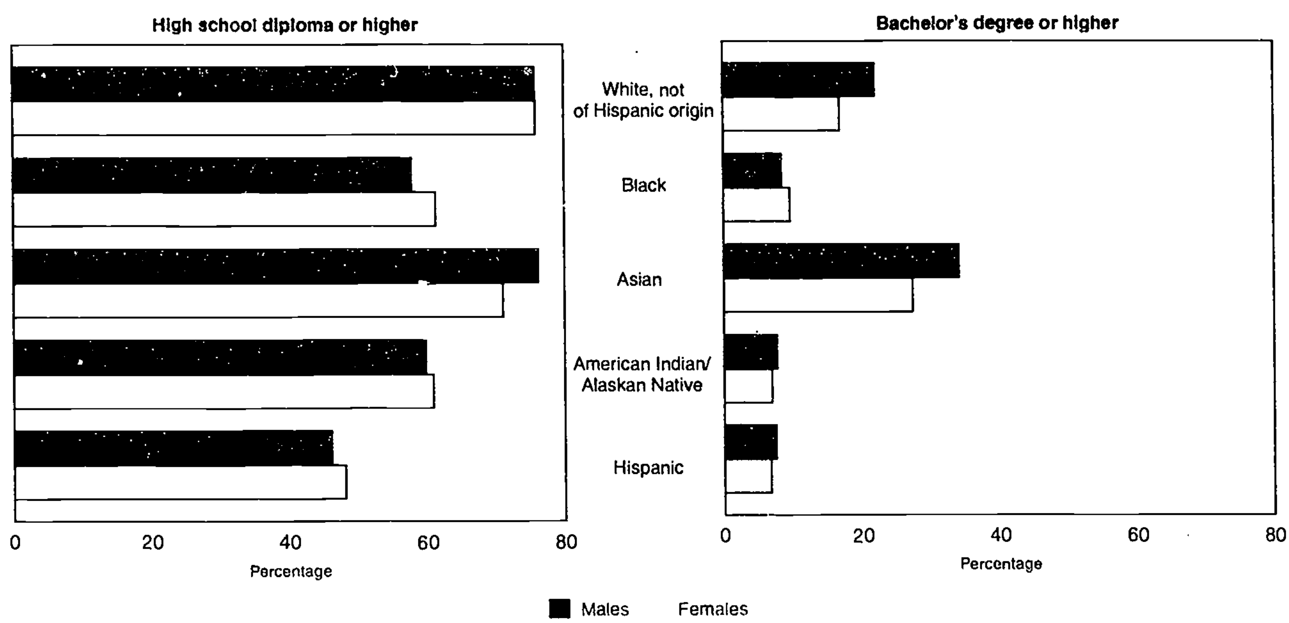
Race/ethnicity	Total population	Total with a disability		Total with a severe disability	
		Number	Percentage of total population	Number	Percentage of total population
Total	251,796	48,936	19.4	24,117	9.6
White	210,873	41,521	19.7	19,736	9.4
Not of Hispanic origin	192,296	38,808	20.2	18,277	9.5
Black	31,420	6,277	20.0	3,836	12.2
American Indian, Eskimo, or Aleut	1,649	361	21.9	162	9.8
Asian or Pacific Islander	7,855	777	9.9	384	4.9
Hispanic origin	21,905	3,343	15.3	1,838	8.4

NOTE: See appendix table 1-1 for definitions.

See appendix table 1-7.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 1-5.
Educational attainment of persons 15 years and over, by sex and race/ethnicity: 1990



See appendix table 1-5.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Not all groups have shared equally in this expansion. The proportions of high school graduates in the adult populations of each racial/ethnic group show the results of past opportunities and experiences. For each group except Asians, women had completion rates very slightly higher than men; the difference by gender was greatest among Asians, where men led women by 5 percentage points, 76 percent compared with 71 percent. Much greater discrepancies occur in the proportions across groups that have completed a bachelor's degree or higher. (See figure 1-5.)

Enrollment in higher education increased substantially during the 20th century, particularly during the 1920's, the 1940's, and the 1960's. During the 1960's, in addition to the "baby boom" generation entering college, there were efforts to increase access to higher education. Data on the racial/ethnic composition of students in higher education have been available since the late 1970's: Between 1978 and 1991, total enrollment increased from 9.8 million to 12.6 million and the proportion of the student population that was white dropped from 79 percent to 76 percent of the total. The increase in shares occurred almost entirely among Asian and Hispanic students. Documentation of these shifts—and the resulting implications for degree awards and participation in the workplace—are the focus of later chapters.

Attitudes Toward Science and Scientists

Participation in science and engineering is affected by the views held by the public. Most of the data on participation in science and engineering are provided by objective measures such as the successful completion of a course of study, performance on a test, or employment in a particular type of job. Fewer data have been available on the views of different groups within the population toward science.

Attitudinal surveys in the United States over the past 20 years have documented sustained high levels of interest in, and widespread support for, science and scientists (National Science Board 1994, ch. 7). At least four out of five American adults feel that science has a positive effect on their lives and trust the motives of scientists. It has also been established that attitudes toward science and interest in science are strongly and positively related to levels of education.

Prior to 1993 the adult U.S. population had not been appropriately sampled to permit reliable comparisons across racial/ethnic groups on these attitudinal and valuative measures. A 1993 study of U.S. adult attitudes toward science and scientists oversampled the black and Hispanic adult populations, and within these minority groups, it oversampled adults who have completed the baccalaureate.[4] The survey found both similarities and differences across the black, Hispanic, and white[5] subpopulations.

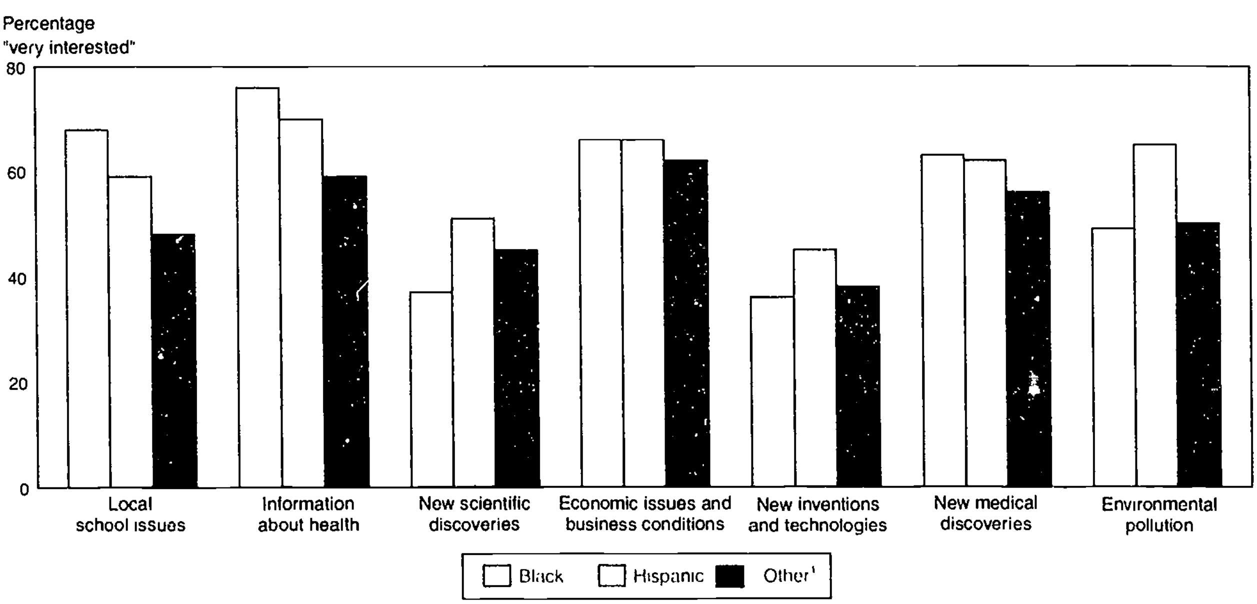
Patterns of Interest and Knowledge

The study asked respondents about their level of interest in a number of topical issues that may appear in the news. (See figure 1-6.) Respondents from the general adult population have traditionally indicated high levels of interest in school, medical, and economic issues and somewhat lower levels of interest in scientific and technological issues. These patterns did not change significantly when the adult population holding bachelor's degrees was stratified by race and ethnicity. However, a few notable patterns emerged:

[4] The study, designed to develop comparisons across racial/ethnic populations, was sponsored by the National Institutes of Health (NIH) in collaboration with NSF. For a technical description of the study and a thorough presentation of its findings, see National Institutes of Health 1994 (forthcoming).

[5] "White," in this discussion, refers to all respondents *not* identifying themselves as African or Hispanic American. Therefore, it includes Asians, whites, and all other groups.

Figure 1-6.
Interest in selected issues among adults holding bachelor's degrees, by race/ethnicity: 1993



[1] Includes Asians, whites, and all other groups

See appendix table 1-8.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

- Local school issues are particularly salient to black college graduates; college-educated Hispanics are also "very interested" in these issues;
- Hispanic adults with bachelor's degrees are particularly interested in issues concerning environmental pollution and showed more interest in scientific discoveries than blacks or whites;
- Both blacks and Hispanics with college degrees expressed greater interest in information about health than whites.

In terms of self-ratings of knowledge about these same issue sets, blacks rated themselves more knowledgeable about local school issues than did white or Hispanic respondents. (See appendix table 1-8.) Between one-fourth and one-third of each population group rated their knowledge of scientific discoveries and new technologies as poor.

Attitudes Toward Science

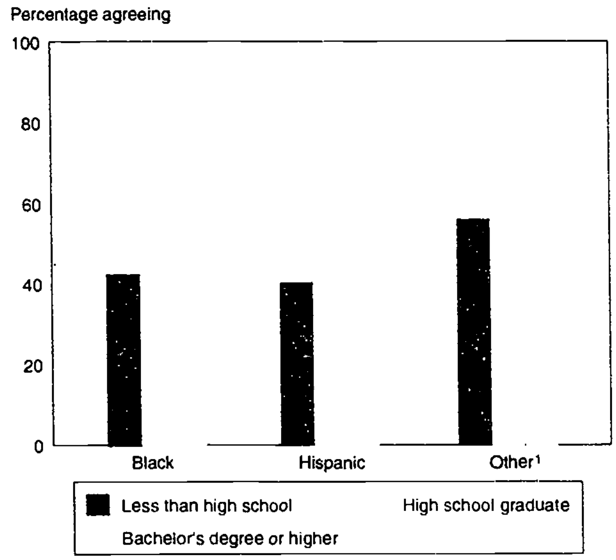
Responses confirmed that education is related to attitudes toward science for both blacks and Hispanics as well as for whites: the more years of formal schooling of the respondents, the more highly they rated the benefits of scientific research. (See figure 1-7.) However, the overall regard for scientific research is not as high among these educated minority populations as among whites.[6] Twelve percent of both minorities view the results of scientific research negatively, in contrast with 5 percent of other races. (See appendix table 1-9.)

Some gender differences in assessments of science are also evident in all three of the population groups. (See figure 1-8.) Black women with a bachelor's or higher degree, for example, less often agree that science and technology are making their lives "healthier, easier, and more comfortable" than do black men, whose response patterns are the same as those of white men. Women of all three groups are more likely to express support for antivivisectionist positions; even so, more women support research on animals than oppose it. (See appendix table 1-10.)

On some issues, men and women of a particular racial/ethnic group shared similar views; on other issues, they diverged. For example, among persons with baccalaureates, a majority of black men and women and Hispanic men were much more likely to agree with the statement, "We depend too much on science and not enough on faith." (See appendix table 1-10.) Black and white women tend to agree with this statement in larger proportions than men, but the gender effect among Hispanics was in the opposite direction. Only 37 percent of Hispanic women, versus 50 percent of men, agreed with the statement.

[6] For an exact wording of the question and response categories, see appendix table 1-8. This was one of the most complex questions in the study and responses were probed for the degree of feeling (e.g., "strongly" or "only slightly" beneficial).

Figure 1-7.
Education effects on attitudes toward scientific research, by race/ethnicity: 1993



"On balance, the benefits of scientific research have outweighed the harmful results."

[1] Includes Asians, whites, and all other groups

See appendix table 1-9

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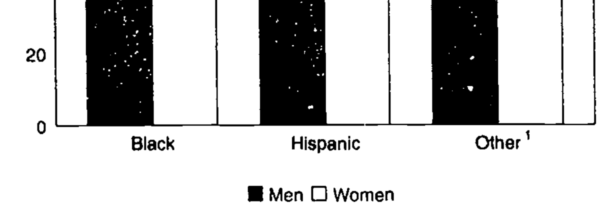
Figure 1-8.
Gender differences in attitudes toward science and technology, by race/ethnicity: 1993



"Science and technology are making our lives healthier, easier, and more comfortable."

[1] Includes Asians, whites, and all other groups

NOTE: Respondents with a bachelor's degree or higher

See appendix table 1-10.

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The Dynamics of U.S. Population Change

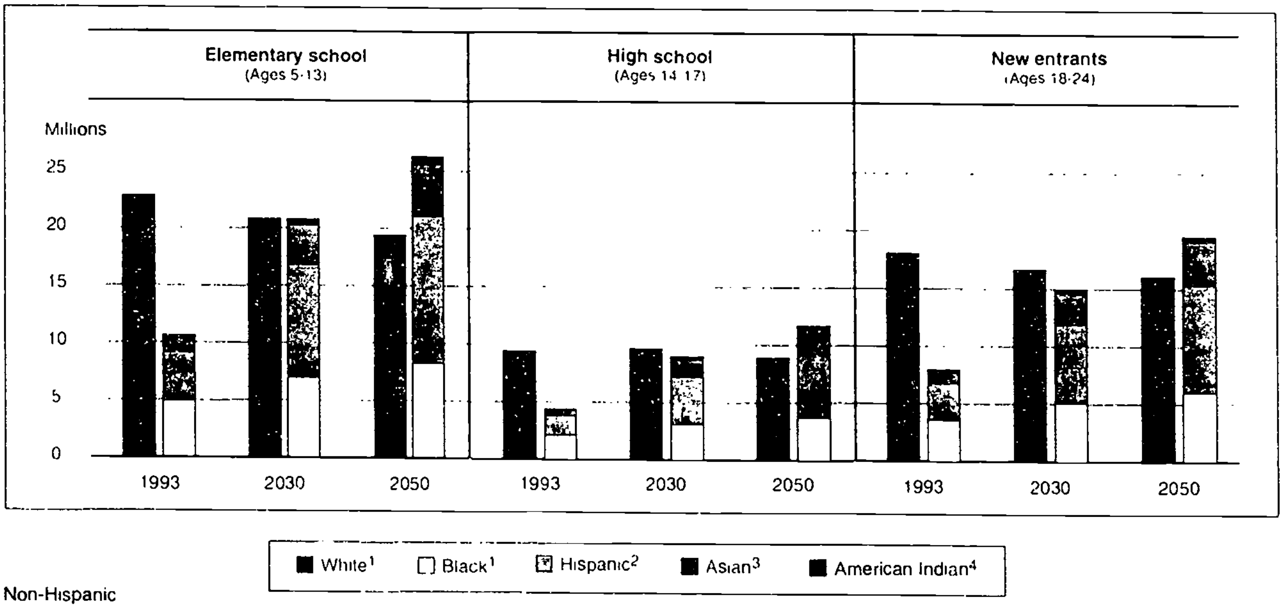
Profound changes are likely to occur in the composition of the U.S. population over the next half-century. Different fertility rates, immigration patterns, and age distributions—and thus death rates—of population subgroups point to a 21st century population profile that contrasts sharply with that of the 20th.[7]

Under the "middle series" of assumptions used by researchers at the Bureau of the Census, the total non-Hispanic white proportion of the U.S. population would decline from 76 percent in 1990 to 53 percent in 2050. But, within this gradual overall trend are more dramatic anticipated changes. For example, by 2012 more blacks than non-Hispanic whites would be added to the population each year. In 2030, the non-Hispanic white population would be less than half of the under-18 population, while it would still make up 75 percent of those over 65.

Around 2030 the total elementary school-aged cohort of the United States would be about equally divided between non-Hispanic whites and all other racial/ethnic groups combined. (See figure 1-9.) Over the following 20 years, American Indians, Asians and Pacific Islanders, Hispanics of all races, and blacks would together far outnumber the total white non-Hispanic population of elementary school children, high school students, and new entrants into college, the workforce, and the military.

[7] This discussion relies exclusively on Day 1993, which also contains the detailed methodology underlying the projections.

Figure 1-9.
Projections of the U.S. population, by selected age groups and race/ethnicity: 1993, 2030, and 2050



[1] Non-Hispanic
[2] Of any race
[3] Including Pacific Islanders
[4] Including Eskimos and Aleuts

See appendix table 1-11

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Chapter 2

Elementary/Secondary Mathematics and Science Education

Science and mathematics at the elementary/secondary level is an important concern to educators. For some students, this level of education provides the foundation to enter higher education to become a scientist or engineer; for others, it provides preparation for entry into an increasingly technological workplace. *The National Education Goals Report* (National Education Goals Panel 1993) specifically states that by the year 2000 U.S. students will be first in the world in science and mathematics achievement. It mandates that American students will leave grades 4, 8, and 12 with demonstrated competency in challenging subject matter, including science and mathematics. Although responsibility for pre-kindergarten through 12th grade education rests with local and State governments, the Federal Government has nonetheless increased its involvement through support of development and implementation of systematic reforms in content, teaching, materials, and assessment (Federal Coordinating Council for Science, Engineering, and Technology 1993).

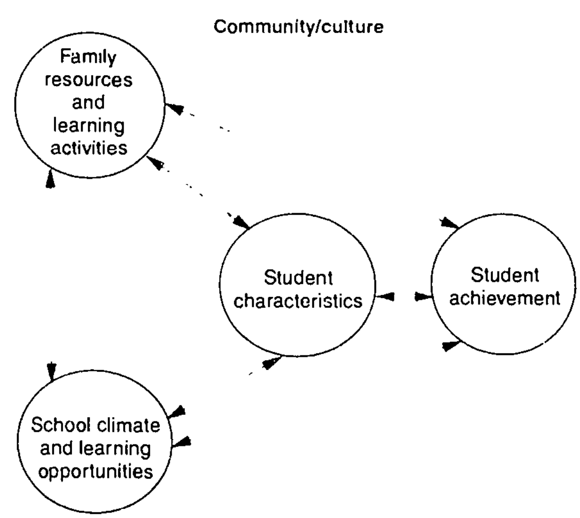
Reaching the Nation's goal for science and mathematics achievement will not occur unless all participate, including female and minority students and students with disabilities (Oakes 1990). In general, these students graduate from high school ill prepared for technology-oriented employment and they are less likely than white, male students or students without disabilities to enter science and mathematics fields in postsecondary education. As data in chapter 5 show, women and minority groups are underrepresented in many science and engineering fields. The underrepresentation begins in elementary and secondary schools.

Conceptual Framework

Although this chapter provides information on elementary/secondary achievement in mathematics and science of students by race/ethnicity and by sex (updated data similar to those provided in earlier versions of the Women and Minorities report), test scores are not its primary focus. Nor is the purpose of this chapter to describe all facets of elementary/secondary science and mathematics education for females and minorities, as other NSF reports have provided various statistics on characteristics of the mathematics and science education of the almost 50 million (and growing) students in our Nation's schools, including data on females and on underrepresented minorities (National Science Foundation 1993, 1994).

Rather than trying to describe all characteristics of elementary/secondary mathematics and science education for females and for underrepresented minorities, therefore, this chapter focuses on selected characteristics. A large national data base allowed the integrated study of individual achievement for these population groups in conjunction with data on family resources and activities, school climate and learning opportunities, and community characteristics. (See figure 2-1.) Variables that were shown to be

Figure 2-1.
Conceptual framework for studying science and mathematics education



NOTE: The results of the regression for these variables are available in U.S. Department of Education/NCES 1994.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

Text table 2-1.
Average mathematics proficiency and percentage of students at or above three proficiency levels, by grade and race/ethnicity: 1992

Grade and race/ethnicity	Average proficiency	Percentage of students at or above proficiency level		
		Advanced	Proficient	Basic
Grade 4:				
Asian	231	5	30	76
Hispanic	201	0	6	37
Black	192	0	3	24
White	227	3	23	72
American Indian	209	2	10	46
Grade 8:				
Asian	288	14	44	80
Hispanic	246	1	8	39
Black	237	0	3	27
White	277	4	32	74
American Indian	254	0	9	47
Grade 12:				
Asian	315	6	31	81
Hispanic	283	1	6	45
Black	275	0	3	34
White	305	2	19	72
American Indian	281	0	4	46

SOURCE: U.S. Department of Education/NCES. National Assessment of Educational Progress, "1992 Mathematics Assessment."

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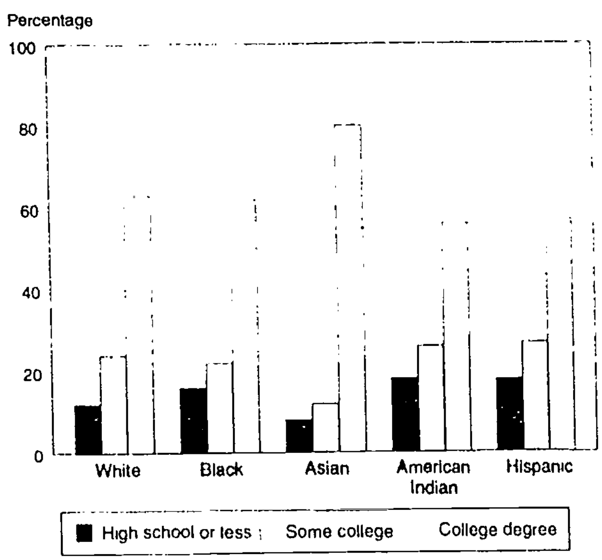
Figure 2-2.
Percentage distribution of level of education expected by parents for 1988 eighth grade students, by race/ethnicity



See appendix table 2-8.

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strongly **correlated to achievement** in mathematics and science in this study are highlighted in this chapter. The information presented on students with disabilities also considers broader issues of instructional environment and student needs.

Although this chapter presents data from a variety of sources, it primarily uses the National Education Longitudinal Study of 1988 (NELS:88), a large-scale longitudinal survey sponsored by the U.S. Department of Education, National Center for Education Statistics, and the National Science Foundation. This national study began in 1988 with a sample of about 24,000 eighth grade students who have been surveyed biennially to obtain rich information about student characteristics and family background, as well as school context and achievement outcomes. NELS:88 collected data on science and mathematics achievement scores, coursework in school, attitudes toward mathematics and science classes, and a variety of other education-related factors. Half of the students surveyed were female and approximately one-third were underrepresented minorities (black, Hispanic, or American Indian).

This chapter uses regression analysis to determine which variables are most closely associated with student achievement. The limitations to this approach are twofold: (1) The analysis only includes those variables that were collected in the survey (for example, it does not include such things as the actual processes that occur in a classroom). (2) Although a variable may be highly correlated with achievement, it does not necessarily mean that factor *causes* high achievement levels; that a variable had a high correlation means only that a close association exists between mathematics and science achievement and that variable. Correlation coefficients then provide indicators of the *strength* of the relationship. Given these limitations, the purpose of this chapter is to examine factors that are strongly related to achievement in science and mathematics in this study—factors that can be changed by students, parents, teachers, schools, and policymakers—in order to increase the representation of women and minorities in the science and engineering workforce.

Minorities

Many reports on the elementary/secondary education of minorities have presented data on student achievement, noting differences among minority groups and the differences between minorities and whites (e.g., Educational Testing Service 1991). While such data are useful as a starting point for examining the role that elementary/secondary education plays in the underrepresentation of minorities in science and engineering, additional information is necessary to

Data on American Indian Students

Who Are the American Indians?

"At the time of contact [with Europeans], the present United States territory encompassed native societies that ranged from small hunting and gathering groups (in Alaska, the Northwest, Atlantic Coast, and other locations) to relatively large political confederacies (such as the League of the Iroquois), as well as dense, sedentary communities (like those of the Eastern and Western Pueblos).

"At the time of Columbus' arrival, the total population in what became the United States is estimated to have been about 1 million, comprising 200 to 300 societies and some 2,000 language groupings. At least 100 native languages are still spoken today by more than 300 tribes" (Quality Education for Minorities Project 1990, p. 27).

American Indian Students

"There are approximately 1.9 million American Indians and Alaskan Natives in the United States, with Navajos, Cherokees, and Alaskan Natives representing the three largest groups. Of the total, between 300,000 and 400,000 Natives are of school age. Natives represent about 1 percent of the total student population in the United States and, because of their relatively small numbers, are often lost in reports about educational achievement and progress.

"Contrary to the public's image of Native children being taught in separate reservation schools, 85 to 90 percent are educated in public schools; the rest attend schools operated by the Bureau of Indian Affairs [BIA], Indian contract schools, or private schools. In most States, Natives account for a small share of the population, but they make up at least 9 percent of the public school enrollment in Alaska, Oklahoma, and New Mexico" (U.S. Department of Education 1991, p. 2)

Data From the Indian and Public School Questionnaire

Large percentages of American Indian/Alaskan Native students live in poverty, regardless of types of school attended. Over 40 percent of elementary/secondary American Indian children speak English as a second language; also, over 60 percent receive remedial instruction in mathematics (U.S. Department of Education/NCES 1991b).

Nearly 88 percent of American Indian students attending BIA or tribal schools are eligible for free or reduced-price lunches. In public schools where the American Indian enrollment exceeds 25 percent, over 61 percent of the American Indian students qualify for the lunch programs, contrasting with the 32 percent of American Indian students who qualify in those public schools where the enrollment of American Indians is 25 percent or less.

present a more complete picture. It is especially useful to analyze not just the "outcome," but the "inputs" to minority achievement, i.e., selected variables that are related to how well those children perform in school.[1]

This analysis attempts to relate at the secondary school level—where many critical decisions are made—the **achievements, family resources, school characteristics, and student opportunities to learn** (Stevens 1993) of underrepresented minority students. (Underrepresented minority groups in science, mathematics, and engineering are blacks, Hispanics, and American Indians.)

Achievement

There are important differences in student achievement in science and mathematics across minority groups and between minorities and whites. In general, Asian students have levels of achievement in mathematics and science higher than students from any other racial/ethnic group, including whites. The average achievement levels of Hispanics, blacks, and American Indians are lower than those of both whites and Asians. Similar differences appear in undergraduate education, graduate education, and the science and engineering workforce. This is a strong indicator that factors affecting representation in science and engineering are operating in elementary and secondary school.

In the last 15 years, the differences in the mathematics and science test scores between whites and underrepresented minorities have declined, but they are still an area for national concern. (See appendix tables 2-1 to 2-6.)

In mathematics, the average proficiency of Asian students was higher than that of whites and other minorities at grades 4, 8, and 12 in 1992. For example, the mathematics proficiency of Asian 12th grade students was 10 points higher than that of whites, 32 points higher than Hispanics, 34 points higher than American Indians, and 40 points higher than blacks. (See text table 2-1.)

[1] All references, detailed tables, and detailed methodological discussions for the analysis are found in U.S. Department of Education/NCES 1994.

Text table 2-2.
Average science proficiency and percentage of students at or above four proficiency levels, by grade and race/ethnicity: 1990

Grade and race/ethnicity	Average proficiency	Percentage of students at or above proficiency level			
		Level 200	Level 250	Level 300	Level 350
Grade 4:					
Asian	233	88	29	2	0
Hispanic	212	66	10	0	0
Black	205	58	5	0	0
White	242	93	40	1	0
American Indian	226	81	20	0	0
Grade 8:					
Asian	271	96	71	23	1
Hispanic	241	87	42	5	0
Black	231	80	31	3	0
White	273	97	74	23	1
American Indian	252	92	54	8	0
Grade 12:					
Asian	308	99	90	60	17
Hispanic	273	98	70	23	3
Black	256	94	57	12	1
White	303	100	91	53	12
American Indian	286	100	89	33	2

KEY: Proficiency levels are defined as follows:
Less than 200—Knows everyday science facts.
200—Understands simple scientific principles.
250—Applies basic scientific information.
300—Analyzes scientific procedures and data.
350—Integrates specialized scientific information.

SOURCE: U.S. Department of Education/NCES. National Assessment of Educational Progress, "1990 Science Assessment."

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In science proficiency, Asian students trailed whites by 9 points in grade 4, were almost equally proficient at grade 8, and led whites by 5 points at grade 12 in 1990. The other racial/ethnic groups trailed at all grade levels. At grade 12, American Indians' proficiency was lower than that of Asians by 22 points, Hispanics' by 35 points, and blacks' by 52 points. (See text table 2-2.)

Although the persistent gap in average achievements between whites and Asians and underrepresented minority groups is narrowing, differences remain. Scrutiny of many factors involving families, schools, and students suggests means to close the gap.

Family Resources/Support

A correlation analysis of the strength of the relationship between student achievement and family resources shows that for the eighth grade student population in 1988 the top three variables related to science and mathematics achievement test scores were

- parents' expectations about student educational attainment,
- learning materials made available by parents, and
- parental education level. (See appendix table 2-7.)

Almost 80 percent of Asian parents expected their eighth grade students to receive a college degree, a level unmatched by any other racial/ethnic group. Sixty-three percent of white parents expected their children to earn a college degree, compared with 62 percent of black parents, 57 percent of Hispanic parents, and 56 percent of American Indian parents. (See figure 2-2 and appendix table 2-8.)

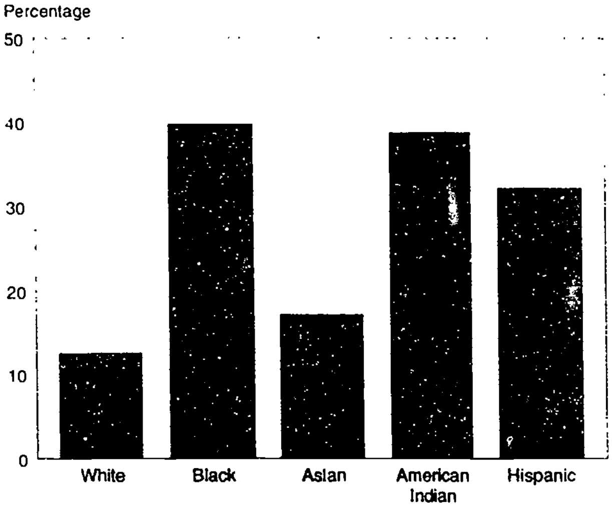
Underrepresented minority students in general have fewer learning materials and opportunities made available at home and participate in fewer educational activities outside of school. Hispanic and black students were less likely than white students to visit an art gallery, museum, zoo, or aquarium or to go to a movie, play, concert, or other live show in their early childhood (U.S. Department of Education/NCES 1991a). In the eighth grade, significantly fewer underrepresented minority students than whites had borrowed books from a library or visited a museum. (See appendix table 2-9.) A lack of materials and resources typically reflects the economic status of the parent(s); the proportion of Hispanic, American Indian, or black children living in poverty is high. (See figure 2-3.) Poverty has a reverberating effect not only on children and their families, but also on the schools the students attend.

Both parental expectations for the level of education their children may attain and the learning materials and resources made available by parents are often closely tied to the parental educational level. While most parents of white and Asian students had completed high school, there were significant percentages of Hispanic, black, and American Indian parents who had not completed high school. (See figure 2-4.)

School Characteristics

A correlation analysis on the strength of the relationship between student achievement and school climate shows that for all eighth grade student popula-

Figure 2-3.
Percentage of U.S. children under age 18 living in poverty, by race/ethnicity: 1990



NOTE: Hispanics may be of any race.

SOURCE: Center for the Study of Social Policy. 1992. *The Challenge of Change: What the 1990 Census Tells Us About Children.*

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tions the top three variables in predicting science and mathematics achievement test scores are

- the socioeconomic status of students in the school,
- whether students place a priority on learning, and
- teacher ability to motivate students. (See appendix table 2-10.)

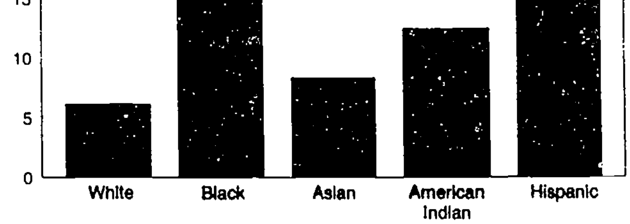
As a proxy for socioeconomic status, schools were divided into two categories: advantaged schools and disadvantaged schools. Disadvantaged schools are defined as those with at least 50 percent of students participating in a free or reduced-price lunch program based on poverty income levels. Only 7 percent of white eighth grade students attended disadvantaged schools. The percentage of Asian eighth grade students attending disadvantaged schools, 15 percent, was more than twice as high. By far the largest percentages of students attending disadvantaged schools were found among American Indians (40 percent), Hispanics (39 percent), and blacks (36 percent). (See figure 2-5.)

Students at disadvantaged schools tend to face more barriers to learning than students at advantaged schools. For example, according to a survey of administrators, teachers at advantaged schools were more likely to have high morale and positive attitudes about students. Teachers at disadvantaged schools were more than twice as likely to have difficulty motivating students as those at advantaged schools. (See text table 2-3.)

There are other important differences among racial/ethnic groups in the backgrounds their teachers are likely to have. Almost 46 percent of white eighth grade students were taught mathematics by teachers who had majored in math. This was the highest percentage of any racial/ethnic group, though Asians were a close second, with 44 percent of their math teachers having math majors. Forty percent of the mathematics teachers of black students had majored in math, one-third of the teachers of Hispanics, and 30 percent of the teachers of American Indians. Fifty-three percent of Asian eighth grade students were taught science by teachers who had majored in science, the highest percentage of all racial/ethnic groups. Almost 49 percent of the science teachers of whites and blacks had majored in science, compared with 47 percent for Hispanics, and 40 percent for American Indians. (See appendix table 2-11.)

The relative lack of physical resources in disadvantaged schools presents another barrier to learning. For example, in a survey of physics teachers, almost half indicated that the best method to improve or expand physics programs is to improve the laboratory component (American Institute of Physics 1994). "Hands-on" laboratory experience is important to science courses, but students in disadvantaged schools have this experience less often than students in advantaged schools. Although 30 percent of eighth grade students in advantaged schools have laboratory work at least once a week, only 22 percent of the

Figure 2-4.
Percentage of 1988 eighth grade students whose parents did not finish high school, by race/ethnicity



NOTE: Hispanics may be of any race.

SOURCE: U.S. Department of Education/NCES. National Education Longitudinal Study of 1988, "Base Year Student Survey."

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Text table 2-3.
Percentage of school administrators of eighth grade students reporting selected characteristics, by school socioeconomic status: 1988

School characteristics	School socioeconomic status	
	Advantaged	Disadvantaged
Students face competition for grades	47.2	32.2
Students place a priority on learning	63.5	49.1
Teachers encourage students to do their best	93.6	92.2
Teachers have positive attitudes about students	81.5	65.5
Teachers do not have difficulty motivating students	50.3	23.4
Teachers respond to students' individual needs	84.6	75.7
Discipline is emphasized	91.7	88.7
Teacher morale is high	82.0	68.2

NOTE: Disadvantaged schools are schools with 50 percent or more of students participating in a free or reduced-price lunch program.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

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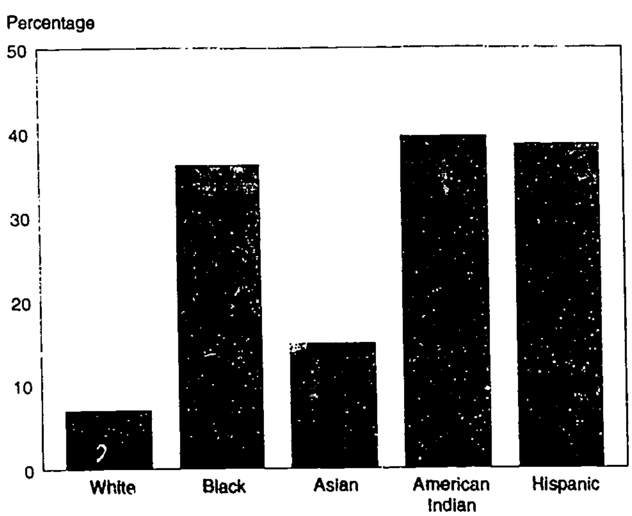
Figure 2-5.
Percentage of 1988 eighth grade students attending disadvantaged schools, by race/ethnicity



NOTES: Disadvantaged schools are schools with 50 percent or more of students participating in a free or reduced-price lunch program. Hispanics may be of any race.

SOURCE: U.S. Department of Education/NCES. National Education Longitudinal Study of 1988, "Base Year Student Survey."

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students in disadvantaged schools have similar opportunities.

Student Opportunities To Learn

A correlation analysis of the strength of the relationship between student achievement and student characteristics shows that for all eighth grade student populations the two most important variables in predicting science and mathematics achievement test scores are

- the students' educational aspirations and
- the courses students take in school. (See appendix table 2-12.)

In particular, there is a very high correlation between taking geometry courses and high test scores in science and mathematics. There is also a high correlation between taking advanced algebra courses and achievement in science and mathematics. Students in an "honors track" program would most likely have had the opportunity to take these classes.

It is important to distinguish between *attitudes* toward mathematics and science and *educational aspirations*. There appear to be no significant differences among racial/ethnic groups in their attitudes toward mathematics and science (i.e., whether they "like" those subjects).[2] Measures of student attitudes indicate that eighth grade students in all racial/ethnic groups have positive attitudes toward mathematics and science classes. In 1988, large majorities of both whites and minorities agreed that mathematics and science classes were important to their future. (See appendix table 2-13.) The percentages of black, Hispanic, and American Indian eighth grade students who said they looked forward to mathematics and science classes were higher than for whites, even though these groups trailed whites in average math and science achievement. In 1992, white 12th grade students were also less likely than blacks, Hispanics, and American Indians to say they liked mathematics and less likely than Hispanics and American Indians to say they liked science. (See text table 2-4.)

Although liking math or science is a first step, it does not necessarily lead to aspirations for a career in these fields. Important differences among racial/ethnic groups appear when students are asked about the education levels and kinds of career they hope or expect to achieve. In terms of educational attainment, 31 percent of white and 30 percent of Asian 10th grade students expect to graduate from college, a requirement for almost any science or mathematics career. Only 26 percent of black, 23 percent of Hispanic, and

[2] Comparisons of attitudes toward science of the adult population for racial/ethnic groups are presented in chapter 1.

Text table 2-4.
Percentage of students who like science (1990) and mathematics (1992), by subject, grade, and race/ethnicity

Subject and grade	Race/ethnicity				
	Asian	Hispanic	Black	White	American Indian
Science:					
Grade 4	78	76	75	81	80
Grade 8	70	71	70	67	71
Grade 12	69	68	60	66	71
Mathematics:					
Grade 4	80	72	74	71	66
Grade 8	65	55	64	56	51
Grade 12	64	55	55	49	50

SOURCE: U.S. Department of Education/NCES. National Assessment of Educational Progress, "1990 Science Assessment" and "1992 Mathematics Assessment."

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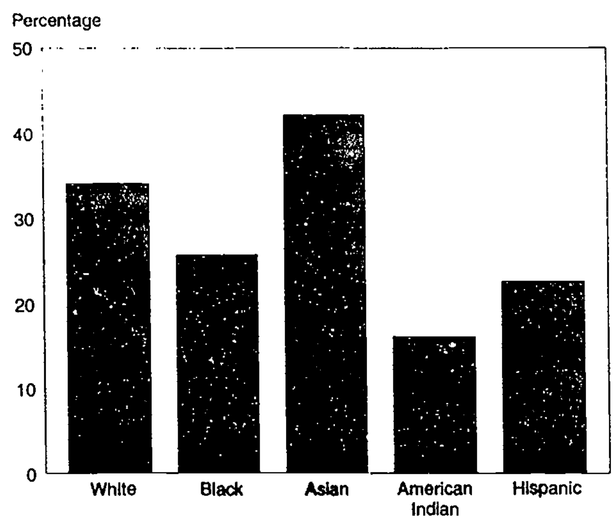
Figure 2-6.
Percentage of 1990 10th grade students enrolled in college preparatory, academic, or specialized academic programs, by race/ethnicity



NOTE: Hispanics may be of any race.

SOURCE: U.S. Department of Education/NCES. National Education Longitudinal Study of 1988, "First Follow-Up Student Survey."

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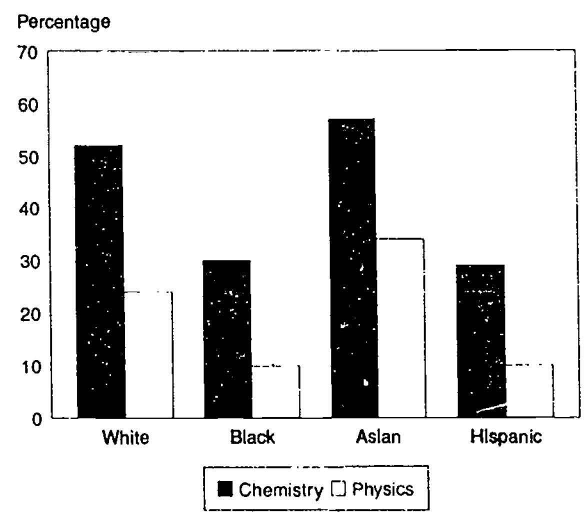
19 percent of American Indian students expect to complete a college education. (See appendix table 2-14.)

Almost 11 percent of Asian eighth grade students in 1988 said they expected to be a science or engineering professional when they were 30 years old. Seven percent of whites had the same expectation, while 5 percent of Hispanic and black students said they thought they would have a career in science or engineering.

The types of courses taken by students are also especially important as "opportunities to learn" and are often determined overall by the type of high school program in which the student is enrolled. For example, 34 percent of white 10th grade students were enrolled in college preparatory, academic, or specialized academic programs in 1990. Only 26 percent of blacks, 23 percent of Hispanics, and 16 percent of American Indians were enrolled in such programs. Asian enrollment in college preparatory programs was at 42 percent. (See figure 2-6.) In addition, a recent survey of enrollment rates in high school chemistry and physics classes shows that Asian students are three times and white students are two times more likely to take physics than are black or Hispanic students. (See figure 2-7.)

A similar pattern emerged in enrollment in advanced mathematics courses, particularly geometry enrollment, the factor most highly correlated with math and science achievement. In 1990, almost 65 percent of Asian and more than 53 percent of white 10th grade students had taken or were taking geometry. Blacks, Hispanics, and American Indians trail well behind, at less than 42 percent, 39 percent, and 34 percent respectively. (See figure 2-8.)

Figure 2-7.
Enrollment rates in chemistry and physics, by race/ethnicity: 1990



NOTE: No data on American Indians are provided.

SOURCE: American Institute of Physics. High School Physics & Chemistry Teacher Survey, 1990.

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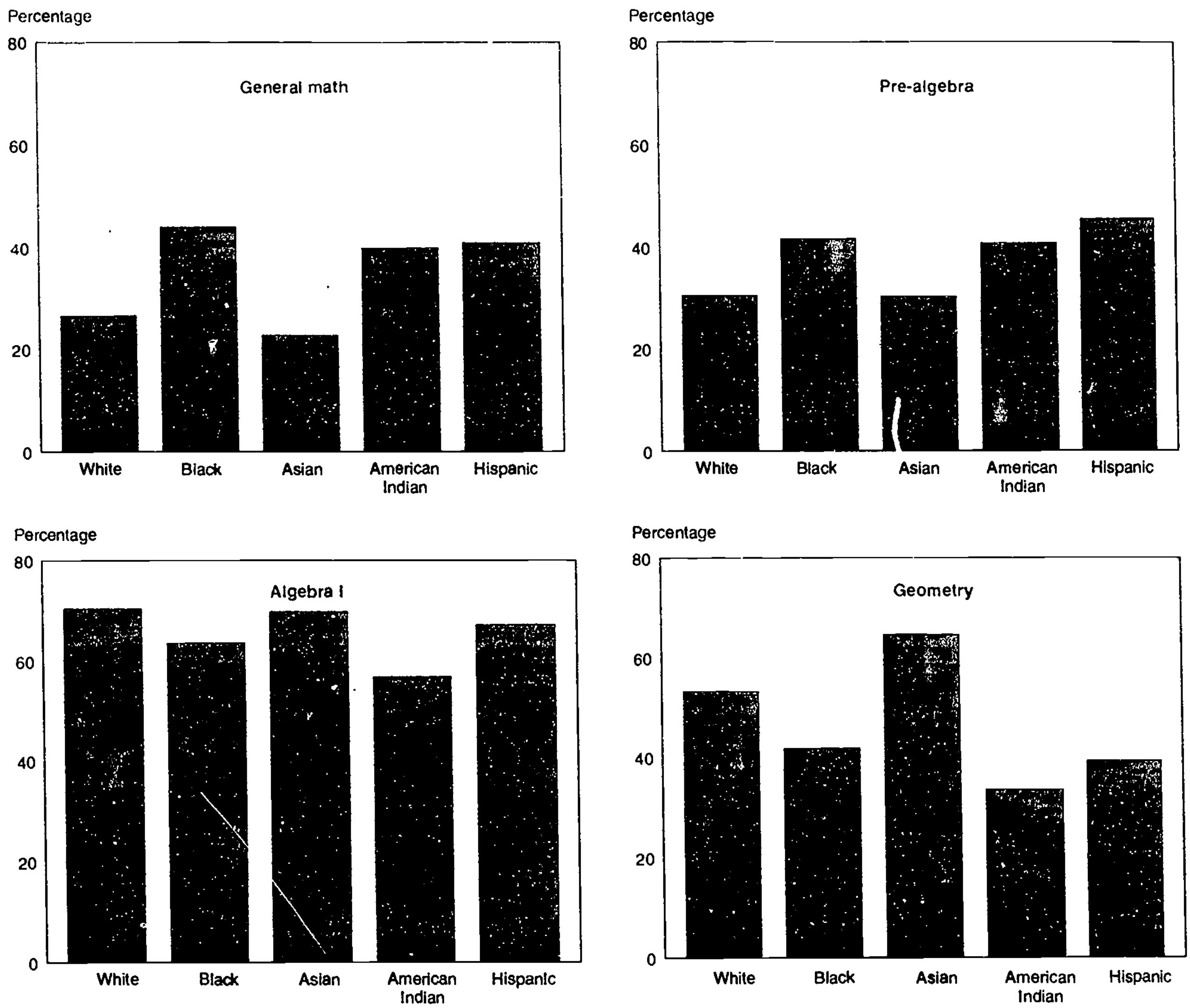
Figure 2-8.
Percentage of 1990 10th grade students with exposure to mathematics, by course and race/ethnicity



NOTE: Hispanics may be of any race.

SOURCE: U.S. Department of Education/NCES. National Education Longitudinal Study of 1988. "First Follow-Up Student Survey."

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In 1992, Asian and white 12th grade students were also significantly more likely to have taken eight or more semesters of mathematics classes in high school than were blacks, Hispanics, or American Indians. Forty-four percent of whites had taken eight or more classes, compared with 32 percent of blacks, 30 percent of Hispanics, and 28 percent of American Indians, all considerably less than the 64 percent of Asians who had taken eight or more semesters. (See text table 2-5.)

Both the level and the number of science courses taken by students are important in determining general scientific literacy *and* the pool of future scientists.

The number of courses taken in science is an important factor in preparation for additional study. Racial/ethnic groups differ in the proportions who could by this indicator be characterized as well prepared for undergraduate majors in science and engineering. Among students at postsecondary institutions, 40 percent of Asians and 19 percent of whites had been science course "concentrators" in high school (that is, their coursework was concentrated on science courses). Fewer than 10 percent of Hispanics and 6

Text table 2-5.
Percentage distribution of the number of semesters of high school mathematics courses taken in grades 9 through 12, by race/ethnicity: 1992

Number of semesters	Race/ethnicity				
	Asian	Hispanic	Black	White	American Indian
0-3	4	20	21	12	24
4-5	15	19	27	18	22
6-7	17	30	19	26	26
8 or more	64	30	32	44	28

NOTE: Because of rounding, percentages may not add to 100.

SOURCE: U.S. Department of Education/NCES. National Assessment of Educational Progress, "1992 Twelfth Grade Mathematics Assessment."

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percent of blacks had such concentrations. (See appendix table 2-15.) (The number of courses in their field of study taken by undergraduate majors are compared across gender and racial/ethnic groups in chapter 5.)

Although many variables contribute to the differences in achievement levels among racial/ethnic groups, the most significant is the opportunity to learn. Advanced science and mathematics courses, especially geometry, are essential for all students to progress in the sequence of science and mathematics instruction. They increase the population that is "scientifically literate" and increase the size of the group of students for whom science-related careers are possible. It is interesting to note that among *college-bound* students, more than 85 percent of male and female students from all racial/ethnic groups took geometry. As discussed in chapter 3, students who took the more advanced mathematics courses in high school received higher mathematics scores on college entrance examinations. These courses also assist in clari-

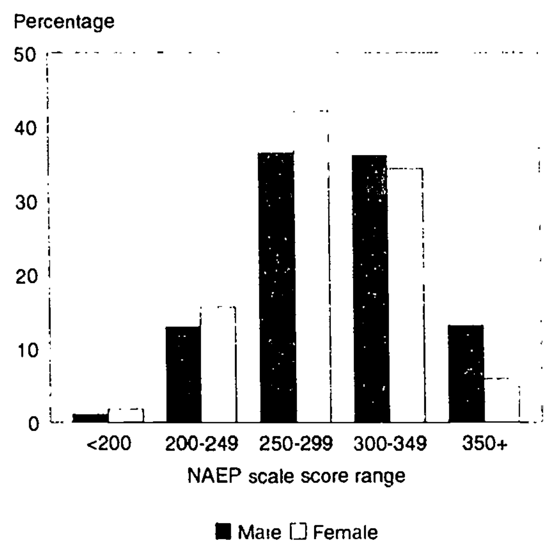
Gender and Culture

Many researchers have studied the issue of gender preferences as they relate to science. Studies by several investigators showed that math and science teachers treat girls and boys differently in the classroom. Teachers make more eye contact with boys and pay more attention to them than they do to girls in their classes. Teachers have also been shown to have differing styles of dealing with male and female pupils. When boys give wrong answers in class, teachers challenge them to find the correct answer; girls get sympathy. "Boys tend to operate the equipment and actually perform the experiment while girls tend to record data and write reports."[3]

The result of a loss in self-confidence from differential treatment appears to begin around the seventh grade and continue through high school. A study of seventh graders found an interesting difference: "The difference wasn't in performance—males and females performed comparably in math and science courses—but in the fact that females consistently underestimated their abilities. Because of this lack of confidence, the females begin taking fewer math and science courses than their male schoolmates, a trend that accelerates in high school" (Astin and Astin 1993).

[3] See discussion in Alper 1993.

Figure 2-9.
Percentage of 12th grade students at each scale score range in science, by sex: 1990



KEY: 200-249: Understands simple scientific principles
250-299: Applies general scientific information
300-349: Analyzes scientific procedures and data
350+: Integrates specialized scientific information

SOURCE: U.S. Department of Education/NCES. 1992. *The 1990 Science Report Card: NAEP's Assessment of Fourth, Eighth, and Twelfth Graders*, pp. 148-50. Washington, DC: U.S. Department of Education.

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Text table 2-6.
Percentage of public high school seniors citing selected reasons for not taking a mathematics or science course in their senior year, by subject and sex: 1989–90

Subject and sex	Took all	Will not need	Did not like	Not do well	Advised not to	Wanted other	Avoid work	Sample size
Mathematics:								
Total	5	28	34	31	31	37	27	687
Male	7	31	27	28	26	33	27	297
Female	3	25	40	33	34	40	27	390
Science:								
Total	8	39	29	24	30	37	24	918
Male	9	42	22	24	26	31	21	412
Female	7	38	35	24	32	41	26	506

NOTES: The students were asked the following question:
"If you are not taking any science classes this semester, which of the following best indicate your reasons for this decision? (Mark all that apply.)
— I have taken the highest level science course available here.
— I will not need advanced science for what I plan to do in the future.
— I do not like science.
— I did not think that I would do well in more advanced science classes.
— I was advised that I did not need to take more science.
— There were other courses that I wanted to take.
— I did not want to work that hard during my senior year."

SOURCE: Miller, J.D., et al. 1992. *Longitudinal Study of American Youth Codebook.* DeKalb, IL: Social Science Research Institute, Northern Illinois University. Unpublished tabulations.

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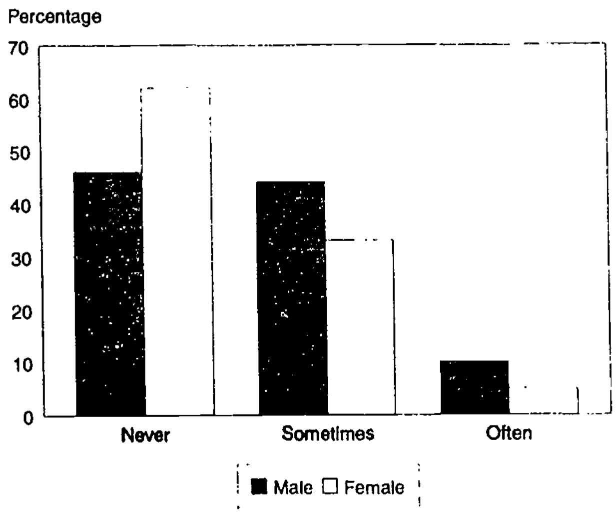
Figure 2-10.
Percentage of 10th grade students talking to parents about science and technology issues, by sex: 1990



SOURCE: Northern Illinois University, Social Science Research Institute. Special tabulations of the Longitudinal Study of American Youth.

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fying goals related to careers in science and engineering. Yet opportunities for study in advanced science and mathematics are different across groups.

Females

Framework of Analysis

Like blacks, Hispanics, and American Indians, girls begin to drop out of science and mathematics courses and activities during elementary and secondary school. But the reasons they drop out appear to be different. The most striking differences between whites and Asians on the one hand and underrepresented minorities on the other are in science and mathematics achievement as well as in the opportunity for exposure to advanced classes. The most striking differences between boys and girls are *not* in achievement or opportunities to learn, but in their attitudes toward science and mathematics. Even when girls have similar exposure to courses and similar achievement levels, they are less confident of their ability and less interested in science and engineering careers. These differences in attitude may be due to subtle messages females receive from their families, schools, and soci-

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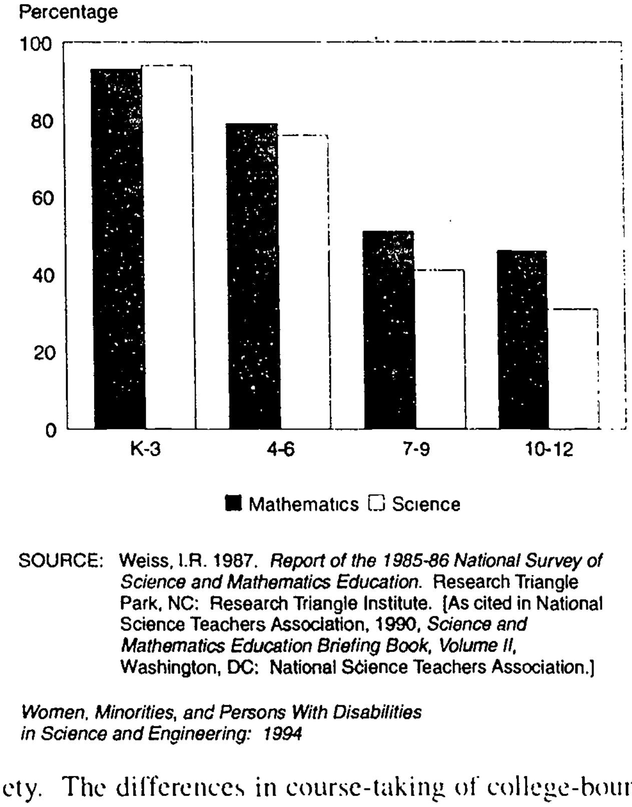
Visions of What a Scientist Looks Like

Students' views of science and scientists have been widely studied. Classroom learning environment has been found to play a major role in these perceptions. High school students often have a stereotypically masculine image of science and view scientists and scientific work as unpleasant entities. To examine where students develop their images, children have been asked to draw pictures of scientists. Most drawings portray a scientist as an elderly male wearing a white coat and glasses. However, teacher intervention programs have been shown to be effective in helping to alter these negative images (Mason et al. 1991).

Figure 2-11.
Female teachers of mathematics and science at different grades, as percentage of total: 1985-86



SOURCE: Weiss, I.R. 1987. *Report of the 1985-86 National Survey of Science and Mathematics Education.* Research Triangle Park, NC: Research Triangle Institute. [As cited in National Science Teachers Association, 1990, *Science and Mathematics Education Briefing Book, Volume II,* Washington, DC: National Science Teachers Association.]

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ety. The differences in course-taking of college-bound students are discussed in chapter 3.

Achievement

Since 1973, there has not been a gap in the mathematics proficiency scores of girls and boys at ages 9 and 13, according to the National Assessment of Educational Progress (NAEP) tests. A slight gap that existed from 1973 to 1986 between the scores of 17-year-old boys and girls has now virtually disappeared. (See appendix table 2-17.) In science proficiency, the 1990 scores of 9-year-old girls were virtually the same as boys'. There was a growing gap between girls' and boys' scores at age 13 and age 17, which has been persistent since the 1970's. (See appendix table 2-16.) This gap is found primarily at the highest levels of science proficiency, however; there are very small differences between males and females when their scores are broken down by range of achievement level (i.e., basic to advanced) except at the highest range. (See figure 2-9.) Most of the differences in average science proficiency in the 12th grade between males and females were found in the physical sciences (U.S. Department of Education/NCES 1992, p. 63). These slight differences may be related to courses taken at the advanced levels; see the discussion on course-taking in chapter 3.

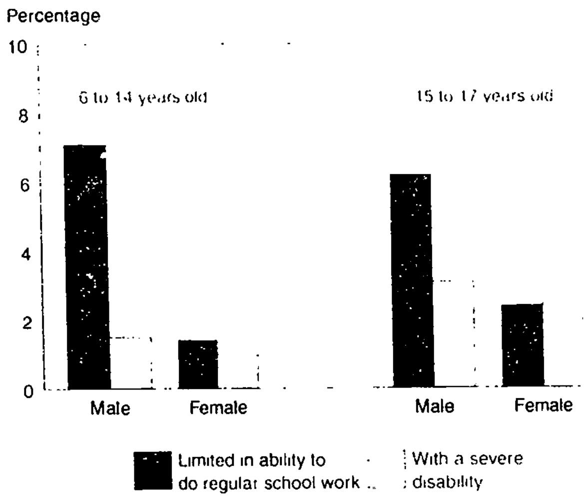
Attitude

Differences appear in indicators of student attitudes toward taking science and mathematics courses, especially in the senior year. In a survey of high school students about why they decided not to take certain courses in their senior year, higher percentages of females than males said they did not like math (40 percent of females versus 27 percent of males) or said there were other courses they wanted to take (40 percent versus 33 percent). Similar explanations were given for decisions not to take a science course in their senior year: Higher percentages of females than males said they did not like science (35 percent of females versus 22 percent of males) or said there were other courses they wanted to take (41 percent versus 31 percent). (See text table 2-6.)

These attitudes in high school are reflected in the decisions of students about their future careers. In 1990 only 6 percent of public high school seniors overall reported that they expected to pursue a career in science, mathematics, or engineering, but the breakdown by sex indicated that the percentage for males was more than three times higher than for females (10 percent versus 3 percent). Much of this difference was accounted for by the small percentage of females (2 percent) versus males (9 percent) anticipating engineering careers.

The young women's relative lack of enthusiasm for science and mathematics may reflect school, family, or societal attitudes. Higher percentages of females reported being advised not to take senior math (34 percent of females versus 26 percent of males) or science (32 percent versus 26 percent). (See text table 2-6.) In addition, in 1990, 16 percent more male than

Figure 2-12.
Percentage of children with disability, by age and sex: 1991-92



See appendix table 2-18

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female 10th grade students reported ever talking to their parents about science and technology issues. (See figure 2-10.)

The females' attitudes could also be influenced by their lack of teacher role models. As students move from elementary to secondary school, the percentage of female teachers of mathematics and science drops steadily. (See figure 2-11.)

The critical factors that keep females from pursuing science and engineering courses in elementary/secondary school appear to be their attitudes toward the subject areas—which are influenced by family and societal biases as well as by the lack of exposure to role models in the field—and counseling by school advisors against taking advanced courses. Although progress has been made, in that females' achievement is similar to that of males in all but the most advanced levels of science and mathematics, it is success at these advanced levels that encourages students to enter science-related fields.

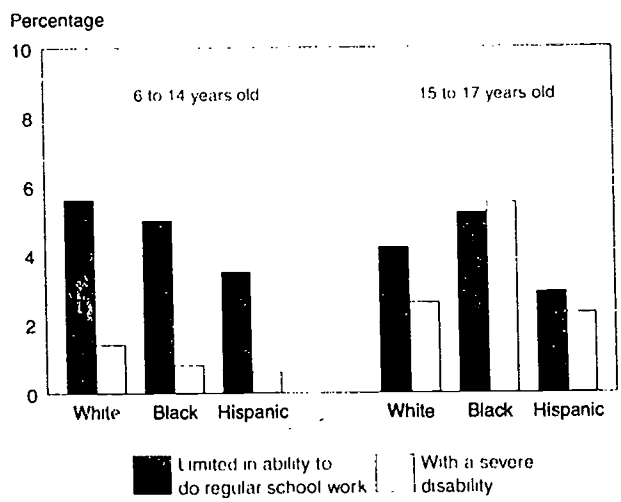
Persons With Disabilities

Elementary/secondary school-age children with disabilities have a variety of special needs that must be met if they are to benefit from educational experiences. Of children 6 to 17 years old in 1991-92, an estimated 2,995,000 had a disability, about 7 percent of the population.[1] For 2,200,000 of these individuals, the disability was a limitation in their ability to do regular school work. More than 700,000 children had a severe disability. (See appendix table 2-18.) The limitation in ability to do school work was greater for males than for females in both younger (6 to 14 years) and older (15 to 17 years) students. The sexes were comparable in the percentages with severe disabilities, which were higher among older than younger students. (See figure 2-12.) The presence of severe disabilities in older students was more than twice as high for blacks than for whites or Hispanics (5.5 percent of blacks had severe disabilities, compared with 2.6 percent of whites and 2.3 percent of Hispanics). (See figure 2-13.)

Special Education Services

Approximately 12 percent of the students in public schools are served in federally supported special education programs. (See appendix table 2-20.) Although it is not a complete count of the population with disabilities, this figure provides a baseline for estimating the present level of services provided. The diversity of need for educational services, as well as the extent of need, may be better understood by noting the range of disabilities reflected in the counts of students served. By far the largest single segment of this group, 45 percent, is composed of persons with specific learning disabilities (which may encompass a variety of different conditions). The next largest group, 20 percent of the total with disabilities, have speech or language impairments. About 1 percent each have orthopedic, hearing, or other impairments,

Figure 2-13.
Percentage of children with disability, by age and race/ethnicity: 1991-92



See appendix table 2-19.

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[1] The survey cited here, Survey of Income and Program Participation, used a functional definition of disability that specifies the extent of the limitation a person experiences in carrying out a variety of customary tasks, such as doing regular school work or ability to walk or run. (See Technical Notes and McNeil 1993.)

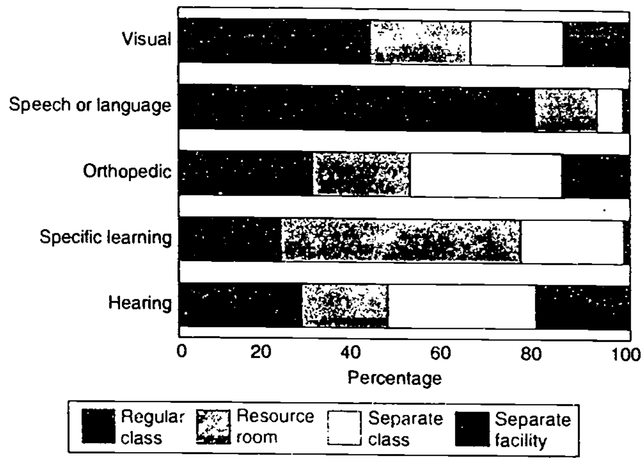
while 2 percent have multiple disabilities. About one-half of 1 percent have visual impairments. Increases in the reported numbers of students served reflect in part changes in legislation requiring that public schools provide special education services to all children 3 to 5 years old.

The environments whereby students are introduced to science, engineering, and mathematics are important aspects of access to these disciplines. Depending on the nature of their disability, students may be served in regular classrooms and be provided with special services via a resource room, or receive instruction at a variety of special sites. Given the often equipment- or facility-intensive needs for instruction in science, especially in higher levels of education, access to science could vary widely for these students. Students with speech or language impairments are most likely to be served in regular classrooms, with nearly 80 percent receiving their instruction in these settings and an additional 14 percent receiving assistance in resource rooms. Hence, a total of 94 percent of these students have access to science instruction similar to that of their classmates. (See appendix table 2-21.) For students with other disabilities, this combination of instructional environments is available to 86 percent of students with learning disabilities, 67 percent of those with visual impairments, 52 percent of those with orthopedic impairments, and 47 percent of those with hearing impairments. (See figure 2-14.)

Approximately 7 percent of students receive services through programs for students with disabilities, about the same proportion of the student populations who receive services through gifted and talented programs. Nine percent of students receive diagnostic and prescriptive services. (See appendix table 2-22.) At the same time, 11 percent of all students receive remedial reading instruction and 7 percent receive remedial mathematics instruction.

Figure 2-14.

Percentage distribution of students 3 to 21 years old with disabilities receiving special education services, by type of disability and educational environment: 1990-91



See appendix table 2-21.

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CHAPTER 3

TRANSITION TO HIGHER EDUCATION

The transition from elementary/secondary school to higher education is an important step not only to the individuals making it, but also to a Nation committed to the well-being of its citizens. Information on persons making this transition also provides opportunities for the assessment of their progress through stages just completed and their readiness for future activities. In this report, the transition points mark an important opportunity for examining the status of underrepresented groups as they progress through the educational system. The last chapter examined precollege educational participation and achievement for all students. It noted that differences arise as early as elementary school between girls and boys and among the minorities who are ultimately underrepresented in science and engineering—blacks, Hispanics, and American Indians.

This chapter examines selected data from two organizations administering college entrance examinations—the Admissions Testing Program of the College Entrance Examination Board, which administers the Scholastic Aptitude Test (SAT), and the American College Testing Program, which administers the American College Testing (ACT) Assessment. Results of these examinations are of substantial importance to college admissions decisions and hence to opportunities for college students. A close analysis also offers further insight into the precollege preparation of women and underrepresented minorities. The data show substantial differences in standardized test results among the various groups at the critical transition point from secondary school to higher education. This chapter also presents selected data on characteristics of American college first-year students from an ongoing annual survey[1] and data from surveys of first-year students with disabilities.

Each student completing the SAT or ACT examination is asked to fill out a descriptive questionnaire that requests such information as the sex and racial/ethnic background of the student as well as courses taken and high school grades. This information is used as the basis for comparing characteristics of student groups.

Women

Scholastic Aptitude Test

The Admissions Testing Program of the College Entrance Examination Board collects and tabulates data on the scores of college-bound seniors who have taken the SAT. The examination consists of two components: The verbal component tests reading comprehension and vocabulary skills; the mathematics component assesses the ability to solve problems by using arithmetic reasoning and such skills as basic algebra and geometry. The score range for each component is from 200 to 800.

Continuing a long-time trend, in 1993 females scored below males in both the mathematics and verbal portions of the SAT. This pattern persists despite the fact that females tend to do as well as males in high school in courses that they take and they tend to have better grades in college than males (see the related discussion on undergraduates in chapters 4 and 5). This section presents SAT trend data through 1993; a new format will be implemented in 1994.[2]

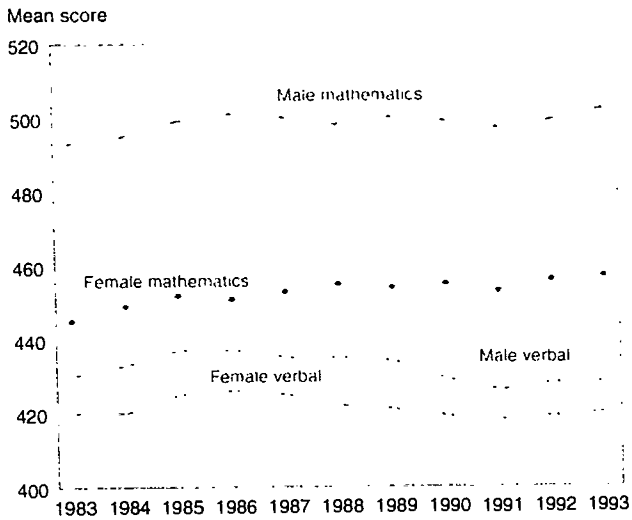
SAT Scores and High School Classes

Mathematics. On the mathematics component of the SAT, scores for both sexes have increased since 1983, a period of increased emphasis on mathematics and science education at the K-12 level. Nevertheless, females in 1993 continued to score considerably below males in mathematics, although the gap is growing slightly smaller. (See figure 3-1.) Since 1983, female scores increased 12 points to 457 in 1993, while male scores increased 9 points to 502. Females are narrowing the gap from male scores very slowly: a

[1] The American Freshman: National Norms (Cooperative Institutional Research Program 1966-1992) was established in 1966 at the American Council on Education. This survey is conducted by the Cooperative Institutional Research Program, administered by the Higher Education Research Institute at the University of California, Los Angeles, under the continuing sponsorship of the American Council on Education.

[2] In 1987 the College Board initiated a review of the Admissions Testing Program and, in 1988, established the Commission on New Possibilities for the Admissions Testing Program. The Commission's report stated that "the new testing program should do more than predict college grades. It recommended that the new program of tests be used to 'reinforce the growth of sound high school curricula and...assist school and college officials in guiding and placing a more diverse student population'" (College Board 1993, p. 1). The SAT program was revised into two formats: the SAT I Reasoning Test (the mathematical and verbal sections, with revisions beginning in March 1994) and SAT II Subject Tests (the Achievement Tests, with revisions beginning in May 1994).

Figure 3-1.
SAT scores, by sex: 1983-1993



NOTE: The score range is 200 to 800.

See appendix table 3-1.

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45 point difference in 1993, from a 48 point difference in 1983. (See appendix table 3-1.)

This large difference in mathematics scores occurred despite the similarity in high school characteristics between the two genders. In 1993, females who took the SAT exam reported completing an average of 3.7 years of mathematics coursework and receiving a grade point average (GPA) of 2.94.[3] Males taking the SAT reported completing an average of 3.8 years of mathematics coursework and received virtually the same mathematics GPA in high school (College Entrance Examination Board 1993, p. 10).

A larger percentage of males than females took an intensive concentration of coursework, however: Fifteen percent of the males took more than 4 years of mathematics in high school, while only 11 percent of the females took that much math. (See appendix table 3-2.) This difference may contribute to the result that females were also much less likely than males to place in the top range of scores on the mathematics component, i.e., in the 600 to 800 range. In 1993, only 14 percent of females scored in this top range versus 25 percent of males. (See appendix table 3-3.)

Verbal. In 1993, females also continued to score somewhat lower than males on the verbal component of the SAT. (See figure 3-1.) This occurred even though females reported a higher high school grade point average than males in both English and social sciences/history.[4] Females and males also took the same average number of years of coursework in English (3.9 years) and social sciences/history (3.4 years) (College Entrance Examination Board 1993, p.10).

The percentage distribution of scores on the verbal component of the SAT was similar for females and males in 1993, except that males had slightly higher performance at the upper levels. (See appendix table 3-3.)

SAT Scores and Level of Difficulty of High School Mathematics and Science Courses

Intensity of coursework in high school may account for some of the differences between males and females in mathematics test scores, according to an analysis of the profiles data reported by high school seniors who take the SAT. In particular, although males and females took about the same average number of years of high school mathematics classes, participated at almost exactly the same rate in honors courses, and had almost identical GPA's in mathematics courses, a smaller percentage of females took the most advanced coursework.

The discrepancy in course-taking between the males and the females taking the SAT occurs in courses that are normally electives following the geometry course. For example, 93 percent of both females and males reported taking a geometry course and 96 percent of males and females took algebra. There is a 3 percent difference in the proportion taking precalculus, however: 32 percent for females versus 35 percent for males. The gap increases to 4 percent for trigonometry (52 percent versus 56 percent) and there is a 5 percent difference in the proportion of high school students taking calculus (18 percent female versus 23 percent male). (See appendix table 3-2.)

There is a similar pattern in enrollment in advanced natural science classes. Females' GPA's are very similar to males', they take about the same number of years of coursework, and they participate almost equally in honors courses.[5] As is the case with math, however, a smaller percentage of females take the most advanced coursework in the natural science fields. For example, 97 percent of all students, both female and male, had taken biology, and 82 percent of both sexes had taken chemistry. Only 40 percent of females took physics, however, compared with 51 percent of males. In coursework intensiveness, only 7 percent of females

[3] Based on the grading of A = 4 points, B = 3 points, C = 2 points, and D = 1 point.

[4] Females earned a GPA of 3.24 in English, compared with 3.0 for males; they earned a GPA of 3.22 in social sciences/history, compared with 3.18 for males.

[5] In 1993, female college bound seniors reported that they had studied natural science for an average of 3.2 years and received an average GPA of 3.06. Males took natural science courses for an average of 3.3 years, but received a slightly lower GPA of 3.05. The percentage who reported taking honors courses in natural science was very close (23 percent for females versus 24 percent for males).

took more than 4 years of natural science, compared with 9 percent of males.

Achievement Tests

The differences in coursework taken may also affect the differences between males and females in scores received on the achievement tests offered by the Admissions Testing Program. Approximately 18 percent of both males and females who took the SAT also elected to take at least one achievement test.[6] Although females took 48 percent of the achievement tests in science and mathematics in 1993,[7] female participation was concentrated in mathematics I (the less advanced of the two mathematics exams), where women took 56 percent of the exams, and in biology, where they took 54 percent. Females took only 40 percent of the chemistry achievement exams and 25 percent of the physics exams.

In the achievement tests they did take, females' mean scores were lower than the mean scores for males in 1993: The discrepancy ranged from 32 points on the biology test to 57 points on the physics exam. (See appendix table 3-4.)

Advanced Placement Exams

The College Board also administers the Advanced Placement (AP) Program,[8] which offers a series of exams in 29 areas, 9 of which are in science and mathematics/computer science. Although females took 51 percent of the total number of AP exams, they took only 42 percent of the exams in the mathematics and science fields. Only in biology did females take the majority of the AP exams (53 percent): for the other eight mathematics and science fields, females participated at a much lower rate (Advanced Placement Program of the College Entrance Examination Board 1993). Repeating the pattern of the overall SAT scores, females scored below males on all of the mathematics and science AP exams in 1993. (See appendix table 3-5.)

Intended Undergraduate Major

Differences between females and males in their intended preference for degree major are striking for students planning to enter college.[9] Perhaps in keeping with their lower scores on the mathematics SAT, relatively few females about to enter college in 1993 intended to pursue a major in engineering. (See figure 3-2.) In 1993, 18 percent of males but only 4 percent of females intended to major in this subject. (See appendix table 3-6.)[10]

Engineering was the largest single probable major for males, followed by business (16 percent). The natural science and mathematics fields combined was the third choice of males (14 percent), with health and related fields following (13 percent).

Minorities

Scholastic Aptitude Test

Mathematics

An analysis of the descriptive information submitted by students taking the SAT reveals a wide divergence in precollege preparation among the racial/ethnic groups. For instance, compared with whites, the three minority groups underrepresented in science and engineering—blacks, Hispanics, and American Indians—tend to take fewer courses in mathematics and science, and Asians take more of these courses than whites. These differing rates of participation in mathematics and science training in elementary and secondary school are reflected in the scores received on the mathematics portion of the SAT.

An analysis of scores reveals that, overall, Asians perform better than all other racial/ethnic groups[11] on the mathematics component of the SAT and on the science and mathematics achievement tests; whites score second highest. Asians also tend to take a much more intensive series of mathematics and science courses in high school than do students in other groups. (See appendix table 3-2.)

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[6] The achievement test series includes 1 hour multiple choice exams in 14 academic areas. The score range for each exam is 200 to 800. The College Board reports that students who take achievement tests tend to apply to selective colleges and universities.

[7] Of the 14 academic subjects in which achievement tests were administered in 1991, 5 were in science and mathematics fields: mathematics level I, mathematics level II, biology, chemistry, and physics.

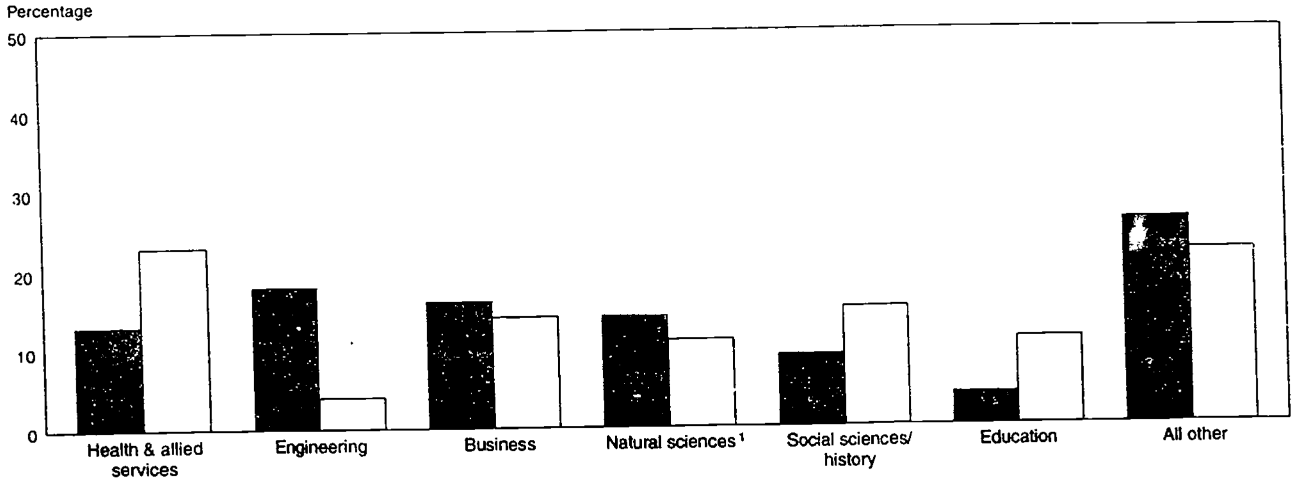
[8] This program is based on the premise that college level material can be taught to well prepared secondary school students. A student who does well on one or more of these exams may be granted college credit and/or appropriate college placement by participating higher education institutions. The advanced placement grading scale ranges from 1 (no recommendation for credit) to 5 (extremely well qualified in the subject area).

[9] The intended undergraduate major of college-bound seniors is determined by answers to questions on the Student Descriptive Questionnaire distributed to all college-bound seniors as part of the SAT application package. The questionnaire asks students to indicate their first choice of college curriculum from a list of 29 major categories, of which 7 are in science, mathematics, or engineering.

[10] See the discussion in chapter 5 concerning faculty as role models.

[11] Data for Hispanic groups are available separately and are presented in this report at the most detailed level possible. SAT data for Hispanics were subdivided in 1987 from two ethnic groups into three ethnic groups, so that the 10 year trend of specific Hispanic subgroups is not comparable. (The subgroup "Latin American" was available as an option beginning in 1987, in addition to the previously available Mexican American and Puerto Rican). Since 1987, scores for those who listed themselves as Latin American tended to be higher than the scores for Mexican Americans or Puerto Ricans.

Figure 3-2.
Intended undergraduate major of college-bound seniors, by sex: 1993



[1] Includes agriculture, math, computer, biological, and physical sciences

See appendix table 3-6.

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On the mathematics component of the SAT, the scores of every racial/ethnic group improved over the decade, again probably reflecting increased emphasis on improving mathematics and science education at the K-12 level. (See figure 3-3.) The relative standing of the racial/ethnic groups did not change over the 10-year period; the groups scored in the same rank order in 1983. In 1993 Asians continued to have the highest average mathematics SAT scores, followed by whites and American Indians, Latin Americans, Mexican Americans, Puerto Ricans, and blacks. (See appendix table 3-1.)

During the decade, American Indians achieved the highest increase in mathematics scores of any racial/ethnic group, rising 22 points. Asians' scores increased by 21 points and blacks' by 19 points.

Verbal

On the verbal component of the SAT, whites had the highest scores in 1993, followed by Asians and American Indians. (See figure 3-4.) The relative ranking of these groups remained about the same between 1983 and 1993, but there were several significant changes in the level of the verbal scores. Asians achieved the highest increase in scores of any racial or ethnic group: Verbal scores rose every year for a total increase of 20 points over the decade.

Blacks had the second highest increase in verbal scores, 14 points, and American Indians increased their verbal scores by 12 points. White scores fluctuated slightly over the decade, but increased by only 1 point overall between 1983 and 1993. Trend data on Hispanics are more difficult to compare because of the data subdivision in 1987. Of the three Hispanic groups, however, only the Puerto Ricans had verbal scores higher in 1993 than in 1987: They rose a total of 7 points by 1993.

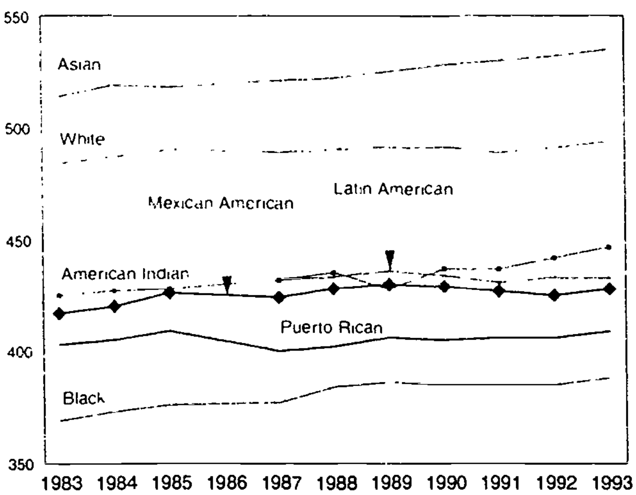
SAT Scores and Level of Difficulty of High School Mathematics and Science Courses

The amount and type of coursework taken in high school are related to the scores on the SAT. In particular, Asians and whites, the two groups with the consistently highest mathematics scores on the SAT, were also the two groups who had taken the most courses in high school in mathematics and natural science.

Science. In 1993, more than 88 percent of Asians and 84 percent of whites took chemistry in high school; roughly three-quarters of each of the other groups took chemistry. The biggest difference in science coursework among racial/ethnic groups was in physics. Sixty-four percent of Asians took physics, compared with 45 percent of whites, 43 percent of Latin Americans, and less than 40 percent for all the other racial/ethnic groups. (See appendix table 3-2.)

Mathematics. As with females, high percentages of students taking the SAT from all racial/ethnic groups

Figure 3-3.
SAT mathematics scores, by race/ethnicity: 1983-1993

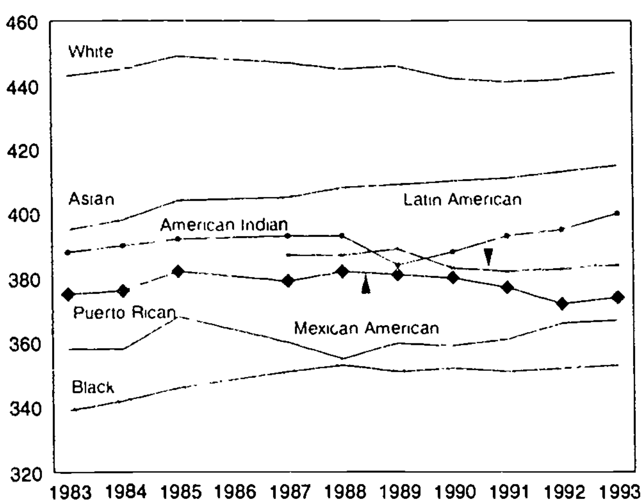


NOTES: The score range is 200 to 800. No data are available for 1986. Data for Latin Americans are not available until 1987.

See appendix table 3-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 3-4.
SAT verbal scores, by race/ethnicity: 1983-1993



NOTES: The score range is 200 to 800. No data are available for 1986. Data for Latin Americans are not available until 1987.

See appendix table 3-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

took algebra and geometry, but the percentages of students in racial/ethnic groups taking advanced courses start to diverge after these two mathematics courses. Only a small proportion of most racial/ethnic groups took calculus in high school: between 10 and 15 percent for underrepresented minorities, 21 percent for whites, and 39 percent for Asians.

Parental Income and SAT Scores

The SAT data show that for every racial/ethnic group, higher reported levels of parental income are generally associated with higher scores on both the verbal and mathematics sections of the SAT. Family income does not uniformly relate to achievement, however. SAT mathematics scores for Asian students at the lowest family income levels exceeded those at virtually the highest levels for other groups. (See appendix table 3-8.)

Parental Education and SAT Scores

Within every racial/ethnic group, higher levels of parental education were associated with higher students' scores on both the mathematics and verbal portions of the SAT. For example, the difference in mean SAT mathematics scores between the group whose parents did not receive a high school diploma and those whose parents held a graduate degree ranged from 116 points for whites to 82 points for Mexican Americans. (See appendix table 3-9.)

Four racial/ethnic groups reported that the highest level of education attained by a majority of their parents was a high school diploma or less. Although these four groups tended to score lower on the SAT, within each of these groups the pattern held: Average SAT scores increased with the increase in parental education.

Citizenship Status and SAT Scores

In all but two of the racial/ethnic groups studied, more than 90 percent of college-bound students taking the SAT in 1993 were U.S. citizens.[12] Only 57 percent of the Asian students taking the SAT were U.S. citizens; 28 percent were permanent residents, and the additional 15 percent were citizens of another country. Latin Americans reported that 64 percent of the students taking the SAT were U.S. citizens, 26 percent were permanent residents, and 10 percent were citizens of another country. (See appendix table 3-10.)

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[12] The SAT's descriptive questionnaire also contains a question on citizenship status.

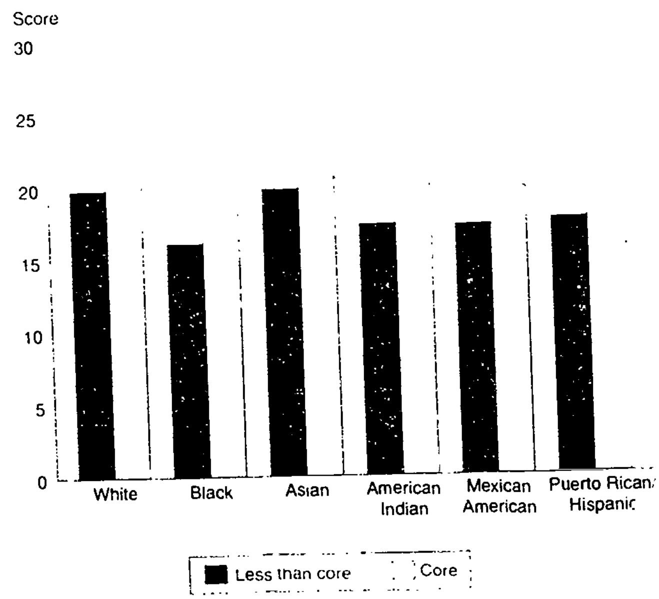
Course-taking and Test Performance

The American College Testing (ACT) Assessment is another national college-entrance examination whose results are used by many college administrators as part of their admissions procedures.[13] Students taking the ACT are asked to self-report details of the high school curriculum they have taken.

ACT officials have identified a certain series of high school courses as "core" courses, i.e., those that are recommended as college preparatory courses.[14] By correlating the self-reported coursework data with the ACT test scores, ACT officials are able to compare the scores of students who have taken at least the core courses with the scores of students who have taken less than the core curriculum.

In every racial/ethnic group, students who completed the core subjects scored higher on the ACT tests than those who had not taken all the core courses. (See figure 3-5.) The composite scores of the students who took the core courses were at least 12 percent above the composite scores of those who had not.

Figure 3-5.
Composite ACT scores of students who took core subjects and less than core subjects in high school, by race/ethnicity: 1993



See appendix table 3-7.

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An analysis of students taking the core courses reveals that there is a pattern of less participation by the underrepresented minorities. While 68 percent of Asians and 55 percent of whites took the core courses, a majority of black, American Indian, and Puerto Rican students did *not* take the core course series, and the number of Mexican Americans who took the core courses was virtually even with the number who did not. As would be expected from this pattern, the composite scores of the students in these latter four groups were lower than the scores of whites and Asians. (See appendix table 3-7.)

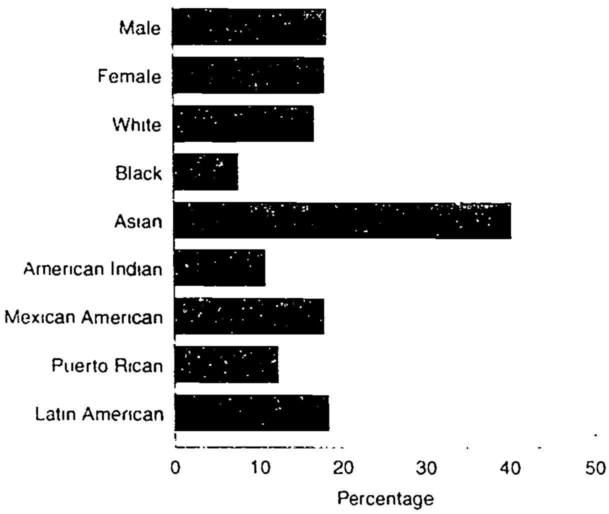
A higher proportion of both sexes among whites, Asians, and Puerto Ricans/Hispanics took the basic core courses than did not. For American Indians, however, the majority of students of both sexes did not take the minimum core courses. Fifty percent of black females took the core courses, although less than half of black males took the basic core curriculum (47 percent). The situation was reversed among Mexican Americans: The majority of males took at least the core courses, while the majority of females did not.

Mirroring the results in the SAT scores, in all racial/ethnic groups the ACT composite scores for males were higher than for females. (See appendix table 3-7.) Females in all racial/ethnic groups scored higher in English than their male counterparts and scored virtually even with males in reading. Males scored higher than females in math, however, and in science/reasoning the scores ranged from 3 percent higher for black males than females to 8 percent higher for American Indian males than females.

[13] ACT officials report that college-bound students who take the ACT Assessment are in some respects not representative of college-bound students nationally. First, students who live in the Midwest, Rocky Mountains and Plains, and the South are overrepresented among ACT-tested students as compared with college-bound students nationally. In addition, ACT-tested students tend to enroll in public colleges and universities more frequently than do college-bound students nationally (American College Testing Program 1993).

[14] The ACT core courses consist of 4 or more years of English, 3 or more years of mathematics, 3 or more years of social studies, and 3 or more years of science

Figure 3-6.
Percentage of students taking the SAT who also took at least one achievement test, by sex and race/ethnicity: 1993



SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors, 1993 SAT Profile, Profile of SAT and Achievement Test Takers.* Princeton, NJ: Educational Testing Service

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Achievement Tests

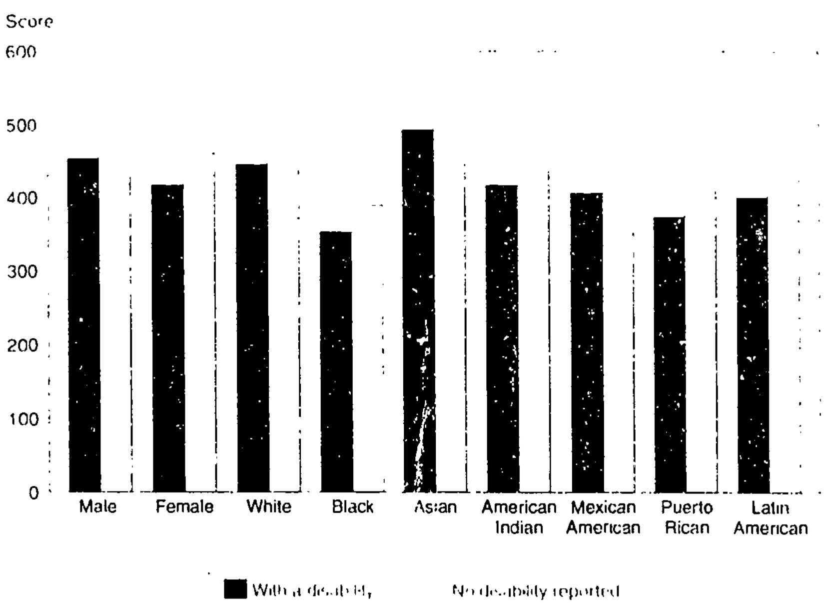
Although approximately 18 percent of all students who took the SAT in 1993 also took at least one achievement test, the proportion of students taking at least one achievement test varies dramatically by racial/ethnic group. While whites, Mexican Americans, and Latin Americans all took achievement tests at a rate similar to the national average of 18 percent, the proportion was lower for blacks (8 percent), American Indians (11 percent), and Puerto Ricans (12 percent). On the other hand, the proportion of Asian SAT takers who also took at least one achievement test was far above the national average (40 percent). (See figure 3-6.)

Intended Undergraduate Major

At the time they took the SAT in 1993, only 4 percent of all females intended to study engineering. The females in each racial/ethnic group exhibited the same preference, not excepting Asians: Although more Asian females intended to major in engineering than females of most other racial/ethnic groups, their 5 percent participation is far below the 25 percent of Asian males intending to major in engineering. White females had the lowest percentage intending to study engineering (3 percent). (See appendix table 3-6.)

Six percent of black females intended to major in engineering—the largest proportion of females in any racial/ethnic group. Even here, however, the female percentage is far below the proportion of black males intending to major in engineering—20 percent.

Figure 3-7.
SAT mathematics scores of college-bound seniors, by sex, race/ethnicity, and disability status: 1992



NOTE: Score range is 200 to 800.

See appendix table 3-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Persons With Disabilities

Scholastic Aptitude Test

High school seniors reporting a disabling condition tended to score lower on the SAT than did seniors who reported having no disabilities. (See figure 3-7 and appendix table 3-12.) In mathematics, the average score for students with disabilities was 434, compared with 482 for other students. On the verbal exam, the students with disabilities' average score was 392, compared with 427 for students who reported having no disabling condition.

Characteristics of American First-Year Students

The percentage of full time first year students who report having disabilities increased from 7 percent in 1985 to 9 percent in 1991. (See appen

The Right Track

Science and mathematics courses taken in elementary and secondary schools affect success on a variety of performance measures and the ability to successfully complete college-level work. A study of the effects of assigning students to different levels, or tracks, of mathematics and science courses in high school has revealed differential effects of tracking on students in groups defined by race/ethnicity and gender (Dornbusch 1994).

An examination of tracking practices and the effects on students in a sample of 1,245 northern California high school students in six high schools included the analysis of records for black, Hispanic, Asian, and white students in each of three broad ability level categories. Student questionnaires provided a variety of data to augment the records of courses taught and student performance.

Findings revealed that school course assignment practices have substantial effects on student opportunities and performance:

- An analysis of courses taken by students with high expectations for themselves regarding college attendance and career goals revealed that half of the disadvantaged minorities, compared with 20 percent of whites and Asians, were *not* enrolled in courses that would permit them to complete the expected sequence of courses needed to enter a 4-year college. That is, they were in slower-paced or remedial courses that were insufficient for college entrance. Further, they were unaware that their current courses of study were inadequate.
- In comparing student records with assignments to courses, incorrect (too low) assignments had been made for at least 30 percent of black and Hispanic students, compared with 13 percent for whites and Asians. All of the students labeled "incorrectly assigned" were in the top 50 percent of all students nationally in math skills.
- High-ability students in lower tracks were not challenged to do good work and were likely to sink to the level of coursemates rather than achieve at a high level. Being at the bottom of a high track appeared to bring better educational returns than being at the top of a low track.
- The probability of a student's taking chemistry or physics during the junior or senior year of high school was markedly affected by the student's initial placement level in mathematics and science courses, even controlling for mathematics ability. Students near the 50th percentile in math who were assigned to biology had a 70 percent probability of taking chemistry and physics, compared with only 7 percent for those assigned to "baby biology" courses.
- Higher levels of parental education were associated with taking college preparatory courses, but the "parental education effect" was smaller in its impact on college preparatory enrollment for Hispanics and blacks than it was for whites and Asians.

dix table 3-13.) Most of this increase occurred in a single category of disability: "learning disabilities." The percentage of students in this category doubled, from 1.2 percent of first-year students in 1985 to 2.2 percent in 1991. The percentages of students with other disabilities stayed relatively constant. In 1991, the two categories of disability most frequently cited were learning disabilities and partial sight or blindness. (See appendix table 3-14.)

There were more similarities than differences in the personal and family characteristics of students with and without disabilities, according to a 1991 survey by the American Council on Education of college first-year students with disabilities (Henderson 1992, p. 6). About 16 percent of both students with and without disabilities were minorities. The education level of the parents was similar for both groups, as were the careers of their parents.

But there were also some important differences. Students reporting disabilities were more likely (52 percent versus 46 percent) than other students to be male and to come from lower-income families. Twenty-one percent of the families of students with disabilities earned less than $20,000 in 1991, compared with only 17 percent of other students' families.

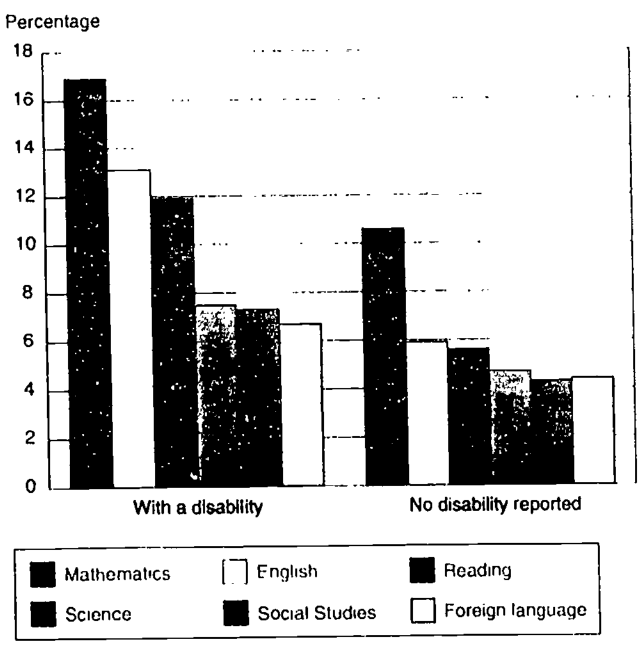
The high school experiences of first-year students with and without disabilities also differed in several ways that are important to their representation in science and engineering. A higher percentage of first-year students with disabilities reported having special tutoring or remedial work in high school. (See figure 3-8.) For example, 17 percent of first-year students with disabilities reported having special tutoring or remedial work in mathematics in high school, compared with 11 percent of other students.

First-year students with disabilities were also more likely than other students to anticipate that they will need special tutoring or other remedial work. (See appendix table 3-16.) In 1991, 38 percent of students with disabilities anticipated needing help in mathematics, while only 28 percent of other students did. Eighteen percent of students with disabilities anticipated needing help in science, versus only 11 percent of other students.

Institutional Services

Colleges and universities differ in the range of services they provide to students with disabilities. Almost two-thirds of the higher education institutions (3,375 out of 5,233) offer access for students whose mobility is impaired. (See appendix table 3-17.) Public institutions are far more likely to offer access than private institutions; over 90 percent of both 4-year and 2-year public institutions reported accessibility for the mobility impaired. Other specialized services are not as generally available. For example, about 35 percent of all institutions offer assistance to the visually impaired or the hearing impaired.

Figure 3-8.
Full-time first-year students who had special tutoring or remedial work in high school, by disability status and subject: 1991



See appendix table 3-15.

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

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Chapter 4

Undergraduate Education: The Role of 2-Year Institutions

Two-year institutions, or community colleges, operate in every State and enroll half of the students who begin college in the United States. Since their origins in the early years of the 20th century, 2-year institutions have played a distinct role in higher education. Most 4-year colleges and universities admit only those students who meet certain academic requirements. Two-year colleges have traditionally exercised less selective admissions policies. These differences stem from the fact that 2-year institutions have provided higher education to students who otherwise might not have access to it: students who could not afford high tuition, who could not afford the time to attend college full time, and who may not have been adequately prepared in school (Cohen and Brawer 1989, p. 14).

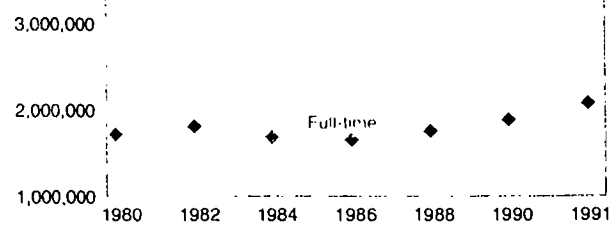
In 1991, almost 50 percent of all first-time first-year students attending college were in 2-year institutions; a slightly higher percentage of the underrepresented minorities who were enrolled as first-time first-year students, 52 percent, attended 2-year institutions. (See appendix tables 4-3 and 5-5.) In the last decade, both the number and the variety of students attending 2-year institutions have increased substantially. Community colleges have attracted large numbers of older students and part-time students, as well as growing numbers of women, students who are members of racial/ethnic minorities, and students with disabilities.

Two-year institutions often have specialized missions. In pursuit of their higher education role, most community colleges perform several functions: preparing students academically so they can transfer to a 4-year institution and providing vocational-technical education, continuing education, remedial education, and community service. About one-fifth of students who attend a 2-year institution eventually attend a 4-year college or university (Adelman 1988). Most 2-year institutions have also assumed a special mission in relation to education in scientific and technical fields (National Science Foundation/SRS 1994, p. 52). (See figure 4-1.)

Overall enrollment trends for higher education provide an important context for considering the role of 2-year institutions. Full-time and part-time enrollment increases occurred in both 2-year and 4-year institutions. But 2-year and 4-year institutions differ in the share of enrollment that is part time: 63 percent in 2-year institutions in 1991, compared with 25 percent in 4-year institutions. At 2-year institutions, part-time enrollment increased faster than full-time between 1980 and 1991, 30 percent versus 22 percent. (See figure 4-2.)

Future patterns may change because of demographic changes. The numbers of first-year students entering higher education institutions for the first time have dropped at both 2-year and 4-year institutions. (See appendix tables 4-3 and 5-5.) How these entering students choose institutions, and whether they proceed with their studies full time or part time, will determine the direction of future trends.

Figure 4-2.
Total and full-time enrollment at 2-year institutions: fall 1980-1991

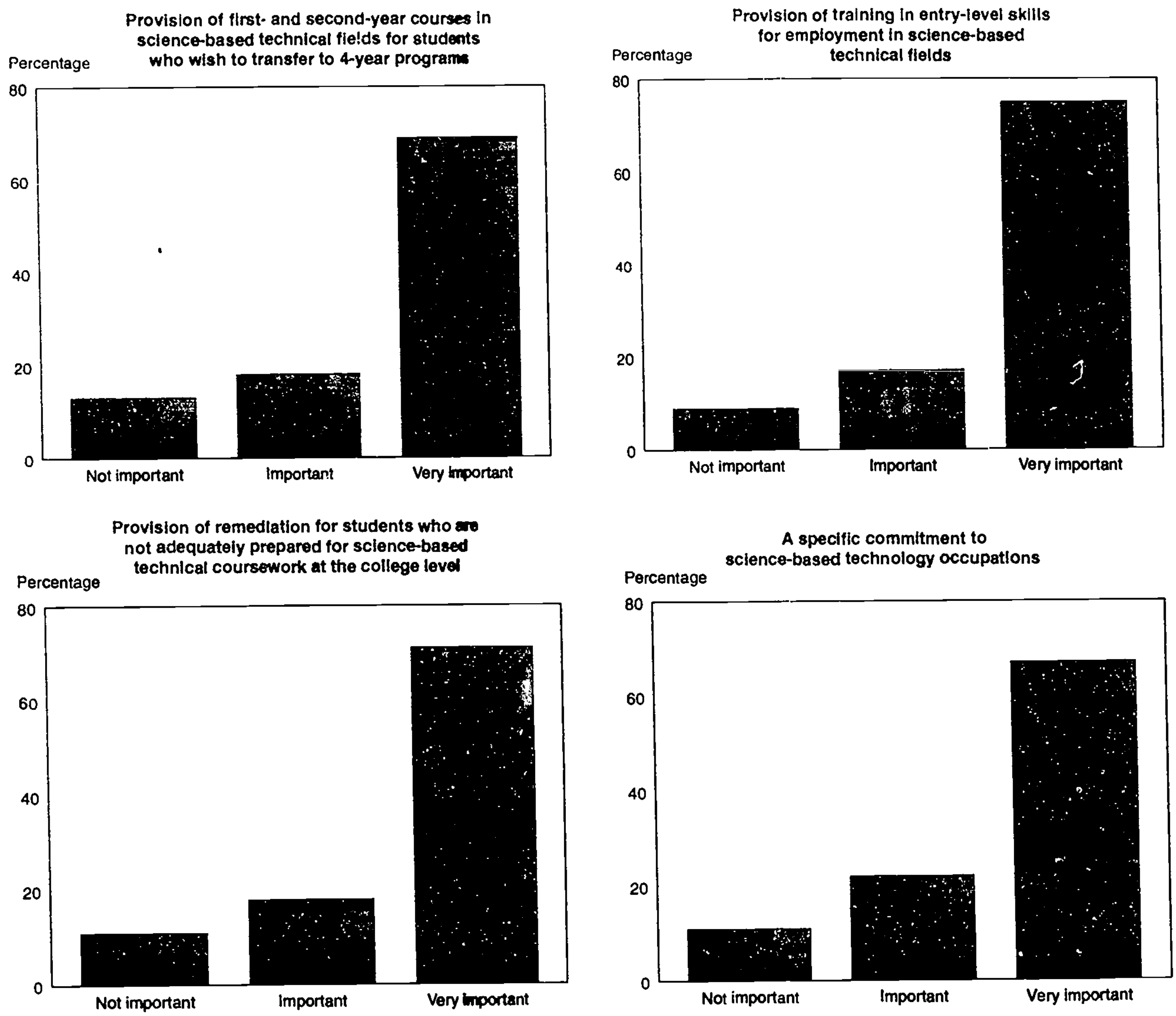


NOTE: Data for 1984 are estimated.

See appendix table 4-2.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 4-1.
Importance of goals to the mission of 2-year institutions: 1993



See appendix table 4-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Women

Enrollment

In 1991, almost 5.6 million students were enrolled in 2-year institutions, almost 2.1 million of these as full-time students. The number of both men and women enrolled as full-time students at 2-year and community colleges increased considerably over the last decade, with the enrollment of women increasing more rapidly. The number of men increased between 1980 and 1991 by 13 percent. The number of women was up 30 percent in the same period. (See figure 4-3.)

Over the decade, both the total number of students enrolled as first-time first-year students and the number of students in this group enrolled full time have declined. In 1980, 1.4 millon of the students enrolled at 2-year schools were first-time first-year students. By 1991, the number had dropped to 1.1 million, a decline of 16 percent. It should be noted that the majority of the decline was in white and black students; most other racial/ethnic groups' enrollment increased. The percentage decline of the total full-time first-time students, including all races and ethnicities, was much smaller, nearly 4 percent. (See appendix table 4-3.)

Women have been more likely to be enrolled as first-time first-year students than men. In 1991 as in 1980, approximately 53 percent of the students enrolled as first-time first-year students were women, and they accounted for just over 50 percent of full-time, first-time, first-year students.

Degrees

Associate's degrees offer one measure of completion for courses of study during the first 2 years of undergraduate education. While all higher education institutions may award associate's degrees, they can be examined in conjunction with characteristics of 2-year colleges.

The total number of associate's degrees earned by women increased over the decade, from 230,758 in 1981 (55 percent of the total awarded) to 286,254 in 1991, almost 59 percent of the total. (See appendix tables 4-4 to 4-6.) The number of associate's degrees earned by women in all fields of science and engineering declined by 15 percent, from 18,751 in 1981 to 15,950 in 1991, just under 25 percent of all science and engineering associate's degrees. (See appendix table 4-6.)

The trends for black women followed the trends for women as a whole in 2-year institutions: Although the total number of associate's degrees earned by black women increased during this time, the number of science and engineering associate's degrees they earned dropped 32 percent during the decade.

The number of Hispanic women earning associate's degrees in science and engineering remained almost level, although the number of Hispanic women receiving associate's degrees in all fields increased 40 percent, reaching 17,317 in 1991.

Although the numbers were small, American Indian women increased the number of associate's degrees they earned in science and engineering during the decade by 62 percent, from 150 to 243. The overall number of American Indian women receiving associate's degrees increased 40 percent.

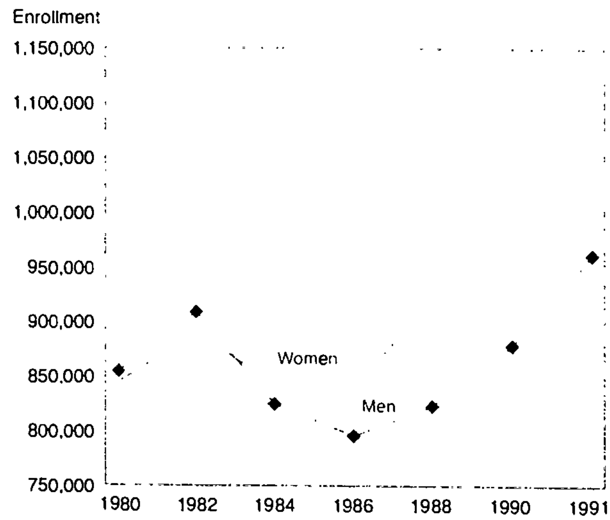
The number of Asian women receiving a science and engineering associate's degree was up by a similar margin, growing 59 percent during the decade, from 355 to 566. The overall number of Asian women receiving associate's degrees increased 93 percent.

Minorities

Enrollment

Two-year institutions make a significant contribution to the higher education of minority students. Of the 5.6 million students enrolled in 2-year colleges in 1991, 20 percent were underrepresented minorities,

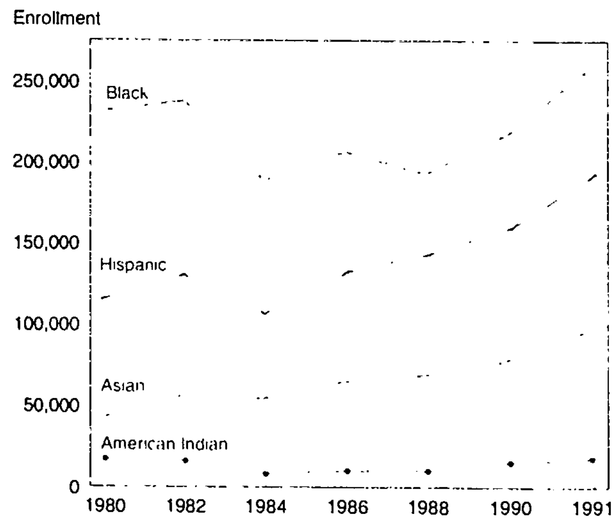
Figure 4-3.
Full-time enrollment at 2-year institutions, by sex: fall 1980-1991



See appendix table 4-2.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 4-4.
Full-time enrollment at 2-year institutions, by race/ethnicity: fall 1980-1991



See appendix table 4-2.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Essential Factors in Teaching Mathematics to American Indians

Cultural factors play an important role in the learning process for all students. A study of community colleges confirmed principles articulated in the literature applicable to American Indian students (Wildcat and Necefer 1993, pp. 37–45).

"Many Native Americans who are successful in completing high school enter postsecondary institutions academically unprepared for rigorous college science curricula. Community colleges must face the challenge of creating programs of instruction whereby these students...can be prepared for the course of study required in these fields.

"It is necessary to explore humanistic and holistic approaches of knowledge delivery to Native American students. Central to this approach is the recognition that Native American worldviews emphasize the importance of grasping the 'big picture' before one sets about studying particular things or subjects. An important component of successful math instruction for Native American students is transforming the learning of mathematics from a purely abstract logical exercise to a subject with a history and applicability to the complex web of life.

"The first challenge math instructors of Native American students must face is to create a classroom environment in which mathematics is seen as relevant and meaningful [Megginson 1990]. Native American students have to be convinced that mathematics relates to their life, or they will avoid the subject and/or refuse to fully participate in the learning process [Green 1978]. Cultural sensitivity to Native American values and behavior is crucial to successful classroom instruction. Direct eye contact, competitiveness, and boasting about oneself are taboos among most Native American peoples [California State Department of Education 1991]. Native American students prefer group-oriented learning environments and view group cooperation and harmony as more important than the success of one individual [Anderson and Stein 1992].

"Two issues converge here. First, it does not make sense to have at-risk students who have been failed for years by formal instruction in mathematics to make up their lost years in a semester or two.... Second, the learning style of Native Americans does not fit a time-bound notion of learning. The Native American approach to learning encourages one to learn by doing and admonishes one to be patient if a task at hand is not accomplished on the first try.

"The lack of professional Native American role models in mathematics often contributes to stereotypes Native American students may have of non-native mathematicians from the dominant society [Megginson 1990]. Native students often perceive mathematicians as calculating, obsessive, sloppy, isolated, and interpersonally out of touch with the real world. This image directly conflicts with attributes Native Americans value.

"It is unrealistic to expect Native American students to make up for 12 years of neglected or failed math instruction and immediately complete college-level math courses. Yet this is exactly the way most colleges treat unprepared students.... Native Americans can meet high academic expectations if they are given the opportunity to have their skills assessed.... [B]e prepared to give unprepared students the time they need,...make outside assistance available, and where possible, use peer tutors. In short, community colleges must hold high and rigorous standards for math and science programs, but must create instructional programs whereby students have an opportunity to meet those standards."

up from 18 percent in 1982. (See figure 4-4.) For minority students, the proportions attending 2-year colleges were all higher than for the group attending 4-year colleges (Adelman 1992).

The number of underrepresented minority women enrolled in 2-year institutions grew from 429,475 in 1980 to 662,263 in 1991, and the number of underrepresented minority men grew from 399,238 to 454,707. Within each racial/ethnic group except Asians, the number of women enrolled in 2-year institutions exceeded the number of men enrolled. (See figure 4-5.)

The total number of students enrolled full time grew by 22 percent from 1980 to 1991. The number of underrepresented minorities enrolled as full-time students increased 28 percent, a considerably larger increase than the percentage increase for the total population. Larger increases in part-time enrollment also occurred among underrepresented minorities: whereas total part-time enrollment rose 30 percent between 1980 and 1991, the part-time enrollment of underrepresented minorities rose 59 percent.

Degrees

In 1981, underrepresented minorities earned just over 60,000 associate's degrees, 14 percent of the total. Ten years later, underrepresented minorities earned

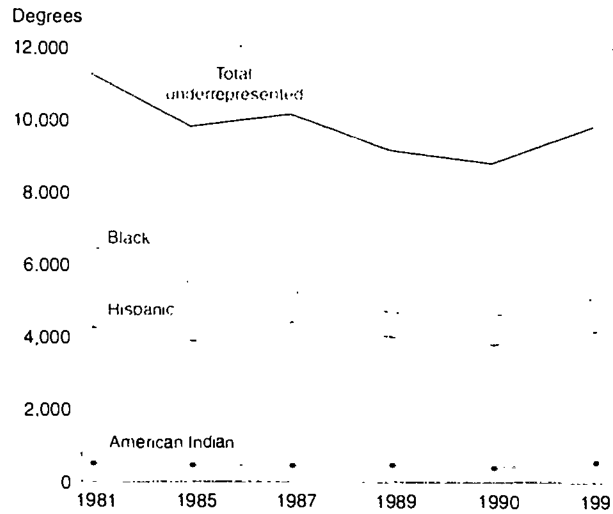
70,645 associate's degrees or 15 percent of the total. Similar percentages characterized their share of science and engineering associate's degrees during a period of decline in these awards to students overall. In 1981, underrepresented minorities earned 11,177 associate's degrees in science and engineering, about 14 percent of the total science and engineering associate's degrees. Ten years later, the number of science and engineering degrees earned by this group had dropped to 9,777, 15 percent of all science and engineering associate's degrees. Sixty-one percent of these degrees (5,973) were in engineering.

The number of blacks earning associate's degrees in science and engineering declined steadily, from 6,446 in 1981 to 4,572 in 1990, but rebounded to 5,068 the following year. (See figure 4-6.) The number of Hispanics earning associate's degrees followed a similar pattern, declining from 4,228 in 1981 to 3,771 in 1990, but then increasing to 4,151 in 1991. Similarly, the number of American Indians earning science and engineering associate's degrees declined from 503 in 1981 to 419 in 1990 before increasing to 558 in 1991. Women from underrepresented minorities tended to follow the pattern for all women. (See figure 4-7.)

The number of Asians earning associate's degrees in science and engineering fluctuated throughout the

Figure 4-6

Associate's degrees earned by underrepresented minorities in science and engineering, by race/ethnicity: 1981-1991



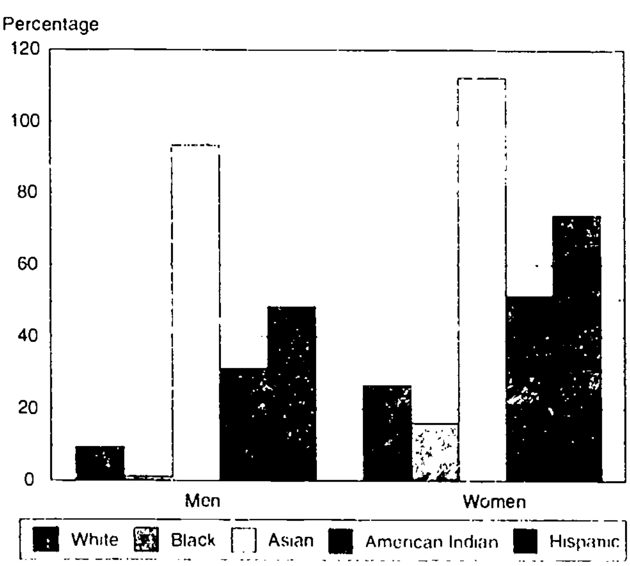
[1] Includes blacks, American Indians, and Hispanics

See appendix table 4-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 4-5.

Percentage change in full-time enrollment at 2-year colleges, by sex and race/ethnicity: fall 1980-91

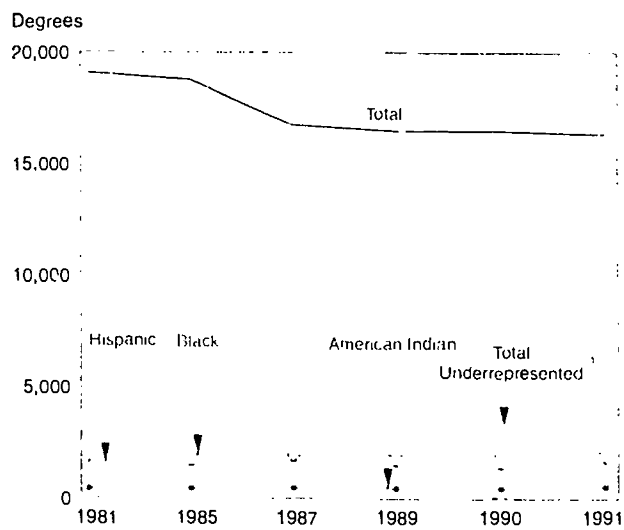


See appendix table 4-2

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 4-7.

Associate's degrees earned by all women and underrepresented minority women in science and engineering, by race/ethnicity: 1981-1991



[1] Includes blacks, American Indians, and Hispanics

See appendix table 4-6.

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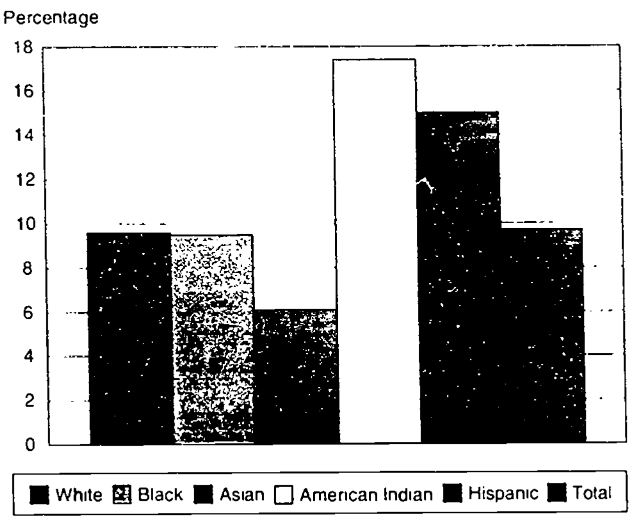
After the 2-Year Experience

Two-year institutions are important for the role they play in the education of minority students who receive doctoral degrees in science and engineering. Higher proportions of Hispanic and American Indian doctoral recipients (15 and 17 percent) attended 2-year colleges than did white doctoral recipients (10 percent). (See figure 4-8.)

Figure 4-8.
Percentage of science and engineering doctorate recipients in 1988-1992 who attended a 2-year college, by race/ethnicity



NOTES: Includes doctorates awarded to U.S. citizens only
Based on the 96 percent of recipients who provided educational histories

See appendix table 4-7.

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decade, growing from 1981 to 1987, then declining in succeeding years to 2,408 in 1991.

Persons With Disabilities

Two-year institutions play a particularly important role in serving students with disabilities. More than half (59 percent) of entering first-year full-time students in 1991 reporting a learning disability were studying at 2-year institutions. (See appendix table 4-8.) More than half of the first-year students with speech disabilities and close to half of those with orthopedic disabilities also attended 2-year colleges.

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Chapter 5

Undergraduate Education: The Role of 4-Year Institutions

Improved access to higher education is not only important to meeting the Nation's needs for an informed workforce, it is also an essential avenue for access to opportunities in science and engineering as well as to improvements in quality of life. This chapter examines the role of 4-year institutions in meeting these important goals. Earlier chapters present the context for this review.

This chapter examines both the educational process and its outcomes in undergraduate education at 4-year institutions. Focus on the process includes a review of changes in enrollment at 4-year institutions, the attendance patterns of undergraduates, course-taking patterns of students intending to pursue studies in science and engineering fields, characteristics of persons with disabilities, and characteristics of the faculty teaching undergraduates. Examination of the outcomes focuses on the degrees awarded by 4-year institutions and their distribution among target groups and across disciplines and institutions.

Process of Undergraduate Education

Enrollment

The number of students enrolled as undergraduates in all institutions of higher education has increased substantially over the last decade, from 10.6 million in the early 1980's to 12.6 million in 1991. (See appendix table 5-2.) The numbers rose for both men and women and for all racial/ethnic groups. These trends in enrollment[1] portray growing diversity within the student population, and provide a context for considering the outcomes by discipline areas.

More than half (56 percent) of the higher education students in 1991 were enrolled in 4-year institutions. An even higher proportion of total full-time enrollment—72 percent—was at these institutions. Full-time enrollment is the predominant pattern of enrollment at 4-year institutions: More than three-quarters of the students were registered as full-time undergraduates. Full-time enrollment constitutes an important factor in participation in higher education because of its obvious relationship to progress toward an earned degree and continuity of academic study. Thus, monitoring the full-time study of population groups of interest and the composition of the population of full-time students provides an important statistical basis for considering access to higher education. Women comprised 52 percent of the students enrolled on a full-time basis at 4-year schools, having been in the majority since the mid-1980's at both 2-year and 4-year institutions. (See appendix table 5-3.) Minorities comprised 21 percent of full-time enrollment at 4-year schools; underrepresented minorities, 16 percent.[2]

[1] The enrollment data for the complete population of higher education students are from the U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) Fall Enrollment Survey. This annual data collection obtains information from all accredited institutions of higher education in the country; imputation is made for nonresponding units. Survey data are available only by level and type of enrollment, not by major field of study.

[2] Underrepresented minority groups in science, mathematics, and engineering are blacks, Hispanics, and American Indians.

Patterns for Success

Strategies that universities can employ to help black, Hispanic, and American Indian science and engineering students succeed were studied at universities with higher-than-average retention for minority students (Rodríguez 1993, pp. 131–38). The strategies found to be most effective were:

1. **Helping students clarify their goals and improve their study habits, starting in secondary school.**
2. **Engaging minority students as role models for each other and as peer tutors.**
3. **Increasing social interactions between teachers and minority students.**
4. **Providing students with sufficient financial support for college.**
5. **Doing more to engage the families of students in activities that support the students.**

Within 4-year institutions, the increase in full-time enrollment was 11 percent overall. Over the past decade, the increase was greater for women than for men: The number of women enrolled as full-time students increased from 2.4 million in 1980 to almost 2.8 million in 1991; among men, the increase was from 2.4 million to 2.5 million. Underrepresented minorities enrolled full time increased nearly 30 percent.

Similar percentages of women and minorities were enrolled full time—nearly three-fourths. (See appendix table 5-3.) The percentage of full-time enrollment for underrepresented minorities and for whites was the same, 75 percent of their total enrollment, a generally stable figure during the decade. Almost 81 percent of the Asian students were enrolled full time.

Since 1980, underrepresented minority women have been more likely than their male counterparts to be enrolled as full-time students. By 1991, Asians were the only racial/ethnic group for which women remained under half (49 percent) of the enrolled full-time students at 4-year institutions.

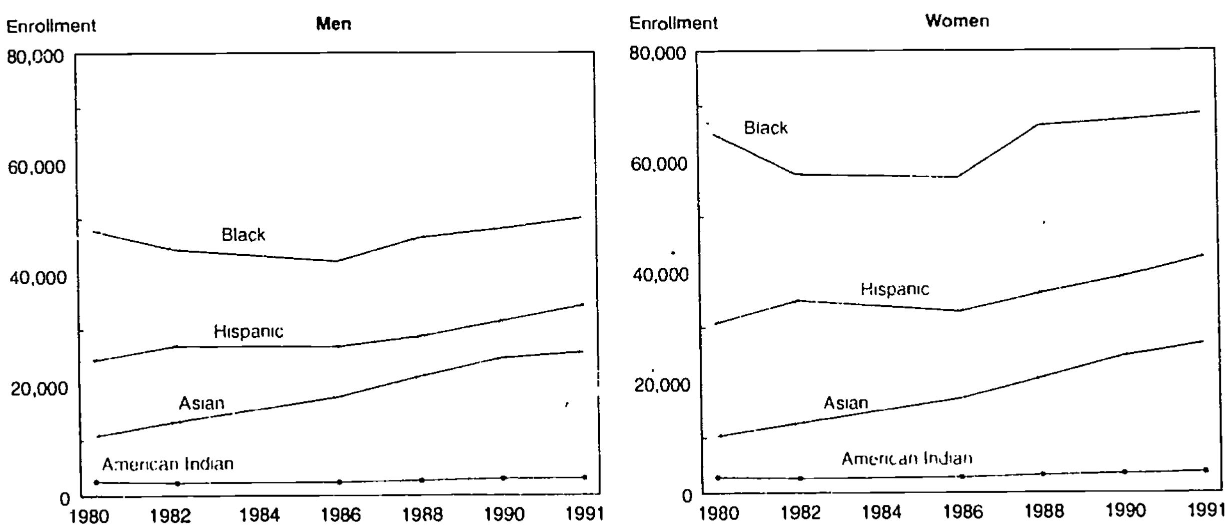
First-Year Enrollment

Trends in enrollment of first-year and first-time first-year students are important indicators for future enrollment in higher education. They not only reflect to some extent the size of the population traditionally entering college, but they also provide indicators of changing higher education enrollment choices by students. The number of full-time first-year students at all institutions has declined since 1980. (See appendix table 5-4.) Although numbers of both men and women have decreased, the loss has been less for women; the drop in enrollment for men has been 7 percent, compared with a drop of less than 4 percent for women. At 4-year institutions, the number of men enrolled declined 11 percent, the number of women, 5 percent.

The decline in first-year enrollment was not shared by all racial/ethnic groups, but was exclusively due to a decrease in enrollment of whites, both men and women. Enrollments of black and American Indian students fluctuated, but 1991 enrollment levels exceeded those of 1980. (See appendix table 5-4.) The number of Asian and Hispanic students of both sexes increased. The largest increase over the decade was among Asians, and among Asian women in particular.

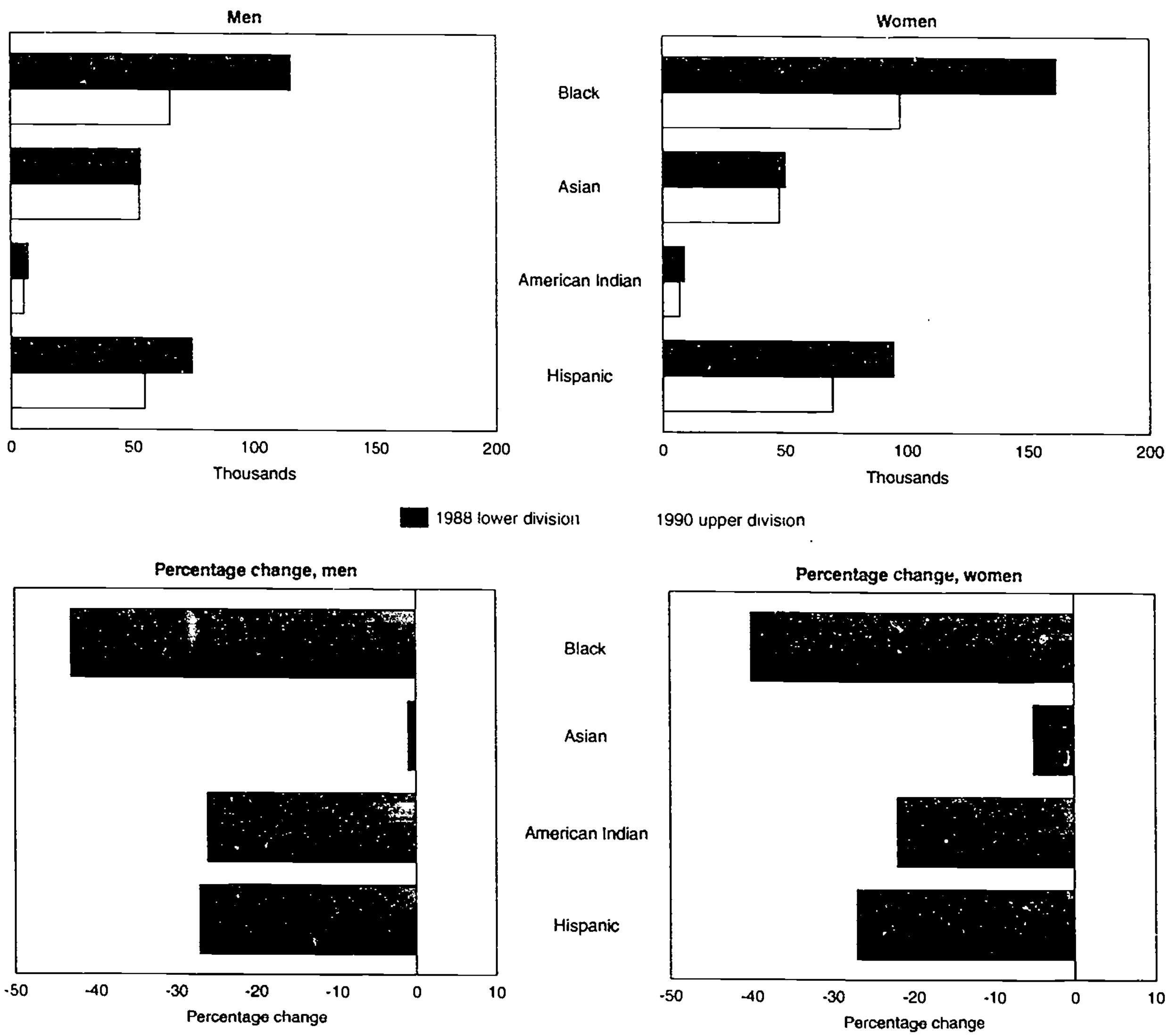
An even more focused view of changes in college-entrance patterns is provided by examining the trends for first-time, full-time first-year students at 4-year institutions. (See appendix table 5-5.) By 1991 the numbers of men and women enrolled as full-time, first-time first-year students had decreased by 10 percent and 3 percent, respectively. The decline, however, was due entirely to decreases in enrollment for whites. Enrollment for all minorities, both Asians and underrepresented minorities, increased. (See figure 5-1.) The number of Hispanic full-time, first-time first-year students at 4-year institutions, both male and female, rose by almost 40 percent over the decade. The numbers of black men and women enrolled were higher in 1991 than in 1980 following some intermediate decreases: 5 percent higher for men, 6 percent

Figure 5-1.
Undergraduate full-time, first-time first-year enrollment of minority students at 4-year institutions, by sex and race/ethnicity: 1980-1991



See appendix table 5-5.

Figure 5-2.
Full-time undergraduate enrollment of minority students in 4-year institutions, by sex, race/ethnicity, and level of enrollment



See appendix tables 5-6 and 5-7.

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higher for women. Although the numbers remain small, the increase for American Indians was 23 percent overall.

Attrition

Persistence is obviously essential for completion of undergraduate education. Some students drop out. Others change fields of study, in many instances switching from highly structured and rigorous fields to fields requiring less extensive prerequisite knowledge. Rates of attrition, from higher education altogether and from study in science and engineering, are believed to be uneven among groups underrepresented in science and engineering occupations. Thus, an examination of attrition rates within higher education is an important supplement to an examination of enrollment trends.

While enrollment of minorities in higher education is up overall, there is some evidence that they leave higher education without completing degrees in higher proportions than do white students. Many students leave higher education between the lower division and the upper division.[3] Comparisons of en-

[3] The notion of lower division and upper division is used here to classify enrolled students on the basis of their progress towards a degree. Lower division includes those students formally matriculated who have earned fewer than half the number of credits needed to graduate, e.g., 60 hours in a 120-hour degree program. Upper-division students are those who have earned more than half of the necessary credits, but have not yet graduated. The data discussed here compare cohorts enrolled at 4-year institutions and can only suggest changes in the status of particular students.

Gender Differences Among Students Leaving Undergraduate Science, Mathematics, and Engineering

Many students who enter college planning to study science, mathematics, and engineering (SME) change their plans during the course of a college career. A study designed to determine the relative importance of factors contributing to career choice and persistence in undergraduate education obtained information from students who "switched out" of SME majors and students who did not switch majors on seven college campuses (Seymour and Hewitt 1994). A total of 23 factors were identified by the students. Despite many shared concerns about their academic programs, there were substantial differences between men and women, suggesting that men and women approach college education with different goals and experience their undergraduate education differently.

Among the students who switched, men and women agreed on their top five concerns overall. (See text table 5-1.) The rank orderings differed, however: The top issues for men and women were different in character. For women the most important issue was the choice of field (reasons for choosing were inappropriate), while for men the top issue dealt with pedagogy and curriculum. Men and women differed most on the importance they attached to their original reasons for the choice of field: 74 percent of the men compared with 91 percent of the women acknowledged that their reasons for choosing SME majors were inappropriate. Men had clearer personal reasons for their choice, while women were strongly influenced by family, high school teachers, and other significant adults. Men more often chose SME majors out of intrinsic interest or for pragmatic reasons; women showed "a greater concern to make their education, their career goals, and their personal priorities fit coherently together" (Seymour and Hewitt 1994, ch. 12).

High proportions of both men and women who switched were concerned about teaching quality (92 percent of the men and 89 percent of the women). However, men and women defined "good teaching" differently, and more women than men were concerned about the difficulties of establishing a personal teacher-student relationship in these majors. Women with good academic records nonetheless lost confidence in judging their academic performances as "good enough" when they did not have a personal teacher-student relationship. Unfortunately, such relationships were reported to be rare.

Text table 5-1.
Factors contributing to undergraduate decisions to switch from science, mathematics, and engineering (SME) majors, by sex: 1994

Issue	Rank importance among students switching majors		Percentage of students switching majors who cited issue	
	Men	Women	Men	Women
Reasons for choice of SME major prove inappropriate	2	1	74.2	91.4
Poor teaching by SME faculty	1	2	92.1	89.2
Inadequate advising or help with academic problems	3	3	68.5	83.9
Non-SME major offers better education/more interest	5	4	57.3	60.2
Lack of/loss of interest in SME: "turned off science"	4	5	61.8	58.1
Rejection of SME careers/associated life styles	11	6	37.1	49.5
Inadequate high school preparation in basic subjects/study skills	8	7	41.6	40.0
SME career options not worth effort to get degree	7	8	48.3	38.7
Curriculum overloaded, fast pace overwhelming	6	9	53.9	37.6
Discouraged/lost confidence due to low grades in early years	13	10	31.5	36.6

SOURCE: Seymour and Hewitt 1994, pp. 258-259.

rollment profiles in each division for gender and racial/ethnic groups, while not actually showing the results of longitudinal analyses, nonetheless indicate changes in the composition of student groups that would not be encountered if all groups progressed at identical rates. In 1988, 1.5 million women were enrolled as full-time lower division students; in 1990, 1.2 millon women were enrolled as full-time upper division students, 17 percent fewer. (See appendix tables 5-6 and 5-7.) A similar decline of 18 percent occurred in the enrollment for men between the lower and upper divisions.

The drop in recorded enrollments for racial/ethnic groups was uneven. (See figure 5-2.) The percentage change was greater for each of the underrepresented minorities than it was for Asians. Approximately 40 percent fewer black students enrolled in 1990 as upper-level full-time students than enrolled in 1988 as lower-level full-time students, suggesting a high attrition rate. Declines of approximately one-quarter of the number of Hispanic students and of more than one-fifth of the American Indians also occurred. This is in contrast to a 15 percent drop in white enrollment and a 3 percent decrease in Asian enrollment. (See appendix tables 5-6 and 5-7.)

Attendance

Undergraduate attendance patterns are important in examining participation of underrepresented groups in higher education for several reasons. Attendance affects the time necessary for the completion of a degree. Time spent on study also imposes costs, both the direct costs of education and costs of possible foregone earnings. In addition, the disciplines of science and engineering are particularly hierarchical, building on prerequisites; a loss in continuity can be particularly detrimental.

College attendance is commonly perceived as following a "traditional" pattern. According to this pattern, students graduate from the school where they began their studies, having attended school full time and without interruption for 4 years. This model has provided the basis for much of the current college curriculum, especially in many science and engineering disciplines (with some notable exceptions, such as formal "co-op" programs as part of an engineering curriculum). It appears that students who follow the traditional pattern generally have a higher probability of success, defined as satisfactory completion of a bachelor's degree.

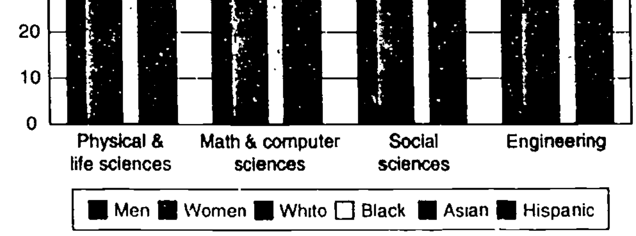
Variations from traditional attendance patterns occur in several ways: (1) part-time enrollment (fewer courses per term than would be needed to complete a bachelor's degrees in 4 years); (2) intermittent enrollment (taking no courses for at least one term between formal entrance into an institution and graduation); and (3) transferring from one institution to another. These variations each have differential effects on college careers.

In reality, college attendance patterns are changing. Only slightly more than half of all enrolled students now follow the traditional pattern[4] and there is very little difference in the proportions of men and women following traditional attendance patterns, 52 percent and 51 percent, respectively. (See appendix table 5-8.) Students from minority groups are slightly less likely to have followed the traditional enrollment pattern, between 47 and 50 percent of each racial/ethnic group, while 53 percent of whites follow the traditional pattern.

Students who majored in most science or engineering fields are more likely to have followed traditional attendance patterns than students generally, with percentages ranging from over 50 percent to almost 75 percent. Only in mathematics and computer science do students follow a variety of attendance patterns, with fewer than half (48 percent) completing traditional patterns. (See figure 5-3.) In these fields there was also very little difference between men and

[4] The data on attendance, grades, and course-taking presented in this chapter are drawn from the Curriculum Assessment Service (CAS), a data base of the transcripts of 1991 spring graduates of American colleges and universities. The project has been conducted at the Institute for Research on Higher Education, University of Pennsylvania, under the direction of the American Association of Colleges (University of Pennsylvania/Institute for Research on Higher Education 1994a), with funding by the Pew Charitable Trust, the National Science Foundation, and the National Endowment for the Humanities.

Figure 5-3.
Percentage of 1991 bachelor's degree recipients following traditional attendance patterns, by sex and race/ethnicity



NOTE: Includes students who were generally enrolled continuously full-time

See appendix table 5-8.

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Why Students Leave Science, Mathematics, and Engineering: Minority Students

A study to determine the relative importance of factors contributing to career choice and persistence in undergraduate education has documented striking differences among student groups (Seymour and Hewitt 1994, ch. 13).

Reasons for leaving science, mathematics, and engineering (SME) fields varied considerably according to the particular ethnic group to which students belonged. However, there were some differences between white and minority students as a whole. (See text table 5-2.)

Minority students placed more of the blame for switching on themselves, while white students more often indicated institutional factors as reasons. For example, white students noted poor teaching and curriculum overload as reasons for switching more than twice as often as did minority students. This greater targeting of external factors by whites occurred even though minority students encountered greater difficulties related to academic achievement: Conceptual difficulties were reported by 31 percent of all minority students, compared with 5 percent of white students; inadequate high school preparation was noted by 25 percent of minority students compared with 11 percent of white students. Inappropriate choice was the second most highly ranked factor (35 percent) for minority switchers, compared with 6 percent for white switchers.

Many minority students reported that they had been "...over-encouraged to enter SME majors for which they were under prepared." Minority students seem to choose SME majors on the basis of less information and less accurate estimates of their own ability and with more focus upon career goals than upon intrinsic interest. These findings suggest a need to more carefully present what an SME major and career entail to high school minority students.

Text table 5-2.
Factors contributing to minority and white undergraduate decisions to switch from science, mathematics, and engineering (SME) majors, by race/ethnicity: 1994

Issue	Rank importance among students switching majors		Percentage of students switching majors who cited issue	
	Minority	White	Minority	White
Non-SME major offers better education/more interest	1	2	36.5	42.0
Reasons for choice of SME major prove inappropriate	2	15	34.6	6.1
Shift to more appealing non-SME career option	3	6	32.7	22.9
Conceptual difficulties with one or more SME subject(s)	4	16	30.8	5.3
Lack of/loss of interest in SME: "turned off science"	5	1	28.9	48.9
Rejection of SME careers/associated life styles	6	4	26.9	29.8
Inadequate high school preparation in basic subjects/study skills	7	10	25.0	10.7
Discouraged/lost confidence due to low grades in early years	8	6	23.1	22.9
Poor teaching by SME faculty	9	2	21.1	42.0
Curriculum overloaded, fast pace overwhelming	10	3	19.2	41.2

SOURCE: [illegible]r and Hewitt 1994, p. 373

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women as traditional students, 47 percent and 48 percent. Among engineering majors, however, a substantially higher percentage of women than men completed degrees with traditional enrollment patterns. (See figure 5-3.) Students not following the traditional pattern often had enrollment characterized by more than one of the variations.

There were more striking differences among racial/ethnic groups completing science and engineering degrees than between men and women. In each of the possible attendance variations, proportions ranged from below to considerably above the proportions for all students, suggesting that the undergraduate experience is highly varied and that generalizations about groups should be tentative at most.

The greatest differences among racial/ethnic groups in science and engineering fields appeared in engineering, where profiles of attendance patterns varied considerably. Between 55 percent and 60 percent of each racial/ethnic group followed traditional enrollment patterns, but the distribution of nontraditional patterns was distinct for each group. White

Stereotype Vulnerability: Effects on Test Performance

Persistent differences in performance across racial/ethnic groups, even among populations comparable on many factors known to be correlated with achievement, have been the focus of research seeking to determine underlying causes. One barrier that may have been underappreciated is negative stereotypes. Efforts to establish the effects of stereotypes have yielded insights into institutional factors or situations that influence the measurement of educational outcomes, such as standardized test performance.

The concept of "stereotype vulnerability" has been applied to testing conditions affecting black students, though the phenomenon is not restricted to members of a single group.[5] A stereotype can place a member of a group in a social-psychological predicament. The mere existence of a culturally held stereotype about a group to which one belongs means than anything one does, or anything about oneself that fits the stereotype, threatens to confirm it as a self-characterization. When the stereotype threatens an important aspect of the self, such as test performance, the vulnerability can be disturbing. The stereotype may set up a pressure that can undermine performance.

As a test of the theory, black and white undergraduates with comparable Scholastic Aptitude Test (SAT) scores were given tests of items selected from the Graduate Record Examination, chosen to present a high level of difficulty to those completing them. Test-taking conditions were carefully controlled, with the experimental manipulation being subtle but explicit differences in key phrases used in the administration of the tests. For example, in the diagnostic condition, subjects read that the main objective of the experiment was to measure ability in order to understand what personal factors are associated with high or low ability. In the nondiagnostic condition, the purpose was stated as examining the psychology of problem solving. A second round of tests was administered to examine aspects of the experimental manipulation: All students were informed that they should expect a low performance level, and were then monitored on such variables as time spent on the test and stress levels produced.

Results from the two experiments showed significant effects related to race and condition. With SAT differences statistically controlled, blacks performed significantly worse than whites when the test was presented as a measure of ability, but at the same level as whites when the test was presented in less evaluative terms.

"Conditions designed to make black subjects stereotype vulnerable depressed their performance relative to white subjects. Conditions designed to alleviate this vulnerability improved blacks' performance, completely equating the two groups.... Thus, in addition to whatever environmental or genetic influences on the skills that a person brings to the testing situation, the present research shows that the situation itself is not neutral—not even when the tester is the same race as the test-taker and shares his or her dialect. It is a microcosm of the individual's predicament in the larger society; the same stereotypes that make them vulnerable there have the power to threaten them and undermine their effectiveness in the testing situation. This is increasingly so as the test includes more items at the limits of, or beyond, the skills of the test-takers, thereby increasing frustration. By providing evidence of this process, the present results raise the possibility that some portion of the black-white difference in standardized test performance is attributable to the biasing effects of stereotype vulnerability in the testing situation" (Steele and Aronson 1994, p. 15).

[5] Several studies examining this phenomenon have been conducted under the direction of Claude M. Steele, Department of Psychology, Stanford University. The particular experiment described here was reported in Steele and Aronson 1994.

engineering majors were more likely to attend school intermittently than were Asians (20 percent to 10 percent), but less likely to do so than black engineering majors, 30 percent of whom attended intermittently.

Grades

Grade distributions of college graduates show that a B average is now the median grade. About one-third of all students who graduated in 1991 had a grade point average (GPA) between 3.0 and 3.49, or between B and B+. (See appendix table 5-9.) Somewhat more students were in the adjacent lower range, 2.5 to 2.99 (31 percent) than were in the highest range, 3.5 and above (20 percent). An analysis of GPA distributions between all students and those with science and engineering majors shows little difference. Students in science and engineering graduated with high proportions registering GPA's of 3.0 or better: mathematics and computer sciences, 54 percent; engineering, 52 percent; and physical and life sciences, 62 percent.

Variations in grades occur between men and women. Although women tend to score lower on the Scholastic Aptitude Test as they enter college, they tend to graduate with higher grades than men, regardless of major. Fifty-nine percent of the women receiving bachelor's degrees in 1991 had a GPA of B or better, compared with approximately 47 percent of the men. (See figure 5-4.)

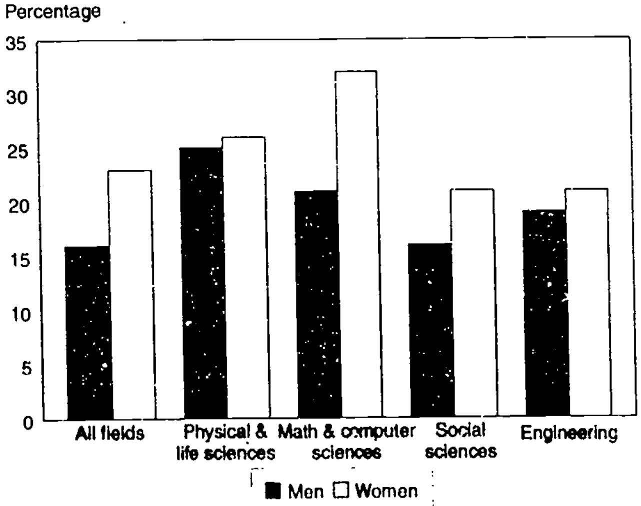
The pattern of higher grades for women prevails in science and engineering fields as well as overall. For example, nearly two-thirds of female mathematics or computer science majors achieved a GPA of B or higher, compared with fewer than half of the men who majored in those fields. In engineering, a higher percentage of women (63 percent) than men (49 percent) had GPA's of B or better.

By field, and by race/ethnicity, the distribution of college grades varied considerably. Grades for white and Asian students were generally higher than grades for students from other racial/ethnic groups. Life and physical sciences majors generally had higher grades than students in other science and engineering fields, regardless of race/ethnicity.

Courses Taken

The amount of coursework in a particular discipline is generally considered an indication of exposure to, and familiarity with, the discipline. Information on the number of courses taken in science and engineering disciplines is therefore of interest in considering both majors and non-majors in science and engineering. In the case of majors, this information may indicate depth of knowledge and preparation for further study. In the case of non-majors, it could signal the feasibility of transferring into a field, as well as a general knowledge of the discipline. Other factors, including the level and content of the coursework, also offer critical dimensions of evidence that a student possesses knowledge of a field, so a measure of

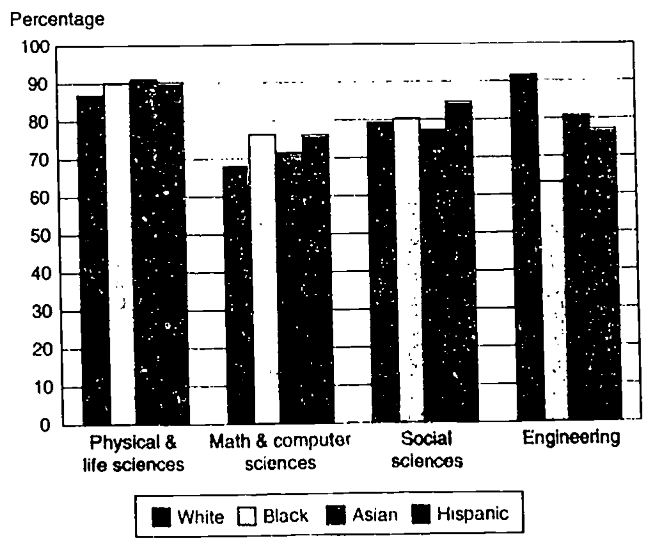
Figure 5-4.
Undergraduate students graduating with a grade point average of 3.5 or higher in major field, by sex: 1991



See appendix table 5-9.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 5-5.
Undergraduate students taking 13 or more courses in their major field, by race/ethnicity: 1991



See appendix table 5-10.

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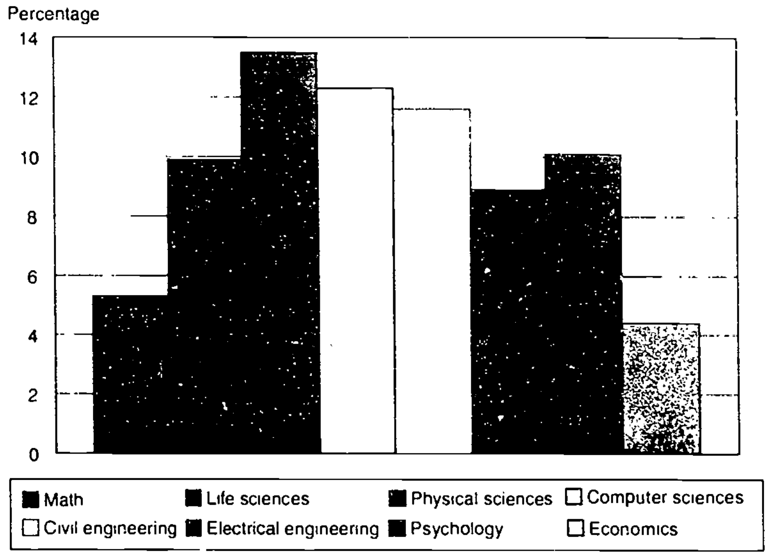
coursework alone must be taken as only one dimension of preparation.[6]

Course-taking by Majors

Women and men showed only small differences in the number of courses completed in their major. In mathematics and computer science, a slightly higher percentage of women than men took 13 or more courses in their major. They took about the same amount of coursework in the social sciences as their male counterparts, as was the case in the life and physical sciences. On the other hand, female engineering majors took fewer engineering courses than men.

In life and physical sciences, Asians took the most courses, with 91 percent taking 13 or more. Students with this major generally took many courses, regardless of their sex or racial/ethnic group. (See figure 5-5.) Among mathematics and computer science majors, differences once again were small among racial/ethnic groups. Among the groups studied, engineering majors exhibited the greatest variation.

Figure 5-7.
Percentage of undergraduate students reporting disability, by selected field: 1989-90

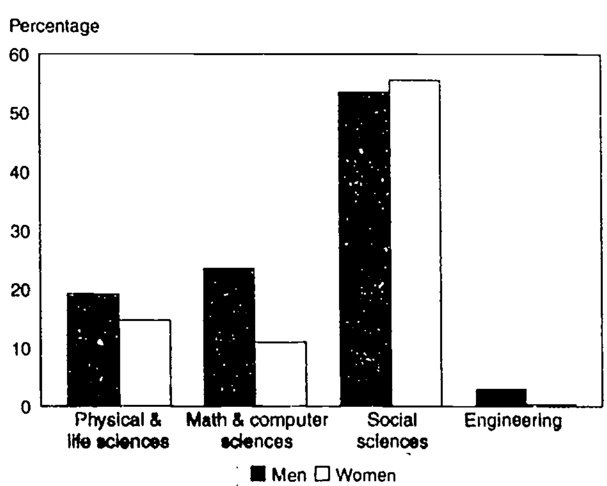


See appendix table 5-14.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

[6] Results discussed here are incomplete for technical reasons related to the data base: course credits granted to transfer students are not included in the course counts. Also, courses for which students "tested out" by demonstrating competence in an area are not included.

Figure 5-6.
Undergraduate students not majoring in science and engineering (S&E) taking five or more courses in an S&E field, by field and sex: 1991



See appendix table 5-11.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

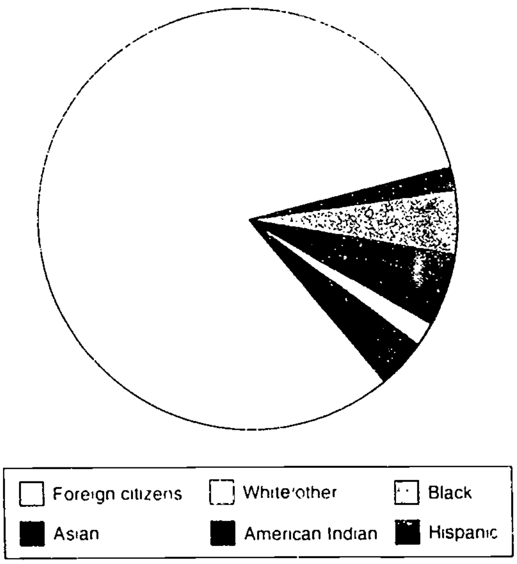
Course-taking by Non-majors

The differences in course-taking patterns in particular science and engineering fields by non-majors far exceed the differences across gender or race/ethnicity, even though the latter are in some instances quite marked. Most striking is that so few non-majors take engineering courses: at least 95 percent of women, Hispanic students, and black students did not take a single engineering course. (See figure 5-6.) Reasons for this phenomenon could be the availability of engineering courses, or requirements for formal entry into the study of engineering, including prerequisites. In any case, engineering does not appear to offer the opportunities for "sampling" that occur in other science and engineering fields. In comparison, for example, courses in the social sciences are completed by all but 5 to 7 percent of most student groups. Well over half of each gender and racial/ethnic group took five or more courses in social sciences. Physical and life sciences and mathematics and computer sciences fall between engineering and the social sciences in the numbers of courses taken by non-majors. (See figure 5-6.)

Persons With Disabilities

Almost 8 percent of all undergraduates in 1990 (9 percent of male students and 7 percent of female students) reported having a disability. (See appendix table 5-12.) Veterans were more likely to have a disability than were nonveterans, and older students were

Figure 5-8.
Race/ethnicity of undergraduate engineering students with a disability: fall 1992



See appendix table 5-15.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

more likely to have a disability than those under age 24.[7]

Compared with students without disabilities, college and university students (undergraduate and graduate students combined) with disabilities were more likely to attend part time (45 percent of students with disabilities versus 41 percent of those without). (See appendix table 5-13.)

First-year students who were partially sighted or blind were more likely to study at 4-year colleges than at 2-year colleges (23,241 versus 10,366). (See appendix table 4-8.) More first-year students with hearing and health-related disabilities also studied at 4-year rather than 2-year colleges, though by smaller majorities.

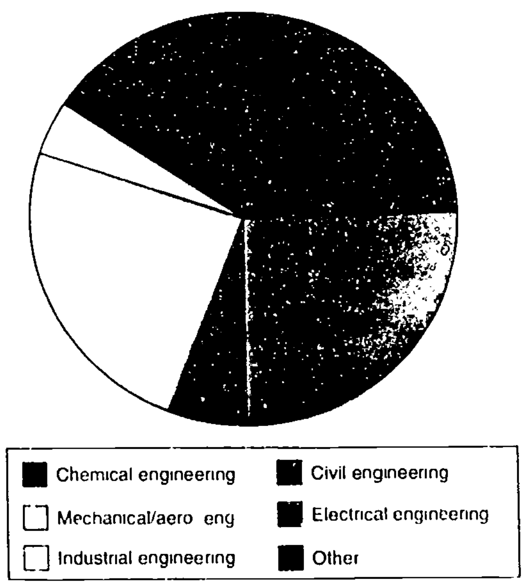
Students with disabilities constituted a higher proportion of majors in physical sciences (14 percent), computer science, and civil engineering (12 percent in each) than they did in mathematics (5 percent) and economics (4 percent). (See figure 5-7).

A 1993 survey of engineering schools to ascertain the number and characteristics of engineering students with disabilities requested enrollment and demographic features of this population. The survey results found very small percentages of students with disabilities among the engineering student population. The low percentages do not agree with anecdotal information gathered over more than a decade by the American Association for the Advancement of Science, which directed the survey. This survey, conducted by the Engineering Workforce Commission (EWC), shows that engineering schools do not currently have systems in place to identify and report on their students with disabilities. While self-reporting instruments (e.g., surveys completed by the students) at institutions of higher education tend to find that 8 to 10 percent of students have a disability (Henderson 1992), institution-reporting instruments (e.g., surveys completed by the schools) at the engineering schools found that about 0.8 percent of students had a disability. The EWC survey found even smaller percentages among some groups, such as master's and doctoral candidates.[8] The survey found the percentages of undergraduate engineering students having disabilities to be the same for both men and women.

[7] These data are from the U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1990. Respondents were college students, both undergraduate and graduate. Among the questions ascertaining demographic and enrollment characteristics, students were asked if they had a functional limitation, disability, or handicap. Each survey participant responded to a set of six separate questions about particular disabilities. The responses were weighted to produce national estimates for the student population. See Technical Notes for more information.

[8] The experiences of engineering colleges and universities in identifying and reporting on their students with disabilities are noted in reports of the Engineering Workforce Commission as part of Access to Engineering, a national project to foster participation in the profession, directed by the American Association for the Advancement of Science with support from the National Science Foundation (Engineering Workforce Commission 1994). For a discussion of measurement problems related to statistics on persons with disabilities, see Technical Notes.

Figure 5-9.
Choice of field among undergraduate engineering students with a disability: fall 1992



See appendix table 5-15.

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(See appendix table 5-15.) Of the students with disabilities, 13 percent were members of underrepresented minority groups. (See figure 5-8.) The most common disability among these engineering undergraduates was learning disability, followed by multiple disabilities and mobility impairment.

The field enrolling the largest number of students identified as having disabilities was electrical/computer engineering, followed by "other (including pre-engineering)" and mechanical/aerospace engineering. (See figure 5-9.)

Faculty Teaching Undergraduates

One of the most profound differences between men and women majoring in science and engineering is that women find very few female role models on the faculty. Studies in selected science and engineering fields at the undergraduate level[9] revealed that the faculty teaching undergraduates were overwhelmingly male in each of the six fields of science and engineering examined—civil, mechanical, and electrical engineering, sociology, geology, and physics.

The most diverse faculty surveyed was in the only social science field in the study—sociology—where 30 percent of the full-time faculty were women. Women comprised less than 10 percent of the full-time faculty in each of the other five fields surveyed, ranging from a high of 9 percent in geology to only 4 percent in mechanical engineering.

The public institutions have a slightly higher percentage of full-time female faculty in the engineering fields; for example, 5 percent of the full-time electrical engineering faculty in public institutions are women versus 4 percent in the private schools. (See appendix table 5-16.)

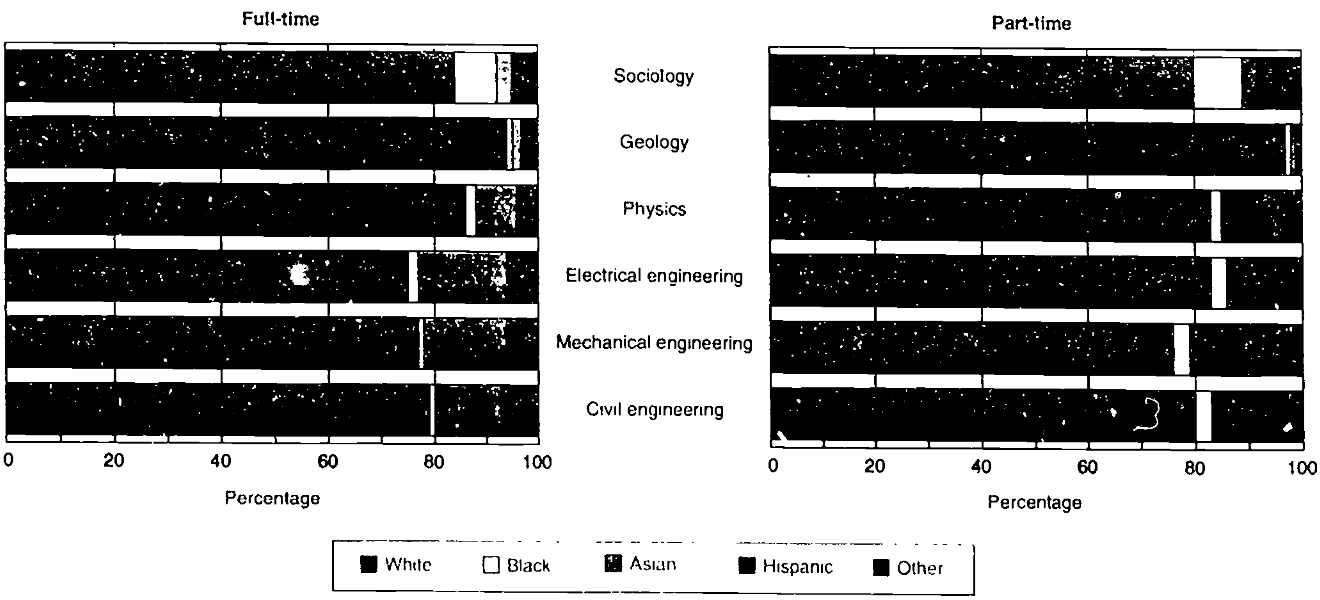
The private institutions include a larger proportion of female full-time faculty in each of the sciences. In sociology, private institutions' faculty was 35 percent women, compared with 30 percent for the public institutions; in geology, the proportions for private/public were 9 percent to 8 percent, and in physics, 8 percent to 6 percent.

Women constitute higher proportions of part-time faculty, although representation varies greatly from field to field. Once again, sociology had the highest proportion of women in part-time positions (47 percent). In geology, women comprised 40 percent of the part-time faculty, and in physics, 14 percent. In each of the three engineering fields, women comprised 7 percent or less of the part-time faculty (7 percent in civil, 5 percent in electrical, and a low of 4 percent in mechanical).

Underrepresented minorities have very few role models among the faculty in the science and engineering fields. (See figure 5-10.) American Indians

[9] Descriptions and results of these studies are presented in a series of reports: National Science Foundation/SRS 1992a, 1992b, 1992c, 1994a, 1994b.

Figure 5-10.
Undergraduate teaching faculty, by employment status, field, and race/ethnicity: 1991



NOTE: Does not display the percentage of American Indian faculty, which is less than 0.5 percent for all fields.

See appendix table 5-16

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have the lowest proportion of faculty among the underrepresented minorities: they constitute less than 0.5 percent of total faculty, whether full-time or part-time, in all six fields surveyed. Hispanics comprise 4 percent of sociology's full-time faculty and 6 percent of its part-time faculty. They comprise 3 percent of the full-time civil engineering faculty, the highest percentage of underrepresented minorities in any full-time engineering faculty. Hispanics do not constitute more than 2 percent of the full-time or part-time faculty in any of the other engineering fields.

Blacks have only slightly better representation in science and engineering faculty than do other underrepresented groups. Eight percent of the full-time faculty in sociology and 9 percent of that field's part-time faculty are black. In both electrical and civil engineering, blacks comprise 3 percent of the part-time faculty. Like Hispanics, they do not constitute more than 2 percent of the full-time or part-time faculty in any of the other fields.

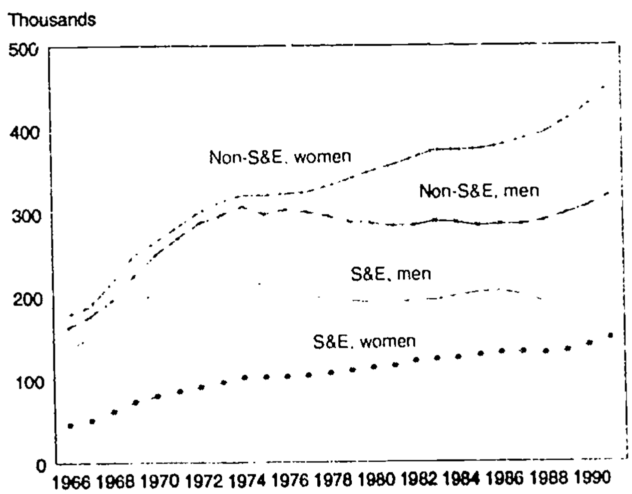
Engineering undergraduate and graduate students with disabilities had very few faculty role models. Only 0.5 percent of the engineering faculty included people with disabilities. Most of the faculty with disabilities (68 out of 134) were mobility impaired. (See appendix table 5-17.)

Outcomes

Degree awards provide the most evident measure of student outcomes from higher education. The number of bachelor's degrees awarded in all fields is at an all-time high, having continued to rise throughout most of the last 25 years.[10] (See appendix table 5-22.) The increase was most rapid during the 1960's; it has continued, though more slowly since then. The decreases in enrollment already noted, particularly among entering first-year students, suggest that this trend could soon shift direction.

The numbers of bachelor's degrees in non-science and engineering fields have increased more rapidly than have those in science and engineering over this period: an increase of 127 percent in non-science and engineering awards compared with an 83 percent growth in the number of science and engineering awards. During the last 10 years the differences have persisted; non-science and engineering awards rose 20 percent, compared with a 10 percent rise for science and engineering.

Figure 5-11.
Bachelor's degrees awarded in science and engineering (S&E) fields and in non-S&E fields, by sex: 1966-1991



See appendix table 5-18.

Women

In 1991, 1,107,997 bachelor's degrees were awarded in all fields to persons of both sexes in all citizenship groups. Women received more than half of the total number, as they have since 1982. Their share has continued to increase; by 1991 it was 54 percent. (See appendix table 5-18.)

Of the total number of bachelor's degrees awarded in 1991, 337,675 (or 30 percent) were in science and engineering fields. Women have lower representation in science and engineering fields than in non-science and engineering fields. (See figure 5-11.) Women have earned a majority of degrees in non-science and engineering throughout the past 25 years. In science and engineering fields combined, they earned 44 percent of the bachelor's degrees granted in 1991, a total of 148,347 degrees. Their share of bachelor's degrees in science and engineering has steadily though slowly increased; in 1981, women earned 38 percent of the total. This increase in percentage is partially due to the fact that while the number of women earning degrees in science and engineering increased, the number of males decreased. (See appendix table 5-18.)

Degree awards to women in science and engineering vary greatly by field. For science as a whole (excluding engineering) women earned 50 percent of the bachelor's degrees in 1991, almost exactly their percentage of the population and an increase from the 46 percent of the science degrees they earned 10 years earlier.

Within the sciences, the field with the highest share of bachelor's degrees awarded to women was psychology, with 73 percent (an increase from 65 percent in 1981). Women also earned more than half the

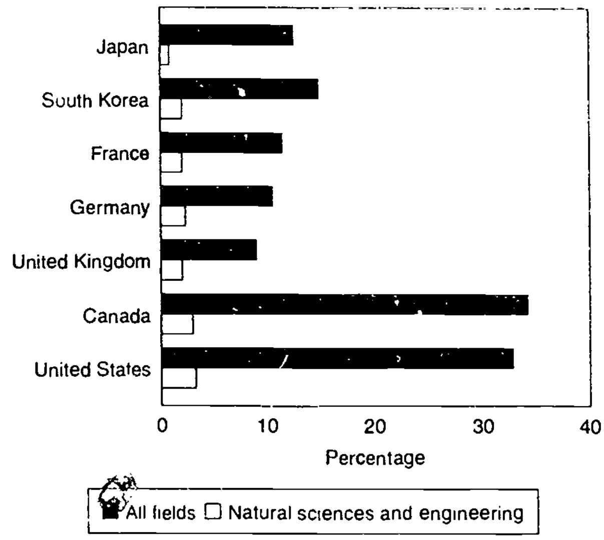
[10] Data on bachelor's degrees are from U.S. Department of Education/NCES IPEDS Completions Surveys. Science and engineering categories have been changed to reflect National Science Foundation categories.

International Comparisons of Women's Participation in Higher Education in Science and Engineering

Relatively few people, men or women, choose science or engineering fields of study at the university level. In the United States, the percentage of all bachelor's degrees awarded in science and engineering has slowly declined since the mid-1960's from a stable 35 percent down to 31 percent in 1991. Yet women and minorities are entering this select group in the United States and throughout the world. Statistics assembled from country sources and adjusted to conform to comparable degree levels and field descriptions permit comparisons of levels of participation among selected countries (Johnson 1994).

In North America, representation of women among persons earning bachelor's degrees leads that of many European and Asian countries. (See figure 5-14.) However, when science and engineering degrees are subdivided into broad fields, differences become more evident. (See figure 5-15 and appendix tables 5-50 to 5-52.)

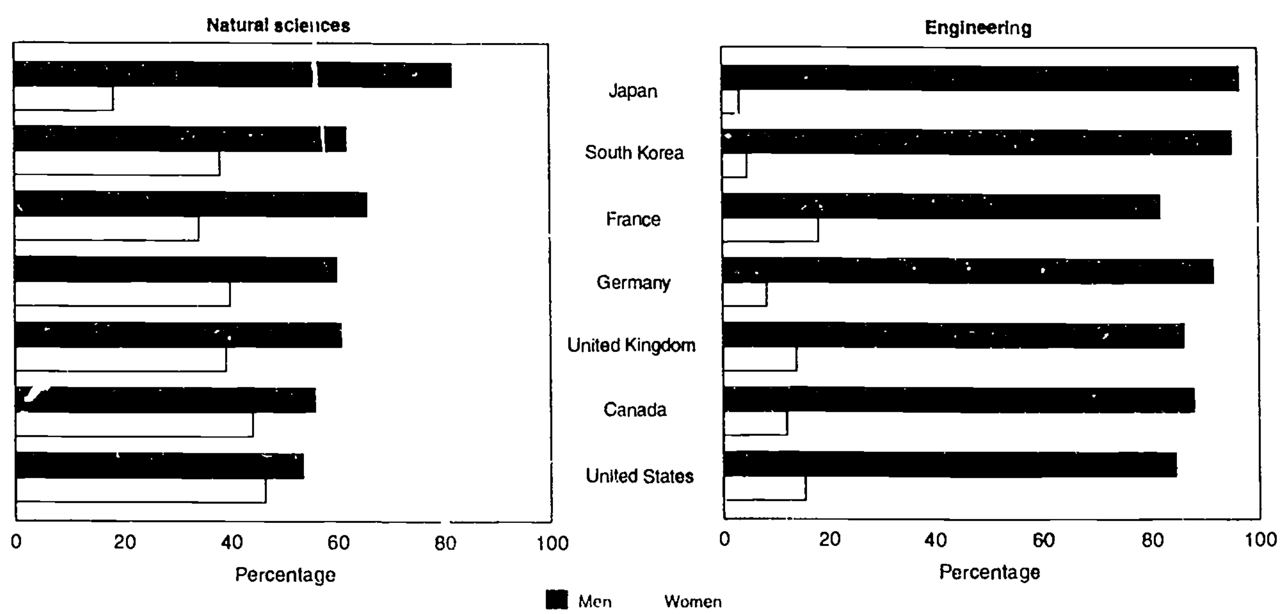
Figure 5-14.
Percentage of 22-year-old women with first university degrees, by field and selected country: most current year



See appendix table 5-50.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 5-15.
Percentage of science and engineering degrees awarded, by sex and selected country: most current year



See appendix table 5-52.

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Where Minorities Earn Their Degrees

Some colleges and universities educate a disproportionately large share of undergraduates who are members of racial/ethnic minorities. America's Historically Black Colleges and Universities (HBCU's) continue to play an important role in the production of bachelor's degrees earned by blacks, despite the growing diversity of the Nation's campuses. The percentage of black students who received bachelor's degrees in science and engineering at HBCU's was 28 percent in 1991, down slightly from 32 percent in 1981. (See appendix tables 5-36 to 5-38.) The decline occurred mainly in non-science and engineering fields (35 percent to 28 percent) and social sciences (28 percent to 23 percent).

Change varied across fields: In physical sciences the percentage of blacks earning bachelor's degrees at HBCU's rose between 1981 and 1991 from 40 percent to 48 percent, whereas in mathematics the percentage fell from 51 percent to 46 percent. In the natural sciences, there was only a slight decline, from 42 percent to 41 percent.

Half of the 26 institutions that awarded the largest number of science bachelor's degrees to black men were HBCU's. (See appendix table 5-42.) Twelve of the top 26 institutions awarding bachelor's degrees to black men in engineering were HBCU's. For black women, 15 of the top 25 institutions for bachelor's degrees in science were HBCU's, as were 8 of the top 26 institutions in engineering. (See appendix table 5-43.)

HBCU's also play an important role in educating blacks who continue their education and obtain science and engineering doctorates. More than 23 percent of blacks who earned their doctorates in science and engineering between 1988 and 1992 received their bachelor's degrees from HBCU's.

Hispanics are likely to attend colleges and universities in regions of the country where they form a large percentage of the population: California, Texas, Florida, and Puerto Rico. (See appendix tables 5-44 and 5-45.) Institutions in Puerto Rico play an important role in undergraduate education, although the number of institutions awarding bachelor's degrees to Hispanics is now more diverse than it once was. In 1991, Puerto Rican institutions awarded 26 percent of all bachelor's degrees given to Hispanics, down from 34 percent in 1981. (See appendix tables 5-39 to 5-41.) In science and engineering the number of bachelor's degrees awarded to Hispanics by institutions in Puerto Rico declined from 30 percent of the science and engineering degrees awarded to all Hispanic recipients in 1981 to 20 percent in 1991.

American Indians, like Hispanics, tend to study at institutions in the regions of the country where they are concentrated by population—Oklahoma, California, and Texas. (See appendix tables 5-48 and 5-49.)

Asians appear to choose large State institutions for their bachelor's degrees in science and engineering. (See appendix tables 5-46 and 5-47.)

bachelor's degrees in biological science (51 percent, up from 44 percent in 1981). Women increased their proportion of degrees in mathematics, agricultural science, and physical sciences. Computer science was the only science field in which the percentage of the bachelor's degrees earned by women declined, from 33 percent in 1981 to 30 percent 10 years later.

Women were most likely to earn degrees in social science, psychology, and biological science. (See appendix tables 5-19 to 5-21.) Engineering continued to be one of the least popular fields for women in 1991: they earned 14 percent of the total engineering degrees, up from 11 percent in 1981. For men, on the other hand, engineering was the second most popular field, narrowly trailing behind social science in number of degrees awarded. There were large differences within engineering fields, however: women earned higher proportions of degrees in chemical and industrial engineering than in mechanical or electrical engineering. (See text table 5-3.)

Minorities

In the last decade, minorities have steadily increased their share of bachelor's degrees in science and engineering.[11] However, there were important differences among minorities and by gender within minority groups. Asians gained a share of bachelor's degrees that was greater than their share of the population. Blacks, Hispanics, and American Indians con-

[11] The race/ethnicity of bachelor's degree recipients is reported only for those who are U.S. citizens or permanent residents. Therefore, discussions of degree awards will use this group as the reference group, although tables report also the numbers of awards to foreign citizens on temporary visas and the total number of awards. In the case of awards at the master's and doctoral levels, the number of awards to foreign citizens is substantial, numerically and proportionately, so establishing comparable comparison groups across degree levels is important

Text table 5-3.
Bachelor's degrees in engineering awarded to women, by field: 1991

Field	Number	Percentage
Engineering, total	9,665	15.5
Aeronautical/astronautical	324	11.3
Chemical	1,164	31.2
Civil	1280	15.8
Electrical	2,763	12.8
Industrial	1,097	28.7
Mechanical	1,590	11.1
Materials/metallurgical	254	21.8
Other engineering	1,193	17.7

SOURCE: National Science Foundation/SRS. 1994. *Science and Engineering Degrees: 1966-91.*

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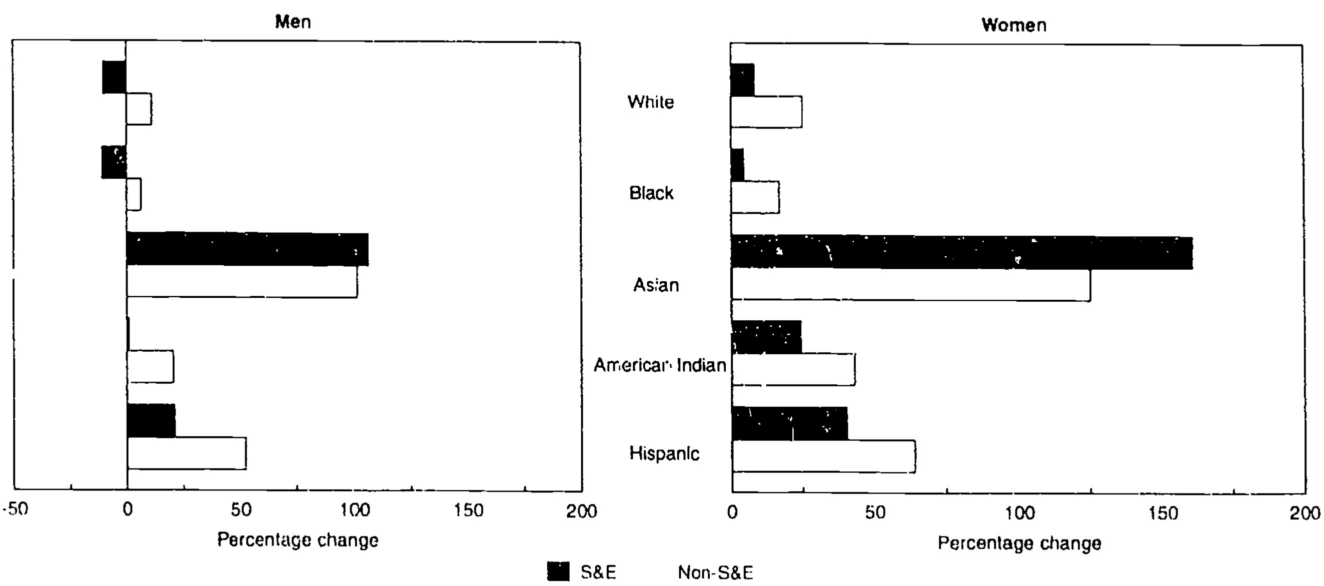
tinued to be underrepresented. In 1991, U.S. citizens and permanent residents earned 1,052,610 bachelor's degrees, 95 percent of the total number of bachelor's degrees awarded. Foreign citizens earned the remaining 5 percent.

Underrepresented minorities (Blacks, Hispanics, and American Indians) comprised about one-fifth (21 percent) of the total U.S. population, according to 1990 census data. (See appendix table 5-1.) They earned 11 percent of all bachelor's degrees awarded, the same percentage they earned in science and engineering fields combined and in non-science and engineering fields. These proportions were virtually unchanged from 10 years earlier. Asians earned another 4 percent of all degrees, 6 percent of those in science and engineering and 3 percent of those in non-science and engineering.

Changes in the number of degree awards suggest mixed progress. Between 1981 and 1991, the number of bachelor's degrees earned by underrepresented minorities in non-science and engineering fields increased 34 percent. (See figure 5-12.) By comparison, the number of science and engineering bachelor's degrees earned by underrepresented minorities grew 8 percent. Most of the growth was in engineering: The number of degrees awarded to underrepresented minorities increased 56 percent over the decade, growing from 7 percent of the total awarded in 1981 to 10 percent in 1991. In the science fields (excluding engineering), although the total number of underrepresented minorities receiving bachelor's degrees barely grew during the decade even in absolute numbers, they nonetheless accounted for 12 percent of science bachelor's degrees awarded in 1991.

The proportion of minorities in the population often differs from their proportion in science and engineering degrees awarded. Asians, who constitute 3 percent of the population according to 1990 census data, earned 6 percent of science and engineering bachelor's degrees in 1991. Blacks were almost 12 percent of the population and earned 6 percent of the

Figure 5-12.
Percentage change in science and engineering (S&E) and non-S&E bachelor's degrees, by sex and race/ethnicity: 1981-91



NOTE: Includes U.S. citizens and permanent residents only

See appendix tables 5-20 and 5-21.

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degrees; Hispanics were 9 percent of the population and earned 5 percent of the degrees; and American Indians were under 1 percent of the population and earned only 0.4 percent of the degrees. (See appendix table 5-23.)

The proportion of all bachelor's degrees and of science and engineering bachelor's degrees awarded to women varied considerably across racial/ethnic groups. (See text table 5-4.) For each racial/ethnic group, in 1991 the representation of women was lower in science and engineering than in all fields, with white, Asian, and Hispanic women receiving fewer than half of the science and engineering awards. Within fields, men and women in each racial/ethnic group generally increased the number of degrees they were awarded, though there were exceptions. Numeric decreases were recorded in some fields for both men (white, black, Hispanic, and American Indian) and women (white and black). (See figure 5-13.) Trends in degree awards with detail for gender and race/ethnicity for broad fields and for individual science and engineering fields are presented in appendix tables 5-22 through 5-35.

Text table 5-4.
Percentage of science and engineering bachelor's degrees earned by women, by race/ethnicity: 1991

Race/ethnicity	All bachelor's degrees	Science and engineering degrees
White	54	43
Asian	50	41
Black	63	58
Hispanic	58	49
American Indian	58	50

NOTE: Based on totals earned by U.S. citizens and permanent residents only

See appendix table 5-23.

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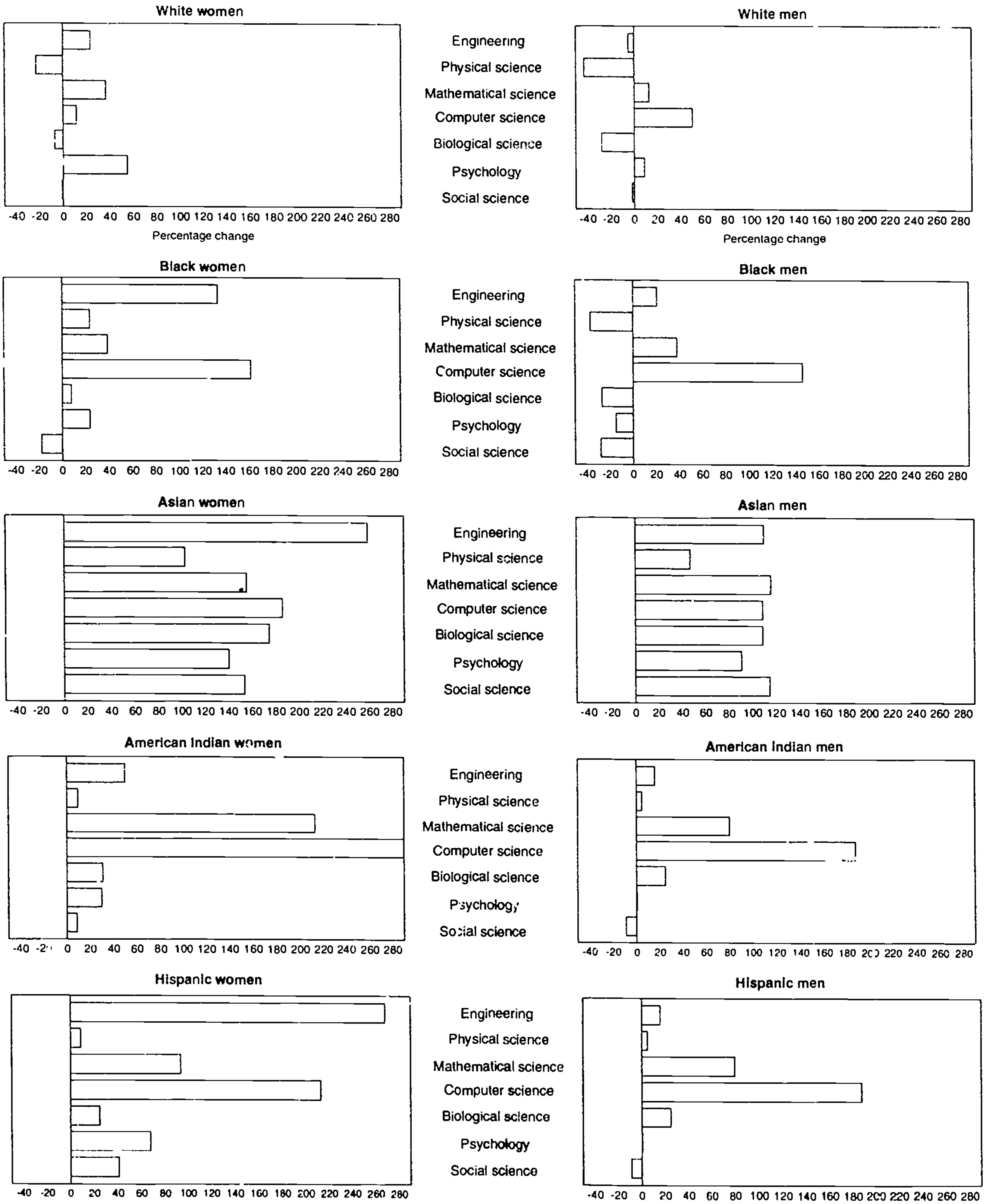
Figure 5-13.
Percentage change in science and engineering bachelor's degrees, by race/ethnicity and sex: 1981-1991



NOTE: The numeric change in computer science degrees awarded to American Indian women was from 4 to 31, a 680 percent increase.

See appendix tables 5-20 and 5-21.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

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CHAPTER 6

GRADUATE EDUCATION: ENROLLMENT

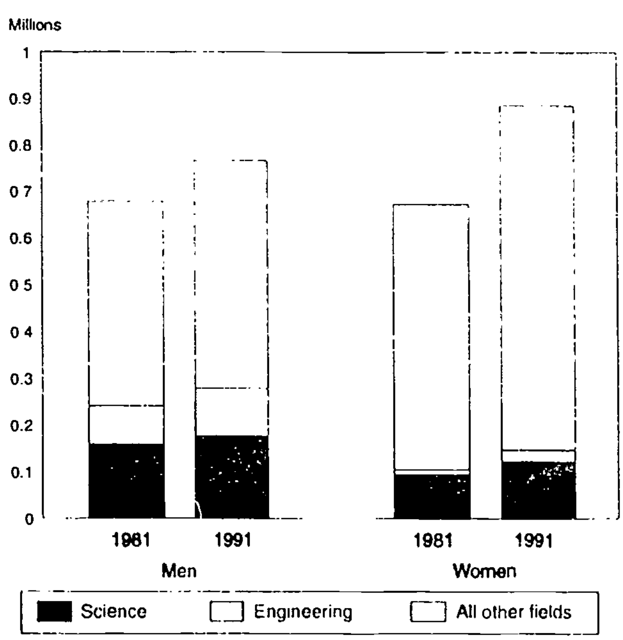
Graduate education constitutes a critical step in the preparation of scholars and professionals, especially scientists and engineers. During this time of focused study, choices become more directed and change across disciplines less likely. Graduate education in the United States sets a world standard; it is highly regarded not only by students in this country but also by persons from abroad.

Graduate school enrollment in the United States in all disciplines increased by more than 22 percent during the 1980's.[1] (See figure 6-1.) In addition, the composition of enrollment in graduate education in all disciplines became more diverse. Women increased not only their numbers but also their share of total graduate enrollment, becoming a majority by the middle of the decade. (See figure 6-2.) Minority enrollment increased somewhat, from 12 percent to 15 percent of the total. (See figure 6-3.)

Progress has been slower in science and engineering fields, where women, blacks, Hispanics, American Indians, and persons with disabilities continue to be underrepresented in graduate school. However, women did register gains over the last decade in both graduate enrollment and degrees, and underrepresented ethnic and racial minorities made limited progress. During the same period, Asians increased their representation in graduate school in science and engineering so that the percentages of Asians now enrolled and earning degrees are higher than the percentage of Asians in the general population.

[1] Data presented on graduate enrollment in this chapter are from two sources unless otherwise noted. Data on total enrollment, including all fields, are reported by the Department of Education, Natural Center for Education Statistics, IPEDS, Fall Enrollment Survey. Data on graduate enrollment by field in science and engineering are from the National Science Foundation Survey of Science and Engineering Graduate Students and Postdoctorates. Both surveys are universe surveys, including all higher education institutions offering graduate programs. Imputations are made for nonresponse.

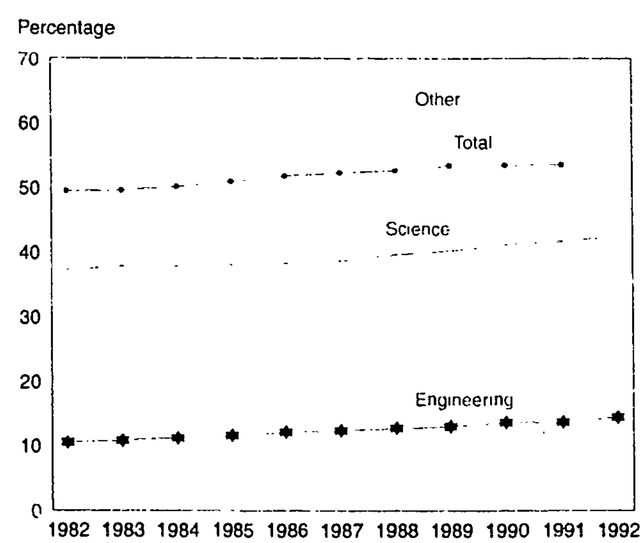
Figure 6-1.
Graduate students in all institutions, by sex and broad area of study: fall 1981 and 1991



See appendix table 6-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

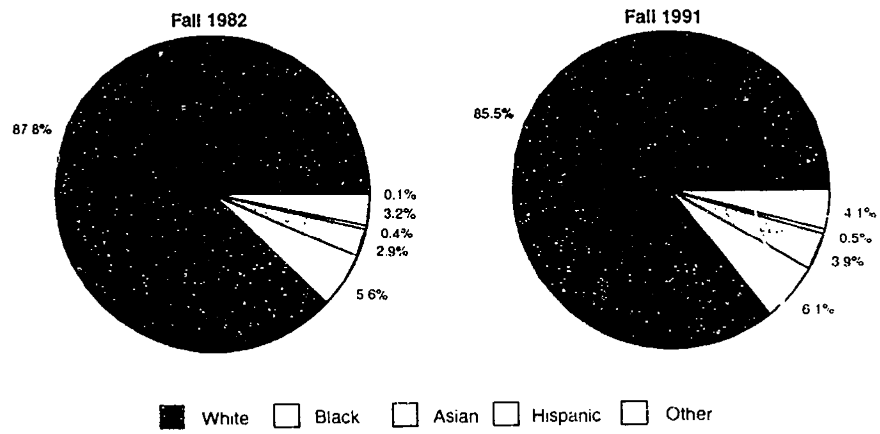
Figure 6-2.
Women as a percentage of all graduate students, by broad area of study: fall 1982-1992



See appendix table 6-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 6-3.
Graduate students in all institutions, by race/ethnicity: fall 1982 and 1991



See appendix table 6-11.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Women

Enrollment Composition

Of the total of 431,613 graduate students enrolled in science and engineering fields in 1992, 150,411 were women. (See appendix table 6-2.) The percentage of women grew steadily though slowly over the past decade, from less than 31 percent in 1982 to 35 percent in 1992. In science fields (excluding engineering), nearly 43 percent of the graduate students in 1992 were women, up from 37 percent in 1982. Women's representation increased in engineering as well during the decade, from 11 percent to almost 15 percent. In non-science and engineering fields, women made up 60 per-

Critical Mass: Women in Academic Science

The persisting underrepresentation of women in many science and engineering fields stands in contrast to increasing female representation in other traditionally male professions and occupations. In an effort to examine the phenomenon, 150 interviews were conducted at 30 academic science departments in five disciplines at research institutions (Etzkowitz et al. 1994). The disciplines were biology, chemistry, physics, computer science, and electrical engineering. Departments were chosen for their high, low, or improving performance on the proportion of doctoral degree awards to women between the mid-1970's and 1990. Interviewees were female graduate students and faculty members in all departments and male students and faculty members in three departments.

The interviews were designed to examine the applicability of the "critical mass" theory in considering the dynamics of progress toward greater female representation. A "critical mass" is defined as a strong minority of at least 15 percent. "The hypothesis of critical mass states that even when only a small presence in a larger population, a minority group (especially one that has traditionally been discriminated against) is easily marginalized; its continued presence and survival is in constant jeopardy often against outside intervention and resistance to prevent extinction" (Etzkowitz et al. 1994, p. 12). As the level of participation increases, at a particular point the perspectives of members of both groups change and the character of the relations between the groups begins to change qualitatively.

A variant of the approach hypothesizes that the transition effect is heightened because, during the initial period prior to the achievement of critical mass, growth in the minority group presence and participation is met with greater hostility and more determined resistance. Conflict may come to a crisis at the point at which critical mass is achieved.

Interviews addressed the effects of sociability and isolation in science, the limits of change induced by critical mass, and the emergence of distinctive female scientific roles. A key finding was that as the number of female faculty members in a department increases, they divide into recognizable subgroups. Senior female scientists may share the values and workstyles of older men, while younger women are attempting to create an alternative scientific role, an objective more likely to be shared by male and female scientists of the same generation.

Findings offered evidence to support both of the two contrasting approaches to the theory. In some instances the presence of a larger number of women encouraged significant positive change. In other cases it provoked increasingly sharp conflict, with the final outcome not always the achievement of critical mass.

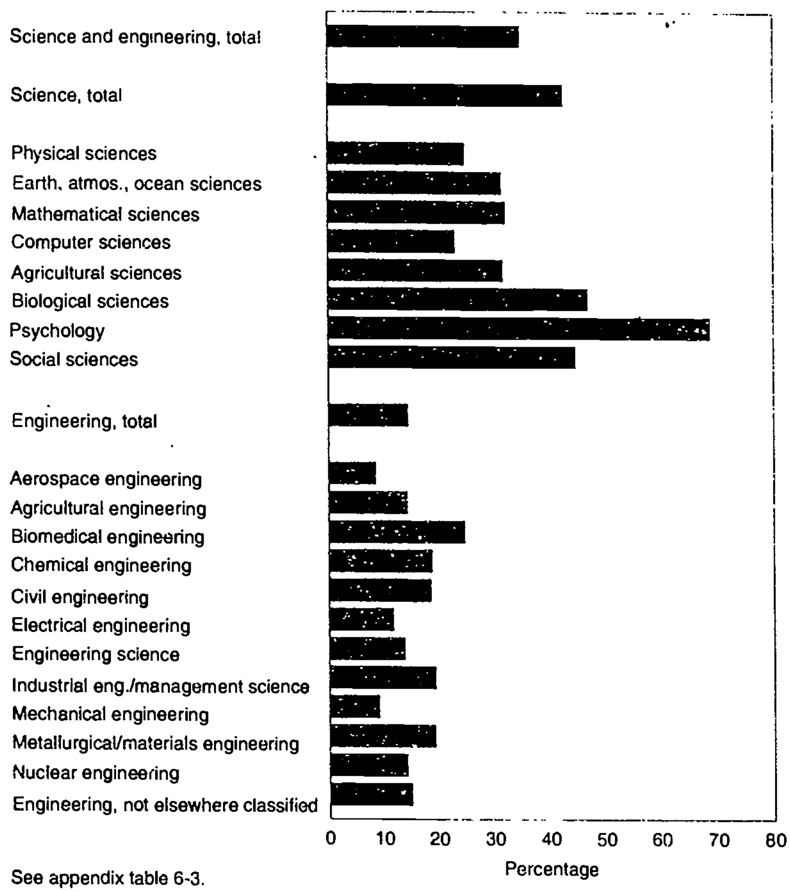
cent of the total graduate enrollment in 1991 (the latest year for which overall data are available), up from 56 percent in 1982.

Field Choices

Women's representation in science and engineering varied greatly by field. (See figure 6-4.) In psychology, more than two-thirds of the graduate students in 1992 were women. Women were also in the majority in biometry/epidemiology, genetics, nutrition, and several social science fields. By contrast, only 14 percent of the graduate students in physics were women.

Among the engineering fields, the highest percentage of female graduate students was in biomedical engineering, about one-fourth. This was followed by industrial engineering/management science and metallurgical/materials engineering, each with a female enrollment of just under 20 percent. At the other extreme, fewer than 10 percent of the graduate students in mechanical engineering, petroleum engineering, and aerospace engineering were women.

Figure 6-4.
Women as a percentage of all science and engineering graduate students, by field: fall 1992



See appendix table 6-3.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Enrollment Status

Women were slightly, though consistently, less likely than men to be enrolled in science fields on a full-time basis in 1992, 66 percent compared with 71 percent. (See figure 6-5.) This gap has narrowed slightly since 1982, when the proportions enrolled full time were 63 percent and 70 percent, respectively. In engineering, however, full-time enrollment is virtually the same: 62 percent of the women were enrolled full time in 1992, compared with 59 percent of the men. These percentages have changed very little over the last 10 years. In 1982, 62 percent of the female graduate engineering students and 60 percent of the men were enrolled full time.

The graduate science and engineering student population is slowly becoming more female, as indicated by the increasing percentage of women among first-year graduate students. (See appendix table 6-5.) Although the enrollment is declining slightly among both sexes, the decline is greater among men than women. Between 1985 and 1992, the proportion of first-time graduate enrollment dropped from 29 percent to 27 percent for men and from 33 percent to under 31 percent for women. In addition, women constitute a growing share of first-time enrollees: 37 percent in 1992 compared with 33 percent in 1985. (See figure 6-6.)

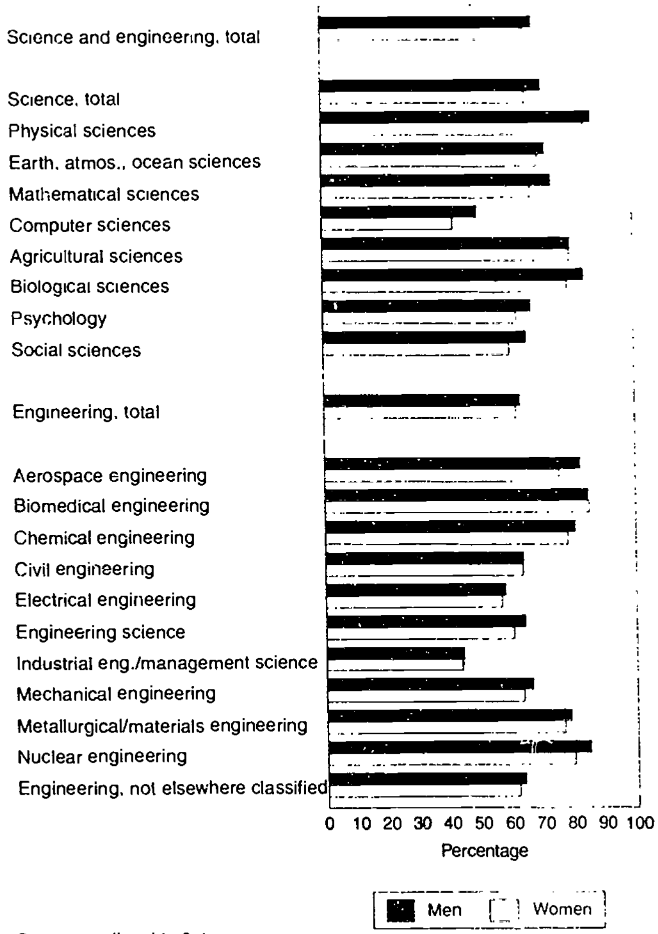
Sources of Support

Both men and women in graduate science programs were more likely to be supported primarily by outside sources than to be self-supporting or to be supported by loans and/or family contributions. (See figure 6-7.) Women in science, however, were more likely to rely on self-support than were men (34 percent versus 27 percent). In engineering, however, the proportions relying primarily on self-support were virtually identical (36 percent for men, 35 percent for women). Overall, male science and engineering graduate students were more likely to receive their primary support from the Federal Government than were women (21 percent compared with less than 17 percent) and somewhat less likely to be supported by their institutions (41 percent versus 43 percent).

Geographic Distribution

An analysis of women's graduate school enrollment by geographic region shows that only in Puerto Rico did women comprise a majority of all graduate

Figure 6-5.
Percentage of science and engineering graduate students enrolled full time, by sex and field: fall 1992



See appendix table 6-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

students in science and engineering in 1992, 52 percent of the total. Other geographic areas in which women made up 40 percent or more of the total graduate enrollment in 1992 include Guam, Minnesota, Maryland, the District of Columbia, and Arkansas. (See figure 6-8.)

Within science disciplines, the numbers of female graduate students varied greatly across institutions. For example, only in agriculture and the social sciences did the institution with the largest number of female graduate students appear in the top 10 overall (See text table 6-1 and appendix table 6-9.) Fewer institutions offer graduate engineering programs; in 4

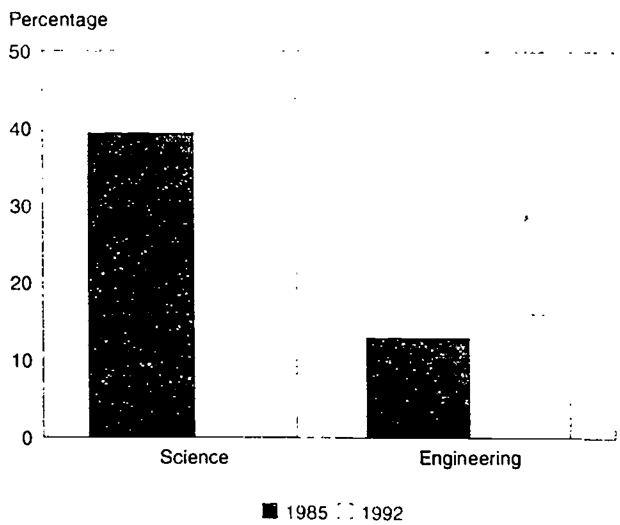
Where Blacks and Hispanics Enroll

The proportion of all black graduate science and engineering students enrolled in Historically Black Colleges and Universities remained virtually unchanged between 1982 and 1992 at about 13 percent of the total. In science fields, the proportion was virtually the same in 1982 as in 1992, 15 percent compared with 14 percent, despite increases in enrollment of black graduate science and engineering students in many institutions. In engineering fields, the proportion of graduate students in these institutions rose significantly, from 4 percent to more than 7 percent. Four institutions—Howard University, North Carolina A&T, Prairie View A&M University, and Florida A&M University—indicated that they had either established or significantly expanded their engineering programs, which accounted for most of the increase. (See appendix table 6-26.)

Institutions that were members of the Hispanic Association of Colleges and Universities (HACU) enrolled 19 percent of all Hispanic graduate students in science and engineering fields in 1992, a proportion down slightly from the 22 percent reported by these institutions in 1982 probably because of increases in Hispanic enrollments overall. (See appendix table 6-27.) In engineering fields, these schools enrolled 13 percent of the total, a proportion virtually unchanged from 10 years earlier. In the science fields, the total number of Hispanic graduate students at HACU institutions increased by 47 percent over the decade.

The high proportionate enrollment of Hispanic graduate students in institutions in Puerto Rico is illustrated by the fact that although only about one-half of 1 percent of all graduate students were enrolled in these institutions in 1992, Puerto Rican colleges and universities enrolled 13 percent of all Hispanic graduate students in science and engineering fields, including 15 percent of those in sciences and almost 5 percent of those in engineering. The latter statistic is particularly remarkable given the fact that only one institution, the University of Puerto Rico at Mayagüez, offered any graduate programs in engineering. (See appendix table 6-28.)

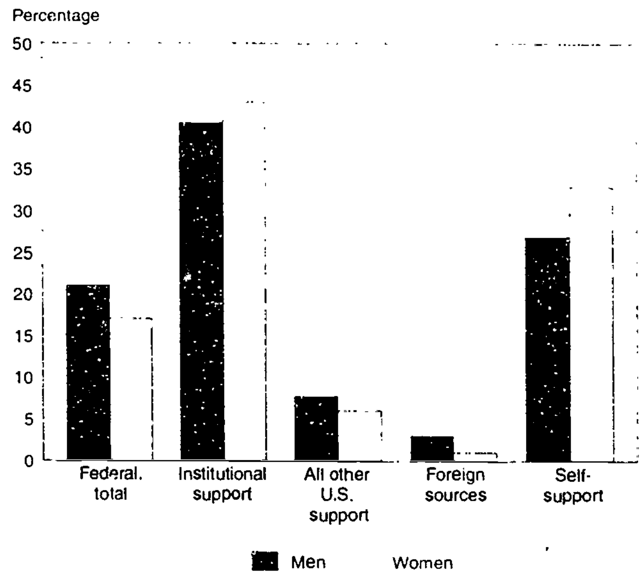
Figure 6-6.
Women as a percentage of first-year full-time graduate students in science and engineering: fall 1985 and 1992



See appendix table 6-5.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

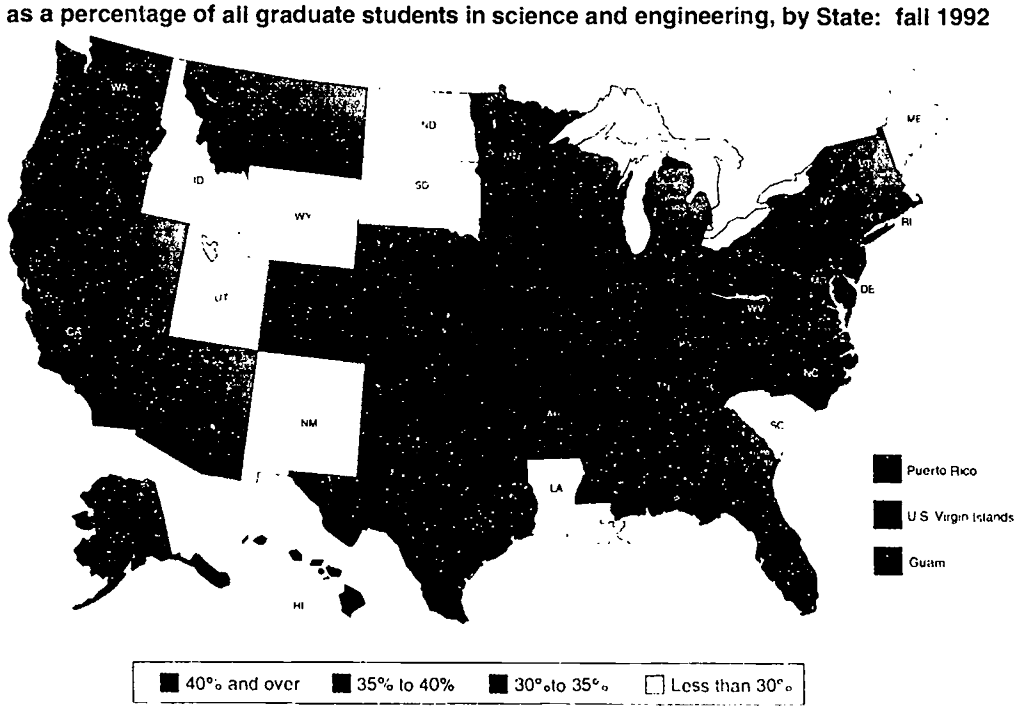
Figure 6-7.
Primary source of support for full-time graduate students, by sex: fall 1992



See appendix table 6-6.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

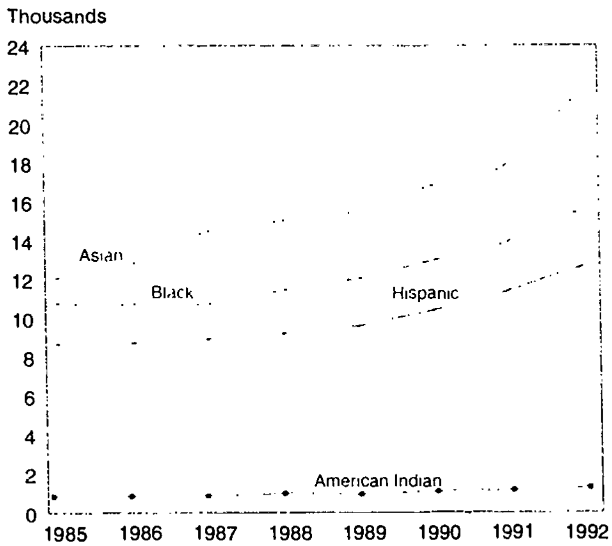
Figure 6-8.
Women as a percentage of all graduate students in science and engineering, by State: fall 1992



See appendix table 6-7.

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

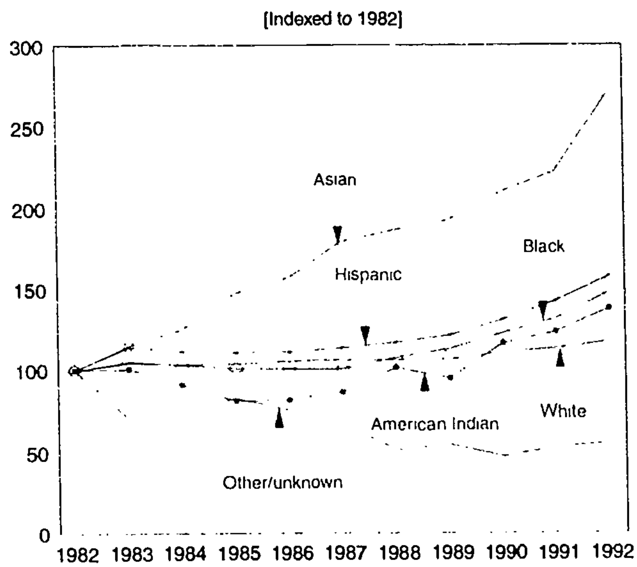
Figure 6-9.
Minority graduate students in science and engineering: fall 1985-1992



See appendix table 6-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 6-10.
Change in enrollment of graduate students in science and engineering, by race/ethnicity: fall 1982-1992



See appendix table 6-13.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

of the largest fields (civil, electrical, industrial, and mechanical engineering), the institutions with the largest numbers of women enrolled were in the top 10 overall. (See appendix table 6-10.)

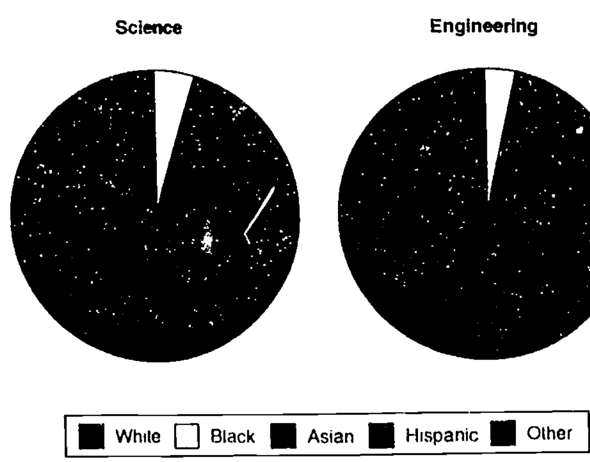
Minorities

Enrollment Composition

Of the 322,449 U.S. citizens enrolled in graduate science and engineering programs in 1992 (both full-time and part-time), 50,833, or 16 percent, were minorities, excluding those for whom racial/ethnic data were not provided.[2] Blacks, Hispanics, and American Indians continued to be seriously underrepresented, with only 9 percent of the total number enrolled in graduate science and engineering programs. Improved reporting of race/ethnicity, evidenced by declines in the numbers of students of "unknown race/ethnicity," could account for significant portions of the reported increases among underrepresented minorities. (See figure 6-9.) Hence, the slight increases in the proportions of enrollments reported for minorities are as likely to reflect improvements in statistical quality as they are to be actual increases. For blacks, the reported increase in graduate science and engineering enrollment from 1985 to 1992 was from 4 to 5 percent; for Hispanics, from 3 to 4 percent. The proportion for American Indians remained at less than 1 percent and whites remained

[2] Data on race/ethnicity for science and engineering graduate students are available only for U.S. citizens, whereas data on sex have been collected for all students.

Figure 6-11.
Percentage distribution of graduate students in science and engineering, by race/ethnicity: fall 1992



NOTE: American Indian enrollment less than 0.5%

See appendix table 6-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Text table 6-1.
Twenty institutions with largest enrollments of women in science and in engineering: fall 1992

	Institution	Number of women enrolled
	Science:	
1	University of Minnesota, all campuses	1,674
2	University of Wisconsin-Madison	1,565
3	Rutgers, the State University, all campuses	1,436
4	Indiana University, all campuses	1,333
5	New York University	1,329
6	Harvard University	1,216
7	George Washington University	1,206
8	Ohio State University, all campuses	1,187
9	Texas A&M University, all campuses	1,183
10	University of Colorado, all campuses	1,180
11	Cornell University, all campuses	1,169
12	University of Washington	1,139
13	University of Illinois at Urbana-Champaign	1,129
14	Antioch University, main campus	1,113
15	University of California-Berkeley	1,076
16	University of Maryland at College Park	1,054
17	American University	1,052
18	University of Michigan, all campuses	993
19	University of Southern California	989
20	Pennsylvania State University, all campuses	983
	Engineering:	
1	Georgia Institute of Technology, all campuses	486
2	Massachusetts Institute of Technology	451
3	University of Michigan, all campuses	389
4	University of Southern California	378
5	Stanford University	361
6	George Washington University	339
7	University of California-Berkeley	334
8	University of Texas at Austin	243
9	University of Houston-University Park	236
10	Virginia Polytechnic Institute and State University	236
11	Pennsylvania State University, all campuses	235
12	University of Washington	233
13	Texas A&M University, all campuses	208
14	University of Illinois at Urbana-Champaign	208
15	North Carolina State University at Raleigh	208
16	Purdue University, all campuses	207
17	Arizona State University	205
18	Northeastern University	203
19	University of Illinois at Chicago	200
20	University of Maryland at College Park	194

See appendix table 6-8.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

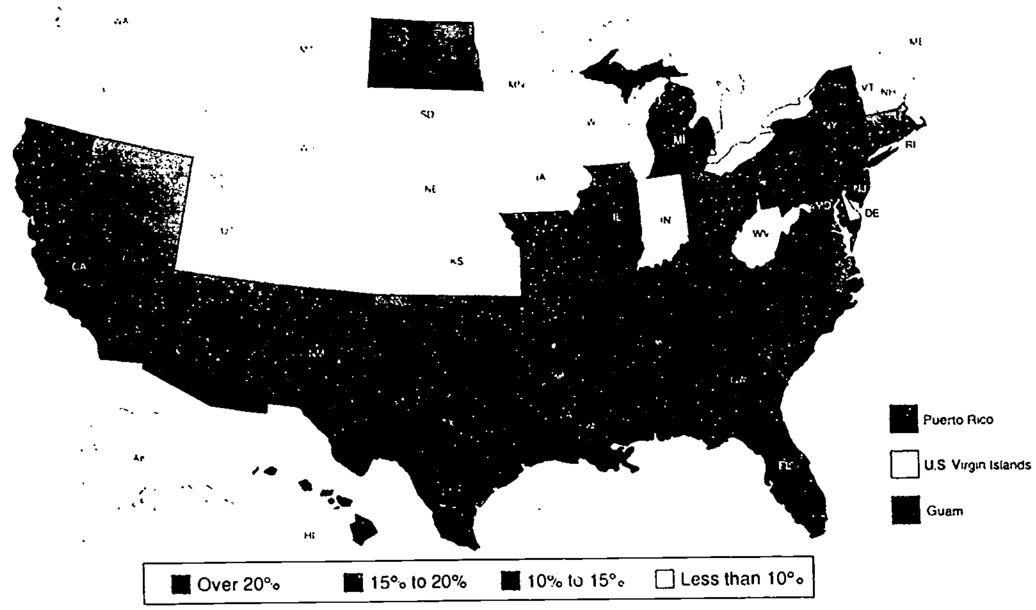
at 79 percent of the total enrollment. (See figure 6-10.) The drop in the share of students of unknown race/ethnicity was from 9 to 5 percent.

Field Choices

Students of different racial/ethnic groups varied widely in their choice of fields of study. (See appendix tables 6-14 to 6-18.) For example, 39 percent of Asian science and engineering graduate students were enrolled in engineering fields, compared with 23 percent of whites, 20 percent of Hispanics, 14 percent of American Indians, and 15 percent of blacks. (See figure 6-11.) The 3,800 Asians enrolled in electrical engineering—more than one-tenth of all graduate students in this field—largely accounted for the heavy concentration of Asians in engineering.

Conversely, 38 percent of all black graduate students in science and engineering were in social science fields, compared with 32 percent of American Indians and 29 percent of Hispanics, but only 12 percent of Asians. Similarly, only 6 percent of the Asian students were enrolled in psychology, whereas stu-

Figure 6-12.
Concentration of minority graduate students in science and engineering, by State: fall 1992



NOTE: Percentages of U.S. citizen graduate students.

See appendix table 6-9.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

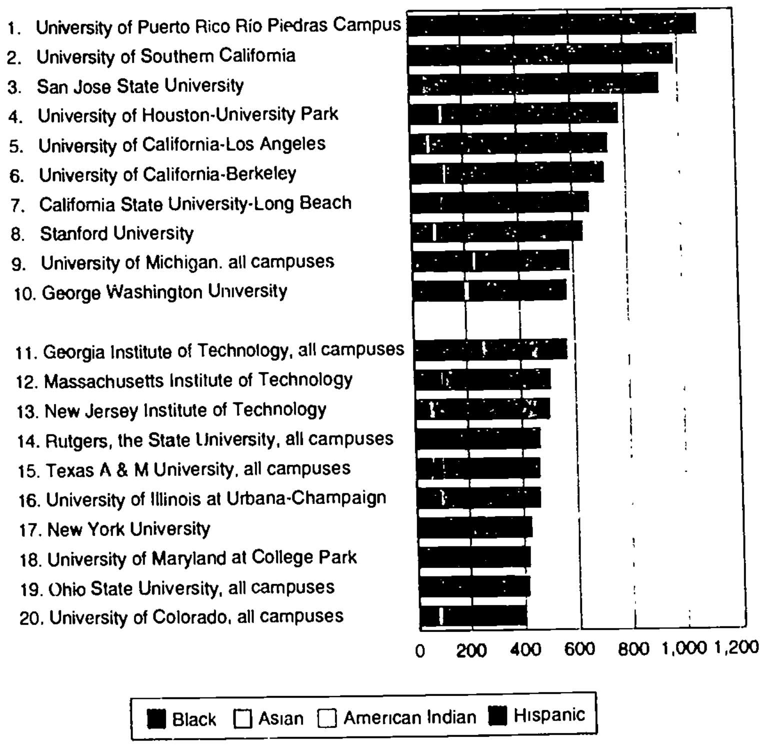
dents in psychology represented 17 percent to 23 percent of the total number of science and engineering graduate students from all other racial/ethnic groups.

Geographic Distribution

The population of minority racial/ethnic groups is differentially distributed around the country. (See figure 1-2.) Similarly, the graduate student population reflects regional concentrations of minority groups. Puerto Rico, with an almost entirely Hispanic population, had the highest percentage of minority graduates enrolled in science and engineering, 91 percent, virtually all Hispanic. (See figure 6-12.) Asians made up significant proportions of the totals in Guam and Hawaii (48 percent and 27 percent, respectively), where they are highly represented in the general population, though in neither case were they a majority. Minorities also made up more than one-fifth of total graduate science and engineering enrollment in Mississippi, California, the District of Columbia, Georgia, and Louisiana.

The highest proportions of black graduate students in science and engineering were in the southern States. (See appendix tables 6-19 to 6-21.) American Indians tended to be more heavily represented in the West. Aside from their concentration in their high-population ar-

Figure 6-13.
Minority graduate students in science and engineering at 20 leading institutions: fall 1992



SOURCE: National Science Foundation/SRS. Survey of Science and Engineering Graduate Students and Postdoctorates.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Valuable Snapshots

Racial/ethnic groups within the population change size, both absolutely and relative to other groups (Olivas 1992). And within groups of interest, important variations may occur *within* subpopulations that are masked by conventions in data collection categories (Raya 1994). As a result, many instruments used to collect data are blunt for the purposes of this report.

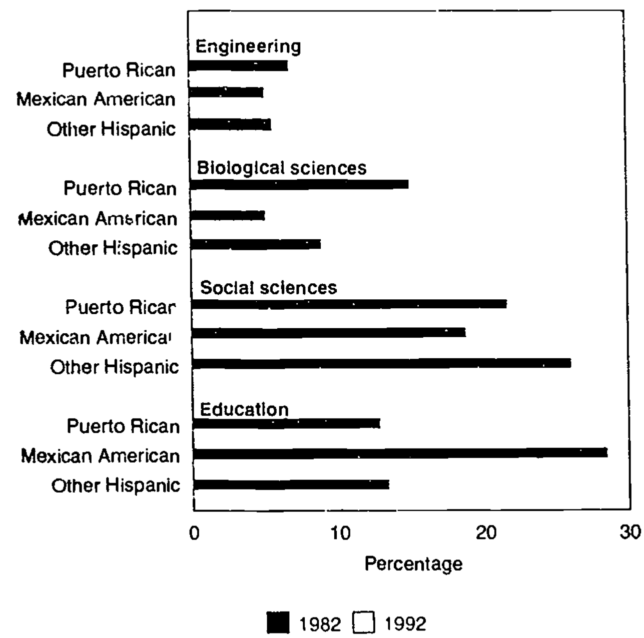
The Graduate Record Examination (GRE) asks test-takers to report their ethnic backgrounds and provides three categories for persons to report Hispanic ethnicity: "Mexican American," "Puerto Rican," and "Other Hispanic." (See appendix table 6-30.) These data provide an opportunity to explore intragroup characteristics that are often impossible to analyze with other data sets and to highlight differences that would normally be concealed within a single data category.

For example, the percentage changes between 1982 and 1992 in the total number of GRE test-takers in the three subpopulations are quite different: more than 200 percent for "Other Hispanic," 118 percent for Mexican Americans, and 62 percent for Puerto Ricans.

In terms of intended areas of graduate study, the three subgroups display different patterns. (See figure 6-14.) Mexican Americans, for example, have traditionally shown greater levels of interest in studying education at the graduate level, though this interest has declined somewhat as indicated by GRE test-taking. Interest in the biological sciences was highest among Puerto Ricans in 1982 but had fallen precipitously by 1992. The percentage of GRE test-takers who intended to continue into graduate engineering study had increased in all three groups by 1992.

Data on GRE test-takers do not necessarily provide a complete picture, but they do indicate aspirations for study at the highest levels of U.S. higher education and in which broad fields the aspiring examinees are interested. Despite changes in the mix of broad fields of interest, the GRE data show that in 1992 versus 1982, greater numbers of U.S. citizens identifying themselves as ethnically Hispanic hoped to study science and engineering at the highest levels. In 1982, 952 test-takers identified themselves in one of these three ethnic categories and identified the social sciences, biological sciences, physical sciences, or engineering as their intended area of study. (See appendix table 6-29.) By 1992, the corresponding number had grown to 2,205, more than a two-fold increase over the decade.

Figure 6-14.
Intended areas of graduate study among Hispanic American Graduate Record examinees, by ethnic subgroup: 1982 and 1992



See appendix table 6-29.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

eas of Hawaii, California, and Guam, Asians showed little discernable pattern in their choice of graduate schools. In addition to their majority status in Puerto Rico, Hispanic graduate science and engineering students were most heavily concentrated in the Southwest and in Florida.

Minority science and engineering graduate students are enrolled in just over 80 percent of the institutions offering graduate programs, 539 out of 665. The top 10 institutions enrolled 15 percent of all minority graduate science and engineering students; the top 20 enrolled 24 percent. (See figure 6-13.) Of the 10 institutions with the largest proportions of black science and engineering graduate students, 4 were Historically Black Colleges and Universities. (See appendix table 6-22.) The 10 institutions with the highest black enrollment accounted for 14 percent of all black graduate students in science and engineering fields. The 10 institutions with the highest Hispanic enrollment accounted for 23 percent of all Hispanic graduate students in science and engineering in the United States. (See appendix table 6-23.) Almost one-fifth of American Indian graduate students in science and engineering were enrolled in the 10 institutions with the highest American Indian enrollment. (See appendix table 6-25.) Twenty-two percent of all Asian science and engineering graduate students were enrolled in the 10 leading institutions. (See appendix table 6-24.)

Persons With Disabilities

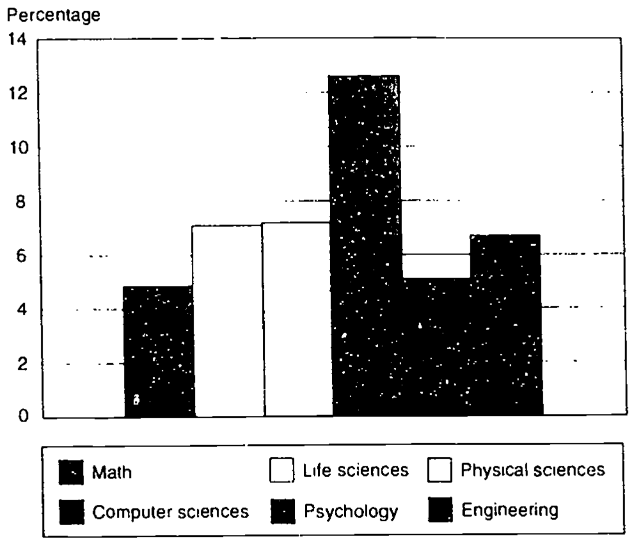
Characteristics of the graduate student population were similar to those of the undergraduate population with respect to comparisons of the total student body to students reporting that they had a disability. About 7.5 percent of graduate students reported a disability, almost the same percentage as for undergraduates; the shares were almost equal for male and female students. Veterans as a group included a higher proportion of persons with disabilities than did nonveterans; older students (30 years old and older) also had higher proportions with disabilities than did younger students. (See appendix table 6-31.)

Persons with disabilities comprise larger proportions of the graduate student population in some disciplines than in others; the proportion of students with disabilities was higher in psychology, nearly 13 percent, and lower in mathematics (under 5 percent) and physical sciences (just over 5 percent).[1] (See figure 6-15.) Engineering also has one of the lower proportions of students with disabilities, 7 percent, based on self-reported surveys.

Despite the similarities in undergraduate and graduate student comparisons, there is some evidence that the transition to graduate education may be difficult for students with disabilities in some fields. A project to study engineering students with disabilities identified only about one-third as many of the graduate students as of undergraduates as having a disability. The proportions were even smaller at higher enrollment levels: The percentage of master's candidates in engineering who had disabilities was more than twice as high as the percentage of doctoral candidates with disabilities (0.5 percent versus 0.2 percent) (Engineering Workforce Commission 1994). (See appendix table 6-33.)

The percentages of graduate engineering students with disabilities reported by institutions able to respond was only about one-third of 1 percent and the percentage was virtually the same for women as for men. The most common disability among these engineering graduate students was mobility impairment, followed by multiple disabilities and learning disabilities. (See figure 6-16.) The engineering specialty chosen by the largest number of students was electrical/computer engineering.

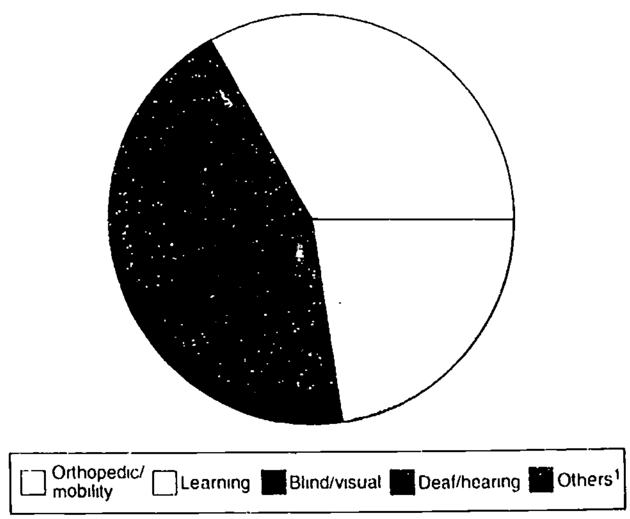
Figure 6-15.
Percentage of graduate students reporting a disability, by field: 1989-90



See appendix table 6-31.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 6-16.
Types of disability for engineering graduate students: fall 1992



[1] Includes multiple disabilities

See appendix table 6-32.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

[1] These data are from the U.S. Department of Education, National Center for Education Statistics, National Postsecondary Student Aid Study, 1990 Respondents were college students, both undergraduate and graduate. Among the questions ascertaining demographic and enrollment characteristics, students were asked if they had a functional limitation, disability, or handicap. Each survey participant responded to a set of six separate questions about particular disabilities. The responses were weighted to produce national estimates for the student population. See Technical Notes for more information.

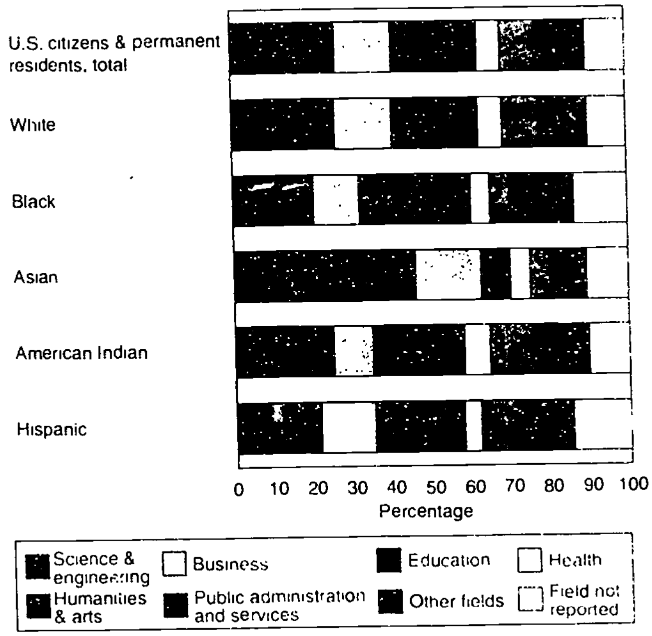
Field Choices of Graduate Students

Female graduate students were considerably more likely to be enrolled in non-science and engineering fields in 1992 than were men (Syverson and Maguire 1994, p. 4).[4] Women were the majority in all non-science and engineering areas except business—ranging from 75 percent in the health fields to 54 percent in the humanities and arts. (See figure 6-17.)

The field choices of graduate students vary considerably among the different racial/ethnic groups. Almost one-half of the U.S. citizens who were Asian were enrolled in science and engineering programs, compared to one-fourth or less in every other group.

[4] This survey, conducted by the Council of Graduate Schools and the Educational Testing Service, includes universities that are members of the Council of Graduate Schools. Percentages are based on the number reporting their sex or race/ethnicity.

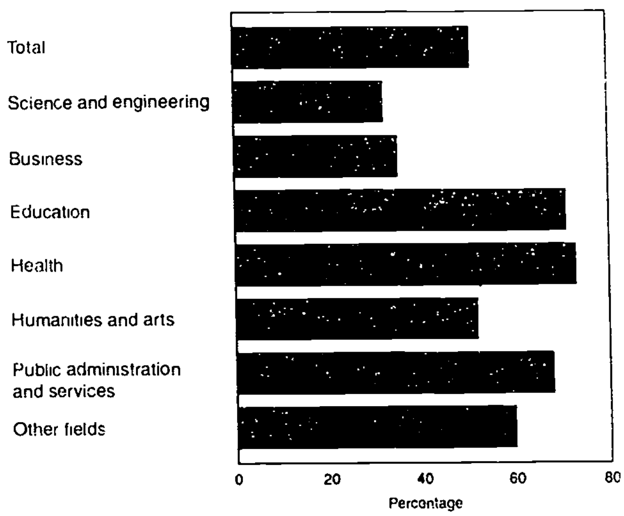
Figure 6-18.
Field distribution of graduate students with U.S. citizenship, by race/ethnicity: 1992



SOURCE: Council of Graduate Schools 1994 *Graduate Enrollment and Degrees: 1986 to 1992* Washington, DC: Council of Graduate Schools.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 6-17.
Women as a percentage of all graduate students, by field: 1992



SOURCE: Council of Graduate Schools. 1994. *Graduate Enrollment and Degrees: 1986 to 1992.* Washington, DC: Council of Graduate Schools.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

The most popular non-science and engineering field for most groups was education, which accounted for more than 20 percent of every group except Asians, only 7 percent of whom were in education. Asian students in non-science and engineering were more likely with be studying business, 17 percent, compared to 15 percent of whites and as few as 10 percent of American Indian students. (See figure 6-18.)

Only one-third of non-U.S. citizens on temporary visas were enrolled in non-science and engineering programs, and of these the largest group—12 percent—was studying business (Syverson and Maguire 1994, p. 12).

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CHAPTER 7

GRADUATE EDUCATION: OUTCOMES

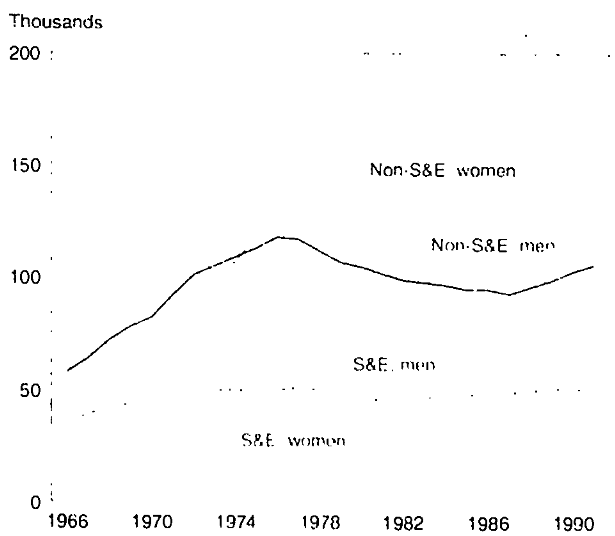
Earned degrees marking the formal outcomes of graduate education represent important credentials for those pursuing science and engineering careers. Data on these outcomes provide benchmarks for measuring the progress of population groups in increasing their representation in these fields.

Graduate education has expanded significantly during the past 25 years. The overall trends in degree awards document the pattern of growth: For about 10 years, from approximately the mid-1960's until the mid-1970's, there was sustained and rapid growth. From that point forward, increases occurred, but they were slower, limited to certain discipline areas, or marked by interim periods of decline. Degree awards in science and engineering fields increased more slowly than those in non-science and engineering. Even so, at both the master's and doctoral degree levels, the science and engineering awards just about doubled—a [illegible]1 percent increase for master's degrees, a 111 percent increase for doctorates.

Periods of expansion generally offer environments in which barriers may fall or ease. While change has in fact occurred, during the last 25 years the magnitudes of increases for underrepresented groups are strikingly different and in many instances do not approach the level of overall increase. A variety of factors unique to each group or to particular situations appear to have influenced outcomes, making generalizations difficult. This chapter analyzes the trends in degree awards as a means of monitoring progress.

The representation of women in graduate science and engineering degrees has increased substantially, although it lags behind their representation in non-science and engineering fields. At both the master's degree and doctoral degree levels, women now receive more than half of all degrees in non-science and engineering fields (59 percent of master's degrees and 52 percent of doctorates). They receive much smaller proportions of the degrees in science and engineering at these levels, 36 and 29 percent. (See figures 7-1 and 7-4.)

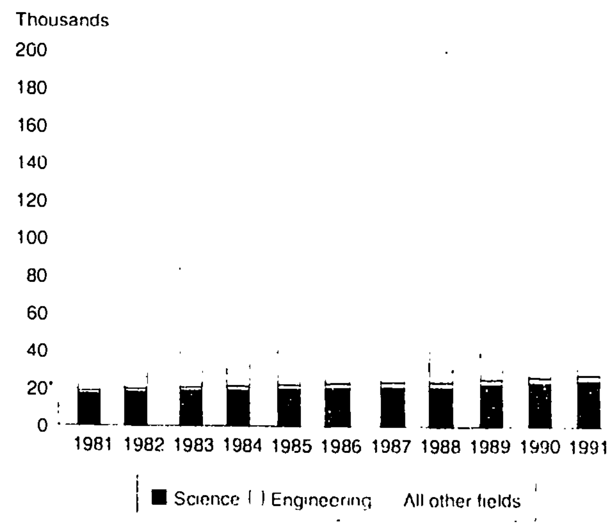
Figure 7-1.
Master's degrees awarded in science and engineering (S&E) fields and in non-S&E fields, by sex: 1966-1991



See appendix table 7-1

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

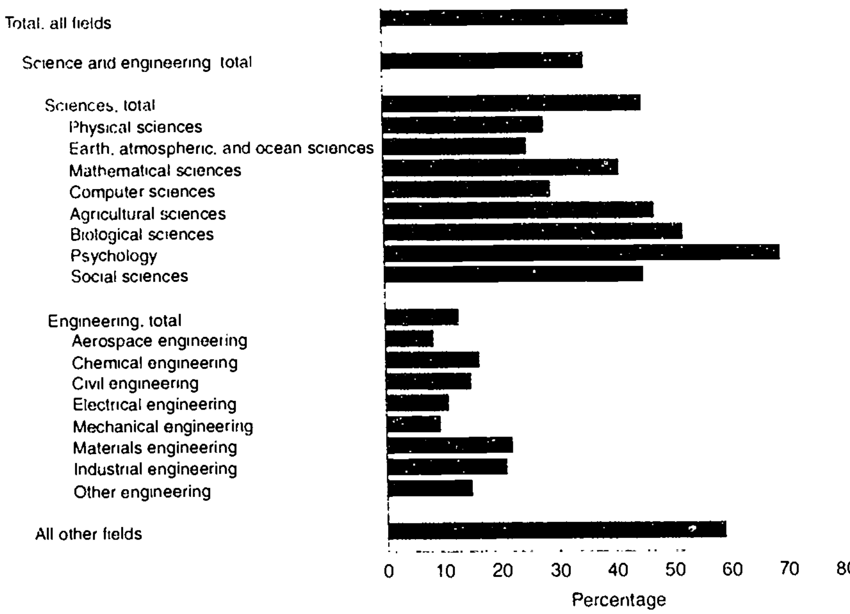
Figure 7-2.
Master's degrees awarded to women, by field: 1981-1991



See appendix table 7-2.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

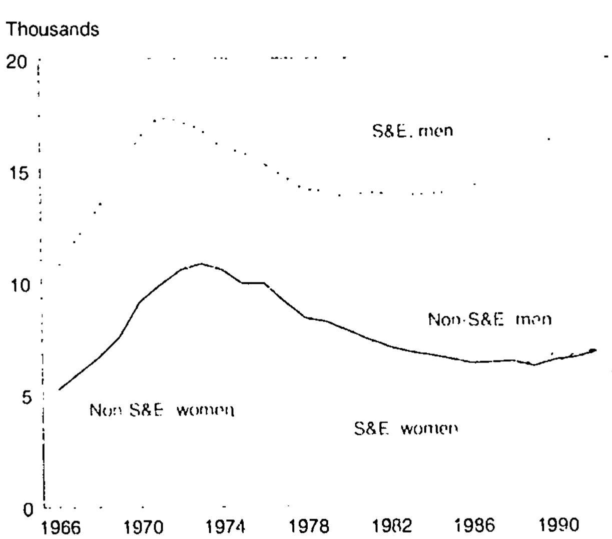
Figure 7-3.
Percentage of master's degrees awarded to women, by field: 1991



See appendix table 7-3.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 7-4.
Doctoral degrees awarded in science and engineering (S&E) fields and in non-S&E fields, by sex: 1966-1992



See appendix table 7-1.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Across racial/ethnic groups, participation varies by group as well as by degree level. However, increases occurred in total degree awards (all disciplines) during the last decade to whites, to Asians, and to underrepresented minorities.

Factors other than group identification also need to be incorporated in the examination of the data on graduate outcomes. Disaggregation of race/ethnicity by gender reveals additional differences: Generally, women have increased their participation in science and engineering fields, while men do not show a consistent pattern. In addition, at the level of the doctorate especially, the citizenship of degree recipients must be noted.

To present the trends in degrees as consistently as possible with available data, the presentation of trends for racial/ethnic groups in this chapter will show data for those recipients who are U.S. citizens and foreign citizens who are permanent residents. Data on foreign citizens on temporary visas are noted in summary comments, and included in tables, but factored out of the discussions. In examining doctorate recipients, information is also presented for U.S. citizens only, on the presumption that these individuals are the most likely to have received their education in its entirety within this country and, hence, that their representation reflects the ability of the U.S. educational system to provide access to careers as scientists and engineers for all groups.

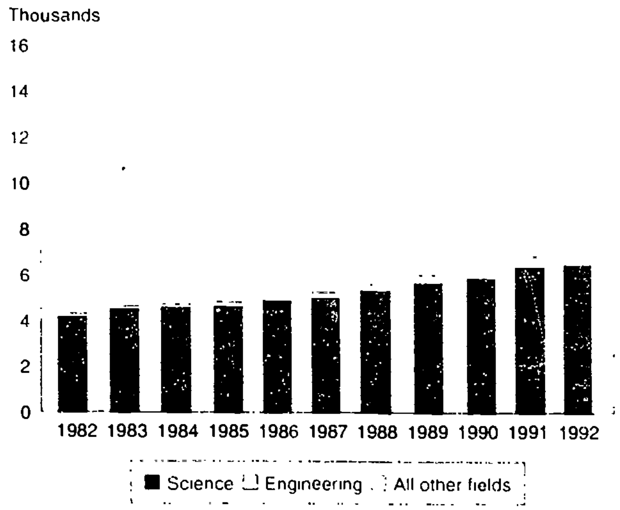
Women

Master's Degrees

Of the 338,498 master's degrees awarded in all fields in 1991, 181,603, or 54 percent, were earned by women.[1] They first received a majority of all master's degrees in 1981; they earned more than half the non-science and engineering degrees beginning in 1975. In science and engineering fields, both the number of women earning master's degrees and their percentage of the total have risen steadily, increasing in the last 10 years to 27,927, with their share of the

[1] This report presents the latest data available at each degree level. For master's degrees, data are shown through 1991. Data for doctorates are available for 1992.

Figure 7-5.
Doctorates awarded to women, by field: 1982-1992



See appendix table 7-5.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

total rising to 36 percent. (See figures 7-2 and 7-3.) In contrast, the number of science and engineering degree awards to men reached a high in 1977 that has been equalled only once since then, in 1990.

There were important differences in the degree awards to women by field. In the science fields as a whole (excluding engineering), women steadily increased their share of the master's degrees awarded, so that by the end of the decade their percentage of master's degrees was approaching the percentage of women in the population. By 1991 women, who represent 51 percent of the U.S. population, accounted for 45 percent of science master's degrees, up from 37 percent a decade earlier. (See appendix table 7-2.)

Among the science fields, women were most heavily represented in psychology, earning almost 70 percent of the master's degrees, up from 58 percent in 1981; biological sciences (52 percent in 1991, 39 percent in 1981); and social sciences (almost 46 percent in 1991). Men were most heavily represented in earth, atmospheric, and ocean sciences (74 percent of the degrees) and the physical sciences (72 percent).

Women remained underrepresented in engineering, although the percentage of master's degrees earned by women did increase, from 8 percent to 14 percent. (See figure 7-3 and appendix table 7-3.)

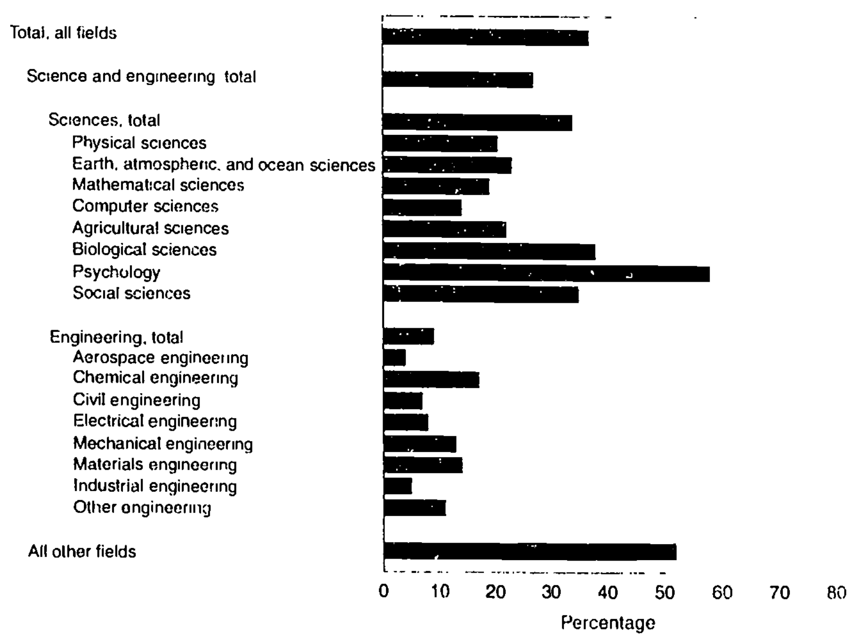
The top 50 institutions ranked on master's degrees awarded to women accounted for 34 percent of the science and engineering master's degrees awarded to women. (See appendix table 7-4.)

Doctorates

The trends in doctorates parallel those in bachelor's and master's degrees. Women of all citizenship groups earned 14,366 of the 38,814 doctorates awarded in all fields in 1992, 37 percent of the total. In nonscience and engineering, women earned 52 percent of the doctorates awarded in 1992, up from 45 percent a decade earlier. (See figure 7-4.) In science and engineering, women earned 29 percent of the doctorates awarded in 1992, up from 24 percent of the total in 1982. The numeric increase in doctoral degrees in science and engineering awarded to women, from 4,307 in 1982 to 6,956 in 1992, was an increase of almost 62 percent. (See figure 7-5.)

Important differences marked trends in science and engineering fields. In science as a whole (excluding engineering) women received 34 percent of the doctorates in 1992, a sizeable increase from 27 percent in 1982. (See appendix table 7-6.) In 1992 women

Figure 7-6.
Percentage of doctorates awarded to women, by field: 1992



See appendix table 7-6.

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

earned the highest percentage of doctorates in psychology (59 percent), the only broad science field in which women received a majority of the doctorates. Psychology was followed by biological sciences (38 percent of all awards to women) and the social sciences (35 percent). (See figure 7-6.) Men, on the other hand, earned the highest percentage of doctorates in engineering (91 percent), computer sciences (86 percent), and mathematical sciences (81 percent). (See appendix table 7-5.)

Although the number of women earning doctorates in engineering remained small in 1992—503, less than 10 percent of the total—it was still a major increase from 1982. (See appendix table 7-6.) A decade earlier only 124 women had earned engineering doctorates, less than 5 percent of the total. In the physical sciences, women more than doubled their number of doctoral degrees, from 357 in 1982 to 765 in 1992.

Text table 7-1.
Master's degrees awarded in science and engineering (S&E) fields and in non-S&E fields to U.S. citizens and non-U.S. citizens on permanent visas, by race/ethnicity: 1981 and 1991

Race/ethnicity	1981	1991	Percentage change
S&E, total[1]	68,892	70,764	2.7
White	60,407	59,265	-1.9
Asian	2,481	4,736	90.9
Underrepresented minorities	6,004	6,763	12.6
Non-S&E, total[1]	204,292	214,496	5.0
White	180,848	188,259	4.1
Asian	3,823	6,334	65.7
Underrepresented minorities	19,621	19,903	1.4

[1] Total includes U.S. citizens and foreign citizens on permanent visas.
NOTE: Includes degrees in engineering technology.

See appendix table 7-12.

Women, Minoriti · and Persons With Disabilities in Science anc ·ıgineering: 1994

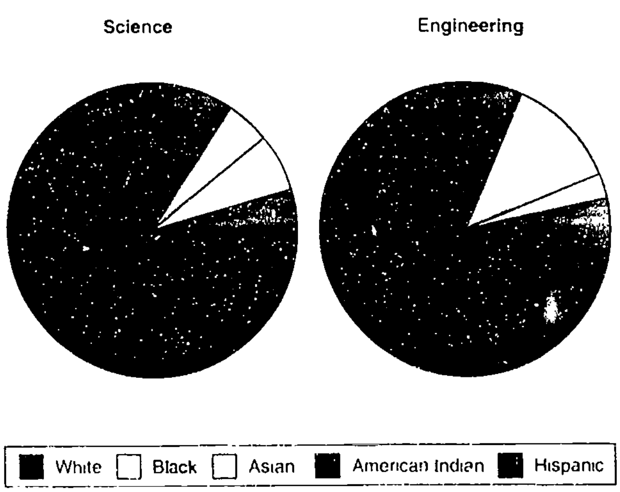
Minorities

Master's Degrees

Persons in minority groups who were U.S. citizens or permanent residents earned 11,499 master's degrees in science and engineering in 1991, 12 percent of the total (including awards to foreign citizens). This was an increase from 1981, when 8,485 minority group members earned science and engineering master's degrees, slightly less than 11 percent of the total. The increase was due primarily to substantial growth in the number of awards to Asians receiving science and engineering master's degrees, which was large enough that their numbers nearly doubled. (See text table 7-1 and figure 7-7.) The number and percentage of science and engineering master's degrees earned by underrepresented minorities—blacks, Hispanics, and American Indians—rose by only 13 percent between 1981 and 1991. (See figure 7-8.)

Among minority groups, gender differences were striking. At the master's level, awards to women increased more in science and engineering than in non-science and engineering fields. (See figure 7-9.) For men, awards in both non-science and engineering and science and engineering fields decreased for several groups. Only for Asian men did an increase in sci-

Figure 7-7.
Race/ethnicity of science and engineering master's degree recipients: 1991



NOTE. U.S citizens and permanent residents only

See appendix table 7-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

Baccalaureate Origin Institutions

Liberal arts colleges in general, and women's liberal arts colleges in particular, played an important role in the education of women receiving science and engineering bachelor's degrees who subsequently continued their education and earned a doctorate in science and engineering. The Nation's top 50 baccalaureate-granting institutions for science and engineering doctorates earned by women between 1988 and 1992 include liberal arts colleges and women's colleges as well as large universities. (See appendix table 7-8.)

ence and engineering awards exceed an increase in non-science and engineering awards.

Asians

Between 1981 and 1991, the number of Asians earning master's degrees in science and engineering (including only U.S. citizens and permanent residents) increased from 2,481 to 4,676. (See appendix table 7-9.) As a result of this large increase, by 1991 Asians were earning more science and engineering degrees than either blacks or Hispanics, even though they were a much smaller proportion of the population than either of these groups. By 1991 Asians accounted for 5 percent of all science and engineering master's degrees, up from 3 percent in 1981.

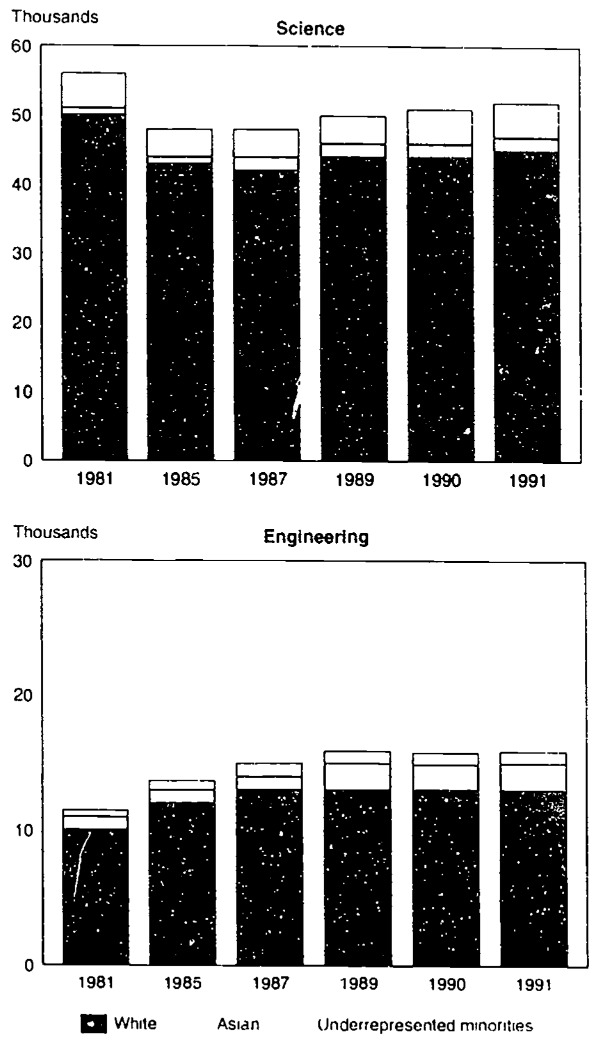
The increases were especially striking in computer science and in engineering. These dramatic increases took place wnen the number of science master's degrees earned by U.S. citizens and permanent residents overall declined nearly 1 percent and the total number of engineering master's degrees rose significantly.

Blacks

Some progress was made in increasing the representation of blacks in science and engineering at the master's degree level between 1981 and 1991. Blacks earned 3,872 science and engineering master's degrees in 1991, 4 percent of the total earned by all awardees and over 5 percent of those earned by U.S. citizens and permanent residents. (See appendix table 7-9.) This was a slight increase in numbers of science and engineering master's degrees awarded to blacks over the 3,695 they earned a decade earlier. The only recorded gains occurred in awards to women: master's degree awards to black men in science and engineering declined during the decade. The slight progress in science and engineering master's degree awards to blacks—all attributable to women—contrasts with the awards in all fields combined. Both in absolute number and in percentage of the total, master's degrees to blacks decreased. In 1991, blacks earned 15,857 master's degrees in all fields, not quite 6 percent of the master's degrees earned by all U.S. citizens and permanent residents. (See appendix table 7-12.)

Social science accounted for almost 15 percent of all of the master's degrees awarded to blacks (compared with 10 percent of all master's degrees earned by U.S. citizens and permanent residents). Despite generally slow increases during the last decade, some disciplines offered exceptions. The number of blacks awarded master's degrees in engineering grew faster than the annual increase for all U.S. citizens. The biggest gain was in computer science—only 70 blacks earned master's degrees in 1981 compared with 283 a decade later.

Figure 7-8.
Science and engineering master's degrees awarded to U.S. citizens and permanent residents, by race/ethnicity: 1981-1991, selected years



See appendix table 7-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

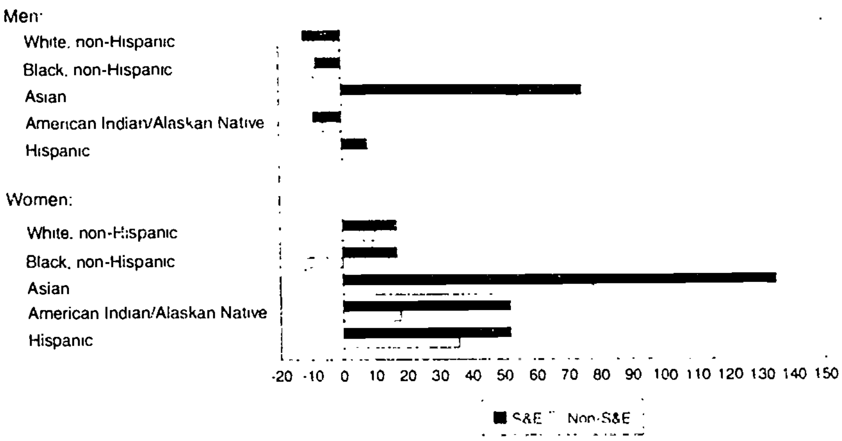
Hispanics

The overall trend for Hispanics earning master's degrees in science and engineering was similar to that for blacks, with modest growth over the decade. In contrast to blacks, however, there were gains for both men and women, though the gains for men were smaller than for women. Hispanics earned 2,594 science and engineering master's degrees in 1991, 4 percent of the total earned by U.S. citizens and permanent residents. This was a modest increase in numbers from the 2,052 who earned science and engineering master's degrees a decade earlier; the percentage of the total was up from 3 percent in 1981. In

1991, Hispanics earned almost 10,000 master's degrees in all fields, just over 3 percent of the total earned by U.S. citizens and permanent residents. Again, this was a modest increase from 1981, when Hispanics earned just under 3 percent of the master's degrees awarded to U.S. citizens and permanent residents that year.

The science and engineering field with the largest number of awards at the master's degree level for Hispanics, as for blacks and for whites, was social science. (See figure 7-10.)

Figure 7-9.
Percentage change in science and engineering (S&E) and non-S&E master's degrees, by sex and race/ethnicity: 1981-91



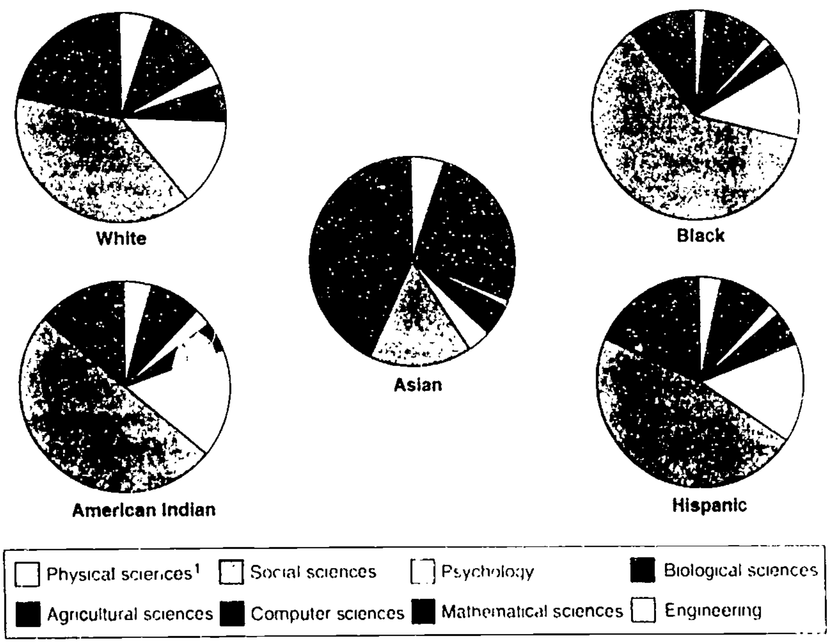
See appendix table 7-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

American Indians

The extremely small number of American Indians earning master's degrees—slightly more than 1,125 in all fields in 1991, less than 0.4 percent of all master's degrees—makes comparisons and generalizations difficult. Fewer than 300 American Indians earned master's degrees in science and engineering in 1991; this figure was up slightly from 1981, though the number of awards to men decreased, while the awards to women rose 52 percent. The most popular fields were social science (13 percent of all master's degrees earned by American Indians), psychology (4 percent), and engineering (4 percent). In each of these fields there was a modest increase from 1981. Awards in social science rose from 142 in 1981 to 148; psychology went from 32 to 49; and engineering went from 31 to 40.

Figure 7-10.
Field distribution of science and engineering master's degree recipients, by race/ethnicity: 1991



[1] Includes earth, atmospheric, and ocean sciences

See appendix table 7-9

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Geographic Distribution

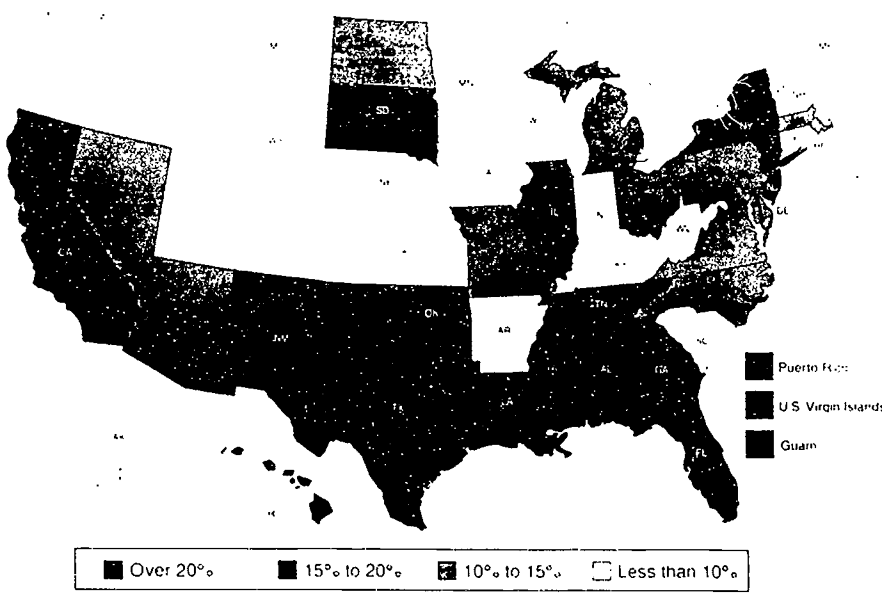
Minorities receiving science and engineering master's degrees were not uniformly distributed across the country. (See figure 7-11 and appendix tables 7-13 to 7-21.) As is the case with bachelor's degrees, regional concentrations occurred except in the case of Asians.

Doctorates

Citizenship

U.S. universities occupy a position of world leadership in science and engineering doctoral education. Consequently, they award degrees to a diverse group of individuals in terms of citizenship as well as race/ethnicity. In addition, the composition of each of the citizenship groups receiving doctoral awards is diverse. (See text table 7-2.) Whites constituted only 21 percent of the doctoral recipients who were non-U.S. citizens

Figure 7-11.
Percentage earned by minorities of all science and engineering master's degrees awarded to U.S. citizens and permanent residents, by State: 1991



See appendix table 7-13.

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

on temporary visas, whereas they were 88 percent of the U.S. citizens.

U.S citizens and permanent residents earned 15,706 doctorates in science and engineering fields in 1992, 10 percent more than they had earned a decade earlier. Of this number, 14 percent were earned by minorities, with 6 percent earned by underrepresented minorities. (See text table 7-3.) The increases were largest in percentage terms among Asians; this group registered substantial increases among both men and women in science and engineering as well as non-science and engineering fields.

Gender differences are important within racial/ethnic groups. Most notably, doctorates in science and engineering awarded to white men who were U.S. citizens or permanent residents declined between 1982 and 1992, while awards to white women increased 30 percent. Within underrepresented minorities, awards to both men and women increased in science and engineering for Hispanics and American Indians, while the number for black men decreased slightly. (See figure 7-12.)

Disaggregating doctoral degree recipients between U.S. citizens and non-U.S. citizens on permanent visas reveals that among the minority group members receiving doctorates in science and engineering, more than half of the Asians were on permanent visas, a much higher proportion than for other minority groups. Among U.S. citizens, steady increases among Asians and Hispanics contrast with much smaller increases for blacks. (See figure 7-13.)

In 1992, U.S. citizens earned 25,759 doctorates in all fields, an increase from the 24,391 reported in 1982. (See figures 7-14 and 7-15.) Minority citizens of the United States earned 10 percent of the total doctorates awarded to U.S. citizens, up from about 9 percent of the total in 1982.

As was the case with master's degrees, much of the increase in science and engineering doctorates was accounted for by Asians and whites. There was a much more modest growth in the number of Hispanic and American Indian science and engineering doctorate recipients, and the number of black science and engi-

Text table 7-2.
Percentage distribution of science and engineering (S&E) doctorates, by citizenship status and race/ethnicity: 1992

	U.S. citizens	Non-U.S. citizens: Permanent visas	Non-U.S. citizens: Temporary visas
Number:			
Total S&E doctorates	14,262	1,358	8,014
Percentage distribution:			
Total	100.0	100.0	100.0
American Indian	.5	0.0	1.0
Black	2.1	6.1	2.4
Hispanic	2.9	5.7	4.5
Asian	4.4	50.3	67.9
White	88.4	34.1	21.0
Unknown	1.6	3.8	4.2

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates, 1992.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Time to Completion of the Ph.D.: What Factors Make a Difference?

Concern over attrition rates has directed attention to factors that lengthen the time between entry into graduate study and completion of the doctoral degree. A study by the University of California of its own graduates from nine campuses between 1980 and 1988 considered several factors (Nerad 1991). Their impact was examined for men and women and for racial/ethnic groups. While the study provides information only on those who completed doctorates, it documents differences in factors believed to contribute to attrition.

- Completion times average less for persons in science and engineering fields than for all doctorate recipients; arts and humanities graduates and those in professional schools take considerably longer.

- Having dependents lengthens the time for completion of the doctorate. The additional time differs for men and women, however, and is greater for women than for men in some science and engineering fields. Dependents made only small differences in social sciences, with men and women about equally affected.

- Financial resources to support graduate study also make a difference in completion times for all students. Those supported primarily by fellowships or loans, or by assistantships (either research or teaching), completed degrees in much less time than those relying on their own or other resources. For all disciplines, completion times for all doctorate recipients were 7 years for those with research assistantships and 11 years for those relying on their own or other resources.

- The effect of different types of assistance is not the same for all groups or all disciplines. Differences across racial/ethnic groups between those receiving research assistantships and those relying on their own resources were somewhat greater in the physical sciences than in the social sciences. The amounts by which completion times in physical sciences were longer were 3.1 years for Asians, 2.9 years for whites, and 1.2 years for underrepresented minorities. In the social sciences, the racial/ethnic groups showed fewer differences within the field: Relying on one's own resources increased completion time by 2.7 years for Asians, 2.8 years for whites, and 2.4 years for underrepresented minorities.

neering doctorate recipients stayed virtually level. For all of the *underrepresented* minorities the numbers of science and engineering doctorate recipients in 1992 were very small: 306 blacks, 416 Hispanics, and 69 American Indians.

Text table 7-3.
Doctorates awarded in science and engineering (S&E) fields and in non-S&E fields to U.S. citizens and non-U.S. citizens on permanent visas, by race/ethnicity: 1982 and 1992

Race/ethnicity	1982	1992	Percentage change
S&E, total	14,259	15,706	10.1
White	12,422	13,146	5.8
Asian	767	1,321	72.2
Underrepresented minorities	662	953	44.0
Non-S&E, total	11,360	12,011	5.7
White	9,721	10,279	5.7
Asian	237	410	73.0
Underrepresented minorities	1,172	1,169	-.3

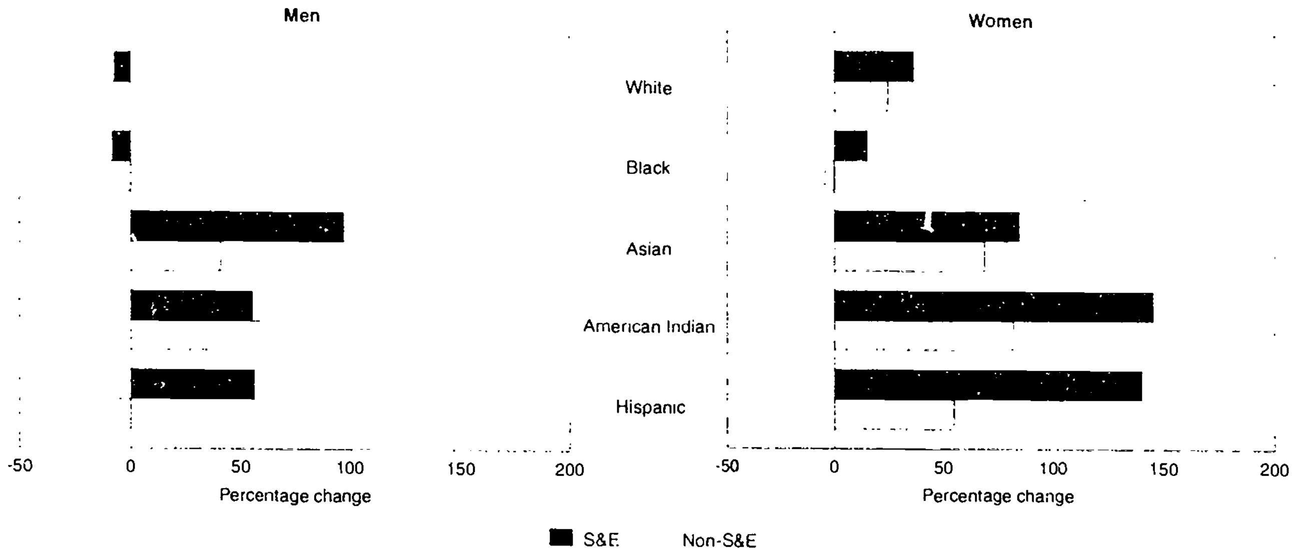
See appendix table 7-22.

Asians

Between 1982 and 1992, Asians who were U.S. citizens increased their representation in doctorates in all fields, earning 828 degrees in 1992, over 3 percent of the total to U.S. citizens. The number of Asian U.S. citizens who earned doctorates in science and engineering increased also, to 636 in 1992—4 percent of all science and engineering doctorates awarded to U.S. citizens. The increases were especially large in engineering.

The distribution of awards between men and women who were Asian U.S. citizens generally paralleled that of awards to U.S. citizens overall, with respect to both increases

Figure 7-12.
Percentage change in science and engineering (S&E) and non-S&E doctorates, by sex and race/ethnicity: 1982-92



NOTE: U.S. citizens only

See appendix table 7-23

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

and distributions across fields. Women had their lowest representation in computer and information sciences, their highest in psychology. Women earned 30 percent of the doctorates awarded to Asian U.S. citizens in science and engineering in 1992.

Blacks

In 1992, both the number and the percentage of black U.S. citizens earning doctorates were lower than in 1982. While there was some fluctuation during the decade, the number never reached the figure for 1982, when blacks had earned 1,047 doctorates in all fields, over 4 percent of the total earned by all U.S. citizens. In 1992, blacks earned 951 doctorates, less than 4 percent of the doctorates earned by U.S. citizens.

In science and engineering, blacks earned 306 doctorates in 1992, just over 2 percent of the total doctorates in those fields earned by U.S. citizens. This was an increase from the 300 who earned science and engineering doctorates a decade earlier. The science and engineering doctorate awards to men fluctuated during the decade. The doctorate awards to women rose 15 percent over the decade to 151.

Blacks earning science and engineering doctorate degrees in 1992 were less likely to earn them in engineering (10 percent) than were U.S. citizens as a whole (15 percent), and one-third as likely to earn them in computer science (1 percent compared with 3 percent). The most popular science and engineering field by far for black U.S. citizens at the doctorate level was psychology, which accounted for almost one-third of all of the science and engineering doctorates awarded. (See figure 7-16.)

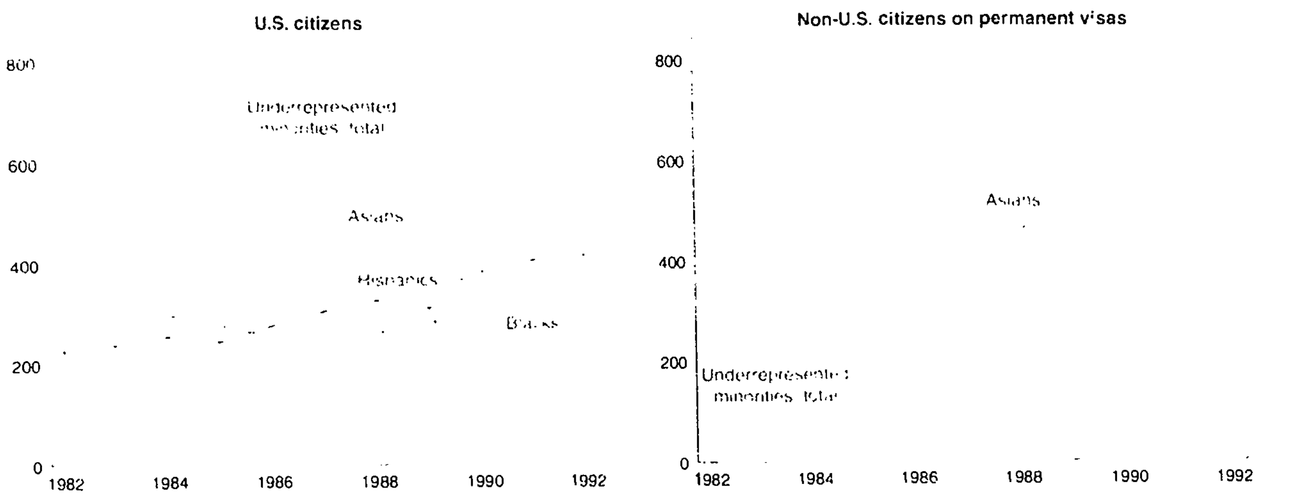
A notable feature of science and engineering doctorates awarded to blacks was the effect of increases for women and decreases for men: In 1992, black women earned 49 percent of the science and engineering doctorates awarded to black U.S. citizens, the highest percentage of awards to women for any racial/ethnic group.

Hispanics

In 1992, Hispanic U.S. citizens earned 755 doctorates in all fields, just under 3 percent of the doctorates earned by all U.S. citizens. This was a numeric increase from 1982, when Hispanic U.S. citizens earned 535 doctorates in all fields, 2 percent of the doctorates awarded to all U.S. citizens that year.

There was an 81 percent increase in the number of science and engineering doctorates earned by Hispanics over the decade, though, as in the case of blacks, the numbers were quite small. In science and engineering, Hispanics who were U.S. citizens earned 416 doctorates in 1992, 3 percent of the total science and engineering doctorates earned by U.S. citizens.

Figure 7-13.
Science and engineering doctorates awarded to minorities, by citizenship status: 1982-1992

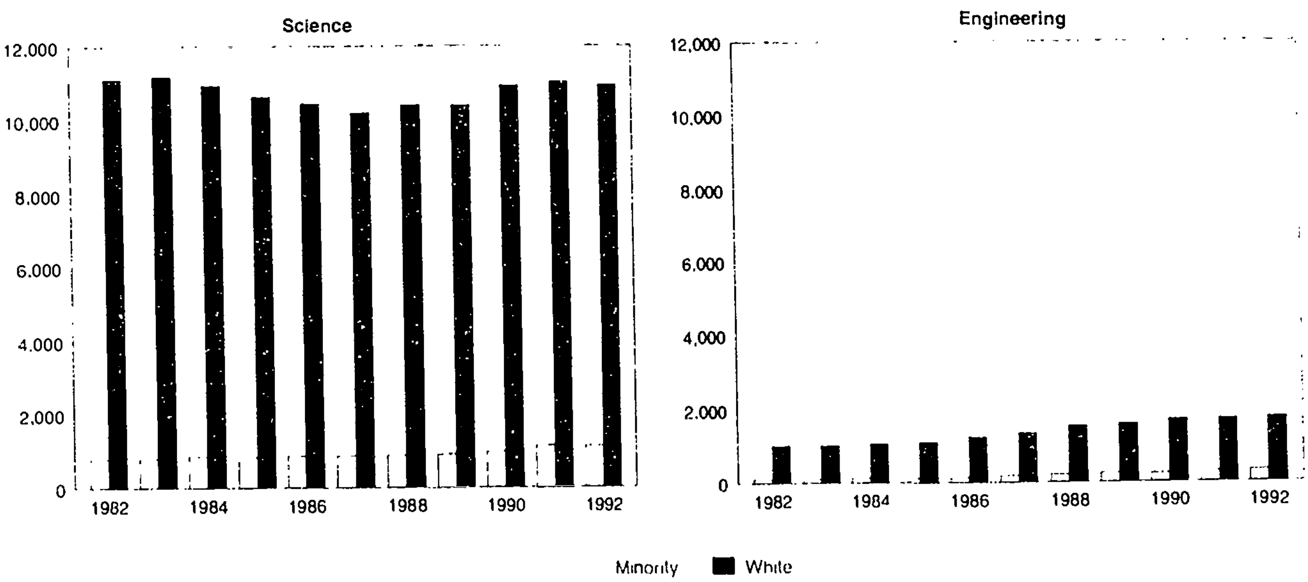


NOTE: Underrepresented minorities includes blacks, Hispanics, and American Indians.

See appendix table 7-22.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

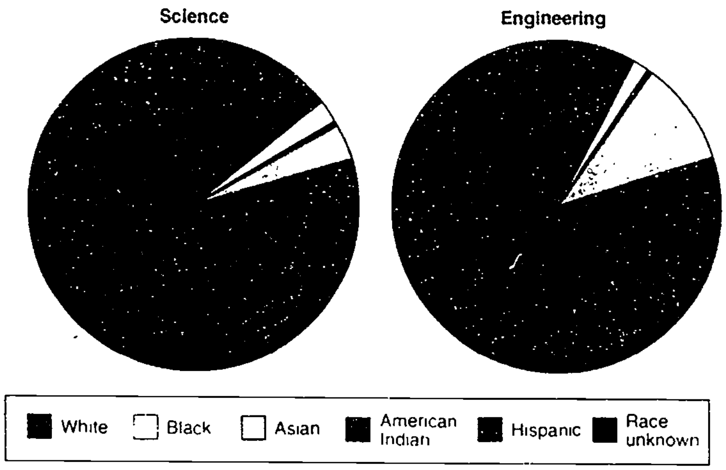
Figure 7-14.
Science and engineering doctorates awarded to U.S. citizens, by race/ethnicity: 1982-1992



See appendix table 7-23

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

Figure 7-15
Race/ethnicity of science and engineering doctorate recipients: 1992



NOTE: U.S. citizens only

See appendix table 7-23.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

This was an increase in numbers from the 230 who earned science and engineering doctorates a decade earlier, and the percentage of the total was up slightly from 2 percent in 1982.

The most popular science and engineering field at the doctorate level for Hispanics was psychology, the field chosen by 26 percent of Hispanics earning science and engineering doctorates.

Doctorate awards to both male and female Hispanic U.S. citizens increased, though the proportionate increase was larger for women (140 percent, compared with 56 percent for men). Hispanic women earned 19 percent of the doctorates in engineering awarded to U.S. citizen Hispanics, a proportion equal to that for black women and higher than that for white women (13 percent).

American Indians

Fewer than 150 American Indians earned doctorates in all fields in 1992, about 0.6 percent of the total. Only 69 Americans Indians earned doctorates in science and engineering in 1992. The most popular field was psychology (22 percent of all science and engineering doctorates).

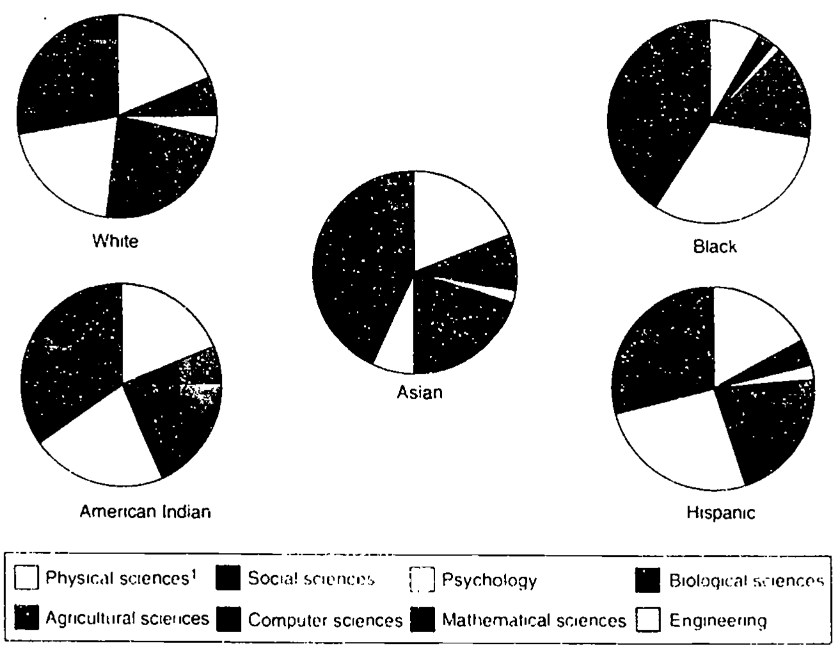
Geographic Distribution

While doctoral education in the United States is considered a national resource, operating to some extent in a national market, awards of science and engineering doctorates to U.S. citizens show regional variations by race/ethnicity. (See text table 7-4 and appendix tables 7-25 to 7-29.)

Persons With Disabilities

The number of science and engineering doctorates earned by people who reported that they had disabilities was very small in 1992, only 280, barely more than 1 percent of the total science and engineering doctoral degrees awarded. Two hundred forty of the science and engineering doctorates earned by people with disabilities were earned in science fields (1.3 percent of the total science doctorates).

Figure 7-16.
Field distribution of science and engineering doctorate recipients, by race/ethnicity: 1992



[1] Includes earth, atmospheric, and ocean sciences

See appendix table 7-12

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

and only 40 were earned in engineering (0.7 percent of the total). (See appendix table 7-30.) Nevertheless, the reported 1992 total represented an increase over 1988, when only 231 persons earning science and engineering doctorates reported having a disability.[2]

The kinds of disabilities reported by science and engineering doctorate recipients have changed over time in several significant ways. First, the percentage of doctorate recipients who reported having a disability identified as orthopedic dropped from 33 percent in 1988 to 19 percent in 1992. (See appendix table 7-31.) As was seen with other surveys in which respondents were requested to identify their disabilities, the percentage who reported having "other" disabilities rose from 23 percent in 1988 to 39 percent 4 years later. This category could account for a large portion of the change. It may indicate that broader views now characterize the concept of disability as well as that the number of persons receiving doctorates who have less apparent disabilities (e.g., learning disabilities, health-related disabilities) is growing.

Types of disabilities may affect the possibilities for advanced study. Suitable accommodation of disabilities in doctoral education may vary by field, also. Science fields are more frequently chosen for doctoral study by persons with disabilities than engineering. Almost 86 percent of persons with disabilities receiving doctorates in science and engineering re-

[2] The question asking doctoral recipients whether they had a disability was somewhat more restrictive in 1988 than in 1992, so some of this increase may be attributable to respondents' interpretation of the question rather than to actual increases. Changes in the willingness of respondents to identify themselves as having a disability may also account for some of this increase over time.

Critical Incidents for Scientists and Engineers With Disabilities

Interviews were conducted with 286 persons with disabilities who were college students or were employed in science and engineering fields to ascertain the factors that had been influential in their choice and pursuit of field.[3] Employing the "critical incident technique," the study asked interviewees to describe four incidents, two negative and two positive, both recent and retrospective, that played an important part in their entry and advancement. A total of 1,280 unduplicated incidents were studied.

Natural groupings of incidents placed them into four categories, which were then further subdivided. A total of 110 types of in idents were noted. The categories, with specific types of incidents cited most frequently (i.e., by 25 persons or more), were

1. Understanding oneself (36 percent of incidents)
   - Being encouraged (or discouraged) by instructors, deans, parents, and significant others.
   - Having self-satisfaction from doing good work or discouragement from poor performance.
   - Receiving recognition for accomplishments.
   - Having outstanding courses or teachers, including special opportunities.
   - Having negative/positive advice toward field.
   - Observing adult role models, mentors, parents.
2. Seeking quality of life as an adult (25 percent of incidents)
   - Dealing with work problems, stresses, and disappointment.
   - Sensing personal accomplishment and making a contribution.
3. Interacting with others (20 percent of incidents)
   - Dealing with negative communication.
   - Interacting with admissions officers, college counselors.
4. Addressing barriers (18 percent of incidents)
   - Coping with limitations of the disabling condition.

More specific topics cited were related to obtaining accommodations in tasks at school and work settings, dealing with requirements imposed by instructors and institutions, overcoming physical barriers, obtaining and using special equipment, and engaging in the job application process.

Responses of men and women differed. The women were more likely than men to have included an incident that related to interacting with others (75 percent of the women compared with 59 percent of the men). More men than women, 70 percent compared with 60 percent, included an incident related to addressing barriers. There was little evidence that the type of career-influencing incident was significantly related to a person's specific disability, whether it was physical or sensory/perceptual. Neither did age at onset of the disability appear to affect the choice of incidents.

[3] The study *Research to Identify Critical Factors Contributing to Entry and Advancement in Science, Mathematics, and Engineering Fields by Disabled Persons* was conducted by American Institute for Research and its subcontractor the American Association for the Advancement of Science, with support from the National Science Foundation (Grant #MDR-8751195). Results are presented in Weisgerber 1991.

Text table 7-4.
Science and engineering doctorates awarded to U.S. citizens, by State/territory and race/ethnicity: 1992

State/territory	Total, U.S. citizens	White	Total minorities	Black	American Indian	Asian	Hispanic	Unknown race	Percentage minorities
United States, total	14,343	12,681	1,427	306	69	636	416	235	9.9
Puerto Rico	10	1	9	0	0	0	9	0	90.0
Hawaii	67	51	15	0	0	12	3	1	22.4
District of Columbia	167	133	33	22	1	6	4	1	19.8
South Dakota	13	11	2	0	1	0	1	0	15.4
Mississippi	79	66	11	3	1	4	3	2	13.9
California	2,118	1,776	291	29	9	169	84	51	13.7
Vermont	23	20	3	1	0	1	1	0	13.0
Arizona	209	180	27	1	5	11	10	2	12.9
Florida	375	324	47	15	3	2	27	4	12.5
Tennessee	217	188	27	15	2	6	4	2	12.4
Illinois	754	649	93	11	5	59	18	12	12.3
Georgia	311	270	38	17	0	12	9	3	12.2
Massachusetts	808	695	91	12	2	47	30	22	11.3
Delaware	65	58	7	4	0	2	1	0	10.8
Wyoming	28	25	3	0	0	2	1	0	10.7
New York	1,339	1,182	141	24	3	71	43	16	10.5
Michigan	492	428	51	19	1	18	13	13	10.4
Texas	773	680	78	17	5	22	34	15	10.1
Oklahoma	113	102	.11	1	2	6	2	0	9.7
Maryland	350	312	33	12	0	14	7	5	9.4
New Mexico	97	84	9	1	2	1	5	4	9.3
New Jersey	304	274	28	3	0	16	9	2	9.2
Washington	255	229	23	3	1	12	7	3	9.0
Alabama	123	110	11	2	2	4	3	2	8.9
Rhode Island	103	94	9	1	1	4	3	0	8.7
West Virginia	35	32	3	1	0	0	2	0	8.6
Ohio	541	488	44	12	0	22	10	9	8.1
Wisconsin	350	319	28	4	4	12	8	3	8.0
Indiana	378	345	29	9	0	12	8	4	7.7
Virginia	334	300	25	10	2	9	4	9	7.5
Colorado	308	278	23	3	1	9	10	7	7.5
Louisiana	135	124	10	4	1	2	3	1	7.4
Missouri	267	243	19	6	2	10	1	5	7.1
New Hampshire	43	40	3	0	0	0	3	0	7.0
South Carolina	117	107	8	2	0	3	3	2	6.8
North Carolina	426	394	29	8	4	10	7	3	6.8
Pennsylvania	756	697	49	13	4	20	12	10	6.5
Oregon	156	145	10	0	2	5	3	1	6.4
Arkansas	34	32	2	2	0	0	0	0	5.9
Minnesota	258	239	15	7	0	4	4	4	5.8
Connecticut	229	210	13	4	0	7	2	6	5.7
Nevada	19	17	1	0	0	1	0	1	5.3
Kansas	153	145	8	2	2	2	2	0	5.2
Utah	132	126	6	1	1	3	1	0	4.5
Kentucky	98	94	4	3	0	1	0	0	4.1
Iowa	189	176	5	1	0	2	2	8	2.6
Idaho	38	36	1	0	0	1	0	1	2.6
Nebraska	66	65	1	1	0	0	0	0	1.5
Alaska	6	6	0	0	0	0	0	0	0.0
Maine	17	17	0	0	0	0	0	0	0.0
Montana	31	30	0	0	0	0	0	1	0.0
North Dakota	34	34	0	0	0	0	0	0	0.0
American Samoa	0	0	0	0	0	0	0	0	—
Guam	0	0	0	0	0	0	0	0	—
Virgin Islands	0	0	0	0	0	0	0	0	—

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates. 1992.

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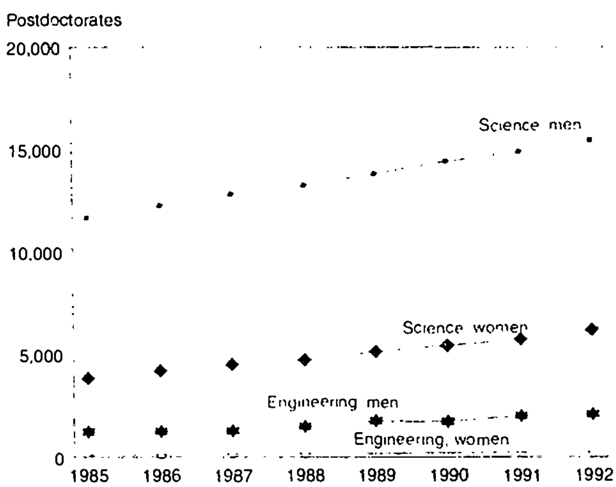
Postdoctorates

The number of postdoctorates in science and engineering fields has increased since the mid-1980's.[4] Postdoctorates have been regarded as a more integral part of education in some fields in the sciences than in engineering, providing opportunities for individuals to establish credentials as research scientists. Their numbers are increasing in other fields beyond those in the life sciences and physical sciences where they have been more customary. Recently, postdoctorates have offered interim opportunities to continue a career while an individual searches for a desired type of permanent appointment, whether a faculty position or a position with industry. Net effects of all of these changes and situations are combined in the data on trends in postdoctorate appointments. While postdoctorate appointments have continued a steady increase in science and engineering, the largest proportionate increase has occurred among women in engineering. (See figures 7-17 and 7-18.)

[4] Data on postdoctorates are not collected by racial/ethnic group, nor by presence or absence of disability.

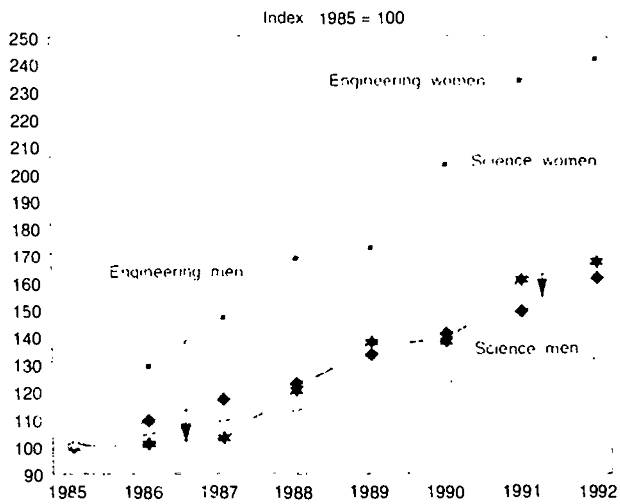
Figure 7-17.
Postdoctorates in science and engineering, by sex: fall 1985-1992



See appendix table 7-35.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 7-18.
Increase in science and engineering postdoctorates, by sex: fall 1985-1992



See appendix table 7-35.

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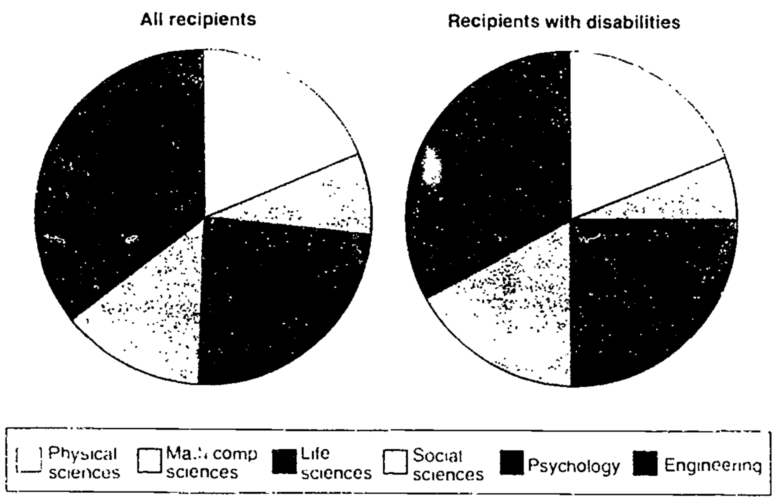
ceived them in science, compared with 78 percent of all science and engineering doctorate recipients. Agricultural/biological sciences (chosen by 25 percent of recipients with disabilities), physical sciences (19 percent), and psychology (18 percent) were the most popular fields. (See appendix table 7-32.) Only 14 percent of the persons with disabilities who earned doctoral degrees in science and engineering earned their degrees in engineering, compared with 22 percent of all science and engineering doctorate recipients. Sufficient data on doctoral students with disabilities have not been collected, making it impossible to compare their interests, goals, and abilities with their field choices. (See figures 7-19 and 7-20.)

The racial/ethnic distribution of persons with disabilities holding doctorates in science and engineer-

Figure 7-19.
Distribution of science and engineering doctorates, by major field for all recipients and recipients with disabilities: 1992



See appendix table 7-32

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ing parallels the racial/ethnic distribution of all of those who hold such degrees, with one exception. Asians earned 29 percent of all doctorates in science and engineering in 1992. They constitute only 18 percent of the persons with disabilities earning doctorates in science and engineering. (See appendix table 7-33.)

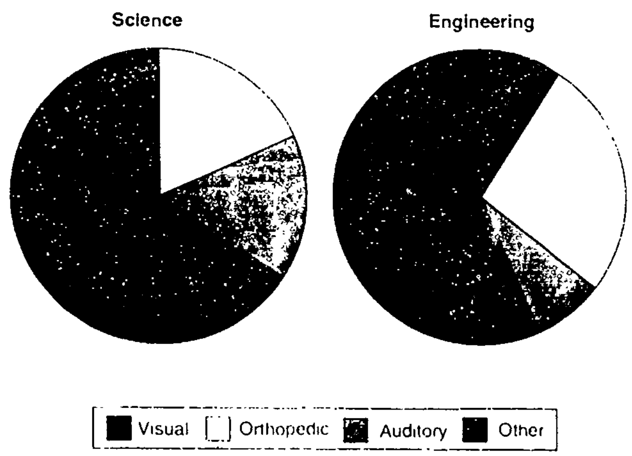
The process of earning a doctorate is generally longer for those with disabilities than those without. Almost half of all graduate students with disabilities spend more than 10 years completing their doctorates; only a third of all graduate students in science and engineering spend as long. (See figure 7-21.)

References

Nerad, Maresi. 1991. *Doctoral Education at the University of California and Factors Affecting Time-to-Degree.* Oakland: University of California, Office of the President.

Weisgerber, Robert A. 1991. *The Challenged Scientists.* New York: Praeger.

Figure 7-20.
Types of disability reported by science and engineering doctorate recipients with disabilities: 1992



See appendix table 7-31

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 7-21.
Time between bachelor's and doctoral degrees, by disability status: 1992

See appendix table 7-34

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Chapter 8

Employment Levels and Trends

Dramatic changes have occurred in the composition of the U.S. labor force during the last half of the 20th century. These changes are attributable in large part to demographic changes stemming from immigration and from birth rates that differ among racial/ethnic subgroups in the United States. They also reflect changing cultural attitudes towards groups traditionally at a disadvantage in the labor market and enactment of laws such as the Civil Rights Act of 1964 and the Americans with Disabilities Act of 1990. The result has been a workforce in which women, racial/ethnic minorities, and people with disabilities play an increasingly important role.

Not surprisingly, the trends that have led to changes in the U.S. workforce have also affected the science and engineering (S&E) workforce in this country. This chapter documents the growing diversity of the S&E workforce and examines the extent to which there are differences between men and women, between whites and racial/ethnic minorities, and between those with and without disabilities in terms of available indicators of equity.

Organization of the Chapter

The chapter has two major sections. The first discusses diversity in the current S&E labor market and contrasts the 1990 S&E labor market with that of 1980. The second major section presents information pertaining to job equity. It starts with an introductory section that provides a brief overview of key facts important for understanding equity in the labor market. The section then focuses in turn on each of the following groups: women, Asians, Hispanics, blacks, American Indians, and persons with disabilities. For each group, the following will be presented:

- Background information on equity issues related to the group, including data on each group's representation within various S&E fields and the change between 1980 and 1990 in each group's representation in the S&E labor force;
- Information on unemployment, underemployment, and the median salary of doctoral scientists and engineers within the group; and
- Information on employment of doctoral scientists and engineers within academia and their achievements in terms of academic rank and tenure.

Diversity

The growing diversity of the S&E labor force can be easily documented. The S&E labor force in 1990 contained proportionately more women (22 percent compared with 13 percent) and racial/ethnic minorities (14 percent compared with 10 percent) than it did in 1980.[1] (See figure 8-1.) Only the population of individuals with work disabilities declined from 1980 to 1990 (from 3.3 percent to 2.7 percent of the S&E population), which parallels a decline in the total labor force reporting work disabilities (from 11.8 percent to 10.4 percent).

Women and minority men comprised 35 percent of the civilian S&E labor force in 1990. Although considerably lower than the comparable figure of 57 percent for the total civilian labor force, this statistic is considerably above the 24 percent level reported for 1980.

Members of the S&E labor force possessing doctorates in S&E fields from U.S. universities display a degree of diversity similar to that in the larger S&E population. Thirty-one percent of the doctoral S&E population were women or racial/ethnic minority group members in 1991; 4.9 percent had functional disabilities.[2]

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[1] These data are based on data from the Public Use Microdata Files for the 1980 and 1990 Decennial Censuses. The definition of S&E used in this survey differs somewhat from the National Science Foundation's preferred definition. Most important, individuals in certain occupations (e.g., S&E faculty) may not be counted as S&E personnel (e.g., most S&E faculty are included in postsecondary teachers, field not specified). The data are, however, sufficiently close to what is needed to provide a reasonable approximation of the S&E workforce.

[2] Changes in the doctoral population are not presented because changes in survey methodology between 1991 and earlier years preclude direct comparisons of the results of the 1991 survey with earlier surveys. The changes implemented in 1991 should produce more reliable data than existed in the past. However, analyses of the data indicate that surveys prior to 1991 may have underestimated the number of blacks in the doctoral S&E population and overestimated the number of Asians. This issue is currently being evaluated. Until this evaluation is completed, readers are cautioned that they should not compare the 1991 doctorate figures with results from prior years.

Note on Data Sources on the S&E Labor Force

In the previous six editions of this report (formerly entitled *Women and Minorities in Science and Engineering*), the primary data on the S&E workforce were obtained from a series of surveys conducted by the National Science Foundation (NSF), collectively referred to as the Scientific and Technical Personnel Data System (STPDS). A careful evaluation of these surveys by the Committee on National Statistics (CNSTAT) indicated that significant improvements were needed in the surveys in order to provide reliable estimates of the S&E population (Citro and Kalton 1989). Because of the long time required to redesign major surveys, there are no new data since the January 1992 *Women and Minorities* report for two of the three surveys used in the preparation of former volumes—the Survey of Experienced Scientists and Engineers that tracked scientists and engineers identified in the 1980 Decennial Census and the Survey of Recent Graduates in science and engineering.

The primary source of information for this chapter is the 1991 Survey of Doctorate Recipients, since the results of this survey were not available for the 1992 edition of *Women and Minorities*. Since the major methodological changes recommended by CNSTAT were implemented for this survey, NSF believes that the data on the S&E doctorate population are considerably improved over prior surveys. Especially important for the purposes of this report are significant improvements in response rates and estimation techniques that have resulted in more accurate estimates of the racial/ethnic distribution of the S&E population and a significant improvement in the questions needed to identify individuals with disabilities. The cost of making these improvements, however, was a temporary loss in the ability to track changes in the S&E population over time. NSF is currently evaluating the feasibility of revising its estimates of earlier Survey of Doctorate Recipients data in order to permit trend analysis.

The second primary source of information on scientists and engineers used in this chapter is the decennial census. Since the last volume of *Women and Minorities* was published, NSF has obtained copies of public use tapes from the 1990 and 1980 decennial censuses. Although the definitions of some variables (including occupation and disability status) used in the decennial census are not optimal from NSF's perspective, the data file permits estimation of statistics not previously available for the S&E population.

Equity

Introduction

Equity in the marketplace exists between groups when they have equal opportunity for obtaining comparable positions and salaries. Measuring equity, however, is not simple. In this section, five variables are used as indicators of equity: unemployment rates, underemployment rates, salary, academic rank, and tenure.

Differences between groups on the indicators of equity examined in this chapter are frequently attributable to several interrelated factors. For example, within disciplines, average salaries for women and most of the minority groups are lower than those of white men. Is this attributable to wage discrimination or is it an inadvertent consequence of other factors, such as their younger ages, arising from their increasing participation in the S&E labor market? This section presents a variety of statistics examining such issues, although it is not possible to identify, measure, and analyze all the factors that could explain differences among the groups examined.[3]

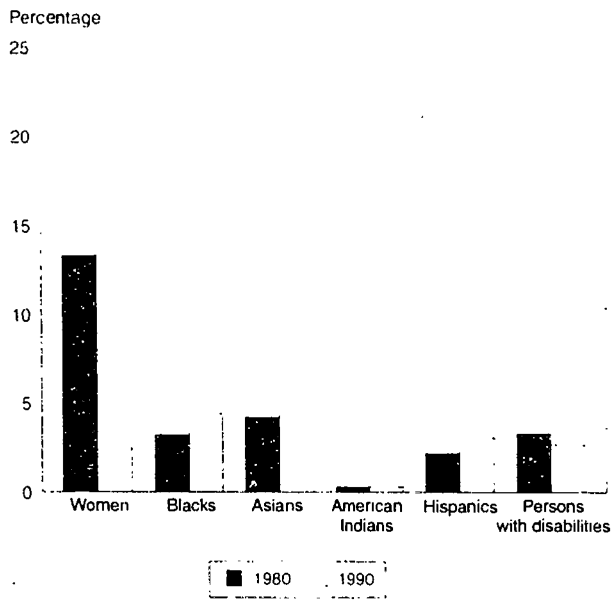
The statistics presented in this section are often subject to alternate interpretations. For example, women are much more likely to pursue careers in the social sciences than in engineering. Does this denote inequity, different cultural values, or some other unexplored reasons for career choice?

Because new information from two key sources of data on the S&E labor force is currently unavailable (see sidebar), the equity discussion focuses on the segment of the S&E labor force with doctorates from U.S. universities. Although this excludes many individuals of interest from the analysis, it provides an opportunity to focus more completely on this important segment of the population.

The role of women, minorities, and people with disabilities within the academic sector receives special attention within this section. This analysis is important for two reasons. First, 4-year colleges and universities employ 45 percent of doctoral scientists and engineers; they constitute the single largest employer of the S&E doctoral population. (See appen-

[3] The major limitation is the inevitable existence of sampling error in sample surveys. Although the Survey of Doctorate Recipients oversampled women in traditionally male fields, racial/ethnic minority group members, and people with disabilities, many subgroup sample sizes were not sufficiently large to provide reliable estimates of all measures of interest. This is especially true for estimates of unemployment and underemployment rates. Since these rates are so small in the doctoral population, very small differences are of considerable substantive interest. For example, the minimum sample size of 500 used in the body of the report for determining whether results on unemployment and underemployment can be presented could result in an estimate off by more than 1 percentage point, far from a negligible difference when average rates are in the 1 to 2 percent range. Various advanced statistical techniques could be used to study the issues further. A good example of such an approach using the Survey of Doctorate Recipients is Kahn

Figure 8-1.
Women, minorities, and persons with disabilities in the science and engineering labor force: 1980 and 1990



NOTE: Individuals belonging to more than one group (e.g., Asian women) are included in both categories (e.g., women and Asian).

See appendix table 8-1.

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dix table 8-8.) Second, academic scientists and engineers provide important role models for young people.

An Overview of the S&E Labor Force

The preceding chapters have repeatedly documented three major factors that typically differentiate women from men and minority group members from non-Hispanic whites in the S&E labor force:

- Women and minority group members are likely to attain degrees in fields that differ from those selected by non-minority men.
- Among those receiving S&E degrees, the proportion who are women and the proportion who belong to minority groups are much higher now than several decades ago.
- The percentage of doctoral degrees awarded to foreign-born individuals, most of whom are counted as belonging to minority groups, has been rising.

These educational trends have obvious implications for the S&E labor force:

- Women and minority group members often bring a different set of educationally obtained job skills to the marketplace than do men and non-minority group members.
- Women and minority group members generally are younger and have less work experience than men and non-minority group members.
- Members of racial/ethnic groups vary considerably with respect to nativity (i.e., whether they were born in the United States or in a foreign country).

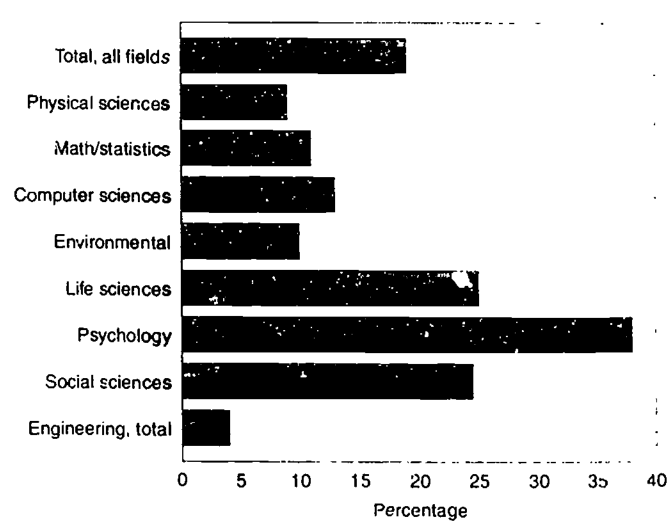
To the extent that work experience, degree fields, and nativity affect factors commonly used to measure equity, a complete picture of equity requires comparisons of women with men and of racial/ethnic minority group members with non-Hispanic whites having similar characteristics on these factors.

In examining information on people with disabilities, it is vital to note that the incidence of disabilities increases dramatically with age. For example, national statistics show that the incidence of disabilities in the population rises from 5 percent for individuals under 15 years to 18 percent for individuals 15 to 64 years to 54 percent for those 65 years and over (McNeil 1993, p. 5). Thus, examination of equity issues for persons with disabilities requires comparisons of persons with and without disabilities who have similar years of work experience.

A few additional observations about the doctoral S&E labor force in 1991 provide a general context for the discussion to follow:

- Doctoral scientists and engineers fared quite well in 1991. Their total unemployment rate

Figure 8-2.
Women as a percentage of doctoral scientists and engineers in the labor force, by field of doctorate: 1991



See appendix table 8-3.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Measuring Disabilities for Persons in the Labor Force

As noted in chapter 1, there is no consensus on the definition of disabilities. This means that in examining statistics related to disabilities, it is necessary to understand the definition used in compiling the statistics.

This chapter uses three different sources for information about people with disabilities. The decennial census has two relevant questions on work-related disabilities. Individuals are considered to have a disability if they answered "yes" to the question, "Does [the person under discussion] have a physical, mental, or other health condition that has lasted for 6 or more months and which limits the kind or amount of work [the person] can do at a job?" or "yes" to a similar question indicating that the disability made the person unable to work. This definition is not adequate for current purposes for two reasons. First, individuals with what are usually regarded as significant disabilities may respond that they do not have a work disability if they regard their work as being consistent with their education and other skills. This is especially important in understanding the representation of those with disabilities in science and engineering fields, since the work is primarily intellectual. With appropriate accommodation, individuals with significant disabilities that impair their sensory functions or mobility can be highly productive and may not regard themselves as having a disability that affects their ability to work. Second, the measure does not distinguish among types of disabilities. Some disabilities (e.g., disabilities that significantly impair mental functioning) would preclude individuals from attaining the necessary skills for S&E employment. It is important, though not always easy, to distinguish between those with disabilities that cannot be accommodated within the S&E labor force and those with disabilities that can be accommodated.

To address the problems with the Census Bureau's definition of disabilities, NSF's Survey of Doctorate Recipients uses a functional definition of disability patterned after one developed for a planned survey of individuals with disabilities developed by the Census Bureau. This measure is based on asking individuals, "What is the USUAL degree of difficulty you have with [specific tasks involving seeing, hearing, walking, and lifting].[4] Respondents are given five choices for each response, ranging from "none" to "unable to do." Unless elsewhere noted, having a disability is defined for this survey as having at least moderate difficulty in performing one or more of these tasks. While this definition was designed to provide a relatively objective measure of disability, it is important to note that not all disabilities are captured by this measure. For example, learning disabilities and behavioral disorders are not included.[5]

The 1991–92 Survey of Income and Program Participation (SIPP) used questions for measuring disability that are quite similar to those in the Survey of Doctorate Recipients (McNeil 1993). This provides an opportunity to make some approximate comparisons between the S&E doctoral population and the larger population.

[4] The full wording of these alternatives is "SEEING words or letters in ordinary newsprint (with glasses/contact lenses if you usually wear them)," "HEARING what is normally said in conversation with another person (with hearing aid, if you usually wear one)," "WALKING without assistance (human or mechanical) or using stairs," "LIFTING or carrying something as heavy as 10 pounds, such as a bag of groceries."

[5] Additional measures of types of disability were omitted from the survey due to practical limitations. The disability questions included in the questionnaire were considered burdensome and intrusive by many respondents. The survey designers were concerned that additional questions in this area would have a serious negative impact on the overall response rate and the validity of the survey. This would be especially true if the survey requested information on highly sensitive disabilities.

was only 1.4 percent, compared with the overall U.S. unemployment rate of 6 percent.[6]

- The underemployment rate, defined as being employed part time when a full-time job was preferred or being employed in a non-S&E position when an S&E position was preferred, was 1.7 percent for doctoral scientists and engineers and their median salary was $60,700.
- Among S&E doctoral recipients employed in academia, 43 percent were full professors and 68 percent had tenure.[7]
- Unemployment and underemployment were associated with degree field and experience level, although the degree fields with high salaries were not always the ones with low

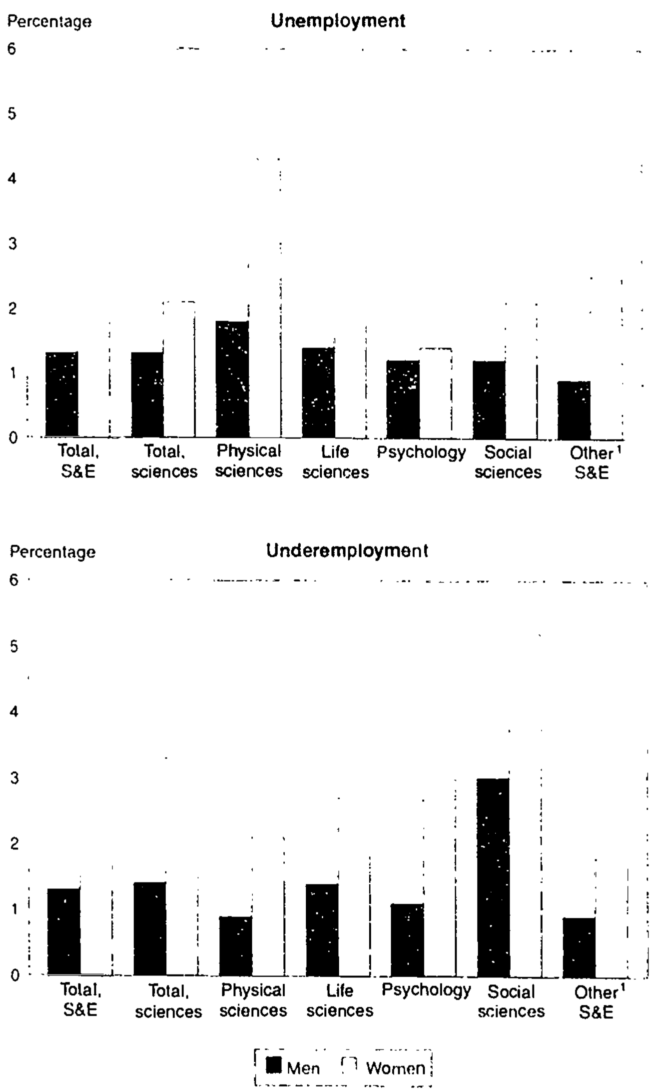
[6] These figures may be surprising to readers familiar with the concern about unemployment among recent S&E doctoral recipients. The 1.4 percent rate applies to the total doctoral S&E labor force. The unemployment rate for recent doctoral recipients in selected fields was higher than 1.4 percent in 1991 (see figure 8.4) and there is evidence from sources other than the Survey of Doctorate Recipients that unemployment has risen since 1991.

[7] Calculations for the percentage distributions for academic [illegible] and tenure exclude individuals employed in academia who report [illegible] academic rank and tenure are not applicable for the positions they hold.

unemployment and/or underemployment. (See figures 8-3 and 8-4.)

- Median salaries of doctoral scientists and engineers differed substantially among degree fields (from $55,500 to $70,200). Individuals with degrees in the life sciences, psychology, and the social sciences received relatively low salaries and those with degrees in engineering, the physical sciences, and computer/information sciences received above average salaries. (See figure 8-5.)
- Median salary is also strongly dependent on years of experience, ranging from $46,000 for doctoral scientists and engineers with less than 5 years of experience to $75,700 for those with 25 or more years of experience. (See figure 8-6.)

Figure 8-3.
Unemployment and underemployment of doctoral scientists and engineers, by field of doctorate and sex: 1991

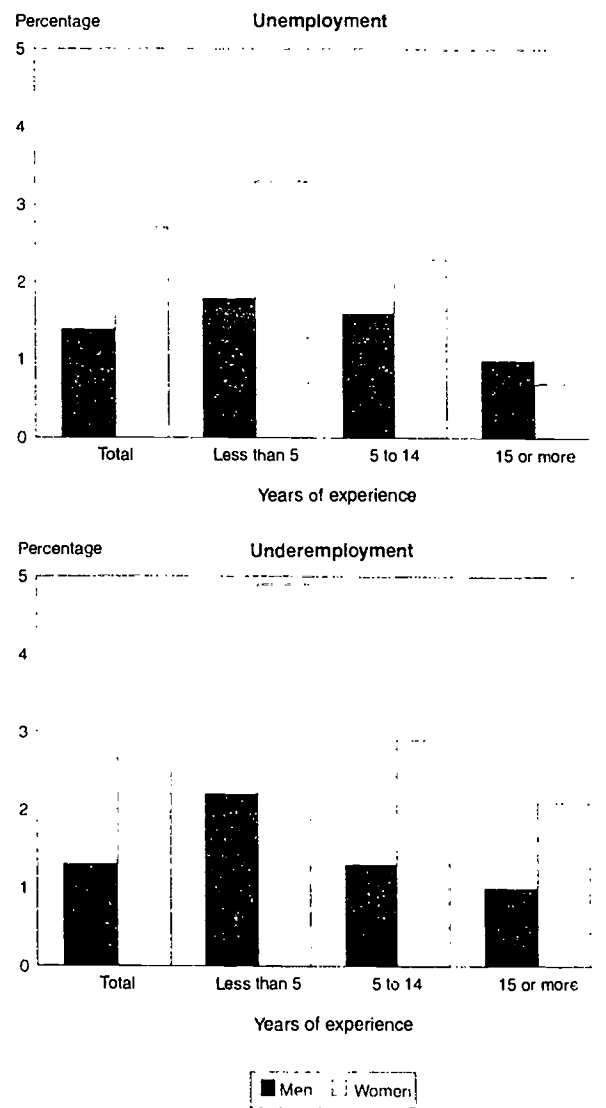


[1] Mathematical sciences, computer/information sciences, environmental sciences, and engineering were combined in this graph because of the small sample sizes for women in these fields.

See appendix table 8-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Figure 8-4.
Unemployment and underemployment of doctoral scientists and engineers, by years of professional work experience and sex: 1991

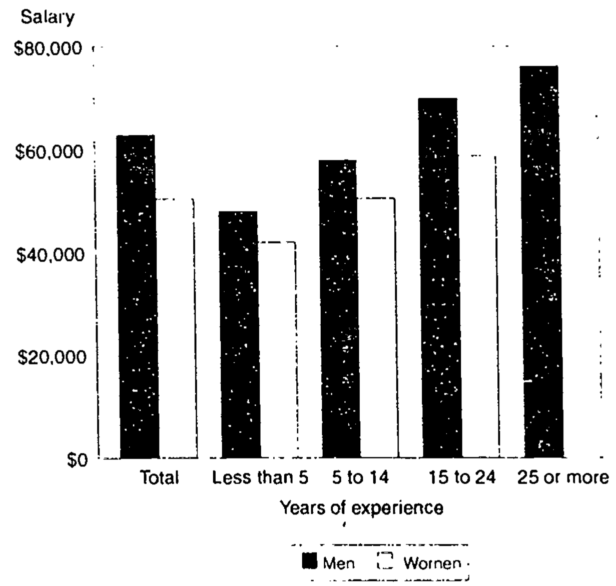


See appendix table 8-4.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

- Median salaries were similar for native-born and foreign-born individuals. (See appendix table 8-14.)
- Unemployment and underemployment were not strongly associated with nativity for doctoral scientists and engineers. (See figure 8-10.) The observed differences in unemployment (1.4 percent compared with 1.8 percent) and underemployment (1.6 percent compared with 1.8 percent) were not statistically significant, i.e., they could be attributable to chance fluctuations due to sampling error.
- Academic rank and tenure are strongly related to years of professional work experience. For example, 56 percent of doctoral scientists and engineers employed in 4-year colleges and universities with 8 or more years of professional work experience were full professors, compared with 2 percent of those with fewer than 8 years of experience. Similarly, 84 percent of those who had 8 or more years of professional work experience were tenured, compared with 16 percent who had fewer than 8 years of work experience. (See figures 8-7 and 8-8.)
- Foreign-born doctoral scientists and engineers are less likely to be full professors or have tenure. (See appendix tables 8-17 and 8-18.) Among the native-born, 44 percent are full professors and 70 percent are tenured. The corresponding figures for the foreign-born are 38 percent and 60 percent.[5]

Figure 8-6.
Median annual salaries of doctoral scientists and engineers, by years of professional work experience and sex: 1991



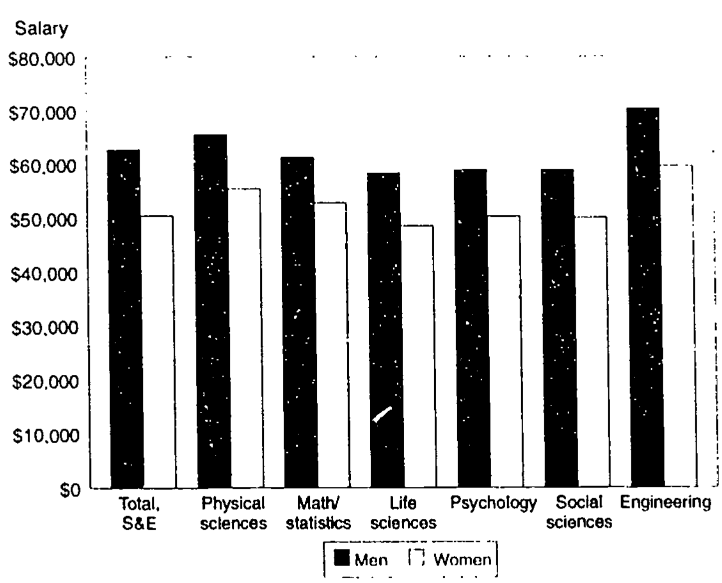
See appendix table 8-7.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Clearly, differences among subpopulation groups with respect to degree fields and years of professional work experience are likely to explain at least some of the differences in the indicators of equity used in this chapter. The following analyses will accordingly compare individuals with similar degree fields and years of professional work experience to the extent feasible.

It is less clear that nativity is an important explanatory factor of differences in career outcomes within the doctoral population. However, it is possible that the similarities between native-born and foreign-born individuals are not as great as the statistics seem to indicate. Most important, the upsurge in immigration among those seeking graduate education has resulted in the immigrant doctoral population being younger than the native-born population; 52 percent of the native-born doctoral S&E labor force have under 15 years of professional work experience compared with 63 percent of the foreign-born.

Figure 8-5.
Median annual salaries of doctoral scientists and engineers employed full time, by field of doctorate and sex: 1991



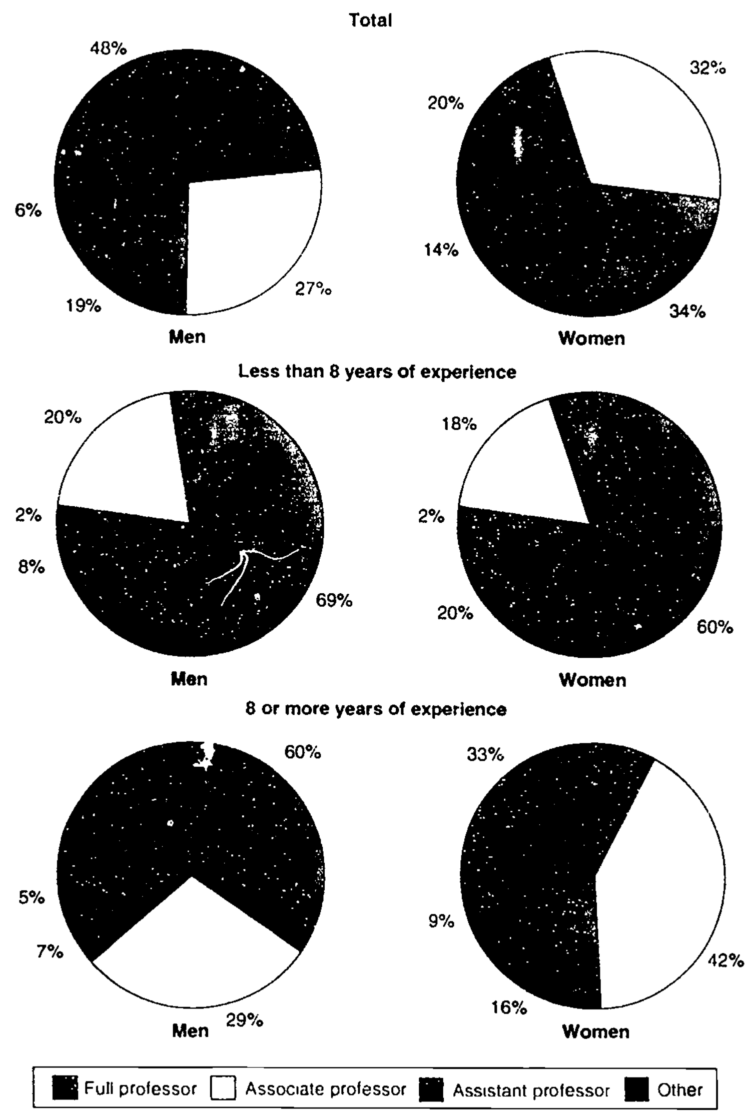
NOTE: Values for female computer and environmental scientists were suppressed due to small sample sizes.

See appendix table 8-6.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

[5] The differences between native born and foreign born doctoral scientists and engineers may, of course, be attributable to differences between the two groups with respect to such factors as age and racial/ethnic distributions.

Figure 8-7.
Academic rank of doctoral scientists and engineers, by years of professional work experience and sex: 1991



See appendix table 8-9.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Women

Background

The role of women in the workforce has changed dramatically during the last several decades. The proportion of women who participated in the labor market increased from 49 percent in 1970 to 69 percent in 1991 (U.S. Department of Commerce, Bureau of the Census 1993, p. 394). In 1990, women constituted 46 percent of the civilian labor force. (See appendix table 8-1.) Recent female graduates are increasingly pursuing degree fields and occupations previously viewed as "masculine," including many S&E occupations.

Representation in the Labor Force

The changes noted above have led to a 144 percent increase in women in the S&E labor force between 1980 and 1990, compared with a total S&E labor force increase of 46 percent. (See appendix table 8-1.) Women have gone from constituting 13 percent of the labor force to constituting 22 percent during the decade. (See figure 8-1.) In 1991, they constituted 19 percent of the doctoral S&E labor force. (See figure 8-2.)

Field of Science and Engineering

In earlier chapters, it was shown that there are considerable differences between degree fields within science and engineering pursued by men and women at all degree levels. It is accordingly not surprising that in 1991, women ranged from 38 percent of those in the labor force with psychology doctorates to only 3.5 percent of those with doctorates in engineering. (See figure 8-2.)

The gender difference in degree fields leads to differences in the occupational distribution of men and women. For example, women comprised 9 percent of engineers in the total labor force and 50 percent of the social scientists in 1990. (See appendix table 8-1.)

Unemployment and Underemployment

One basic indicator of equity is the ability of individuals to obtain desired employment. Although few doctoral scientists and engineers are unemployed, female scientists and engineers were more likely to be unemployed than their male counterparts in 1991 (2.2 percent compared with 1.3 percent). (See figure 8-3.)

Is the higher unemployment among women the result of their field choices? This did not appear to be the case for those doctoral scientists and engineers surveyed in 1991. The field with the highest unemployment rate (physical sciences) in 1991 is a field that attracts disproportionately few women. Psychology, on the other hand, employs a disproportionately high percentage of women and had a slightly lower-than-average unemployment rate in 1991 compared with other S&E fields. (See figure 8-3.)

The increasing participation of women in the S&E labor force means that, on average, women have fewer years of experience than men. Among doctoral scientists and engineers, unemployment rates decline with years of professional work experience. (See figure 8-4.) However, differences in years of work experience do not fully explain differences in unemployment rates between the sexes. Although few women with doctorates are unemployed, women have consistently higher unemployment rates than men with similar years of experience.

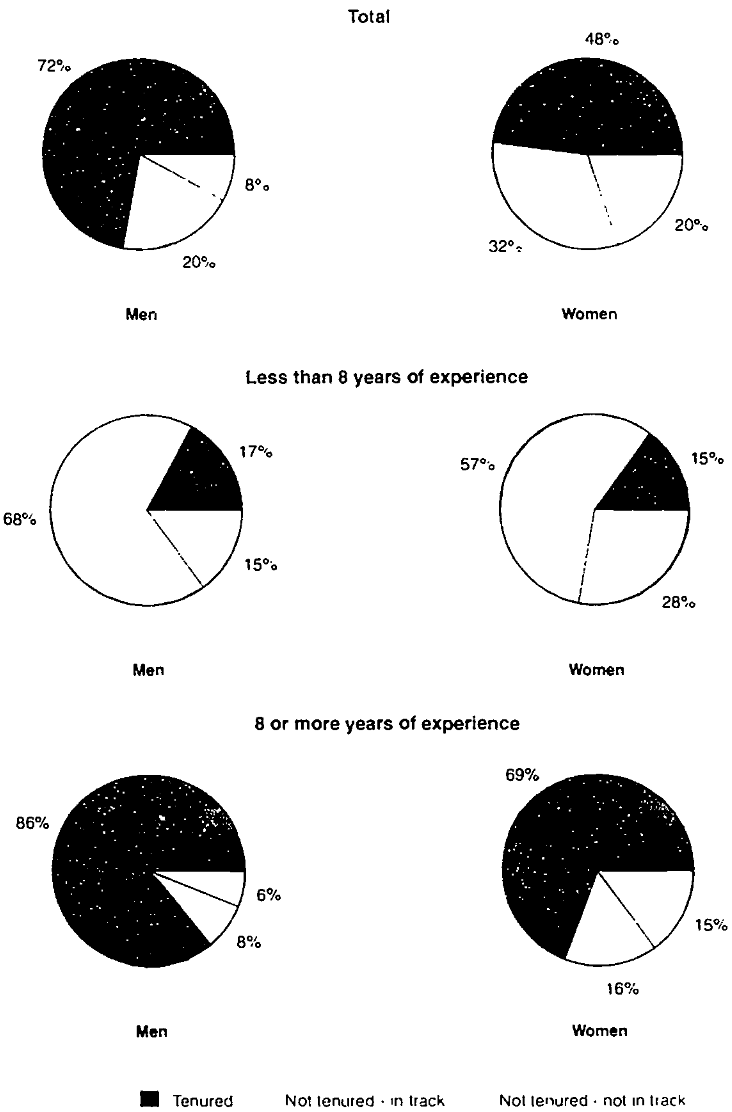
Unemployment rates, of course, do not tell the entire story. Many people accept jobs that do not fully utilize their skills. The term "underemployment" is typically used to describe situations in which there is considerable discrepancy between one's skills and desires and the type of job one has. However, it is difficult to measure underemployment. The National Science Foundation defines underemployment as having a part-time job when a full-time job is preferred or having a non-S&E job when an S&E job is preferred.

The underemployment rate for women with S&E doctoral degrees was also higher than that for men in 1991. This was true even for individuals with similar degree fields and years of work experience. (See figures 8-3 and 8-4.)

Salary

Among doctoral scientists and engineers, full-time employed women averaged salaries that were approximately 80 percent of men's. (See figure 8-5.) This was partially attributable to women's concentration in lower-paying fields. For example, women were relatively more likely to be employed in the life sciences and psychology, which had the lowest median salaries of those studied ($55,500), and less likely to be employed in engineering, which had a relatively high median salary ($70,200). However, the concentration of women within certain fields does not completely explain the salary gap associated with gender. Women's salaries within broad fields ranged from 83 percent to 86 percent of men's.[9]

Figure 8-8.
Tenure status of doctoral scientists and engineers, by years of professional work experience and sex: 1991



See appendix table 8-10.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Differences in years of experience between men and women also explain part of the gender gap in salaries for doctoral scientists and engineers. Within the broad experience groups examined, women's salaries ranged from 84 percent to 88 percent of men's. (See figure 8-6.)

If it had been possible to match women and men more closely on degree field and years of experience, the salary gaps between men and women may have

[9] The fact that the salary gaps within fields are all smaller than the total salary gap may appear contradictory. However, this apparent anomaly is a direct outgrowth of the concentration of women in low paying fields. Understanding this situation is easier if one thinks about a simplified situation. Suppose that all women were in psychology, while all men were distributed across all S&E fields. Assume also that both men and women received the median salary for individuals within psychology ($55,500). Under these assumptions, there would be no difference between men and women in the same field (psychology). However, since many men were employed in fields that paid more than psychology, the median salary for all men would be above the median salary for all women.

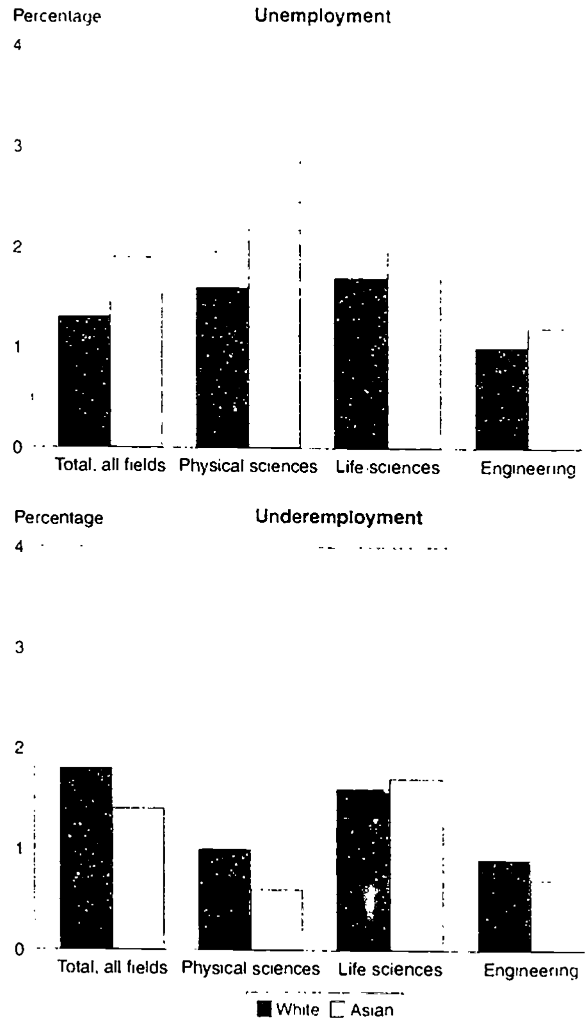
been smaller than observed. Unfortunately, sample sizes are too small to permit this comparison.

Academia

Employment. While women constitute only 20 percent of doctoral scientists and engineers employed in 4-year colleges and universities, this is a representation that slightly exceeds their total representation in the doctoral population. Within fields, as would be expected from the preceding analyses, there are marked differences in women's representation. Women constitute 36 percent of individuals in the academic workforce among those with doctoral degrees in psychology compared with 4 percent of those with doctoral degrees in engineering. (See appendix table 8-8.)

Tenure and Rank. Academic rank and tenure are important determinants of status within the academic community. Doctoral women in academia fare less well than their male counterparts on these measures. Women are less likely than men to be full professors (20 percent compared with 48 percent) and are more likely to be assistant professors (34 percent compared with 19 percent). (See figure 8-7.) They are also less likely to have tenure (48 percent compared with 73 percent). (See figure 8-8.) One reason for these differences, however, is that women have fewer years of work experience than men. For example, women constitute 32 percent of individuals with less than 8 years of professional work experience, but only 15 percent of those with more than 8 years. Among those with fewer than 8 years of experience, differences in academic rank and tenure status are insignificant: Twenty-three percent of men are associate or full professors, compared with 20 percent of women, and 17 percent of men and 15 percent of women are tenured. However, there are significant differences among those with 8 or more years of experience. Eighty-nine percent of men and 74 percent of women are full or associate professors, and 86 percent of the men and 69 percent of the women have tenure.[10] (See figures 8-7 and 8-8.)

Figure 8-9.
Unemployment and underemployment of doctoral scientists and engineers, by field of doctorate and race/ethnicity: 1991



NOTE: Rates are suppressed when there are not enough cases for accurate calculation (n<500).

See appendix table 8-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Conclusion

On essentially all variables examined here, women fare less well than men. However, underlying the apparent inequity is a complex set of factors that at least partially explains the differences. Most important, women's relatively recent entrance into the S&E labor force means, on average, that they have less work experience than men. When women and men with similar years of professional work experience are compared, differences between the sexes narrow considerably, although they are not completely eliminated.

A second major factor in understanding equity between the sexes in the doctoral S&E labor force is

The control for years of experience was fairly rough, since only two experience categories were used. It is likely that there are differences in the experience levels of men and women within each of these categories. More detailed controls would, therefore, be likely to explain some of the remaining observed differences. More detailed categories were not utilized because of the need to maintain adequate sample sizes for the analysis.

the difference in degree fields between men and women. Even within S&E, women tend to be heavily concentrated in lower-paying S&E degree fields. This helps explain why women's salaries are lower, but does not explain why women have higher unemployment and underemployment rates than men.

Asians

Background

Among the minority groups examined in this report, Asians are unique in that they are not underrepresented in science and engineering. Also, Asian scientists and engineers are overwhelmingly foreign-born. Foreign-born scientists and engineers constituted 81 percent of the Asian S&E labor force in 1990 and 91 percent of the U.S.-educated Asian doctoral S&E labor force in 1991.[11] (See appendix tables 8-1 and 8-2.)

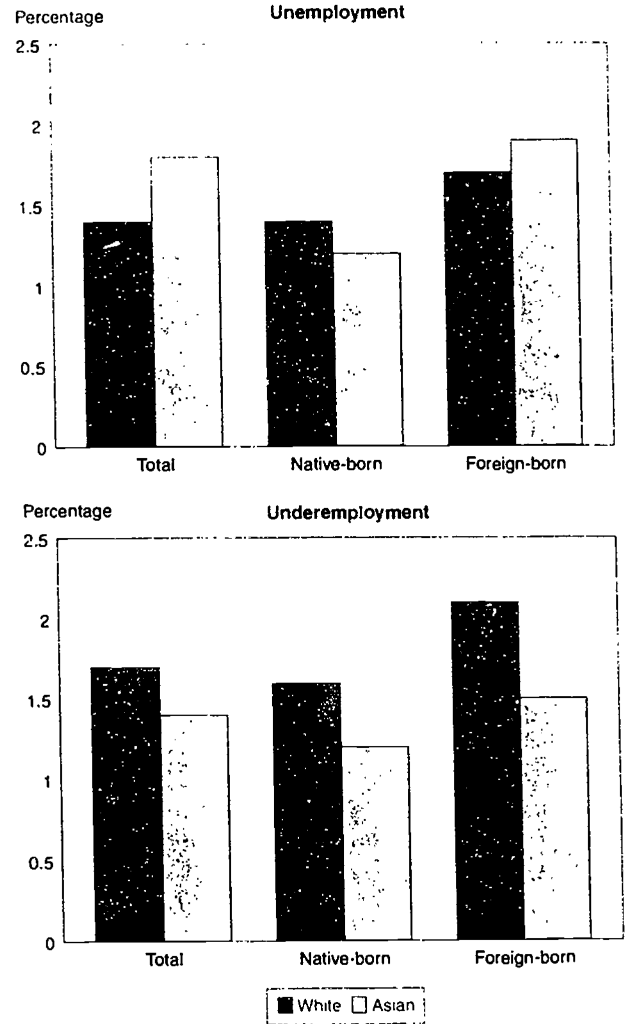
Since most Asian scientists and engineers obtained their precollege education outside the United States, to fully understand the story of Asians in this country it is vital to consider separately those individuals who are foreign-born and those who were born in this country.

Representation in the Labor Force

Since Asians frequently immigrate to this country for the express purpose of pursuing S&E education and careers, it is not surprising that they represent a disproportionately high percentage of the S&E labor force. In 1990, Asians constituted 6.2 percent of the S&E labor force, compared with 2.8 percent of the total civilian labor force. (See appendix table 8-1.) In 1991, Asians constituted 10.2 percent of the doctoral S&E labor force. (See appendix table 8-2.)

Given the growth in the Asian population receiving S&E degrees, it is not surprising that the increase in Asians in the S&E labor force was larger than the overall growth rate in the S&E labor force between 1980 and 1990—115 percent compared with 46 percent. (See appendix table 8-1.)

Figure 8-10.
Unemployment and underemployment of doctoral scientists and engineers, by race/ethnicity and nativity: 1991



See appendix table 8-12.

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

Field of Science and Engineering

Within the doctoral S&E labor force, the distribution of Asians by field of degree is strikingly different from that of the total population. In 1991, Asians comprised 24 percent of the doctoral labor force with degrees in engineering, but only 2 percent of those with degrees in psychology. Similar, though less extreme, differences were noted in the occupational distribution of Asians in the 1990 total S&E labor force. They represented 7.0 percent of the engineers, 6.3 percent of the mathematical and computer scientists, 6.7 percent of the natural scientists, and 2.2 percent of the social scientists. (See appendix table 8-1.) Interestingly, native-born Asians and whites[12] were more similar to each other in terms of degree fields than was true for the total Asian and white populations. (See text table 8-1.) For example, 37 percent of all Asians in the doctoral S&E labor force had degrees in engi-

[11] Information from recent Immigration and Naturalization statistics indicates that "immigrants from the Far East constitute a large and growing proportion of all S&E immigration. In 1991, 44.7 percent of all scientists and engineers admitted were from the Far East, and this percentage rose to 55.3 percent in 1992" (Streeter 1994).

[12] Throughout this chapter, when data are presented for whites and blacks, they are for non-Hispanic whites and non-Hispanic blacks.

Text table 8-1.
Doctoral scientists and engineers in the labor force, by field of doctorate and race/ethnicity: 1991

[Percentage distribution]

Field	Total[1]	White, non-Hispanic	Black, non-Hispanic	Hispanic	Asian	American Indian
Total, all fields	100.0	100.0	100.0	100.0	100.0	100.0
Total, science	84.1	86.5	90.8	83.9	62.7	85.3
Physical sciences	18.6	18.4	10.7	17.9	21.9	14.7
Math/statistics	4.5	4.5	2.5	5.5	4.9	1.3
Computer sciences	1.2	1.1	0.3	1.1	2.4	1.1
Environmental sciences	3.0	3.3	0.3	1.8	1.6	2.9
Life sciences	26.1	26.9	23.7	22.7	20.8	27.4
Psychology	15.0	16.4	22.1	16.1	2.3	15.7
Social sciences	15.7	16.0	31.2	18.8	8.8	22.2
Engineering	15.9	13.5	9.2	16.1	37.3	14.7
Native-born doctoral scientists and engineers:						
Total, all fields	100.0	100.0	100.0	100.0	100.0	100.0
Total, science	87.7	87.6	94.7	88.5	83.6	85.2
Physical sciences	18.3	18.4	10.4	18.1	19.9	14.8
Math/statistics	4.4	4.4	2.5	3.7	2.4	1.3
Computer sciences	1.0	1.1	0.4	0.6	2.3	1.1
Environmental sciences	3.2	3.3	0.4	2.1	2.4	1.9
Life sciences	27.4	27.5	23.9	23.7	34.6	27.7
Psychology	17.1	16.9	29.4	21.2	12.2	15.9
Social sciences	16.3	16.1	27.6	19.2	9.7	22.5
Engineering	12.3	12.4	5.3	11.5	16.4	14.8

[1] Total includes other races.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

neering, compared with 14 percent of whites. The comparable figures for native-born Asians and whites were 16 percent and 12 percent, respectively. (See text table 8-1.)

Unemployment and Underemployment

The 1991 unemployment and underemployment rates for Asian doctoral scientists and engineers were quite similar to the corresponding rates for whites. This observation was true for both the total Asian and white populations and for the subpopulations defined by nativity, years of work experience, and field of degree. Variations between Asian and white rates were within the range expected due to sampling variation. (See figures 8-9 to 8-11.)

Salary

The median salary for Asians with S&E doctoral degrees in 1991 was approximately the same as that for whites ($60,300 compared to $60,900). This was true for both the total population and for native-born individuals. (See figures 8-12 and 8-13.) Within degree fields, salaries of Asians tended to be slightly lower than for whites. (See figure 8-12.) When comparing Asians and whites with similar years of professional work experience, Asians had salaries slightly higher than those for whites. (See figure 8-14.)

Academia

Employment. U.S.-educated Asian doctoral scientists and engineers are less likely to be employed in 4-year colleges and universities than their white counterparts (37 percent compared with 45 percent). (See appendix table 8-16.) The major difference appears to be between foreign-born Asians and foreign-born whites. Thirty-six percent of foreign-born Asians, compared with 50 percent of foreign-born whites, are employed in 4-year colleges or universities. There is little difference between Asians and whites for those who are native-born (43 percent compared with 45 percent).

Rank and Tenure. Asian doctoral scientists and engineers are less likely than whites to be full professors (35 percent compared with 44 percent). (See figure 8-15.) However, this appears to reflect whites' greater years of work experience. Among those with more than 8 years of professional work experience. Asians were no less likely than whites to be full professors. (See figure 8-16.) Similarly, although Asians were less likely than whites to be tenured (56 percent compared with 70 percent), this was apparently a function of their fewer years of professional work experience. (See figure 8-17.) Among Asians and whites with 8 or more years of work experience, the difference in the percentage with tenure was trivial (83 percent compared with 84 percent).

Conclusion

In sum, Asians fare about as well as whites in science and engineering. They are well represented in the S&E labor force and there appears to be little difference on the equity measures examined between Asian and white doctoral scientists and engineers with similar degrees and years of experience. This, of course, does not mean that Asians are not at any disadvantage in the doctoral S&E labor market. As noted above, this analysis cannot provide conclusive evidence on whether discrimination against a group exists.

Hispanics

Background

The story of Hispanics in the S&E labor force in many ways stands in marked contrast to that of Asians. Asians are overrepresented in the S&E labor force; Hispanics are underrepresented. While Asians are approximately on a par with whites in terms of the indicators of equity examined in this report, Hispanics are not.

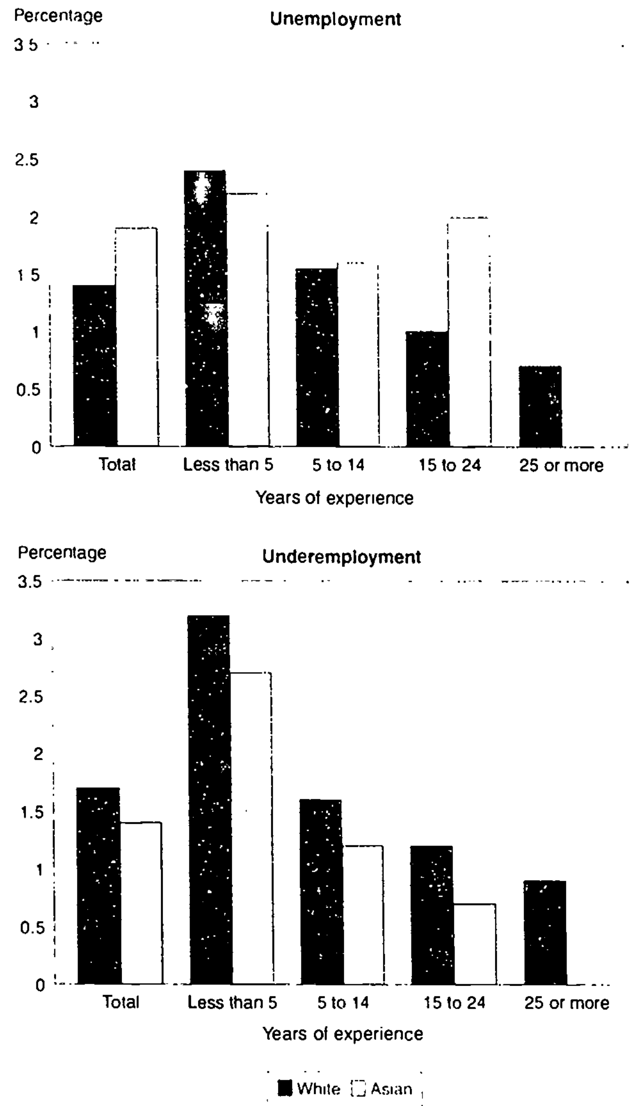
As with Asians, understanding the role of Hispanics in the S&E labor force requires consideration of immigration issues. Thirty-five percent of the 1990 Hispanic S&E labor force was foreign-born. (See appendix table 8-1.) In 1991, 42 percent of the Hispanic doctoral S&E labor force was foreign-born. (See appendix table 8-2.)

Representation in the Labor Force

In 1990, Hispanics constituted 8.1 percent of the civilian labor force, but only 3.1 percent of the S&E labor force. (See appendix table 8-1.) This reflected an increase of 40 percent in their representation in both the total labor force (from 5.7 percent in 1980) and the S&E labor force (from 2.2 percent).

Hispanics constituted only 1.9 percent of the U.S.-educated S&E doctoral labor force in 1991. (See appendix table 8-2.)

Figure 8-11.
Unemployment and underemployment of doctoral scientists and enrgineers, by years of professional work experience and nativity: 1991



NOTE: Asian unemployment and underemployment rates are not shown for 25 or more years of experience because of small sample size (n<500).

See appendix table 8-13

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Field of Science and Engineering

The occupational distribution of Hispanics within S&E fields is fairly similar to the distribution of the total S&E labor force. In 1990, Hispanic representation within specific S&E fields varied between 2.9

percent and 3.3 percent. (See appendix table 8-1.) The doctoral population also showed similar distributions of Hispanics and whites across degree fields within S&E. (See text table 8-1.)

Unemployment and Underemployment

In 1991, Hispanic doctoral scientists and engineers had an unemployment rate that was no different than that for whites (1.4 percent). (See appendix table 8-13.) Hispanics' underemployment rate was somewhat higher (2.2 percent compared with 1.7 percent), though the difference was within the range explicable by chance fluctuation. Due to the small sample size of Hispanic scientists and engineers, analyses of unemployment and underemployment within subgroups are not statistically feasible.

Salary

Salaries of Hispanic doctoral scientists and engineers are approximately 90 percent of those of whites. (See figure 8-12.) The salary differential appears to be explicable, at least in part, by differences in years of professional work experience between whites and Hispanics. (See figure 8-14.) Differences in degree fields between white and Hispanic doctoral scientists and engineers do not appear to explain much of the difference in salaries between the two groups; degree field differences do seem to explain some of the salary difference between native-born whites and Hispanics. (See figure 8-12.)

Academia

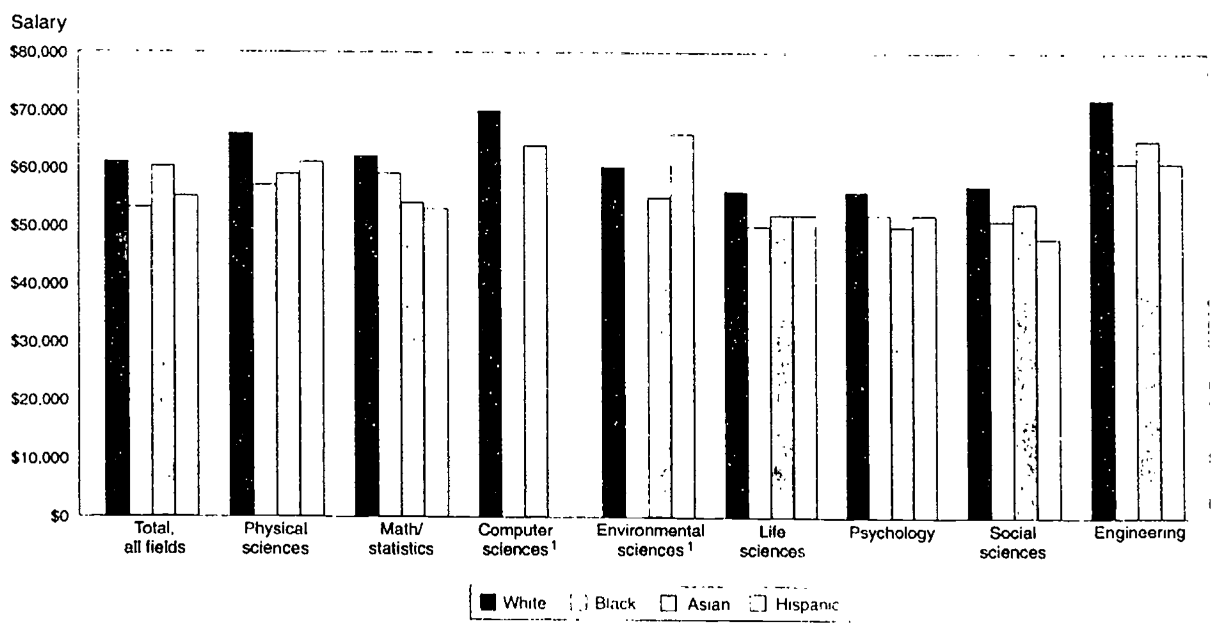
Employment. Hispanic doctoral scientists and engineers are more likely than whites to find employment at 4-year colleges and universities (50 percent compared with 45 percent). (See appendix table 8-16.)

Rank and Tenure. As was true for Asians, Hispanic doctoral scientists and engineers are less likely to be full professors than are whites (33 percent compared with 45 percent). (See figure 8-15.) Similarly, Hispanics were less likely than whites to have tenure (56 percent compared with 70 percent). (See appendix table 8-18.) The small sample size of Hispanics precluded reliable analysis of whether years of professional work experience could explain the observed difference.

Conclusion

Hispanics remain underrepresented in S&E. Although the percentage of Hispanics in the S&E labor force increased by 40 percent from 1980 to 1990, this increase is approximately the same as the increase in their percentage in the total civilian labor force. And although Hispanic and white doctoral scientists

Figure 8-12.
Median annual salaries of doctoral scientists and engineers employed full time, by field of doctorate and race/ethnicity: 1991



[1] Salaries not shown when sample size is less than 100

See appendix table 8-14.

Women, Minorities, and Persons With Disabilities In Science and Engineering: 1994

and engineers were similar on most of the equity measures examined. Hispanics did not fare as well in terms of salary. However, some of the difference between Hispanic and white salaries appears to be due to differences in years of professional work experience of the two groups and to a combination of nativity and degree field differences. Unfortunately, the small sample size of Hispanics precluded as complete an analysis as was possible for women and Asians.

Blacks

Background

Although both blacks and Hispanics are underrepresented in science and engineering, the experience of blacks in S&E differs from that of Hispanics in terms of the role played by immigration. Only 11 percent of the 1990 black S&E labor force and 27 percent of the U.S.-educated 1991 black doctoral labor force were foreign-born. (See appendix tables 8-1 and 8-2.)

Representation in the Labor Force

As noted in earlier chapters, the representation of blacks among students earning S&E degrees has grown only modestly in recent years. However, between 1980 and 1990, blacks had a larger increase in the S&E labor force (101 percent) than in the total civilian labor force (46 percent). (See appendix table 8-1.) Black representation in the S&E labor force grew from 3.2 percent in 1980 to 4.4 percent in 1990—considerable progress, given that during the same time period their representation in the total labor force increased only slightly (from 10.0 percent to 10.4 percent).

In 1991, blacks constituted 2.1 percent of the doctoral S&E labor force (See appendix table 8-2.)

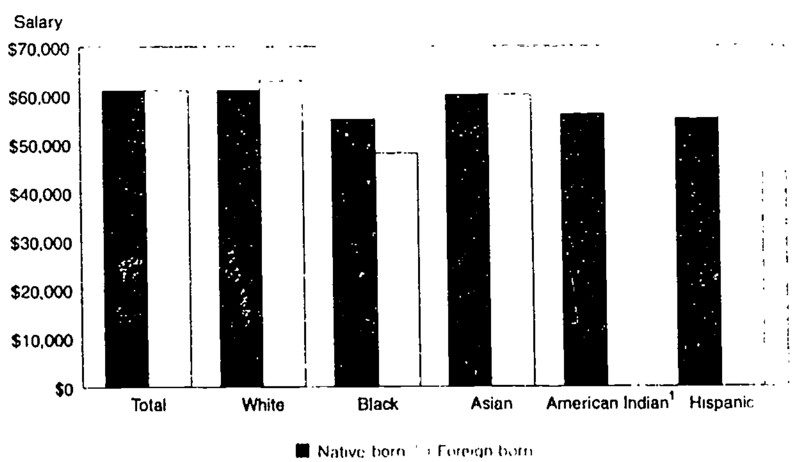
Field of Science and Engineering

In 1990, blacks in the U.S. S&E labor force were relatively likely to have occupations in the social sciences and relatively unlikely to be employed in engineering. (See appendix table 8-1.) In the 1991 doctoral labor force, 9 percent of blacks possessed degrees in engineering, compared with 14 percent of whites. Thirty-one percent of blacks held degrees in the social sciences, compared with 16 percent of whites. (See text table 8-1.) Thus, blacks were disproportionately represented in lower-paying occupations and degree fields.

Unemployment and Underemployment

In 1991, unemployment and underemployment rates for black doctoral scientists and engineers were essentially the same as those of their white counterparts. Black unemployment was 1.6 percent compared with the 1.4 percent rate for whites. Their respective underemployment rates were 1.9 percent and 1.7 percent. (See appendix table 8-13.) The minor differences are consistent with what is expected from chance variations attributable to sampling.

Figure 8-13.
Median annual salaries of employed doctoral scientists and engineers, by race/ethnicity and nativity: 1991



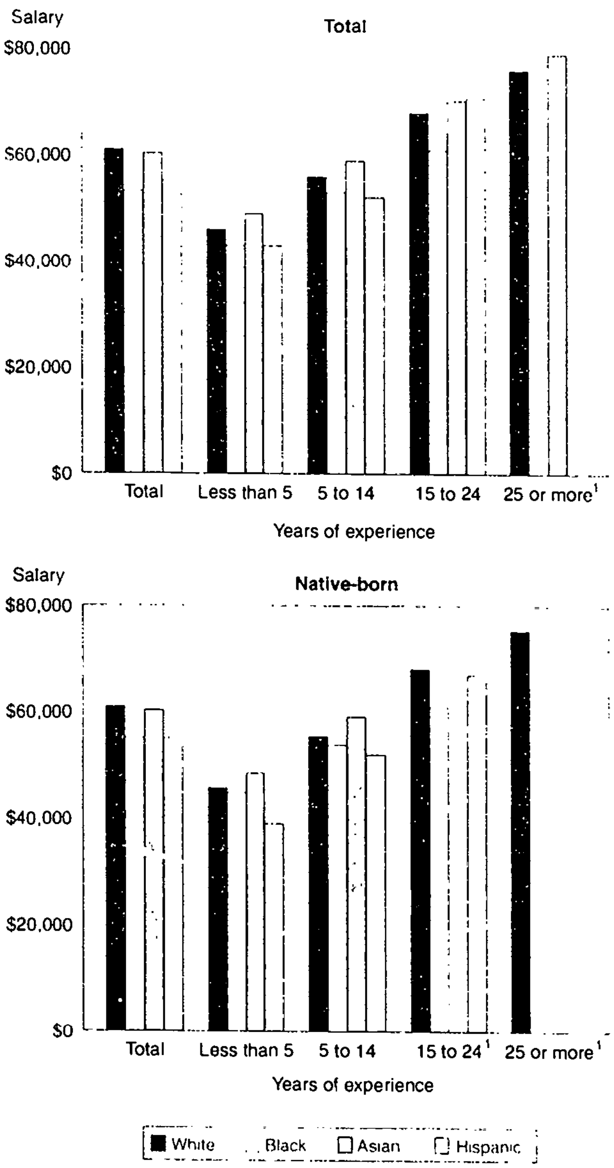
[1] Salary not shown when sample size is less than 100.

See appendix table 8-14

Salary

In 1991, the median salary of black doctoral scientists and engineers was 87 percent of that for whites. (See figure 8-12.) Degree field appears to explain some of the difference. As discussed above, blacks disproportionately pursue degrees in the lower-paying social sciences. Within science fields, the salaries received by blacks ranged from 89 percent to 94 percent of those received by whites in the same field. However, black doctoral engineers had a median salary that was only 84 percent of the comparable salary for whites. (See figure 8-12.) Nativity also appears to be a factor in explaining salary differences between whites and blacks. Native-born black doctoral scientists and engineers had a median salary in 1991 that was 91 percent of the white median salary. (See figure 8-13.) Within fields, the range was 92 percent to 98 percent. (See appendix table 8-14.) Differences

Figure 8-14.
Median annual salaries of doctoral scientists and engineers, by years of professional work experience, race/ethnicity, and nativity: 1991



[1] Salaries not shown when sample size is less than 100.

See appendix table 8-15

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

in years of experience also contribute to differences between the salaries of blacks and whites. (See figure 8-14.) On the basis of this limited analysis, it appears that blacks who attain doctoral degrees in science and engineering are, at most, at a very small disadvantage in terms of salary level when compared with whites with similar years of professional work experience and degree fields.

Academia

Employment. Blacks with doctoral degrees are more likely than whites to be employed at 4-year colleges and universities (52 percent compared with 45 percent). (See appendix table 8-16.)

Rank and Tenure. Of all of the racial/ethnic groups examined, blacks had the lowest percentage of full professors in the U.S.-educated doctoral population in 1991 (27 percent compared with 33 percent for Hispanics and 44 percent for whites). (See figure 8-15.) Blacks also had the lowest percentage tenured (54 percent, compared with a range from 55 percent for Hispanics to 70 percent for whites). (See appendix table 8-18.) The gap is smaller for native-born blacks compared with native-born whites. (See figure 8-15.) Among the native-born, 31 percent of blacks were full professors compared with 45 percent of whites, and 62 percent of blacks were tenured compared with 70 percent of whites. (See appendix table 8-18.) Due to the small sample size of blacks in academia, analysis of their academic rank and tenure status within degree fields and years of professional experience was not feasible.

Conclusion

Like Hispanics, blacks continue to be underrepresented in the S&E labor force. However, unlike Hispanics, blacks demonstrated significant progress in representation between 1980 and 1990. Black doctoral scientists and engineers did not differ substantially from whites in terms of unemployment or underemployment. However, blacks did not fare as well as whites on salary, academic rank, and tenure status. At least some of the differences appear attributable to field of degree, nativity, and years of experience differences between black and white doctoral scientists and engineers.

American Indians

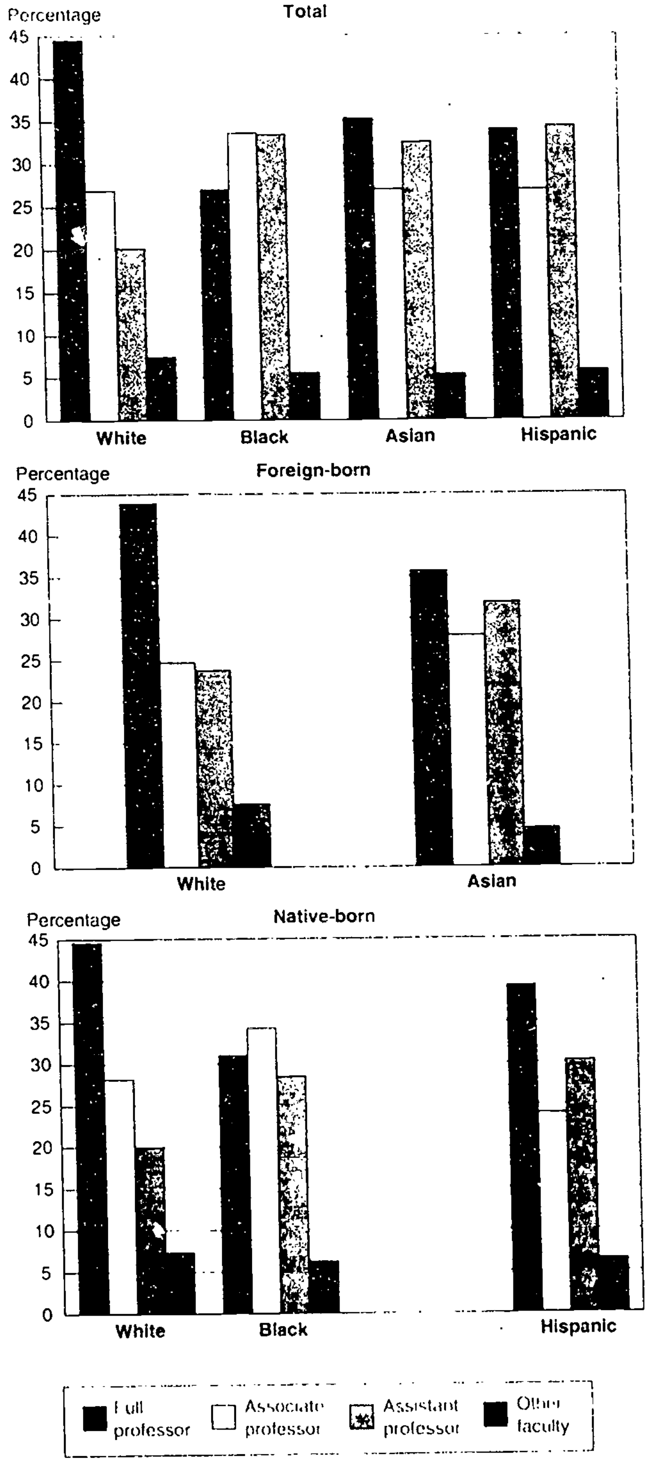
Background

American Indians are by far the smallest of the groups examined in this report, which makes obtaining accurate estimates of relevant information about them quite difficult. This is especially true for estimates based on sample surveys, such as the survey of the doctoral S&E population used throughout this chapter. Therefore, this section does not include some of the analyses presented for other groups.

Representation in the Labor Force

Data from the decennial census indicate that American Indians constituted only 0.6 percent of the U.S. civilian labor force and 0.3 percent of the S&E

Figure 8-15.
Academic rank of doctoral scientists and engineers, by race/ethnicity and nativity: 1991



NOTE: Data are suppressed when sample size is less than 400

See appendix table 8-17

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

labor force in 1990. They constituted 0.3 percent of the S&E labor force in 1980. (See appendix table 8-1.) In 1991, they were 0.2 percent of the doctoral labor force. (See appendix table 8-2.)

Field of Science and Engineering

As was true for Hispanics, American Indians did not evidence much distinctive variation in their choice of S&E field. In 1990, they constituted either 0.3 or 0.4 percent of all the broad fields. (See appendix table 8-1.) The degree fields of American Indian doctoral scientists and engineers were also fairly similar to those of whites. (See text table 8-1.)

Salary

The median annual salary for American Indians with doctoral degrees in science and engineering was $55,800 in 1991. This was 92 percent of the comparable white salary. (See appendix table 8-14.)

Academia

American Indians were more likely than whites to find employment within academia (50 percent compared with 45 percent). (See appendix table 8-16.)

Conclusion

Because American Indians are such a small part of the U.S. population, it is difficult to obtain the accurate statistics needed to evaluate how well they fare compared with other groups. The limited statistics available indicate that they are underrepresented in the S&E population and that American Indian doctoral scientists and engineers have salaries somewhat below whites.

Persons With Disabilities

Background

In recent years, individuals with disabilities have become increasingly aware of their identity as a minority group with interests that bind them together. With the passage of the 1990 Americans with Disabilities Act, they acquired many of the same rights as other disadvantaged groups in this country.

Representation in the Labor Force

Of the groups examined in this report, only persons with disabilities exhibited a decline in their representation in the labor force between 1980 and 1990. In 1990, 2.7 percent of the S&E labor force reported work disabilities, down from 3.3 percent in 1980. A decline in the total labor force reporting disabilities was also noted during the same time period from

11.8 percent in 1980 to 10.4 percent in 1990. (See appendix table 8-1.)

Although data from the decennial census appear to indicate that persons with disabilities are underrepresented in the labor force, it is necessary to be cautious in interpreting the figures: the work disability measure used in the decennial census has serious drawbacks for the present purposes.

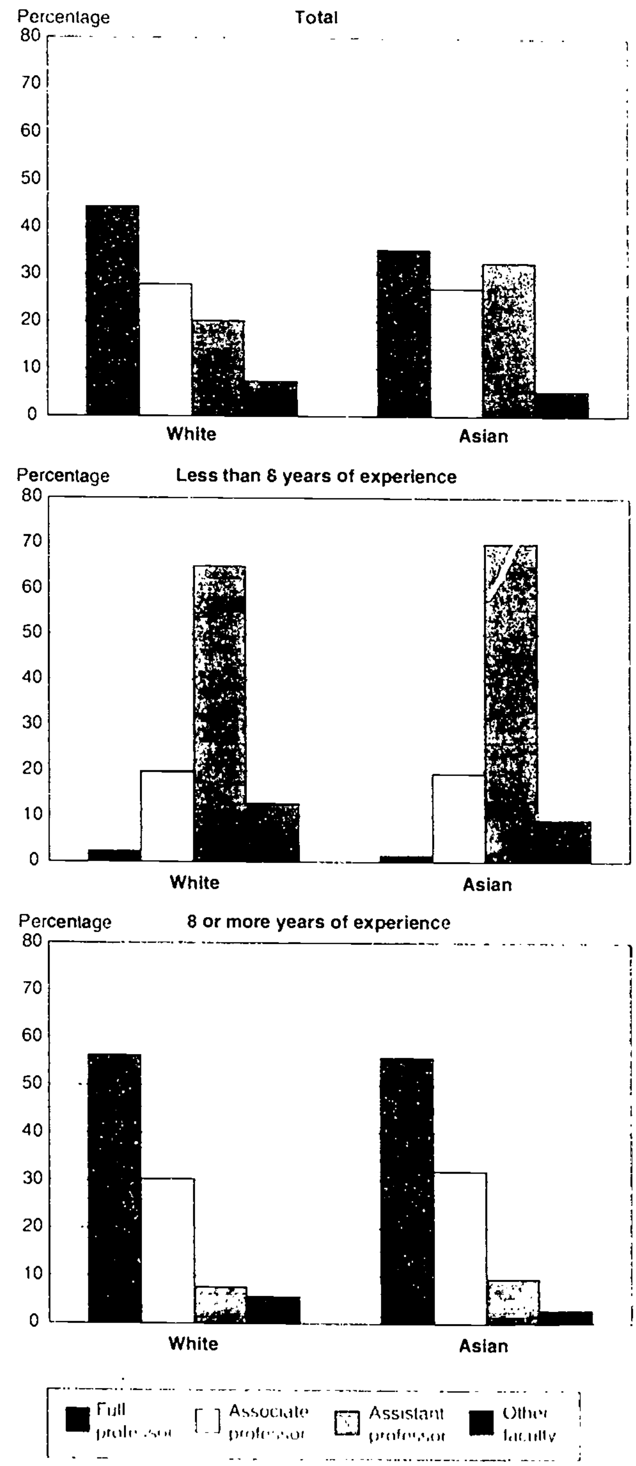
The representation of individuals with disabilities in the doctoral S&E population can be estimated by comparing the results of the Survey of Doctorate Recipients with general population estimates, using similar measures from the Survey of Income and Program Participation.[13] These comparisons indicate that persons with significant sensory-motor disabilities are seriously underrepresented in the S&E population. More specifically, the Survey of Income and Program Participation found in 1991–92 that 0.4 percent of the population 15 to 64 years old reported that they were unable to see words and letters. The comparable percentage for individuals in the Survey of Doctorate Recipients was 0.1 percent. In the total population, 0.2 percent said they were unable to hear normal conversations, compared with 0.02 percent in the doctoral population. In the general population, 1.9 percent reported being unable to lift a 10-pound bag of groceries, compared with 0.2 percent of the doctoral population. For those unable to climb stairs, the total population rate was 2.2 percent compared with 0.2 percent in the doctoral population.[14]

Field of Science and Engineering

Among doctoral scientists and engineers, the field distributions of people with and without disabilities were quite similar except for a somewhat higher percentage of individuals with disabilities among those with degrees in the social sciences (6.3 percent) and a fairly low percentage (2.5 percent) among those with doctoral degrees in the computer sciences. (See figure 8-18.)

In the larger S&E population there was also a slight overrepresentation of people with disabilities in the social sciences in 1990. Three percent of social scientists reported having disabilities, compared with 2.7 percent of the total S&E labor force. (See appendix table 8-1.)

Figure 8-16.
Academic rank of doctoral scientists and engineers, by years of professional work experience and race/ethnicity: 1991



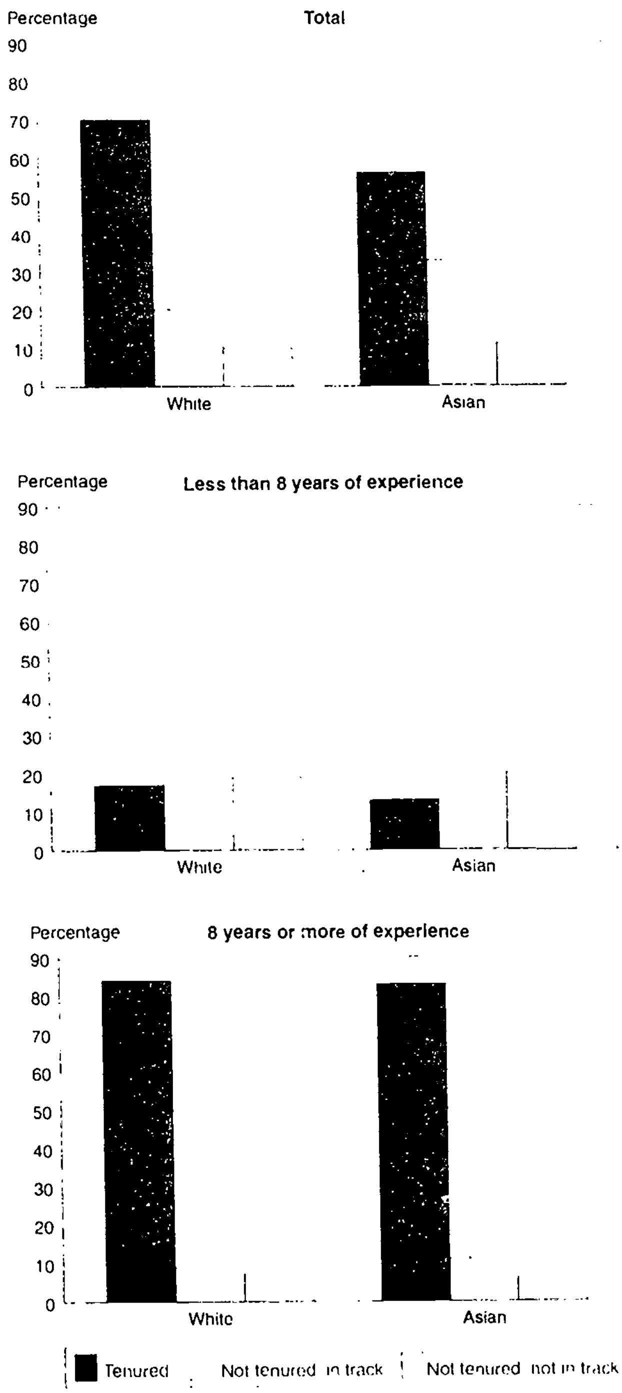
See appendix table 8-17

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

[13] Since there were several differences between the two surveys, comparisons can only be made for certain segments of the two population.

[14] The question used in the Survey of Doctorate Recipients combined stair climbing and walking, while the Survey of Income and Program Participation asked about these two activities separately. The rate reported for the latter survey is for the higher of the two activities.

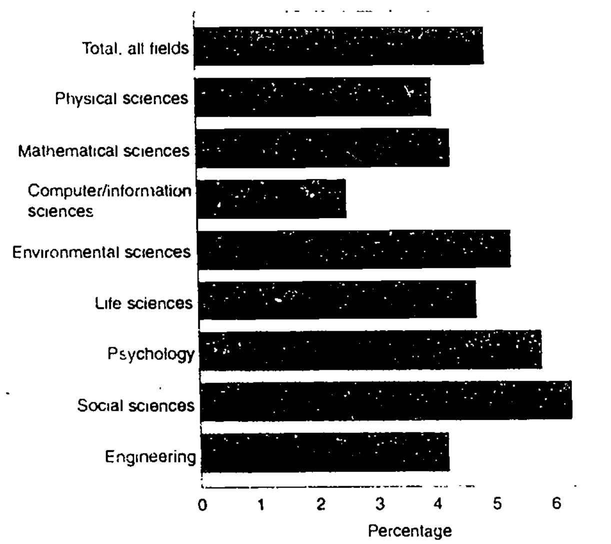
Figure 8-17.
Tenure status of doctoral scientists and engineers, by years of professional work experience and race/ethnicity: 1991



See appendix table 8-18.

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

Figure 8-18.
Persons with disabilities as a percentage of doctoral scientists and engineers in the U.S labor force, by field of doctorate: 1991



See appendix table 8-19.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Unemployment and Underemployment

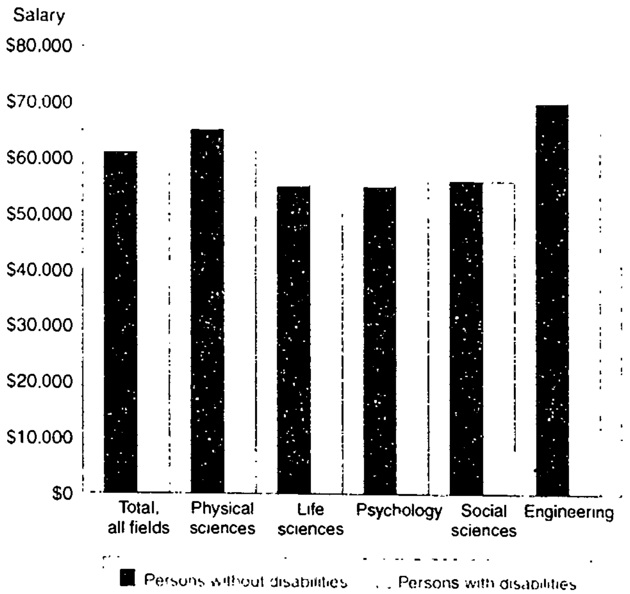
People with disabilities in the doctoral S&E population were less likely than individuals without disabilities to be unemployed (1.1 percent compared with 1.5 percent) or underemployed (1.0 percent compared with 1.7 percent).[15] However, the older average age of persons with disabilities may well explain these differences. Unfortunately, sample sizes were too small to examine accurately unemployment and underemployment rates for persons with and without disabilities having similar years of professional work experience.

Salary

Doctoral scientists and engineers with disabilities had slightly higher median salaries than individuals without disabilities ($61,800 compared with $60,600). (See figure 8-19.) Similar differences were noted within the degree fields examined. However, the slight salary advantage of individuals with disabilities appears to be attributable to the fact that the incidence of disability tends to increase with age. Among

[15] The difference in underemployment rates is statistically significant, i.e., it is larger than expected from chance fluctuations; however, the difference in the unemployment rates is not statistically significant.

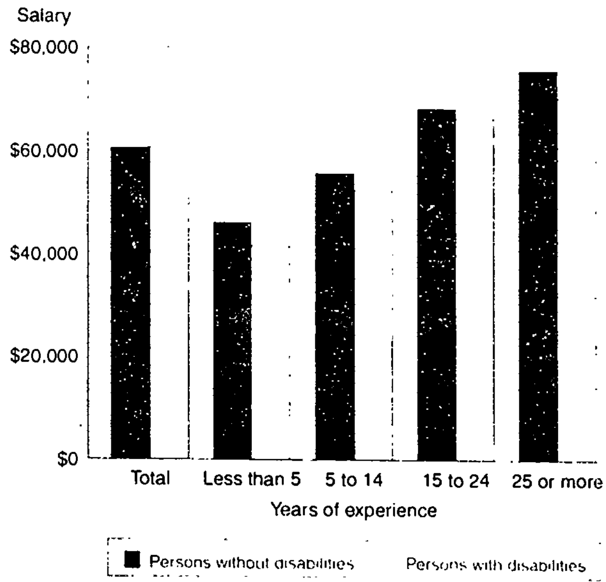
Figure 8-19.
Median annual salaries of doctoral scientists and engineers, by field of doctorate and disability status: 1991



See appendix table 8-20

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

Figure 8-20.
Median annual salaries of employed doctoral scientists and engineers, by years of professional work experience and disability status: 1991



See appendix table 8-21.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

groups with similar years of experience, individuals with disabilities had salaries between 90 and 97 percent of those without disabilities. (See figure 8-20.)

Academia

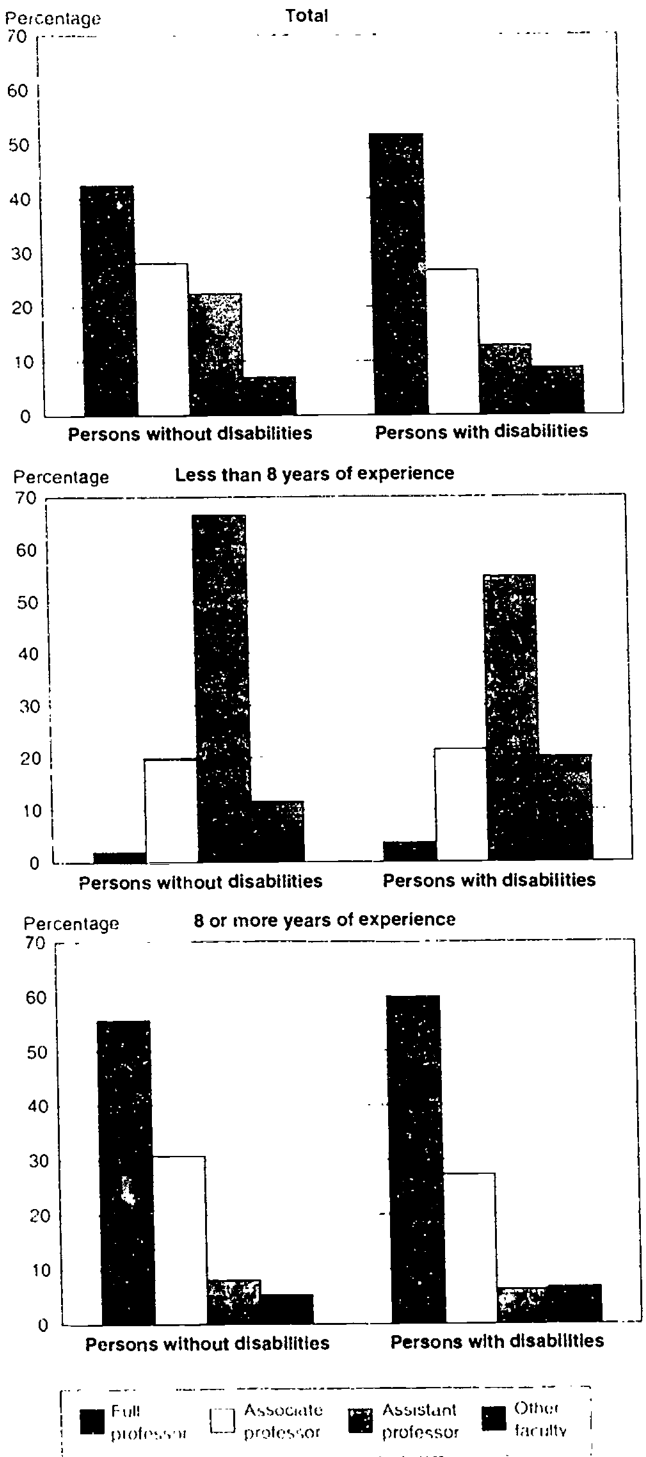
Employment. Among doctoral scientists and engineers, individuals with disabilities were slightly more likely to be employed at 4-year colleges and universities than individuals without disabilities (49 percent compared with 45 percent). (See appendix table 8-22.)

Rank and Tenure. Among doctoral scientists and engineers in 1991, persons with disabilities were more likely to be full professors than those without disabilities (52 percent compared with 43 percent). However, this appears to be largely, if not totally, attributable to their greater years of professional work experience. Among those with 8 or more years of experience, 60 percent of individuals with disabilities employed in 4-year colleges or universities were full professors, compared with 56 percent of those without disabilities. (See figure 8-21.) Similarly, among all doctoral scientists and engineers, 78 percent of those with disabilities were tenured compared with 67 percent of those without disabilities. Among individuals with 8 or more years of experience, however, the tenure gap was negligible (85 percent compared with 84 percent). (See figure 8-22.)

Conclusion

Individuals with disabilities appear to be significantly underrepresented in the S&E population. Although doctoral scientists and engineers with disabilities and those without disabilities have equivalent unemployment and underemployment rates, median salaries, academic rank, and tenure, this seeming equity may be because most disabilities are acquired late in life. As a consequence, doctoral scientists and engineers with disabilities have more work experience than their colleagues without disabilities. Comparing people with disabilities and those without disabilities who have similar years of experience reveals that persons with disabilities have median salaries somewhat lower than those without

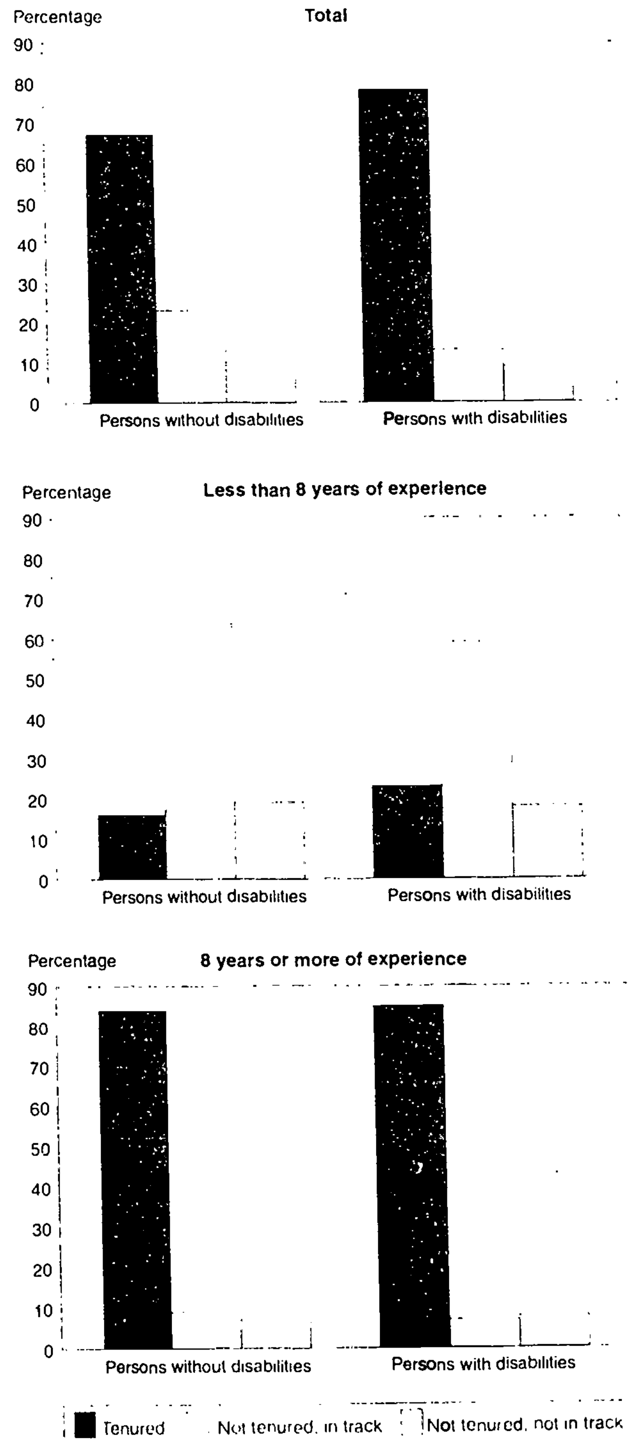
Figure 8-21.
Academic rank of doctoral scientists and engineers, employed in universities and 4-year colleges, by years of professional work experience and disability status: 1991



See appendix table 8-23

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

Figure 8-22.
Tenure status of doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience and disability status: 1991



See appendix table 8-24

Women, Minorities, and Persons With Disabilities in Science and Engineering 1994

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APPENDIX A. TECHNICAL NOTES

General Information

The data in this report come from many sources, including surveys conducted by Federal and State agencies and by professional associations. The data reflect many methods of collection, such as universe surveys, sample surveys, and compilations of administrative records. Users should take great care when comparing data from different sources. Data often will not be strictly comparable due to differences in definitions, survey procedures, phrasing of questions, etc.

Survey accuracy is determined by the joint effects of "sampling" and "nonsampling" errors. Sampling errors arise because estimates based on a sample will differ from the figures that would have been obtained if a complete census had been taken.

All surveys, whether universe or sample, are also subject to nonsampling errors, which can arise from design, reporting, and processing errors as well as errors due to faulty response or nonresponse. These nonsampling errors include respondent-based events such as: some respondents interpreting questions differently from other respondents; respondents making estimates rather than giving actual data; and respondents unable or unwilling to provide complete, correct information. Errors can also arise during the processing of responses, such as faulty imputation or reweighting to adjust for nonresponse, recording and keying errors, etc.

Racial/Ethnic Information

Data collection and reporting of the race/ethnicity of individuals pose several additional problems. First, both the naming of population subgroups and their definitions have often changed over time. Since this report draws on data from many sources, different terminology may have been used to obtain the various statistics presented here. Efforts have been made to maintain consistency throughout this text, but in some data reporting it has been necessary to use distinct terminology that does not match other compilations.

Second, many of the groups of particular interest are quite small, so that it is difficult to measure them accurately without universe surveys. In some instances sample surveys may not have been of sufficient scope to permit calculation of reliable racial/ethnic population estimates, so that results are not shown for all groups. In addition, the reader is cautioned that it is easy to overlook or minimize the heterogeneity within subgroups when only a single statistic is reported for the total racial/ethnic group.

Information About Persons With Disabilities

The data on persons with disabilities in science and engineering are seriously limited for several reasons. First, there have been differing operational definitions of "disability" that include a wide range of physical and mental conditions. Different sets of data have used different definitions and thus are not totally comparable. The Americans with Disabilities Act of 1990 (ADA) encouraged progress toward standard definitions. Under the ADA, an individual is considered to have a disability if the person has a physical or mental impairment that substantially limits one or more of the major life activities; has a record of such impairment; or is regarded as having such an impairment. The ADA also contains definitions of specific disabilities. (See appendix table 1-1.)

Second, data about disabilities are frequently not included in comprehensive institutional records (e.g., in registrars' records in institutions of higher education). If included at all in institutional records, such information is likely to be kept only in confidential files at an office responsible for providing special services to students. Institutions are unlikely to have information regarding any persons with disabilities who have *not* requested special services. In the case of elementary/secondary school programs receiving funds to provide special education, however, counts for the entire student population identified as having special needs are centrally available.

The third limitation on information on persons with disabilities gathered from surveys is that it often is obtained from self-reported responses. Typically, respondents are asked if they have a disability and to specify what kind of disability it is. Resulting data, therefore, reflect individual perceptions, not objective measures.

Finally, data on persons with disabilities are often derived from sample surveys whose main purpose is to derive estimates for a full population. Deriving estimates for any phenomenon that is applicable to a small proportion of the total is particularly difficult, especially when the sampling procedures do not have a way to "oversample" cases providing the characteristic of interest. Since persons with disabilities constitute a relatively small portion of the population, sample sizes may not be sufficiently large to permit calculation of reliable estimates.

An example in which these factors come together can be seen in the attempt to provide estimates of the proportion of the undergraduate student population with disabilities. Self-reported data from the undergraduate student population, queried on a survey to ascertain patterns of student financial aid, suggest that about 10 percent of the undergraduate population report having some disability; estimates from population surveys of higher education institutions, in contrast, place the estimate much lower, between 1 and 5 percent. Whether this discrepancy is the result of self-perception, incomplete reporting, nonevident disabilities, or differing definitions is difficult to ascertain.

Therefore, although there is considerable information available on persons with disabilities and their status in the educational system and in the science and engineering workforce, it is often not possible to compare the numbers of persons with disabilities from different sources.

Primary Sources

Current Population Reports, P70-33: *Americans With Disabilities: 1991–92*

Contact

Current Population Reports
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233
Tel: (301) 763-8300

This report presents data on the disability status of the noninstitutionalized population of the United States. The source of the data is a combined sample from the 1990 and 1991 panels of the Survey of Income and Program Participation. A supplement containing an extensive set of questions about disability status was included as part of the sixth wave of the 1990 panel and the third wave of the 1991 panel. Both of these waves were fielded between October 1991 and January 1992. The total sample size for this study was approximately 30,000 interviewed households. Estimation procedures were used to inflate weighted sample results to independent estimates of the civilian noninstitutional population of the United States.

Twelve questions were used to determine disability status for this study. These concerned the presence of limiting conditions such as difficulty with sensory and physical functional activities; difficulty with activities of daily living; the existence of specific conditions such as dyslexia, developmental disabilities, or other mental or emotional conditions; and the presence of a physical, mental, or other health condition limiting the kind or amount of work or housework that the person can do. For children, there were additional questions such as whether the children had received therapy or diagnostic services, had limitations in their ability to do regular schoolwork, or had a long-lasting condition that limited their ability to undertake activities such as walking and running. A person was considered to have a disability if the individual was identified affirmatively by any of the 12 category questions.

Survey of Public Attitudes Toward and Understanding of Science and Technology and Biomedical Sciences in the United States: 1992 (Public Attitudes Survey)

Contact

Division of Science Resources Studies
National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230
Tel: (703) 306-1777
Fax: (703) 306-0508

Surveys of public attitudes toward science and technology, supported by the National Science Foundation for the past two decades, were designed to collect data on the public's interest in, knowledge of, sources of information for, attentiveness toward, and attitudes regarding science, technology, health, and biomedical information and issues.

The 1992 Survey of Public Attitudes consisted of telephone interviews with 2,001 adults aged 18 and over in a national probability sample. It contained a core set of questions that have been asked since 1979, as well as new topical questions. Data were collected by gender, level of education, extent of science and math education, age, race/ethnicity, and other background demographic characteristics.

In 1992, the National Institutes of Health joined with the National Science Foundation to sponsor a similar national study of public understanding of biomedical concepts. A total of 3,111 telephone interviews were conducted using a national sample stratified by race/ethnicity. Black and Hispanic college graduates were oversampled using the same probability techniques employed with the base sample to allow meaningful comparisons of college graduates of these populations.

National Assessment of Educational Progress, 1969 to 1992

Contact

National Center for Education Statistics
U.S. Department of Education
555 New Jersey Avenue, NW
Washington, DC 20208-5653
Tel: (202) 219-1761
Fax: (202) 219-1751

The National Assessment of Educational Progress (NAEP) is sponsored by the National Center for Education Statistics (NCES) and has been conducted since 1983 by the Educational Testing Service. The overall goal of the project is to determine the Nation's progress in education. Accordingly, NAEP encompasses a series of national sample surveys designed to assess students in 10 subject areas such as reading, mathematics, science, writing, history, etc. Begun in 1969, NAEP was conducted annually through 1980; since 1980 the project has been conducted biennially. NAEP has surveyed the educational accomplishments of 9-, 13-, and 17-year-old students (and in recent years, those in grades 4, 8, and 12 as well). Over the years NAEP has undergone extensive changes both in survey methodology and in the assessment areas covered, to reflect changing informational needs and possible changes in education achievement.

NAEP used a complex multistage stratified sample of schools, selected to ensure adequate representation of schools with high enrollment of blacks and Hispanics. Approximately 8,500 students at each age/grade level were tested in mathematics and another 8,500 in science. Overall response rates (taking into account both school and student response rates) for the grade levels examined in 1990 ranged from 75 to 82 percent.

The assessment excluded students with limited English proficiency and students receiving special education services who were mainstreamed less than 50 percent of the time.

National Education Longitudinal Study of 1988

Contact

National Center for Education Statistics
U.S. Department of Education
555 New Jersey Avenue, NW
Washington, DC 20208-5651
Tel: (202) 219-1777
Fax: (202) 219-1728

The National Education Longitudinal Study of 1988 (NELS:88) was conducted by the National Center for Education Statistics as part of a long-term national education project that also included both the National Longitudinal Study of the High School Class of 1972 and the High School and Beyond Study. The project's goal was to monitor the educational, vocational, and personal development of students as they move through the grades. NELS:88 began with a baseline assessment of academic achievement and school experience of eighth grade students in 1988; they were followed up on a biennial basis to observe how the eighth grade experience affected later educational and occupational attainment.

The base year study obtained participation from 1,057 public and private schools and encompassed 24,599 students. The instruments utilized in the base year study included student questionnaires combined with cognitive tests, as well as questionnaires for parents, teachers, and school administrators. As a complement to NELS:88, teacher transcript data were collected to examine science and mathematics teachers' characteristics, their qualifications, and their preparation for teaching.

The first follow-up survey was conducted in 1990, surveying the initial 8th grade cohort as 10th graders; the second follow-up was performed in 1992 for the cohort as seniors. For the follow-ups, a dropout questionnaire was added to the existing instruments to obtain information about the characteristics of dropouts from the eighth grade cohorts and their return to school.

Readers of this report should note several factors about the NELS:88 coverage of certain subgroups: The school universe chosen was restricted to regular public and private schools with eighth grade students. A supplementary sample of Hispanic and Asian/Pacific Islander students (and their parents and teachers) was included, but schools operated by the Bureau of Indian Affairs were excluded. Special education schools for persons with disabilities, area vocational schools that did not enroll students directly, and schools for dependents of U.S. personnel overseas were also excluded. Students identified as having mental disability, physical or emotional problems, or a language barrier were also excluded from the sample.

American College Testing Program

Contact

The American College Testing Program
2201 North Dodge Street
P.O. Box 168
Iowa City, IA 52243
Tel: (319) 337-1510

The American College Testing (ACT) Assessment is taken by college-bound high school students who request that the results be sent to designated colleges and scholarship boards. The ACT is designed to measure educational development in the areas of English, mathematics, social studies, and natural sciences. The test results are used in part to help predict how well students might perform in college. In 1993, approximately 875,000 students took the ACT examinations.

ACT standard scores are reported for each subject area on a scale from 1 to 36. A composite score is obtained by taking the simple average of the four standard scores and is an indication of a student's overall academic development across the four subject areas.

Since the 1984–85 school year, national norms have been based on the test scores of all students taking the test. These norms are based on the most recent ACT scores available from students scheduled to graduate in the spring of the year.

It should be noted that college-bound students who take the ACT Assessment are not, in some respects, representative of college-bound students nationally. First, students who live in the Midwest, South, and Rocky Mountains and Plains regions are overrepresented among ACT-tested students compared with college-bound students nationally. Second, ACT-tested students tend to enroll in public colleges and universities more frequently than do college-bound students nationally.

Scholastic Aptitude Test (SAT)

Contact

College Entrance Examination Board
Educational Testing Service
Princeton, NJ 08541
(609) 771-7600

The Admissions Testing Program of the College Board comprises a number of college admissions tests, including the Scholastic Aptitude Test (SAT). The SAT is taken by students who need the results to apply to a particular college or university or scholarship board. High school students participate in the testing program as sophomores, juniors, or seniors—some more than once during these 3 years. If they have taken the tests more than once, only the most recent scores are tabulated.

The SAT reports subscores in the areas of mathematics and verbal ability. Students may also elect to take Achievement Tests in any of 18 subject areas; these exams are generally taken by students who are applying to the more competitive schools. In 1993, approximately 1 million students took the SAT examination, and close to 200,000 took at least one Achievement Test.

Students may also take Advanced Placement exams in any of 29 subject areas; high scores on these exams may qualify them for advanced placement in their college courses in these areas. In 1993, over 400,000 students took at least one Advanced Placement exam.

The SAT results are not representative of high school students or college-bound students nationally since the sample is self-selected. In addition, public colleges in a number of States require that students applying for admission submit ACT scores (see above) rather than SAT scores; thus, the proportion of students taking the SAT in some States is very low.

The 1992 National Norms Study of The Cooperative Institutional Research Program

Contact

Higher Education Research Institute
Graduate School of Education
University of California
320 Moore Hall
Los Angeles, CA 90024-1521
Tel: (310) 825-1925
Fax: (310) 206-2228

This series, initiated in 1966, provides national normative data on the characteristics of students attending American colleges and universities as first-time, full-time first-year students. The series is a project of the Cooperative Institutional Research Program (CIRP), a national longitudinal study of the American higher education system sponsored by the American Council on Education and the Graduate School of Education at the University of California, Los Angeles.

Since 1972, the CIRP freshman surveys have been conducted by the Higher Education Research Institute at the University of California, Los Angeles. The 1992 CIRP freshman norms are based on the responses of 213,630 students at 404 of the Nation's 2- and 4-year colleges and universities, statistically adjusted to reflect the responses of the 1.7 million first-time, full-time students entering college as freshmen in fall 1992.

The 1992 Student Information Form is a student self-report questionnaire composed of 39 multiple choice items. The questionnaire obtains data from students in eight areas: academic skills and preparation; demographic trends; high school activities and experiences; educational and career plans; majors and careers; attitudes; student values; and means of financing education.

The CIRP National Norms Study sample is derived from students attending institutions that volunteered to participate in the study. Therefore, it is not a random sample of the U.S. population of higher education institutions and students. As a result, survey findings may not present trends in the Nation as a whole.

The Integrated Postsecondary Education Data System Survey: Fall Enrollment, Completions and Institutional Characteristics

Contact

National Center for Education Statistics
U.S. Department of Education
555 New Jersey Avenue, NW
Washington, DC 20208-5652
Tel: (202) 219-1373
Fax: (202) 219-1679

The Integrated Postsecondary Education Data System (IPEDS) began in 1986 as a supplement to and replacement for the Higher Education General Information Survey (HEGIS) which began in 1966. HEGIS was an annual survey of institutions listed in the current *NCES Education Directory, Colleges and Universities*; IPEDS surveys all postsecondary institutions, including universities and colleges and the institutions that offer technical and vocational education. The higher education portion is a census of accredited 2- and 4-year colleges, while technical and vocational schools are surveyed on a sample basis.

IPEDS consists of several integrated components that obtain information on types of institutions where postsecondary education is available, student participants, programs offered and completed, and the human and financial resources involved in the delivery of postsecondary education. The components of IPEDS include surveys of institutional characteristics; fall enrollment of students, including their age and residence; fall enrollment in occupationally specific programs; completions; finance; staff; salaries of full-time instructional faculty; and academic libraries.

The IPEDS Institutional Characteristics survey provides the basis for the universe of institutions reported in the *Education Directory of Colleges and Universities*. The universe includes institutions that met certain accreditation criteria and offered at least a 1-year program of college-level studies leading toward a degree. Each fall, institutions listed in the previous year's directory are asked to update information on the characteristics of their school.

The IPEDS Completions Survey replaces and extends the HEGIS Degrees and Other Formal Awards Conferred Survey. The Completions Survey is administered to a census of institutions offering degrees at the bachelor's level and above, all 2-year institutions, and a sample of less than 2-year institutions.

The IPEDS Fall Enrollment Survey replaces and extends the previous HEGIS *Fall Enrollment and Compliance Report of Institutions of Higher Education*.

Imputations were developed for institutions that provided incomplete racial/ethnic data. Some of these institutions had reported total degrees awarded but not racial/ethnic data. In these cases, NCES imputed data on the basis of an earlier response for each institution, if available. The percentage of imputed data for racial/ethnic categories in 1991 ranged from 2.4 percent to 14.9 percent for bachelor's degrees, and from 2.4 percent to 7.1 percent for master's degrees.

Other institutions reported totals that were larger or smaller than the sum of the racial/ethnic components, or reported racial/ethnic data as unknown. In these cases, NCES distributed the difference among the racial/ethnic groups for that institution.

Survey of Earned Doctorates

Contact

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The Survey of Earned Doctorates (SED) has been conducted annually since 1957, under contract by the National Research Council of the National Academy of Sciences, for the National Science Foundation, the U.S. Department of Education, the National Endowment for the Humanities, the National Institutes of Health, and the U.S. Department of Agriculture. This is a census survey of all recipients of research doctoral degrees such as Ph.D. or D.Sc.; it excludes the recipients of first-professional degrees such as J.D. or M.D. Therefore, SED data are restricted to research doctorates.

Data for the SED are collected directly from individual doctorate recipients. The recipients are asked to provide information on the field and specialty of their degree, as well as their personal educational history, selected demographic data, and information on their postgraduate work and study plans. Approximately 95 percent of the annual cohort of doctorate recipients respond to the questionnaire, which is distributed through the cooperation of the graduate deans at institutions awarding doctorates.

Partial data from public sources, such as field of study, are added to the file for nonrespondents. However, there are no imputations for nonresponse for data not available elsewhere, such as race/ethnicity information. The data for a given year include all doctorates awarded in the 12-month period ending on June 30 of that year.

Curriculum Assessment Service Database: Estimates of Student Curricular Activities From a National Survey of Colleges and Universities (Transcript Study)

Contact

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The data base for this study contains both student course enrollment (transcript) data and demographic information for baccalaureate recipients. The study was developed to provide policy makers and researchers with a national data base that would allow them to examine and assess the program choices of baccalaureate degree recipients.

The data for this study were drawn from a stratified random sample of U.S. institutions (including schools in Puerto Rico) that granted bachelor's degrees in the liberal arts and sciences in spring 1991. The sample was stratified according to three variables: private or State control; institutional type based on four Carnegie Commission classes (Comprehensive, Doctoral, Liberal Arts, and Research); and East, Middle, and West regions.

From the 1,360 colleges and universities identified as candidates for inclusion in the sample, a sample of 100 institutions was drawn. A total of 42,007 transcripts from the sample schools were examined. Eighty-one institutions submitted transcripts for the data base study.

Survey of Graduate Students and Postdoctorates in Science and Engineering: 1992

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This annual survey collects data from all institutions offering graduate programs in any science, engineering, or health field. Data are collected at the academic department level. Available information includes: full-time graduate students by source and mechanism of support, with data on women and first-year students enrolled full time; part-time graduate students by sex; and citizenship and racial/ethnic background of all graduate students. In addition, detailed data on postdoctorates are available by source of support, sex, and citizenship, with separate data on those holding first-professional doctorates in the health fields; there is also summary information on other doctorate nonfaculty research personnel.

In fall 1992, the latest survey cycle for which final data are available, the survey universe included approximately 10,800 departments at 608 institutions of higher education, including 333 doctorate- and 275 master's-granting institutions. Separate data were obtained from 119 specialized entities such as medical and dental schools, schools of public health, and other organizational units, bringing the total number of responding entities to 727. Coverage included all departments in 62 science, engineering, and health fields: 39 science fields (4 physical, 4 environmental, mathematical, computer, agricultural, 17 biological, psychology, and 10 social), 14 engineering fields, and 9 health fields.

The National Postsecondary Student Aid Study, "Undergraduate Financing of Postsecondary Education," 1989–90

Contact

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The National Postsecondary Student Aid Study (NPSAS) was established by NCES to collect information concerning financial aid allocated to students enrolled in U.S. postsecondary institutions. After a national field test in 1985–86, NPSAS was first administered in the fall of the 1986–87 academic year. NCES conducted a second cycle of NPSAS for the 1989–90 school year. This second cycle also contained enhancements to the methodology used in the 1987 cycle.

The 1990 in-school sample involved about 70,000 students selected from registrar lists of enrollees at approximately 1,200 postsecondary institutions. The sample included students who did and did not receive financial aid. Student information such as field of study, educational level, and attendance status (part-time or full-time) was obtained from registrar records. Types and amounts of financial aid and family financial characteristics were abstracted from school financial aid records. Also, approximately 26,000 parents of students were sampled to compile data concerning family composition and parental financial characteristics.

Biennial follow-up data collections are expected. Students enrolled in postsecondary education for the first time in 1990 will serve as the base for the longitudinal component of NPSAS.

Higher Education Survey, Surveys on Undergraduate Education in Sociology, Physics, Geology, 1991; Undergraduate Education in Electrical, Mechanical, and Civil Engineering, 1994: Technical Education in 2-Year Institutions, 1994

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The Higher Education Surveys (HES) system was established to conduct brief surveys of higher education institutions on topics of interest to Federal policymakers and the education community. The system is sponsored by the National Science Foundation, the U.S. Department of Education, and the National Endowment for the Humanities.

HES questionnaires typically request a limited amount of readily accessible data from a subsample of institutions in the HES panel, which is a nationally representative sample of approximately 1,100 institutions representing approximately 3,200 colleges and universities in the United States. Each institution in the panel appoints a HES campus representative who serves as the survey coordinator. The campus representative facilitates data collection by identifying the appropriate respondent for each survey and distributing the questionnaire to that person.

Public Use Microdata Samples of the Decennial Census: 1980 and 1990

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To obtain detailed tabulations of scientists and engineers from the 1980 and 1990 Decennial Census, NSF tabulated data from the Public Use Microdata Samples (PUMS) files of the Bureau of the Census. The 1980 5 percent PUMS contains records of the 1980 Census Long Form responses for approximately 5 percent of the total U.S. population. For 1990 data, tabulations were from a combined file made from the 1990 1 percent PUMS and the 1990 5 percent PUMS with appropriate reweighting.

The tabulations of scientists and engineers from census data were limited to those with a bachelor's degree who reported a science or engineering occupation and were not working in academia. Unlike other data sources used in this report, scientists and engineers are identifiable on census data only by self-described occupation and not by field of degree: this eliminates those who have left science or engineering employment. In addition, many active scientists and engineers are excluded because their occupational responses were too generic to classify them within science and engineering (e.g., manager or college professor).

Survey of Doctorate Recipients: 1991

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The Survey of Doctorate Recipients (SDR) is a longitudinal survey designed to provide demographic and career history information about individuals with doctoral degrees. The survey is conducted for the National Science Foundation and other Federal agencies under contract by the National Research Council of the National Academy of Sciences. The 1991 survey, the 10th in a biennial series, reflects a number of improvements made by the National Science Foundation. The SDR is a survey of individuals under the age of 76 who hold doctorates in science and engineering from U.S. institutions. The 1991 population differs from prior surveys in the series, which followed a cohort of doctorate recipients for 42 years. Several other improvements introduced into the 1991 SDR also affect comparability with SDR data published in prior survey years. For example, there was a change in the definition of doctoral scientists and engineers. Another change made in 1991 was the introduction of more intensive follow-up of mail nonrespondents in order to raise the survey response rate.

Among the variables included in this survey are citizenship, date of birth, disability status, educational history, employment status (unemployed, employed part time, or employed full time), field of degrees, geographic place of employment, labor force status, occupation, postdoctorate status, primary work activity (e.g., teaching, basic research, etc.), race/ethnicity, salary, sector of employment (academia, industry, government), sex, and years of professional experience.

The sample size for the 1991 survey was approximately 38,000, with a response rate of 87 percent. The sample was stratified on the basis of field of degree, sex, disability status, racial/ethnic group, and nativity (i.e., whether born in the United States) in order to provide more reliable data on rare subgroups in the population. The sample frame used to identify these individuals is the Doctorate Records File, maintained by the National Academy of Sciences. The primary source of information for the frame is the Survey of Earned Doctorates (SED) (discussed separately above). For individuals who received a degree prior to 1957 when the SED started, information was taken from a register of highly qualified scientists and engineers that the National Academy of Sciences had assembled from a variety of sources.

Since this is a longitudinal survey, recent recipients of research doctorates are added each time the survey is conducted and individuals no longer under age 76 are dropped. Initial data collection in 1991 was by mail. Nonrespondents to the mail questionnaire were followed up, using Computer Assisted Telephone Interviewing techniques. The instrument used in the phone follow-up was modified from the mail instrument to avoid difficulties encountered in administering some of the questions by phone, especially those (such as field of degree and field of occupation) that require individuals to select from an extensive list of possible responses.

APPENDIX B. STATISTICAL TABLES

Appendix table 1-1. Federal definitions of special education disability categories

Page 1 of 1

Specific learning disability. A disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, write, spell, or to do mathematical calculations; this includes perceptual handicaps, brain injury, minimal brain disfunction, dyslexia, and developmental aphasia, but does not include learning problems resulting from visual, hearing, or motor handicaps, or from mental retardation.

Seriously emotionally disturbed. Exhibition of behavior disorders over a long period of time that adversely affect educational performance; this includes an inability to learn that cannot be explained by intellectual, sensory, or health factors; an inability to build or maintain satisfactory interpersonal relationships with peers and teachers; inappropriate types of behaviors or feelings under normal circumstances; a general pervasive mood of unhappiness or depression; or a tendency to develop physical symptoms or fears associated with personal or school problems.

Speech impaired. Communication disorders, such as stuttering, impaired articulation, language or voice impairments, that adversely affect educational performance.

Mentally retarded. Significantly subaverage general intellectual functioning with concurrent deficits in adaptive behavior that were manifested in the development period and that adversely affect educational performance.

Visually impaired. A visual impairment that, even with correction, adversely affects educational performance, including students who are partially signted or completely blinded.

Hard of hearing. A hearing impairment, permanent or fluctuating, that adversely affects educational performance but that is not included in the deaf category.

Deaf. A hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, which adversely affects educational performance.

Orthopedically impaired. A severe orthopedic impairment that adversely affects educational performance, including those caused by congenital anomaly, disease, or other causes.

Other health impaired. Limited strength, vitality, or alertness due to chronic or acute health problems that adversely affect educational performance (includes autistic students).

Multiply handicapped. Concomitant impairments, the combination of which causes such severe educational problems that they cannot be accommodated in special education programs solely for one of the impairments (does not include deaf/blind).

Deaf/blind. Concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational problems that they cannot be accommodated in special education programs solely for deaf or blind students.

SOURCE: SRI International. 1991. *Youth With Disabilities: How Are They Doing? The First Comprehensive Report from the National Longitudinal Transition Study of Special Educational Students.* Washington, DC: SRI International.

Appendix table 1-2. Selected population, education, and employment characteristics, by sex: selected years

Page 1 of 1

Measure	Total U.S. citizens and permanent residents	Males	Females
Total population, 1990 census	248,709,873	121,239,418	127,470,455
Persons 5-18 years old, October 1992	50,392,000	25,780,000	24,612,000
Persons 5-18 years old enrolled in school, October 1992	48,388,000	24,850,000	23,538,000
Undergraduate enrollment, fall 1991	12,360,287	5,499,123	6,861,164
Bachelor's degrees, 1991	1,078,340	490,725	587,615
Science	353,189	175,527	177,662
Engineering	57,604	48,410	9,194
Other	667,547	266,788	400,759
Graduate enrollment, fall 1992[1]	1,681,294	779,448	901,846
Science	313,566	180,313	133,253
Engineering	118,047	100,889	17,158
Other	1,249,681	498,246	751,435
Master's degrees, 1991	300,887	131,745	169,142
Science	64,003	28,901	35,102
Engineering	16,487	13,977	2,510
Other	220,397	88,867	131,530
Doctoral degrees, 1992	27,717	15,673	12,044
Science	13,110	8,000	5,110
Engineering	2,510	2,185	325
Other	12,097	5,488	6,609
Civilian labor force, 1990	123,473,450	66,986,201	56,487,249
Scientists	1,591,800	1,009,100	582,700
Natural scientists	424,400	311,900	112,500
Math and computer scientists	779,900	503,300	276,600
Social scientists	387,500	193,900	193,600
Engineers	1,714,900	1,558,000	156,900

[1] Includes nonresident aliens

NOTE. Because of nonresponse, details may not add to totals.

SOURCES: U.S. Department of Commerce, Bureau of the Census; U.S. Department of Education/NCES, Fall Enrollment Survey; and National Science Foundation/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering and Survey of Earned Doctorates

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 1-3. Selected population, education, and employment characteristics, by race/ethnicity: selected years

Page 1 of 1

Measure	Total U.S. citizens and permanent residents	White, non-Hispanic	Black, non-Hispanic	American Indian/ Alaskan Native	Asian/ Pacific Islander	Hispanic
Total population, 1990 census[1]	248,709,873	199,686,070	29,986,060	1,959,234	7,273,662	22,354,059
Persons 5-18 years old, October 1992[1]	50,392,000	40,094,000	7,870,000	NA	NA	5,773,000
Persons 5-18 years old enrolled in school, October 1992	48,388,000	38,525,000	7,514,000	NA	NA	5,613,000
Undergraduate enrollment, fall 1991	12,360,287	9,508,661	1,231,275	105,839	565,166	949,346
Bachelor's degrees, 1991	1,078,340	892,363	65,009	4,486	41,725	49,027
Science	309,472	244,191	19,714	1,361	14,640	13,724
Engineering	57,604	45,162	2,229	158	6,220	2,566
Other	711,264	603,010	43,066	2,967	20,865	32,737
Graduate enrollment, fall 1992	1,604,679	1,312,628	83,443	4,814	133,188	70,606
Science	245,600	196,600	12,998	1,076	13,391	9,793
Engineering	76,849	57,368	2,372	177	8,576	2,450
Other	1,282,230	1,058,660	68,073	3,561	111,221	58,363
Master's degrees, 1991	300,887	247,524	15,857	1,125	11,070	9,684
Science	56,798	45,800	3,427	254	2,668	2,107
Engineering	16,487	12,635	398	40	2,008	468
Other	227,602	189,089	12,032	831	6,394	7,109
Doctoral degrees, 1992	27,717	23,425	1,092	150	1,731	882
Science	13,110	11,200	335	58	870	420
Engineering	2,510	1,874	48	11	447	72
Other	12,097	10,351	709	81	414	390
Civilian labor force, 1990	123,473,450	96,243,121	12,835,601	783,362	3,495,762	10,021,723
Scientists	1,591,800	1,363,300	86,900	5,100	86,700	48,900
Natural scientists	424,400	364,300	17,400	1,600	28,500	12,300
Math and computer scientists	779,900	654,700	49,000	2,300	49,500	23,800
Social scientists	387,500	344,300	20,500	1,200	8,700	12,800
Engineers	1,714,900	1,474,900	60,000	4,700	119,900	54,600
Other	120,166,750	93,404,921	12,688,701	773,562	3,289,162	9,918,223

[1] In census statistics, Hispanics are double-counted both as "Hispanic" and under the applicable race/ethnicity category.

NOTE: Because totals include "other and unknown," details may not add to totals.

KEY: NA = not available

SOURCES: U.S. Department of Commerce, Bureau of the Census; U.S. Department of Education/NCES, Fall Enrollment Survey; and National Science Foundation/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering and Survey of Earned Doctorates.

Appendix table 1-4. Population of the United States, by race/ethnicity, region, division, and State: 1990

[Numbers in thousands]

Region, division and State	Total	White	Black	American Indian Alaskan Native	Asian	Other race	Hispanic	White non-Hispanic	[In percentages] Percentage distribution of total: Total	White	Black	American Indian Alaskan Native	Asian
Total United States	248 710	199 686	29 986	1 959	7 274	9 805	22 354	188 128	100 0	80 3	12 1	0 8	2 9
Regions and divisions													
Northeast	50 809	42 069	[illegible]	125	1 335	1 667	3 754	40 367	100 0	82 8	11 0	0 2	2 6
New England	13 207	12 033	628	33	232	282	568	11 766	100 0	91 1	4 8	2	1 8
Middle Atlantic	37 602	30 036	4 986	92	1 104	1 385	3.186	28 601	100 0	79 9	13 3	2	2 9
Midwest	[illegible]	52 018	[illegible]	338	768	829	1 727	51 175	100 0	87 2	9 6	6	1 3
East North Central	42 009	35 764	4 817	150	573	705	1 438	35 075	100 0	85 1	11 5	4	1 4
West North Central	[illegible]	16 254	899	188	195	124	289	16 101	100 0	92 0	5 1	1 1	1 1
South	85 446	65 582	15 829	563	1 122	2 350	6 767	61 359	100 0	76 8	18 5	7	1 3
South Atlantic	43 567	33 391	8 924	172	631	449	2.133	31 821	100 0	76 6	20 5	4	1 4
East South Central	15 176	12 049	2 977	41	84	25	95	11 990	100 0	79 4	19 6	3	6
West South Central	26 703	20 142	3 929	350	407	1 876	4 539	17 548	100 0	75 4	14 7	1 3	1 5
West	52 786	40 017	2 828	933	4 048	4 960	10 106	35 227	100 0	75 8	5 4	1 8	7 7
Mountain	13 659	11 762	374	481	217	826	1 992	10 642	100 0	86 1	2 7	3 5	1 6
Pacific	39 127	28 255	2 454	453	3 831	4 134	8 114	24 585	100 0	72 2	6 3	1 2	9 8
Divisions and States													
New England	[illegible]	[illegible]	628	33	232	282	568	11 766	100 0	91 1	4 8	2	1 8
Maine	1 228	1 208	[illegible]	6	7	2	7	1 203	100 0	98 4	4	5	5
New Hampshire	1 109	1 087	[illegible]	2	9	3	11	1 079	100 0	98 0	6	2	8
Vermont	563	[illegible]	2	[illegible]	3	1	4	552	100 0	98 6	3	3	6
Massachusetts	6 016	5 405	300	[illegible]	143	155	288	5 280	100 0	89 8	5 0	2	2 4
Rhode Island	1 003	917	39	4	18	25	46	896	100 0	91 4	3 9	4	1 8
Connecticut	3 287	2 859	274	7	51	96	213	2 754	100 0	87 0	8 3	2	1 5
Middle Atlantic	37 602	[illegible]	4 986	92	1 104	1 385	3 186	28 601	100 0	79 9	13 3	2	2 9
New York	17 990	13 385	2 859	63	694	990	2 214	12 460	100 0	74 4	15 9	3	3 9
New Jersey	7 730	6 130	1 037	15	273	275	740	5 719	100 0	79 3	13 4	2	3 5
Pennsylvania	11 882	10 520	1 090	15	137	119	232	10 422	100 0	88 5	9 2	1	1 2
East North Central	42 009	35 764	4 817	150	573	705	1 438	35 075	100 0	85 1	11 5	4	1 4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	15	[illegible]	[illegible]	9 115	100 0	87 8	10 6	2	[illegible]
[illegible]	11	[illegible]	43	[illegible]	[illegible]	41	[illegible]	4 165	100 0	90 6	7 8	[illegible]	[illegible]
Illinois	11 431	8 953	1 694	22	285	476	904	8 550	100 0	78 3	11 8	2	[illegible]
Michigan	[illegible]	[illegible]	1 292	56	105	87	202	7 650	100 0	83 4	13 9	6	1
Wisconsin	4 892	[illegible]	245	39	54	42	93	4 465	100 0	92 2	5 0	8	1

[illegible] at end of table.

Appendix table 1-4. Population of the United States, by race/ethnicity, region, division, and State: 1990

[Numbers in thousands]

Region, division, and state	Total	White	Black	American Indian Alaskan Native	Asian	Other race	Hispanic	White non Hispanic	Total	White	Black	American Indian Alaskan Native	Asian
									[In percentages]				
										Percentage distribution of total			
Divisions and States cont'd													
West North Central	[illegible]	16 254	899	188	195	124	289	16 101	100.0	92.0	5.1	1.1	1.1
Minnesota	[illegible]	[illegible]	95	50	78	22	54	4 101	100.0	94.4	2.2	1.1	1.8
Iowa	[illegible]	2 683	48	[illegible]	25	13	33	2 664	100.0	96.6	1.7	.3	.9
Missouri	[illegible]	4 486	548	20	41	22	62	4 448	100.0	87.7	10.7	.4	.8
North Dakota	[illegible]	[illegible]	4	26	3	2	5	602	100.0	94.6	.6	4.1	.5
South Dakota	696	638	3	51	3	2	5	635	100.0	91.6	.5	7.3	.4
Nebraska	1 578	1 481	57	12	12	16	37	1 460	100.0	93.8	3.6	.8	.8
Kansas	2 478	2 232	143	22	32	43	94	2 191	100.0	90.1	5.8	.9	1.3
South Atlantic	43 567	33 391	8 924	172	631	449	2 133	31 821	100.0	76.6	20.5	.4	1.4
Delaware	666	535	112	2	9	8	16	528	100.0	80.3	16.9	.3	1.4
Maryland	4 781	3 394	[illegible]	13	[illegible]	45	125	3 326	100.0	71.0	24.9	.3	2.9
District of Columbia	607	[illegible]	[illegible]	1	[illegible]	15	33	166	100.0	29.6	65.8	.2	1.8
Virginia	6 187	4 792	1 163	15	[illegible]	58	160	4 702	100.0	77.4	18.8	.2	2.6
West Virginia	1 793	1 726	56	2	7	2	8	1 719	100.0	96.2	3.1	.1	.4
North Carolina	6 629	5 008	1 456	80	[illegible]	32	77	4 971	100.0	75.6	22.0	1.2	.8
South Carolina	3 487	2 407	1 040	8	22	4	31	2 390	100.0	69.0	29.8	.2	.6
Georgia	6 478	4 600	1 747	13	76	42	[illegible]	4 543	100.0	71.0	27.0	.2	1.2
Florida	12 938	[illegible]	1 760	36	154	238	1 574	9 475	100.0	83.1	13.6	.3	1.2
East South Central	15 176	[illegible]	2 977	41	84	25	95	11 990	100.0	79.4	19.6	.3	.6
Kentucky	3 685	3 391	263	6	18	7	22	3 378	100.0	92.0	7.1	.2	.5
Tennessee	4 877	4 048	778	10	32	9	33	4 028	100.0	83.0	16.0	.2	.7
Alabama	4 041	2 976	1 021	17	22	6	25	2 960	100.0	73.6	25.3	.4	.5
Mississippi	2 573	1 633	915	[illegible]	13	3	16	1 624	100.0	63.5	35.6	.3	.5
West South Central	[illegible]	[illegible]	3 929	359	407	1 876	4 539	17 548	100.0	75.4	11.7	1.3	1.5
Arkansas	[illegible]	1 945	374	13	13	7	20	1 933	100.0	82.7	15.9	.5	.5
Louisiana	[illegible]	2 839	[illegible]	19	41	22	93	2 776	100.0	67.3	30.8	.4	1.0
Oklahoma	[illegible]	[illegible]	34	252	34	42	86	2 548	100.0	82.1	7.4	8.0	1.1
Texas	[illegible]	[illegible]	[illegible]	66	319	1 805	4 340	10 292	100.0	75.2	11.9	.4	1.9
Mountain	[illegible]	[illegible]	374	481	217	826	1 992	10 642	100.0	86.1	2.7	3.5	1.6
Montana	[illegible]	741	[illegible]	48	4	4	12	734	100.0	92.7	.3	6.0	.5
Idaho	[illegible]	[illegible]	[illegible]	14	9	3	53	929	100.0	94.4	.3	1.4	.9
Wyoming	[illegible]	[illegible]	[illegible]	9	3	11	26	413	100.0	94.2	.8	2.1	.6
Colorado	[illegible]	[illegible]	[illegible]	28	60	168	424	2 659	100.0	88.2	4.0	.8	1.8
New Mexico	[illegible]	[illegible]	[illegible]	134	14	190	579	764	100.0	75.6	2.0	8.9	.9
Arizona	[illegible]	[illegible]	[illegible]	204	55	333	688	2 626	100.0	80.8	3.0	5.6	1.5
Utah	[illegible]	[illegible]	[illegible]	24	33	38	85	1 571	100.0	93.8	.7	1.4	1.9
Nevada	[illegible]	[illegible]	[illegible]	20	38	53	124	946	100.0	84.3	6.6	1.6	3.2

Appendix table 1-4. Population of the United States, by race/ethnicity, region, division, and State: 1990

[Numbers in thousands]

Region, division and State	Total	White	Black	American Indian Alaskan Native	Asian	Other race	Hispanic	White non-Hispanic	Total	Percentage distribution of total: White	Black	American Indian Alaskan Native	Asian
									[In percentages]				
Divisions and States — cont.													
Pacific	[illegible] 127	28 255	2 454	453	[illegible] 831	4 134	8 114	24.585	100 0	72 2	6 3	1 2	9 8
Washington	4 86[illegible]	4 30[illegible]	15[illegible]	81	211	116	215	4 222	100 0	88 5	3 1	[illegible] 7	4 3
Oregon	2 842	2 63[illegible]	46	38	69	52	113	2 580	100 0	92 8	1 6	1 4	2 4
California	[illegible] 760	20 524	2 209	242	2 846	3 939	7 688	17 029	100 0	69 0	7 4	8	9 6
Alaska	550	4[illegible]	22	86	20	7	18	407	100 0	75 5	4 1	15 6	3 6
Hawaii	1 108	370	27	5	685	21	81	348	100 0	33 4	2 5	5	61 8

NOTES: [illegible] set forth herein are subject to possible correction for undercount or overcount.
Percentages are based on unrounded numbers.
Hispanics may be of any race.
Because of rounding, percentages may not add to 100.

[illegible]

[illegible]

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Appendix table 1-5. Educational attainment of persons 15 years and over, by sex and race/ethnicity: 1990

[In percentages]

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Race/ethnicity and sex	High school diploma or higher	Bachelor's or higher degree
Total population:		
Both sexes	71 7	17.6
Males	71.4	19.7
Females	71.9	15.6
White:		
Both sexes	74.6	18.9
Males	74.4	21.4
Females	74.7	16.6
Black:		
Both sexes	59.8	9.3
Males	57.9	8.6
Females	61.4	9.8
American Indian/Alaskan Native:		
Both sexes	60.5	7.4
Males	59.9	7 8
Females	61.0	7.0
Asian:		
Both sexes	73.6	30.7
Males	76 2	34.2
Females	71.1	27.4
Hispanic origin:		
Both sexes	47.1	7.2
Males	46 1	7.6
Females	48.1	6 8
White, non-Hispanic:		
Both sexes	75 8	19.4
Males	75.8	22.0
Females	75.9	17.0

SOURCE: U S. Department of Commerce. Bureau of the Census. 1990. *Education in the United States. 1990 Census of Population*, CP-3-4.

See figure 1-4 *Women, Minorities, and Persons With Disabilities in Science and Engineering 1994*

Appendix table 1-6. Persons with disabilities, by age, disability status, and sex: 1991–92

[Numbers in thousands]

Page 1 of 1

Age and disability status	Both sexes		Males		Females	
	Number	Percentage	Number	Percentage	Number	Percentage
All ages:						
Total	251,796	100.0	122,692	100.0	129,104	100.0
With a disability	48,936	19.4	22,916	18.7	26,020	20.2
Severe	24,117	9.6	9,929	8.1	14,187	11.0
Not severe	24,819	9.9	12,987	10.6	11,833	9.2
0 to 14 years old:						
Total	56,067	100.0	28,707	100.0	27,360	100.0
With a disability	2,913	5.2	1,876	6.5	1,038	3.8
Severe	529	.9	336	1.2	192	.7
Not severe	2,384	4.3	1,540	5.4	846	3.1
15 to 64 years old.						
Total	165,040	100.0	81,154	100.0	83,886	100.0
With a disability	29,482	17.9	14,504	17.9	14,978	17.9
Severe	13,171	8.0	5,862	7.2	7,309	8.7
Not severe	16,311	9.9	8,642	10.6	7,669	9.1
With a functional limitation	18,948	11 5	8,901	11.0	10,047	12.0
Severe	6,552	4.0	2,662	3.3	3,891	4.6
Seeing words and letters	4,801	2.9	2,195	2.7	2,606	3.1
Unable	579	.4	280	4	298	.4
Hearing normal conversation	5,522	3.4	3,605	4.4	1,918	2.3
Unable	364	.2	242	.3	122	.1
Having speech understood	1,517	9	899	1.1	618	.7
Unable	161	.1	106	.1	55	1
Lifting and carrying 10 lbs	7,827	4.7	2,755	3.4	5,071	6.1
Unable	3,121	1.9	1,087	1.3	2,035	2.4
Climbing stairs without resting	8,068	4.9	3,228	4 0	4,841	5.8
Unable	3,595	2.2	1,409	1.7	2,186	2.6
Walking 3 city blocks	7,937	4 8	3,408	4.2	4,529	5.4
Unable	3,243	2.0	1,331	1.6	1,912	2.3
Number of functional limitations:						
1	9,826	6 0	4,974	6 1	4,852	5.8
2	3,980	2 4	1,815	2 2	2,165	2 6
3 or more	5,143	3 1	2,113	2.6	3,030	3.6
Number of severe functional limitations						
1	3,642	2.2	1,514	1.9	2,128	2.5
2	1,593	1.0	647	.8	946	1.1
3 or more	1,361	.8	531	.7	830	1.0

SOURCE: U S. Department of Commerce. Bureau of the Census 1993. *Americans with Disabilities 1991-92 Data from the Survey of Income and Program Participation*, P70-33.

Appendix table 1-7. Persons with disabilities, by age, disability status, and race/ethnicity: 1991–92

[Numbers in thousands]

Page 1 of 1

Age and disability status	White		Black		Hispanic	
	Number	Percentage	Number	Percentage	Number	Percentage
All ages:						
Total	210.873	100.0	31,420	100 0	21,905	100.0
With a disability	41.521	19.7	6,277	20 0	3,343	15.3
Severe	19.736	9.4	3.836	12.2	1,838	8.4
Not severe	21,785	10.3	2.441	7.8	1.505	6.9
0 to 14 years old:						
Total	44.704	100.0	8,868	100.0	6.506	100.0
With a disability	2.403	5.4	428	4.8	202	3.1
Severe	451	1.0	59	.7	26	.4
Not severe	1.952	4.4	369	4.2	228	3.5
15 to 64 years old:						
Total	138.773	100.0	19,815	100.0	14,166	100.0
With a disability	24,559	17.7	4.122	20.8	2,396	16.9
Severe	10.286	7.4	2.516	12.7	1.284	9.1
Not severe	14.273	10.3	1,606	8.1	1,112	7.8
With a functional limitation	15.555	11.2	2.863	14.5	1,665	11.8
Severe	5,155	3.7	1,258	6.4	688	4.9
Seeing words and letters	3.691	2.7	984	5.0	509	3.6
Unable	420	3	142	.7	85	.6
Hearing normal conversation	4,928	3.6	471	2.4	315	2 2
Unable	315	.2	41	.2	33	2
Having speech understood	1,126	.8	339	1.7	154	1.1
Unable	136	.1	23	.1	15	.1
Lifting and carrying 10 lbs	6.238	4.5	1,343	6.8	715	5 1
Unable	2.385	1.7	621	3.1	308	2 2
Climbing stairs without resting	6.323	4 6	1.534	7.7	774	5 5
Unable	2.765	2 0	722	3.7	376	2 7
Walking 3 city blocks	6.297	4.5	1.464	7.4	675	4 8
Unable	2.537	1 8	642	3.2	267	1.9
Number of functional limitations:						
1	8,347	6 0	1,195	6 0	847	6 0
2	3.219	2 3	637	3 2	357	2 5
3 or more	3.989	2 9	1.031	5.2	461	3 3
Number of severe functional limitations						
1	2.905	2 1	651	3 3	408	2 9
2	1.208	9	325	1 6	177	1 3
3 or more	1 042	8	283	1 4	103	7

NOTE: Hispanics may be of any race

SOURCE U S Department of Commerce. Bureau of the Census 1993 *Americans with Disabilities 1991-92 Data from the Survey of Income and Program Participation.* P70-33

Appendix table 1-8. Public interest in and knowledge of selected issues among adults holding bachelor's degrees, by race/ethnicity: 1993
[In percentages]

Page 1 of 1

Issue area	Degree of interest[1] and knowledge[2]	Black	Hispanic	Other[3]
Local school issues	Very interested	68	59	48
	Moderately interested	26	31	42
	Not at all interested	6	10	11
	Very well-informed	47	32	29
	Moderately well-informed	39	47	47
	Poorly informed	14	21	24
Information about health	Very interested	76	70	59
	Moderately interested	23	25	38
	Not at all interested	1	5	3
	Very well-informed	40	35	32
	Moderately well-informed	55	55	62
	Poorly informed	5	10	6
New scientific discoveries	Very interested	37	51	45
	Moderately interested	57	40	51
	Not at all interested	6	9	4
	Very well-informed	13	16	12
	Moderately well-informed	56	53	64
	Poorly informed	32	32	24
Economic issues and business conditions	Very interested	66	66	62
	Moderately interested	32	29	33
	Not at all interested	2	5	4
	Very well-informed	39	40	41
	Moderately well-informed	52	44	49
	Poorly informed	9	16	11
Use of new inventions and technologies	Very interested	36	45	38
	Moderately interested	57	49	56
	Not at all interested	7	7	6
	Very well-informed	9	13	13
	Moderately well-informed	58	53	54
	Poorly informed	33	34	33
New medical discoveries	Very interested	63	62	56
	Moderately interested	36	35	42
	Not at all interested	2	3	2
	Very well-informed	23	19	20
	Moderately well-informed	57	55	61
	Poorly informed	21	27	20
Environmental pollution	Very interested	49	65	50
	Moderately interested	48	30	47
	Not at all interested	3	5	3
	Very well-informed	24	25	26
	Moderately well-informed	56	64	61
	Poorly informed	20	12	13
N (unweighted)		282	221	308

[1] *"There are a lot of issues in the news and it is hard to keep up with every area. I'm going to read you a short list of issues and for each one—as I read it—I would like you to tell me if you are very interested, moderately interested, or not at all interested."*

[2] *"Now I'd like to go through this list with you again and for each issue I'd like you to tell me if you are very well-informed, moderately well-informed, or poorly informed."*

[3] All respondents not identifying themselves as African or Hispanic American; therefore, this group includes Asians, whites, and all other groups.

SOURCE: National Institutes of Health. 1993. Survey of Public Understanding of Biomedical Knowledge. Unpublished tabulations

Appendix table 1-9. Public assessments of the results of scientific research, by race/ethnicity and level of education: 1993

[In percentages]

Page 1 of 1

Race/ethnicity and level of education	Beneficial			Harmful		Don't know or no answer	N (Unweighted)
	Strongly	Only slightly	About equal	Only slightly	Strongly		
Black:							
Less than high school	19	21	12	23	8	17	153
High school graduate	32	27	9	19	5	8	657
Bachelor's or higher degree	47	30	6	8	4	4	282
Hispanic:							
Less than high school	16	24	22	18	10	10	245
High school graduate	34	26	10	17	7	6	534
Bachelor's or higher degree	60	22	4	10	2	2	221
All other respondents:[1]							
Less than high school	22	31	7	6	17	17	93
High school graduate	51	25	7	8	3	6	614
Bachelor's or higher degree	69	21	3	4	1	2	308

"People have frequently noted that scientific research has produced both beneficial and harmful consequences. Would you say that, on balance, the benefits of scientific research have outweighed the harmful results, or have the harmful results of scientific research been greater than its benefits?"
"Would you say that the balance has been strongly in favor of beneficial results, or only slightly?"
"Would you say that the balance has been strongly in favor of harmful results, or only slightly?"

[1] All respondents not identifying themselves as African or Hispanic American: therefore, this group includes Asians, whites, and all other groups

SOURCE: National Institutes of Health. 1993 Survey of Public Understanding of Biomedical Knowledge. Unpublished tabulations.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 1-10. Public attitudes toward science and technology among adults holding bachelor's degrees, by race/ethnicity and sex: 1993

[In percentages]

Page 1 of 1

Statement	Response	Black		Hispanic		Other [1]	
		Men	Women	Men	Women	Men	Women
"Science and technology are making our lives healthier, easier, and more comfortable."	Agree	94	81	92	88	94	92
	Disagree	6	19	8	11	5	5
	Don't know/no answer	0	--	0	1	1	3
"The fact that scientists repeat and check each other's work effectively prevents fraud or cheating by scientists."	Agree	63	58	70	65	72	65
	Disagree	36	36	26	32	26	33
	Don't know/no answer	1	6	4	3	2	2
"We depend too much on science and not enough on faith."	Agree	53	63	50	37	31	40
	Disagree	46	38	49	59	66	58
	Don't know/no answer	1	0	2	4	3	2
"Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Federal Government."	Agree	83	85	91	89	90	82
	Disagree	15	13	8	10	9	13
	Don't know/no answer	2	1	1	1	1	5
"Scientists should be allowed to do research that causes pain and injury to animals like dogs and chimpanzees if it produces new information about human health problems."	Agree	58	47	62	52	71	51
	Disagree	38	45	33	46	27	44
	Don't know/no answer	5	2	5	2	3	5
"It is not important for me to know about science in my daily life."	Agree	9	4	14	8	4	8
	Disagree	91	96	85	93	96	93
	Don't know/no answer	0	0	1	0	0	0
"Some numbers are especially lucky for some people."	Agree	33	34	23	29	18	17
	Disagree	61	64	75	68	81	81
	Don't know/no answer	6	2	3	3	--	2
"Science makes our way of life change too fast."	Agree	31	26	33	37	24	22
	Disagree	69	72	67	61	75	77
	Don't know/no answer	0	2	0	2	1	1
"Many scientists make up or falsify research results to advance their careers or make money."	Agree	52	52	47	42	33	42
	Disagree	44	38	49	51	61	48
	Don't know/no answer	4	11	5	8	6	10
"New inventions will always be found to counteract any harmful consequences of technological development."	Agree	34	36	41	47	29	22
	Disagree	60	56	55	46	67	73
	Don't know/no answer	6	8	5	7	4	5
"Most scientists want to work on things that will make life better for the average person."	Agree	71	81	72	75	73	83
	Disagree	28	18	26	23	23	14
	Don't know/no answer	1	1	2	3	4	3
N (unweighted)		101	181	104	117	161	147

[1] All respondents not identifying themselves as African or Hispanic American, therefore, this group includes Asians, whites, and all other groups.

NOTE: Because of rounding, percentages may not add to 100

KEY: -- less than 0.5 percent

SOURCE: National Institutes of Health 1993 Survey of Public Understanding of Biomedical Knowledge. Unpublished tabulations

See figure 1-7

Appendix table 1-11. Projections of the U.S. population, by selected age groups and race/ethnicity: 1993, 2030, and 2050

[In millions]

Page 1 of 1

Age group and race/ethnicity	1993	2030	2050
Elementary:			
White non-Hispanic	22.8	20.8	19.4
Black, non-Hispanic	4.9	7.0	8.3
Hispanic	4 2	9 8	12 8
Asian	1.2	3.5	4.6
American Indian/Alaskan Native	.3	.5	.6
High school.			
White non-Hispanic	9.4	9.7	8.9
Black, non-Hispanic	2.1	3.1	3.7
Hispanic	1.7	4.1	5.5
Asian	.5	1.6	2.2
American Indian/Alaskan Native	.1	.2	.3
New entrants:			
White non-Hispanic	18.1	16.7	16.1
Black, non-Hispanic	3.6	5.1	6.0
Hispanic	3.2	6.9	9.4
Asian	1.0	2.7	3.8
American Indian/Alaskan Native	.2	.3	.4

NOTE: Hispanics may be of any race.

SOURCE: Day, Jennifer Cheeseman. 1993. *Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin. 1993 to 2050.* U.S. Bureau of the Census, Current Population Reports. P25-1104. Washington, DC: U.S. Department of Commerce; Data aggregation by the National Science Foundation.

See figure 1-11. *Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994*

Appendix table 2-1. Average scores by percentile for the National Assessment of Educational Progress mathematics test for age 9, by sex and race/ethnicity: 1978–1990, selected years

Page 1 of 1

Percentile	1978	1982	1986	1990
Total students:				
5th	157 1	159.3	163.0	173 3
10th	171.1	173.2	176.7	185.8
25th	194.6	196.0	199.0	207.8
50th	220.1	220.4	223.3	231.1
75th	243.7	243.3	245.6	252.5
90th	264.0	262.7	264.2	271.0
95th	275.7	273.8	275.5	282.1
Males:				
5th	154.9	156.4	162.7	171.8
10th	169.0	170.2	176.1	184.6
25th	192.8	193.0	198.6	206.7
50th	218 4	218.6	223.0	230.4
75th	243.0	242.3	245.7	252.4
90th	263.8	262.2	265.1	271.6
95th	275.2	273.6	276.4	282.8
Females:				
5th	159.4	162.8	163.5	174.5
10th	173.1	176.6	177.5	187.0
25th	196.4	198.9	199.0	208.9
50th	221.5	222.2	223.5	231.8
75th	244.3	244.2	245.5	252.7
90th	264.2	263.1	263.3	270.4
95th	276.1	273.9	274.2	281.4
Whites:				
5th	166.3	168.1	170.6	181.8
10th	179.4	180.8	183.9	194.0
25th	201.4	201.9	205.3	214 6
50th	225.1	225.3	228.3	214.6
75th	247.7	246.8	249.6	256.4
90th	267.0	265.3	267.4	274.5
95th	278.4	276.0	278.2	284.8
Blacks				
5th	133.7	136 7	146 2	156.0
10th	147.0	150.4	158.4	167 1
25th	169 3	172.5	180.5	186.0
50th	193.0	196.6	202.9	208 4
75th	216.4	218.2	223.6	231.4
90th	236.1	235 7	241.2	248.9
95th	247 5	247 9	251.3	258.9
Hispanics				
5th	144.4	148.1	154 8	161.8
10th	156.3	160.8	163.8	173.4
25th	178.7	181.3	184.5	193 1
50th	204 3	205.2	206 3	216 2
75th	227 2	226 5	226.0	251 7
90th	249 5	246.4	244.8	251.7
95th	259 6	256 6	254.4	262 2

NOTE Standard errors are included in source publication

SOURCE Educational Testing Service 1991 *Trends in Academic Progress*. Washington. DC U S Department of Education.

Appendix table 2-2. Average scores by percentile for the National Assessment of Educational Progress mathematics test for age 13, by sex and race/ethnicity: 1978–1990, selected years

Page 1 of 1

Percentile	1978	1982	1986	1990
Total students:				
5th	198.2	212.4	218.3	217.6
10th	213.3	225.3	230.0	230.2
25th	238.1	246.2	248.3	249.8
50th	265.2	269.5	268.7	270.9
75th	291.1	291.6	289.6	291.7
90th	313.4	310.8	309.2	309.9
95th	326 6	322.2	320.5	320.1
Males:				
5th	195.8	211.5	218.0	215.5
10th	211.4	224.3	229.5	228.6
25th	236.7	246.1	248.9	250.2
50th	264.8	270.2	270.0	272.0
75th	291.5	293.3	291.4	293.1
90th	314.4	312.5	310.8	312.4
95th	327.5	324.1	322.0	323.1
Females:				
5th	200.9	213.5	218.5	220.4
10th	215.0	226.2	230.6	231.4
25th	239.4	246.3	247.8	249.5
50th	265.7	268.8	267.4	269.9
75th	290.7	290.1	287.8	290.3
90th	312.4	308.8	307.2	307.7
95th	325.6	320.1	318.5	317.3
Whites:				
5th	211.9	223.0	225.7	228.2
10th	225.5	234.4	236.5	239.3
25th	247.5	253.5	254.1	257.3
50th	272.2	274.9	273.3	276.6
75th	296.0	295.5	293.2	296.0
90th	317.1	313 8	312.1	313.2
95th	329.6	324.8	322.9	322.9
Blacks:				
5th	170.2	201.7	201.7	201 6
10th	184.1	200.2	213 2	211.8
25th	205.5	219 3	230.7	229.9
50th	229.0	241.0	249.3	249.4
75th	254.1	260.9	266.9	267.8
90th	276.4	279.7	284 4	285.3
95th	288.4	291.1	296.4	296 2
Hispanics:				
5th	180.2	202.3	205.9	206.2
10th	192.5	213 5	216.2	216.4
25th	214.3	230 7	235.5	234 3
50th	237 4	251 9	254 3	255.1
75th	261 9	273 7	254 3	275 2
90th	283.7	292 8	291 7	292 2
95th	296.3	304 1	301 2	303 3

NOTE Standard errors are included in source publication

SOURCE Educational Testing Service 1991. *Trends in Academic Progress* Washington, DC U S Department of Education.

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Appendix table 2-3. Average scores by percentile for the National Assessment of Educational Progress mathematics test for age 17, by sex and race/ethnicity: 1978–1990, selected years

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Percentile	1978	1982	1986	1990
Total students:				
5th	241.3	244.9	251.7	253.4
10th	254.2	255.9	262.7	264.0
25th	276.4	275.8	280.7	282.5
50th	301.4	298.8	301.4	304.9
75th	325.4	321.5	323.1	326.5
90th	344.7	340.6	343.0	344.5
95th	355.7	351.2	354.0	355.5
Males:				
5th	243.8	247.0	252.7	252.8
10th	257.0	257.9	264.1	263.9
25th	278.9	278.1	282.3	283.7
50th	304.8	301.8	303.9	306.4
75th	329.5	325.1	327.8	329.3
90th	349.2	344.4	346.7	347.8
95th	360.1	354.4	357.5	358.5
Females:				
5th	239.3	242.8	250.3	253.9
10th	252.2	254.1	261.2	264.0
25th	274.3	273.7	279.3	303.7
50th	298.3	296.1	299.1	303.7
75th	321.5	317.7	319.8	324.1
90th	340.3	336.7	338.2	341.4
95th	350.4	347.2	349.3	351.8
Whites:				
5th	251.9	253.3	261.2	260.2
10th	263.5	263.8	270.5	270.5
25th	283.5	282.3	286.9	288.8
50th	306.6	303.9	306.8	310.1
75th	328.9	325.1	327.8	330.1
90th	347.3	343.4	346.1	347.2
95th	357.8	353.4	356.0	357.1
Blacks:				
5th	217.2	225.1	236.7	245.4
10th	227.8	234.5	244.3	253.5
25th	245.7	251.4	259.9	268.7
50th	267.7	271.2	278.6	287.1
75th	290.5	291.2	296.1	307.1
90th	310.3	310.8	312.0	325.7
95th	320.7	321.3	324.8	337.7
Hispanics:				
5th	224.1	232.0	236.3	229.1
10th	234.0	240.7	248.5	242.2
25th	2[illegible]3.4	255.8	264.7	263.8
50th	275.1	275.3	283.1	281.8
75th	298.5	297.1	301.2	304.0
90th	319.5	314.9	318.6	325.1
95th	332.0	326.7	329.3	336.3

NOTE Standard errors are included in source publication

SOURCE Educational Testing Service 1991 *Trends in Academic Progress*. Washington, DC U.S. Department of Education

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Appendix table 2-4. Average scores by percentile for the National Assessment of Educational Progress science test for age 9, by sex and race/ethnicity: 1977–1990, selected years

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Percentile	1977	1982	1986	1990
Total students:				
5th	143.8	150.9	155.0	159.8
10th	160.9	166.8	169.9	176.1
25th	190.1	194.4	195.4	202.0
50th	221.5	221.4	225.1	230.3
75th	251.0	249.0	253.1	256.6
90th	276.5	272.4	276.9	278.8
95th	291.4	286.4	290.9	292.1
Males:				
5th	146.8	150.4	158.0	159.6
10th	163.2	166.5	172.9	176.3
25th	191.9	193.5	198.7	202.1
50th	223.6	221.3	227.9	231.6
75th	253.4	250.4	256.1	259.4
90th	279.1	274.7	280.3	283.3
95th	294.2	287.1	294.8	296.3
Females:				
5th	141.3	151.2	152.5	159.9
10th	158.5	167.5	166.9	175.8
25th	188.3	195.3	193.2	201.9
50th	219.5	221.4	222.5	229.2
75th	248.6	247.4	250.2	254.0
90th	273 8	270.6	273.3	274.6
95th	288.2	284.4	287.0	287.0
Whites:				
5th	163.2	167.0	166.5	176.9
10th	177.6	182.2	181.0	189.9
25th	202.4	203.8	205.5	212.6
50th	229.8	228.6	232.5	238.3
75th	256 9	254.9	258.8	262.3
90th	281.1	277.6	281.7	283.5
95th	295 4	290.8	294.9	295.7
Blacks:				
5th	107.0	123 6	132.8	131.3
10th	122 8	136.7	146 9	145.3
25th	146.6	159.2	169.7	169.8
50th	173 8	188.2	195.9	196.3
75th	202.9	214.4	222.6	224.1
90th	229 2	236.4	246 4	246.8
95th	244 1	246.5	259.5	260.0
Hispanics.				
5th	125 2	127.3	134.0	146.2
10th	139.8	141.9	148 1	158 5
25th	163.9	161 9	172.6	180 6
50th	191 4	190.8	199.8	206.2
75th	219 0	215 9	225 6	232 7
90th	245 7	236.2	252 1	252 9
95th	261.3	246 0	264 9	266.8

NOTE Standard errors are included in source publication

SOURCE Educational Testing Service. 1991 *Trends in Academic Progress* Washington. DC U S Department of Education

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Appendix table 2-5. Average scores by percentile for the National Assessment of Educational Progress science test for age 13, by sex and race/ethnicity: 1977–1990, selected years

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Percentile	1977	1982	1986	1990
Total students:				
5th	173.7	185.2	188.9	191.4
10th	190.6	199.6	203.3	205.9
25th	218.4	224.1	227.2	230.0
50th	248.6	250.9	252.1	256.4
75th	277.5	276.7	276.5	281.1
90th	302.4	299.2	298.2	302.4
95th	316.0	312.8	310.3	315.1
Males:				
5th	176.7	190.2	192.3	191.9
10th	193.5	204.4	207.2	207.3
25th	221.5	229.5	231.1	232.9
50th	252.4	256.7	256.9	260.3
75th	281.6	282.6	282.4	285.8
90th	306.5	305.0	303.4	307.4
95th	321.2	318.3	316.2	320.2
Females:				
5th	170.8	180.2	186.3	190.6
10th	187.7	195.5	200.5	204.8
25th	215.5	219.7	223.4	227.8
50th	245.0	246.1	248.0	253.1
75th	273.0	271.0	271.0	276.8
90th	297.7	292.8	291.3	296.8
95th	312.1	305.3	304.0	308.6
Whites:				
5th	190.8	198.0	203.5	208.6
10th	205.2	210.8	215.8	220.4
25th	229.3	233.2	237.0	241.3
50th	256.3	257.6	259.2	264.5
75th	282.9	281.5	282.3	287.0
90th	306.6	302.7	302.2	307.1
95th	320.8	316.2	313.9	319.4
Blacks:				
5th	144.3	160.3	167.8	169.7
10th	157.7	173.0	180.1	181.8
25th	180.5	193.7	198.3	202.3
50th	207.4	216.8	221.2	225.7
75th	234.8	240.7	243.5	249.1
90th	259.5	262.2	264.4	269.0
95th	274.6	274.7	276.8	283.2
Hispanics				
5th	147.1	166.3	171.1	173.7
10th	161.4	179.4	181.3	185.3
25th	185.8	200.7	201.6	205.9
50th	213.3	225.9	225.6	230.9
75th	240.3	249.3	249.8	256.4
90th	265.8	271.2	269.9	280.0
95th	282.1	284.8	283.0	294.2

NOTE Standard errors are included in source publication

SOURCE Educational Testing Service 1991. *Trends in Academic Progress* Washington, DC U S. Department of Education

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Appendix table 2-6. Average scores by percentile for the National Assessment of Educational Progress science test for age 17, by sex and race/ethnicity: 1977–1990, selected years

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Percentile	1977	1982	1986	1990
Total students:				
5th	212.6	203.2	211.8	209.9
10th	231.3	221.5	229.5	228.8
25th	260.6	252.5	259.6	260.3
50th	290.8	285.4	290.1	292.2
75th	320.1	315.3	319.4	322.7
90th	246.2	341.5	344.5	348.3
95th	361.5	357.3	359.9	362.9
Males:				
5th	219.5	210.3	213.9	210.4
10th	238.2	228.9	231.4	229.5
25th	267.6	261.1	263.5	263.4
50th	298.5	294.3	298.7	297.9
75th	328.1	324.8	327.6	329.9
90th	353.9	350.5	353.4	356.7
95th	368.8	365.3	367.0	372.5
Females:				
5th	207.5	198.3	209.8	209.2
10th	226.1	215.5	228.1	228.2
25th	254.5	245.7	256.2	257.7
50th	283.8	2,7.6	283.7	287.7
75th	311.5	306.2	310.8	316.2
90th	336.3	330.1	333.5	339.6
95th	351.2	345.2	348.3	351.5
Whites:				
5th	231.1	223.0	228.3	232.8
10th	246.0	239.1	244.5	249.0
25th	270.3	265.5	271.0	273.4
50th	297.5	293.6	298.7	301.2
75th	325.0	321.2	324.9	329.0
90th	349 9	246.0	348.9	352.3
95th	364.6	360.8	363.5	367.3
Blacks				
5th	172.4	166.0	189.3	182.0
10th	187 3	180 6	201.6	196.6
25th	212.1	206.4	225.0	220.5
50th	240.4	234.7	251.9	251.6
75th	267 9	262.7	279.5	282.9
90th	293.4	288.8	306.0	313.5
95th	309 5	305.4	322 8	329.3
Hispanics.				
5th	193.7	178 0	194 4	188.7
10th	208.4	194.2	209.2	203.9
25th	234.3	218 8	232 0	230 6
50th	262.4	248.0	258.9	260 5
75th	289 5	278 4	285 8	292 6
90th	316 9	302 1	309 9	317.4
95th	331 3	320.8	324.4	329.5

NOTE Standard errors are included in source publication.

SOURCE Educational Testing Service 1991 *Trends in Academic Progress* Washington, DC U S Department of Education

Appendix table 2-7. Correlation coefficients (Spearman Rho) between family variables and science and mathematics achievement test scores of eighth grade students: 1988

Page 1 of 1

Family Variable	Achievement test scores	
	Science	Mathematics
Not in poverty	0.25	0.28
Father's occupation	.28	.32
Mother's occupation	.19	.21
Father's education	.32	.35
Mother's education	.27	.30
Family composition	.14	14
Parent/child communication	.24	.27
Learning materials	.32	.35
Classes outside of school	.25	.29
Educational activities	.25	.27
Homework assistance	- .07	- .08
Parents' educational expectations	.36	.44

NOTE: All correlation coefficients are significant at the 0.01 level.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC. U.S. Department of Education.

Appendix table 2-8. Level of education expected by parents for 1988 eighth grade students, by sex and race/ethnicity

[Percentage distribution]

Page 1 of 1

Expected level of education	Race/ethnicity				
	Asian	Hispanic	Black	White	American Indian
Total students:					
High school or less	7.5	16.7	15.9	12.3	17.9
Some college	12.8	26.6	22.4	24.3	25.8
College degree	79.6	56.7	61.7	63.4	56.3
Male:					
High school or less	9.9	18.3	17.7	13 3	22.0
Some college	13.6	26.8	23.7	24.7	31.0
College degree	76.4	55.0	58.6	62.0	46.9
Female:					
High school or less	4.9	15.2	14.2	11.3	14.1
Some college	12.0	26.4	21 1	23.8	21.4
College degree	83.1	58.4	64.7	64.9	64.5

NOTE: Because of rounding, percentage may not add to 100.

SOURCE: U.S. Department of Education/NCES. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education*. Washington, DC: U.S. Department of Education.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-9. Percentage of 1988 eighth grade students who had selected educational activities outside of school, by race/ethnicity

Page 1 of 1

Race/ethnicity	Activity	
	Visited museums and attended concerts	Borrowed books from public library
Asian	71.2	89.5
Hispanic	56.3	77.6
Black	65.5	77.8
White	77.2	82.4
American Indian	49.5	72.9

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

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Appendix table 2-10. Correlation coefficients (Spearman Rho) between school variables and science and mathematics achievement test scores of 1988 eighth grade students

Page 1 of 1

School variable	Achievement test scores	
	Science	Mathematics
School socioeconomic status	0.21	0.23
School control	18	.22
Students face competition for grades	.11	.12
Discipline is emphasized	- .03	- .04
Students place a priority on learning	.16	.19
Teachers encourage students to do their best	.07	07
Teacher morale is high	.05	.07
Teachers have positive attitudes about students	07	.09
Teachers do not have difficulty motivating students	.14	.17
Teachers respond to students' individual needs	.06	.07
High school program	.29	.33
Math achievement level grouping	.31	.43
Science achievement level grouping	.21	.23

NOTE: All correlation coefficients are significant at the 0.01 level.

SOURCE: U.S. Department of Education/NCES 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S Department of Education.

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Appendix table 2-11. Percentage distribution of 1988 public school eighth grade students, by the bachelor's degree majors of mathematics and science teachers and student race/ethnicity

Page 1 of 1

Student race/ethnicity	Total percentage	Mathematics teachers' area of study			
		Major in mathematics/math education	Minor in mathematics/math education	Major in education only	Major in other subject only
Asian	100	44.1	23.5	15.0	17.5
Hispanic	100	33.3	28.5	17.5	20.8
Black	100	40.0	26.6	21.5	12.9
White	100	45.7	27.2	17.7	9.4
American Indian	100	30.5	23.5	23.4	22.6
		Science teachers' area of study			
		Major in science/science education	Minor in science/science education	Major in education only	Major in other subject only
Asian	100	53.3	22.6	11.4	12.6
Hispanic	100	46.6	20.5	16.1	16.8
Black	100	48.9	19.6	18.5	13.0
White	100	48.6	24.2	15.5	11 7
American Indian	100	39.9	47.7	7.1	5.3

NOTE: Because of rounding, percentages may not add to 100.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

Appendix table 2-12. Correlation coefficients (Spearman Rho) between selected characteristics and science and mathematics achievement test scores of 1988 eighth grade students

Student characteristics	Achievement test scores	
	Science	Mathematics
Educational aspirations	0.24	0.27
Occupational aspirations	.23	.26
Coursework:		
Algebra I	.12	14
Algebra II	.31	.40
Geometry	.41	.52
General science	-.18	-.21
Chemistry	.24	.27
Biology	.19	.22
Teacher ratings:		
Perform below ability	-.23	-.29
Rarely complete homework	-.23	-.27
Frequently absent	-.13	-.15
Frequently tardy	-.12	-.13
Inattentive in class	-.22	-.26
Disruptive in class	-.16	-.17

NOTE: Correlations with science and mathematics achievement test scores were based on science and mathematics teachers' ratings, respectively. All correlation coefficients are significant at the 0.01 level.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-13. Percentage of 1988 public school eighth grade students reflecting different attitudes toward mathematics and science classes, by race/ethnicity

Page 1 of 1

Subject and race/ethnicity	Attitudes toward class		
	Look forward to class	Afraid to ask questions	Important to future
Mathematics:			
Asian	66.3	21.4	90.3
Hispanic	62.7	27.8	88.7
Black	72.0	20.8	89.0
White	52.6	19.8	87.5
American Indian	54.8	33.4	82 5
Science:			
Asian	68.6	14.3	76.5
Hispanic	67.3	20.5	70.6
Black	68.7	18.0	72.7
White	60.6	12.9	68.2
American Indian	69.7	31.7	77.0

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education.* Washington, DC: U.S. Department of Education.

Women, Minorities, and Persons With Disabilities in Science and Engineering. 1994

Appendix table 2-14. How far in school 1988 8th and 1990 10th grade students expect they will get, by race/ethnicity and sex

[Percentage distribution]

Page 1 of 1

Grade and education expectation	Race/ethnicity					Sex	
	Asian	Hispanic	Black	White	American Indian	Male	Female
1988 8th grade students:							
Not finish high school	1.5	2.6	1.4	1.3	3.5	1.8	1.1
Finish high school	5.4	14.9	8.2	10.4	15.0	12.1	9.0
Attend vocational school	5.0	10.7	10.2	9.2	14.7	10.1	8.7
Attend college	11.9	17.1	16.4	11.9	16.2	13.3	13.0
Graduate from college	37.5	33.2	39.4	45.2	32.8	42.5	43.1
Attend more college	38.7	21.5	24.4	21.9	17.9	20 2	25 1
1990 10th grade students:							
Not finish high school	1.3	4.0	2.3	2.4	7.9	2.7	2.5
Finish high school	8.1	15.9	15.4	10.5	18.5	13.1	10.6
Attend vocational school	10.8	14.0	12.9	13.3	16.5	15.4	11.2
Attend college	12.5	23.8	17.4	16.5	22.5	17.0	17.6
Graduate from college	29.8	23.2	25.5	31.5	19.3	29.9	29.4
Attend more college	37.5	19.1	26.4	25.7	15.4	21.9	28.8

NOTE: Because of rounding, percentages may not add to 100.

SOURCE: U.S. Department of Education/NCES. 1994. *Understanding Racial-Ethnic Differences in Secondary School Science and Mathematics Education*. Washington, DC: U.S. Department of Education.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-15. Percentage of postsecondary students with specified high school science course patterns, by race/ethnicity: 1986

Page 1 of 1

Race/ethnicity	High school science course pattern			
	Concentrator	Moderate concentrator	General	Limited/nonparticipant
Asian	40.2	33.7	19.6	6.6
Hispanic	9.7	25.3	48.2	16.8
Black	5.8	32.1	52.2	9.8
White	19.3	40.6	34.1	6.0

NOTE: Data shown for all categories for which reliable national estimates can be computed.

SOURCE. U.S. Department of Education/NCES. High School and Beyond. Third Follow-Up Survey. Sophomore Cohort.

Women. Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-16. Average science proficiency, by age, sex, and race/ethnicity: 1970–1990, selected years

Page 1 of 1

Age and year	Total	Sex		Race/ethnicity		
		Male	Female	White	Black	Hispanic
Age 9:						
1970	225	228	223	236	179	NA
1973	220	223	218	231	177	NA
1977	220	222	218	230	175	192
1982	221	221	221	229	187	189
1986	224	227	221	232	196	199
1990	229	230	227	238	196	206
Age 13:						
1970	255	257	253	263	215	NA
1973	250	252	247	259	205	NA
1977	247	251	244	256	208	213
1982	250	256	245	257	217	226
1986	251	256	247	259	222	226
1990	255	259	252	264	226	232
Age 17:						
1970	305	314	297	312	258	NA
1973	296	304	288	304	250	NA
1977	290	297	288	298	240	262
1982	283	292	275	293	235	249
1986	289	295	282	298	253	259
1990	290	296	285	301	253	262

NOTE: Standard errors are included in source publication.

KEY: NA = not available

SOURCE: Educational Testing Service. 1991. *Trends in Academic Progress.* pp. 225-27 Washington, DC: U.S. Department of Education

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-17. Average mathematics proficiency, by age, sex, and race/ethnicity: 1973–1990, selected years

Page 1 of 1

Age and year	Total	Sex		Race/ethnicity		
		Male	Female	White	Black	Hispanic
Age 9:						
1973	219	218	220	225	190	202
1978	219	217	220	224	192	203
1982	219	217	221	224	195	204
1986	222	222	222	227	202	205
1990	230	229	230	235	208	214
Age 13:						
1973	266	265	267	274	228	239
1978	264	264	265	272	230	238
1982	269	269	268	274	240	252
1986	269	270	268	274	249	254
1990	270	271	270	276	249	255
Age 17.						
1973	304	309	301	310	270	277
1978	300	304	297	306	268	276
1982	299	302	296	304	272	277
1986	302	305	299	308	270	283
1990	305	306	303	310	289	284

NOTE: Standard errors are included in source publication.

SOURCE: Educational Testing Service. 1991. *Trends in Academic Progress*. pp. 267–69. Washington, DC: U.S. Department of Education.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 2-18. Disability status of children 0 to 17 years old, by age and sex: 1991–92

[Numbers in thousands]

Age and disability status	Both sexes		Males		Females	
	Number	Percentage	Number	Percentage	Number	Percentage
Less than 3 years old	11,791	100.0	6,000	100.0	5,791	100.0
With a disability	254	2.2	133	2.2	121	2.1
Limited in usual kinds of activities	149	1.3	72	1.2	76	1.3
Received services for developmental needs	183	1.6	106	1.8	77	1.3
With a severe disability	41	.4	32	.5	8	.1
3 to 5 years old	11,511	100.0	5,946	100.0	5,565	100.0
With a disability	597	5.2	370	6.2	228	4.1
Limited in usual kinds of activities	294	2.6	184	3.1	110	2.0
Received services for developmental needs	496	4.3	323	5.4	176	3.2
Limited in ability to walk, run, or use stairs	147	1.3	76	1.3	71	1.3
With a severe disability	75	.7	54	.9	21	.4
6 to 14 years old	32,766	100.0	16,761	100.0	16,005	100.0
With a disability	2,062	6.3	1,373	8.2	689	4.3
Limited in ability to do regular school work	1,764	5.4	1,197	7.1	567	3.5
Limited in ability to walk, run, or use stairs	524	1.6	301	1.8	223	1.4
With a severe disability	412	1.3	250	1.5	163	1.0
15 to 17 years old	10,067	100.0	5,172	100.0	4,895	100.0
With a disability	933	9.3	558	10.8	374	7.7
Limited in ability to do regular school work	438	4.4	321	6.2	116	2.4
With a severe disability	309	3.1	159	3.1	150	3.1

SOURCE: U.S. Department of Commerce, Bureau of the Census. 1993. *Americans with Disabilities: 1991–92: Data from the Survey of Income and Program Participation.* P70-33

Appendix table 2-19. Disability status of children 0 to 17 years old, by age and race/ethnicity: 1991–92

[Numbers in thousands]

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Characteristic	White		Black		Hispanic	
	Number	Percentage	Number	Percentage	Number	Percentage
Less than 3 years old	9.426	100.0	1,815	100.0	1,437	100.0
With a disability	203	2.2	45	2.5	17	1.2
Limited in usual kinds of activities	119	1.3	27	1.5	10	.8
Received services for developmental needs	148	1.6	32	1.8	15	1.0
With a severe disability	32	.3	9	.5	2	.2
3 to 5 years old	9.136	100.0	1,888	100.0	1,381	100.0
With a disability	498	5.5	80	4.3	35	2.5
Limited in usual kinds of activities	229	2.5	52	2.7	18	1.3
Received services for developmental needs	430	4.7	57	3.0	25	1.8
Limited in ability to walk, run, or use stairs	105	1.2	41	2.2	10	.7
With a severe disability	62	.7	7	.4	2	.2
6 to 14 years old	26.143	100.0	5,165	100.0	3,688	100.0
With a disability	1.702	6.5	302	5.9	151	4.1
Limited in ability to do regular school work	1,452	5.6	260	5.0	128	3.5
Limited in ability to walk, run, or use stairs	421	1.6	88	1.7	39	1.1
With a severe disability	357	1.4	44	.8	22	.6
15 to 17 years old	7.886	100.0	1,700	100.0	1,230	100.0
With a disability	702	8.9	184	10.9	104	8.5
Limited in ability to do regular school work	334	4.2	88	5.2	36	2.9
With a severe disability	207	2.6	94	5.5	28	2.3

NOTE Hispanics may be of any race.

SOURCE U.S. Department of Commerce. Bureau of the Census. 1993. *Americans with Disabilities: 1991-92. Data from the Survey of Income and Program Participation.* P70-33

Appendix table 2-20. Children 0 to 21 years old in federally supported programs for students with disabilities, by type of disability: 1982-83–1991-92

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Type of disability	1982–83	1983–84	1984–85	1985–86	1986–87	1987–88	1988–89	1989–90	1990–91	1991–92
	Number served [in thousands]									
Total[1]	4,255	4,298	4,315	4,317	4,374	4,447	4,544	4,641	4,771	4,949
Specific learning disabilities	1,741	1,806	1,832	1,862	1,914	1,928	1,987	2,050	2,130	2,234
Speech or language impairments	1,131	1,128	1,126	1,125	1,136	953	967	973	987	997
Mental retardation	757	727	694	660	643	582	564	548	536	538
Serious emotional disturbance	352	361	372	375	383	373	376	381	391	399
Hearing impairments	73	72	69	66	65	56	56	57	58	60
Orthopedic impairments	57	56	56	57	57	47	47	48	49	51
Other health impairments	50	53	68	57	52	45	43	52	55	58
Visual impairments	28	29	28	27	26	22	23	22	23	24
Multiple disabilities	63	65	69	86	97	77	85	86	96	97
Deaf-blindness	2	2	2	2	2	1	2	2	1	1
Autism and other	0	0	0	0	0	0	0	0	0	5
Preschool disabled[2]	*	*	*	*	*	636	394	422	445	484
	Number served as a percentage of total enrollment[3]									
Total[1]	10.75	10.95	11.00	10.95	11.00	11.11	11.30	11.44	11.57	11.77
Specific learning disabilities	4.40	4.60	4.67	4.72	4.81	4.82	4.94	5.06	5.17	5.31
Speech or language impairments	2.86	2.87	2.87	2.85	2.86	2.38	2.41	2.40	2.39	2.37
Mental retardation	1.91	1.85	1.77	1.68	1.62	1.45	1.40	1.35	1.30	1.28
Serious emotional disturbance	0.89	0.92	0.95	0.95	0.96	0.93	0.94	0.94	0.95	0.95
Hearing impairments	0.18	0.18	0.18	0.17	0.16	0.14	0.14	0.14	0.14	0.14
Orthopedic impairments	0.14	0.14	0.14	0.14	0.14	0.12	0.12	0.12	0.12	0.12
Other health impairments	0.13	0.13	0.17	0.14	0.13	0.11	0.11	0.13	0.13	0.14
Visual impairments	0.07	0.07	0.07	0.07	0.07	0.05	0.06	0.06	0.06	0.06
Multiple disabilities	0.16	0.17	0.17	0.22	0.24	0.19	0.21	0.21	0.23	0.23
Deaf-blindness	0.01	0.01	--	0.01	--	--	--	--	--	--
Autism and other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Preschool disabled[2]	*	*	*	*	*	0.91	0.98	1.04	1.08	1.15

[1] Includes students served under Chapter 1 and the Individuals with Disabilities Education Act (IDEA), formerly the Education of the Handicapped Act

[2] Includes preschool children 3-5 years and 0-5 years served under Chapter 1 and IDEA, respectively

[3] Based on the enrollment in public schools, including a relatively small number of pre-kindergarten students

KEY: * = Beginning in 1987–88, States are no longer required to report preschool students with disabilities (0-5 years old) by type of disability.
-- = less than 0.005 percent

NOTES: Counts are based on reports from the 50 States and the District of Columbia only. Increases since 1987-88 are due in part to a new law enacted in the fall of 1986 that mandates public school special education services for all children ages 3 to 5 with disabilities.
Some data have been revised from previously published figures.
Because of rounding, details may not add to totals.

SOURCE U.S. Department of Education, Office of Special Education and Rehabilitative Services, Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act; U.S. Department of Education/NCES, Common Core of Data survey.

Appendix table 2-21. Percentage distribution of persons 3 to 21 years old with disabilities receiving special education services, by type of disability and educational environment: 1990–91

Type of disability	Total	Regular class	Resource room	Separate class	Public, separate school facility	Private, separate school facility	Public, residential facility	Private, residential facility	Homebound/ hospital environment
Total	100 0	34 0	34 5	25 2	3 3	1 6	0.5	0 3	0.6
Mental retardation	100 0	7.6	22.6	58.5	8.8	1.1	7	.4	.4
Speech or language impairments	100 0	79.0	13 8	5.6	.3	1.0	--	--	1
Visual impairments	100 0	42 7	22 5	20.1	3 5	1.5	7.9	8	1 0
Serious emotional disturbance	100.0	16 8	29 1	35 7	7 7	5.7	2 0	1 5	1 4
Orthopedic impairments	100 0	29 6	22 1	33 3	7 1	1 6	.3	.4	5 6
Other health impairments	100 0	30 4	27 6	26 3	5.7	1.7	.5	.5	7.4
Specific learning disabilities	100 0	22 6	53 5	22.4	.6	4	1	1	.2
Deaf-blindness	100 0	10 9	6 1	32.9	17.4	4 3	25 0	1 4	2.0
Multiple disabilities	100 0	6.7	17.4	43.1	21.2	6 8	2 5	1 1	1 3
Hearing impairments	100.0	27.2	19.5	32 6	5 9	3 1	10.5	6	5

NOTES This table reflects a compilation of data reported by the States There are some reporting variations (e g . estimated or incomplete data and nonstandard definitions) from State to State Data exclude U.S. territories.
Data for 3- to 5-year-old children are not collected by type of disability
Because of rounding. percentages may not add to 100

KEY -- = less than 0 05 percent

SOURCE U S Department of Education. Office of Special Education and Rehabilitative Services 1993 Fifteenth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act

Appendix table 2-22. Student participation in school programs and services, by control, level of school, and type of community: 1990–91

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Control, level and community type	Total students: Number	Total students: Percentage distribution	Percentage of students participating in program or service: Bilingual education	English as a second language	Remedial reading	Remedial math	Progs. for the handicapped	Progs. for the gifted and talented	Diagnostic and prescriptive	Extended day
Public, total	40.103.700	100 0	2.80	3 37	10 82	7 14	7.07	6 86	8 81	2.20
School level[1]										
Elementary	25.071.464	62 5	3 55	3 70	12 85	7 63	6.69	6.61	8 92	3.14
Secondary	13.652.193	34 0	1 48	2 82	6 99	6 13	7 02	7.50	8 12	52
Combined	1.380.043	3 4	2 33	2.79	11 71	8 35	14 29	5 01	13 63	1.89
Community type										
Central city	11.892.503	29 7	5 37	6.12	12 79	9 02	6.91	7 56	9 15	3.33
Urban fringe/ large town	12.515.609	31 2	2 34	3 42	9 16	6 10	6.84	7 01	8 95	2 45
Rural/small town	15.695.586	39.1	1 23	1 24	10 64	6 55	7.36	6 20	8 45	1 15
Private, total	4.673 878	100 0	1 50	1 42	6 17	4 38	2 09	6 58	4 57	8 40
School level[1]										
Elementary	2.653.599	56.8	1.22	93	6 17	4 12	92	4 77	3.48	10.84
Secondary	888.944	19 0	0 82	2 26	4 29	3 35	1 64	8 81	2.86	70
Combined	1.131.335	24 2	2 71	1 91	7 66	5 82	5 18	9 09	8.47	8.71
Community type										
Central city	2.299.025	49 2	1 51	1 30	6 09	4 10	1 85	6.66	4 15	9 39
Urban fringe/ large town	1.553.338	33 2	1 48	1 20	5.91	4 77	2 51	6.30	5.24	8 20
Rural/small town	821.515	17 6	1 51	2 18	6 90	4 46	1 97	6.90	4 48	6 00

[1] Elementary schools include grade 6 or lower, or a low grade of ungraded and no grade higher than 8. Secondary schools include no grade lower than 7. Combined schools include grades lower than 7 and higher than 8

NOTES. Students may participate in more than one program or service
Includes only kindergarten pupils who attend schools that offer first grade or above
Excludes pre-kindergarten students
Totals differ from data appearing in other tables because of varying survey processing procedures and time period coverages
Because of rounding, percentages may not add to 100

SOURCE: U.S. Department of Education NCES Schools and Staffing Survey 1990-91

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-1. Scholastic Aptitude Test (SAT) scores of college-bound seniors, by test component, sex, and race/ethnicity: 1983–1993

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Test component, sex, and race/ethnicity	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Verbal:											
Total	425	426	431	431	430	428	427	424	422	423	424
Male	430	433	437	437	435	435	434	429	426	428	428
Female	420	420	425	426	425	422	421	419	418	419	420
White	443	445	449	NA	447	445	446	442	441	442	444
Black	339	342	346	NA	351	353	351	352	351	352	353
Asian	395	398	404	NA	405	408	409	410	411	413	415
American Indian	388	390	392	NA	393	393	384	388	393	395	400
Mexican American	375	376	382	NA	379	382	381	380	377	372	374
Puerto Rican	358	358	368	NA	360	355	360	359	361	366	367
Latin American	NA	NA	NA	NA	387	387	389	383	382	383	384
Mathematics:											
Total	468	471	475	475	476	476	476	476	474	476	478
Male	493	495	499	501	500	498	500	499	497	499	502
Female	445	449	452	451	453	455	454	455	453	456	457
White	484	487	490	NA	489	490	491	491	489	491	494
Black	369	373	376	NA	377	384	386	385	385	385	388
Asian	514	519	518	NA	521	522	525	528	530	532	535
American Indian	425	427	428	NA	432	435	428	437	437	442	447
Mexican American	417	420	426	NA	424	428	430	429	427	425	428
Puerto Rican	403	405	409	NA	400	402	406	405	406	406	409
Latin American	NA	NA	NA	NA	432	433	436	434	431	433	433

NOTE: Score range is 200 to 800 for each component.

KEY: NA = not available

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers*, p 1 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service.

See figures 3-1, 3-3, and 3-4

Appendix table 3-2. Percentage of college-bound seniors who took natural science or mathematics in high school, by sex, race/ethnicity, and coursework: 1993

Coursework	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
Natural sciences:										
Biology	97	97	97	97	97	95	96	96	96	96
Chemistry	82	82	82	84	76	88	75	76	76	78
Geography/earth space	45	45	43	47	43	34	46	28	50	39
Physics	44	51	40	45	34	64	35	34	39	43
Honors course taken	23	24	23	24	14	34	16	21	14	21
Total years natural science:										
More than 4 years	8	9	7	8	5	15	6	4	6	8
4 years	35	36	33	37	27	35	30	23	31	30
Mathematics:										
Algebra	96	96	96	97	96	94	97	97	96	96
Geometry	93	93	93	94	87	94	90	94	89	92
Trigonometry	54	56	52	55	43	70	44	44	49	51
Precalculus	33	35	32	34	21	51	24	28	25	30
Calculus	20	23	18	21	10	39	13	15	10	16
Honors course taken	24	25	24	25	14	38	16	22	15	22
Total years math:										
More than 4 years	13	15	11	12	10	21	10	10	10	13
4 years	52	52	52	53	47	51	46	48	49	50

KEY: NA = not available

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers.* pp. 4–5 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service

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Appendix table 3-3. Percentage distribution of scores and means on the Scholastic Aptitude Test for college-bound seniors, by sex, race/ethnicity, and test component: 1993

Test component and score	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
Verbal:										
700–800	1	1	1	1	--	2	--	--	--	--
650–699	2	3	2	3	--	4	1	1	1	1
600–649	4	5	4	5	1	5	3	2	2	3
500–599	18	18	18	21	7	16	14	9	9	11
400–499	33	33	33	36	23	26	31	28	25	28
300–399	28	28	29	27	38	25	35	38	36	34
Below 300	13	13	12	7	30	21	16	23	26	22
Mean	424	428	420	444	353	415	400	374	367	384
Mathematics:										
700–800	5	8	3	6	--	14	3	1	1	3
650–699	6	7	4	6	1	10	3	2	2	3
600–649	8	10	7	9	2	11	5	4	3	5
500–599	26	27	24	29	12	26	24	19	17	20
400–499	28	25	30	29	27	21	31	32	28	30
300–399	21	17	25	18	39	13	27	31	34	29
Below 300	7	5	8	4	19	4	9	11	15	12
Mean	478	502	457	494	388	535	447	428	409	433

NOTES: Scores are for college-bound seniors.
Because of rounding, percentages may not add to 100

KEY: -- = less than 0.5 percent

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers*, p. 9 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service.

Appendix table 3-4. Achievement test scores in science and mathematics and corresponding Scholastic Aptitude Test (SAT) mathematics scores for college-bound seniors, by sex, race/ethnicity, and achievement test: 1993

Achievement and SAT-math tests	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
Chemistry	582	598	558	583	514	593	567	516	523	559
SAT-math score[1]	653	672	626	653	564	672	610	597	578	617
Biology	558	575	543	563	491	558	527	494	518	537
SAT-math score[1]	608	635	584	608	515	632	571	537	537	572
Physics	604	618	561	608	533	606	562	534	535	568
SAT-math score[1]	674	683	648	677	593	685	648	617	619	640
Mathematics level I	554	573	539	560	493	577	526	485	514	515
SAT-math score[1]	569	599	549	581	494	582	543	481	520	519
Mathematics level II	663	679	642	664	594	678	635	596	624	631
SAT-math score[1]	657	676	632	662	574	667	639	577	614	614

[1] Mean score on the mathematics portion of the SAT for seniors who took achievement test in that subject

NOTE: The score range is 200 to 800 for both the achievement test and the math portion of the SAT.

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors, 1993 SAT Profile. Profile of SAT and Achievement Test Takers*, p. 11 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service.

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Appendix table 3-5. Average advanced placement test grades in science and math fields for college-bound seniors, by sex, race/ethnicity, and test field: 1993

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Sex and advanced placement test field	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
Total:										
Biology	2.98	3.14	2.85	2.99	2.11	3.21	2.62	2.30	2.62	2.57
Chemistry	2.86	2.99	2.66	2.83	2.02	3.15	2.35	2.13	2.38	2.34
Physics B	2.83	2.98	2.52	2.84	1.93	3.02	2.20	2.14	3.00*	2.30
Physics C-mechanics	3.40	3.55	2.93	3.44	2.18	3.40	3.26	2.53	3.00	2.83
Physics C-elect. & magnetism	3.27	3.36	2.96	3.27	2.11	3.36	3.10*	2.23*	2.83*	2.93
Mathematics/calculus AB[1]	3.10	3.20	2.98	3.11	2.15	3.33	2.79	2.54	2.63	2.83
Mathematics/calculus BC[1]	3.49	3.58	3.32	3.46	2.81	3.60	2.83*	2.83	3.30*	3.22
Computer science AB[2]	3.10	3.14	2.76	3.15	2.13	3.04	2.56*	2.52*	2.82*	2.65
Computer science A[2]	2.44	2.54	2.08	2.53	1.51	2.40	1.86*	2.09	2.15*	2.26
Males:										
Biology	3.14			3.13	2.34	3.33	2.73	2.54	2.85	2.73
Chemistry	2.99			2.97	2.14	3.22	2.51	2.37	2.58	2.53
Physics B	2.98			2.99	2.11	3.10	2.31	2.25	2.20	2.42
Physics C-mechanics	3.55			3.58	2.51	3.55	3.33	2.67	3.50	3.03
Physics C-elect. & magnetism	3.36			3.35	2.41*	3.42	3.17*	2.48*	2.91*	3.07
Mathematics/calculus AB[1]	3.20			3.21	2.23	3.40	3.12	2.71	2.70	2.93
Mathematics/calculus BC[1]	3.58			3.55	3.04	3.69	2.80*	3.00	3.39*	3.37
Computer science AB[2]	3.14			3.19	2.26	3.08	2.75*	2.64*	2.82*	2.63
Computer science A[2]	2.54			2.61	1.59	2.46	1.94*	2.26	2.29*	2.37
Females:										
Biology	2.85			2.87	2.01	3.08	2.50	2.10	2.46	2.43
Chemistry	2.66			2.61	1.92	3.05	1.07*	1.77	2.09*	2.09
Physics B	2.52			2.49	1.74	2.85	1.93	1.93	2.21*	2.03
Physics C-mechanics	2.93			2.97	1.67	3.01	3.00*	2.00*	1.63*	2.06*
Physics C-elect. & magnetism	2.93			2.94	1.50*	3.18	3.00*	1.17*	2.00*	1.86*
Mathematics/calculus AB[1]	2.98			2.99	2.09	3.26	2.37	2.32	2.55	2.70
Mathematics/calculus BC[1]	3.32			3.29	2.56	3.46	2.88*	2.56	3.13*	2.91
Computer science AB[2]	2.76			2.83	1.61*	2.85	1.00*	1.75*	--	3.00*
Computer science A[2]	2.08			2.15	1.38	2.24	1.60*	1.75*	1.80*	1.92*

[1] Two advanced placement exams are offered in mathematics/calculus. The calculus AB exam is not as rigorous as the calculus BC exam. Although up to a full year of college credit may be earned by those who do well on the BC test, scores on the AB test are used primarily for appropriately placing students in courses.

[2] The computer science A exam concentrates on programming methodology and procedural abstraction. The computer science AB exam includes all questions on the A test, but contains more in-depth material on algorithms, data structures, and data abstraction.

NOTES: The grading scale may be interpreted as follows: 1=no recommendation for college credit; 2=possibly qualified; 3=qualified, 4=well qualified; and 5=extremely well qualified. Average grades are for test-takers at the 9th-, 10th-, 11th-, and 12th-grade and college levels

KEY:
-- = no students in this category
* = fewer than 50 students in this category

SOURCE: Advanced Placement Program of the College Entrance Examination Board. 1993. *College Bound Seniors, 1993 Advanced Placement Program. National Summary Report.* pp 3-5 Princeton, NJ: Educational Testing Service.

Appendix table 3-6. Intended undergraduate majors of college-bound seniors taking the Scholastic Aptitude Test (SAT), by sex, race/ethnicity, and area of study: 1993

[In percentages]

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Sex and area of study	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
Total:										
Science and engineering	34	41	30	33	35	35	31	36	33	34
Agriculture	2	2	1	2	--	--	2	1	1	1
Biological sciences	5	5	6	5	3	6	5	4	4	4
Computer sciences	3	4	2	2	6	4	2	3	4	3
Engineering	10	18	4	9	12	15	9	12	10	11
Mathematics	1	1	1	1	--	1	1	1	--	--
Physical sciences	1	2	1	2	1	1	1	1	1	1
Social sciences/history	12	9	15	12	13	8	11	14	13	14
Non-science and engineering	66	59	70	67	65	65	69	64	67	66
Business	15	16	14	14	19	17	14	16	18	18
Education	8	4	11	9	6	3	9	7	6	5
Health & allied services	18	13	23	17	20	25	19	19	18	17
Other	25	26	22	27	20	20	27	22	25	26
Males:										
Science and engineering	41			38	41	44	38	40	38	40
Agriculture	2			2	1	--	4	1	1	1
Biological sciences	5			5	3	6	5	4	4	4
Computer sciences	4			3	7	6	3	4	4	4
Engineering	18			16	20	25	16	20	19	20
Mathematics	1			1	1	1	1	1	--	1
Physical sciences	2			2	1	1	2	1	1	1
Social sciences/history	9			9	8	5	7	9	9	9
Non-science and engineering	59			62	59	56	62	60	62	60
Business	16			16	20	16	15	16	18	18
Education	4			4	4	1	6	4	3	3
Health & allied services	13			12	11	21	13	14	13	14
Other	26			30	24	18	28	26	28	25
Females:										
Science and engineering	30			29	31	27	30	31	29	32
Agriculture	1			2	--	--	2	1	1	1
Biological sciences	6			6	3	7	5	4	4	5
Computer sciences	2			1	5	2	2	2	3	3
Engineering	4			3	6	5	4	5	4	4
Mathematics	1			1	--	1	1	--	--	--
Physical sciences	1			1	--	1	1	1	1	1
Social sciences/history	15			15	17	11	15	18	16	18
Non-science and engineering	70			71	69	73	70	69	71	68
Business	14			12	17	18	12	16	17	17
Education	11			14	6	4	11	9	8	7
Health & allied services	23			22	27	30	24	23	22	21
Other	22			23	19	21	23	21	24	23

NOTES: SAT mathematics scores are the mean mathematics scores on the aptitude portion of the SAT Scores range from 200 to 800. Because of rounding, percentages may not add to 100.

KEY. -- = less than 1 percent

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers.* p. 80 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ. Educational Testing Service

Appendix table 3-7. Academic preparation and corresponding American College Testing (ACT) scores, by race/ethnicity and sex: 1993

Sex and test component	Total[1]	White	Black	Asian	American Indian	Mexican American	Puerto Rican/ Hispanic
Total, both sexes:							
Students taking core subjects or more:							
Number	453,064	342,884	38,893	16,600	4,537	13,764	7,693
Scores:							
English	21.6	22.2	17.9	21.3	19.1	19.1	20.6
Math	21.6	22.0	18.0	23.9	19.6	19.9	20.6
Reading	22.5	23.2	18.1	22.3	20.5	19.8	20.8
Science/reasoning	22.0	22.6	18.2	22.1	20.3	19.8	20.5
Composite/score	22.0	22.6	18.1	22.5	20.0	19.8	20.5
Students taking less than core subjects:							
Number	374,256	275,294	40,620	7,649	5,390	13,753	5,799
Scores:							
English	18.7	19.4	15.4	18.5	16.3	16.4	16.9
Math	18.3	18.7	15.8	21.0	16.7	17.1	17.4
Reading	19.6	20.4	15.9	19.4	17.9	17.2	17.7
Science/reasoning	19.4	20.0	16.6	19.9	17.9	17.7	18.0
Composite/score	19.1	19.8	16.1	19.8	17.3	17.2	17.6
Males:							
Students taking core subjects or more:							
Number		157,636	15,137	7,673	2,061	6,165	3,204
Scores:							
English		21.8	17.3	20.9	18.9	18.8	19.8
Math		22.7	18.2	24.7	20.3	20.5	21.5
Reading		23.3	17.8	22.3	20.7	19.9	21.0
Science/reasoning		23.3	18.5	22.9	21.1	20.5	21.2
Composite/score		22.9	18.1	22.8	20.4	20.0	21.0
Students taking less than core subjects:							
Number		118,935	17,190	3,642	2,341	5,940	2,335
Scores:							
English		18.8	14.8	18.2	15.9	16.0	16.7
Math		19.2	16.0	21.8	17.1	17.4	18.0
Reading		20.3	15.7	19.4	17.5	17.2	17.7
Science/reasoning		20.6	16.7	20.4	18.2	18.1	18.5
Composite/score		19.8	15.9	20.1	17.3	17.3	17.9
Females:							
Students taking core subjects or more:							
Number		185,248	23,756	8,927	2,476	7,599	4,489
Scores:							
English		22.6	18.2	21.6	19.3	19.3	20.1
Math		21.4	17.8	23.3	19.0	19.4	19.9
Reading		23.2	18.2	22.3	20.3	19.8	20.6
Science/reasoning		21.9	17.9	21.5	19.6	19.3	19.8
Composite/score		22.4	18.2	22.3	19.7	19.5	20.2
Students taking less than core subjects:							
Number		156,359	23,430	4,007	3,049	7,813	3,464
Scores:							
English		19.9	15.8	18.8	16.7	16.6	17.1
Math		18.4	15.7	20.3	16.4	16.8	17.0
Reading		20.5	16.1	19.4	17.7	17.2	17.7
Science/reasoning		19.6	16.4	19.4	17.6	17.4	17.6
Composite/score		19.7	16.2	19.6	17.2	17.1	17.5

[1] Total includes 9 percent of students who did not answer the race/ethnicity question

SOURCE: American College Testing Program. 1993. *The High School Profile Report: A Description of the Academic Abilities and Nonacademic Characteristics of ACT Tested 1993 Graduates*. Iowa City: American College Testing Program

See figure 3-5.

Appendix table 3-8. Estimated family income and corresponding Scholastic Aptitude Test (SAT) verbal and mathematics scores of college-bound seniors, by sex and race/ethnicity: 1993

Estimated family income	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
	Percentage of college-bound seniors									
Less than $10,000	6	5	7	2	15	11	7	12	17	14
$10,000–20,000	11	10	12	7	23	16	14	23	22	23
$20,000–$30,000	14	14	15	13	21	14	17	20	19	18
$30,000–$40,000	17	17	17	17	16	15	19	17	15	14
$40,000–$50,000	13	13	13	14	9	10	13	10	9	8
$50,000–$60,000	11	11	11	13	6	8	10	7	6	6
$60,000–$70,000	8	8	7	9	4	6	6	4	4	4
$70,000 or more	21	22	19	24	6	19	14	7	8	11
	SAT verbal scores									
Less than $10,000	352	358	348	406	319	340	353	331	322	322
$10,000–$20,000	379	381	377	416	334	388	380	351	344	353
$20,000–$30,000	404	407	401	423	351	395	390	369	366	378
$30,000–$40,000	418	420	417	430	364	414	402	384	383	398
$40,000–$50,000	431	434	429	438	373	438	407	395	396	415
$50,000–$60,000	440	442	439	446	382	448	412	407	401	428
$60,000–$70,000	449	450	449	454	390	456	422	418	407	437
$70,000 or more	472	474	470	474	418	485	433	434	432	455
	SAT mathematics scores									
Less than $10,000	416	449	396	460	358	484	393	389	360	375
$10,000–$20,000	434	459	416	458	371	502	426	408	387	403
$20,000–$30,000	453	477	434	468	385	517	437	425	405	425
$30,000–$40,000	469	491	449	477	396	527	446	436	421	445
$40,000–$50,000	483	505	462	487	406	542	455	443	439	464
$50,000–$60,000	493	514	473	496	416	551	463	457	440	475
$60,000–$70,000	504	524	484	506	420	560	471	469	453	484
$70,000 or more	533	554	512	532	453	597	488	482	486	510

NOTE: Because of rounding, percentages may not add to 100.

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors, 1993 SAT Profile, Profile of SAT and Achievement Test Takers*, p. 7 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service.

See figure 3-7.

Appendix table 3-9. Highest level of parental education and corresponding Scholastic Aptitude Test (SAT) verbal and mathematics scores of college-bound seniors, by sex and race/ethnicity: 1993

Page 1 of 1

Highest level of parental education	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
	Percentage									
Less than HS diploma	5	4	5	2	7	11	4	28	14	20
HS diploma	37	35	39	36	52	27	45	42	41	35
Associate's degree	8	8	8	8	9	5	10	7	9	6
Bachelor's degree	27	28	26	29	19	30	24	13	20	17
Graduate degree	24	25	22	26	13	28	17	9	16	21
	SAT verbal scores									
Less than HS diploma	338	341	336	374	308	331	328	332	323	322
HS diploma	395	397	392	412	338	377	383	373	361	375
Associate's degree	408	409	408	422	352	396	394	389	370	388
Bachelor's degree	445	446	443	456	377	425	418	418	382	418
Graduate degree	478	481	476	486	405	484	443	435	406	430
Mean score	424	428	420	444	353	415	400	374	367	384
	SAT mathematics scores									
Less than HS diploma	408	434	389	422	351	478	377	395	363	377
HS diploma	445	468	427	459	374	502	431	426	396	419
Associate's degree	457	479	439	470	385	501	445	437	410	435
Bachelor's degree	501	523	481	509	409	548	466	464	431	466
Graduate degree	534	557	512	538	436	588	491	477	455	487
Mean score	478	502	457	494	388	535	447	428	409	433

NOTE: Because of rounding, percentages may not add to 100.

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers.* p. 8 of each of 10 separate reports for each racial/ethnic group. Princeton, NJ: Educational Testing Service.

Appendix table 3-10. Citizenship status and corresponding Scholastic Aptitude Test (SAT) verbal and mathematics scores of college-bound seniors, by sex and race/ethnicity: 1993

Page 1 of 1

Citizenship status	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
	Percentage									
U.S. citizen	92	92	93	98	93	57	98	91	99	64
Permanent resident	5	5	5	1	4	28	2	8	1	26
Citizen of another country	3	4	3	1	2	15	1	1	--	10
	SAT verbal scores									
U.S. citizen	431	435	427	444	354	456	402	379	368	405
Permanent resident	357	362	352	410	337	354	319	326	349	341
Citizen of another country	390	394	385	423	374	378	322	302	284	361
	SAT mathematics scores									
U.S. citizen	479	503	458	493	387	537	448	431	409	446
Permanent resident	467	498	441	507	381	508	405	395	414	398
Citizen of another country	532	552	508	535	427	584	433	387	358	447

NOTE: Because of rounding, percentages may not add to 100.

KEY: -- = less than 0.5 percent

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers.* p. 6 of each of 10 separate reports for each sex and racial/ethnic group. Princeton. NJ: Educational Testing Service.

Women. Minorities. and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-11. Selected characteristics of American college freshmen, by sex and race/ethnicity: 1982 and 1992

[In percentages]

Page 1 of 2

Year and characteristic	All first-year students[1,2]							First-year students planning a science or engineering major[3]		
	Men	Women	White	Black	Asian	American Indian	Hispanic	Total	Men	Women
1982:										
Average high school grade:										
A to A+	12.0	16.3	14.1	4.2	22.0	11.7	10.2	18.5	16.6	21.5
A-	12.8	17.7	15.2	5.8	19.5	14.5	11.6	17.2	16.3	18.7
B+	19.9	23.4	21.7	16.6	20.9	19.1	20.9	22.1	22.2	22.1
B	23.4	25.0	24.2	24.9	21.2	23.9	25.2	21.2	21.4	21.7
B-	14.9	9.6	12.3	15.7	7.0	12.4	13.6	9.9	11.1	8.1
C+ or below	17.0	8.1	12.5	32.9	9.5	18.5	18.5	10.1	11.5	8.0
Parents' education:										
Father:										
Less than high school	8.4	9.8	9.1	31.2	15.4	21.3	46.1	10.6	9.9	11.7
High school graduate	25.1	24.4	24.7	32.1	14.0	26.3	18.7	22.9	23.1	22.5
Some college	15.8	13.8	14.8	12.4	10.1	13.8	10.2	14.1	14.0	14.3
College graduate	23.0	24.6	23.8	10.6	20.5	16.2	9.6	22.8	23.6	21.7
Some graduate school	3.2	3.2	3.2	1.3	3.4	2.4	1.4	3.5	3.5	3.5
Graduate degree	20.0	20.0	20.0	8.9	33.3	15.4	11.3	21.6	21.4	21.8
Postsecondary, not college	4.7	4.3	4.5	3.6	3.2	4.8	2.7	4.5	4.6	4.3
Mother:										
Less than high school	6.3	6.5	6.4	23.1	20.8	14 6	43.6	8.3	7.8	9.2
High school graduate	39.1	36.1	37.6	33 7	21.6	33.8	25.4	34.0	35.1	35.2
Some college	16.8	17.9	17.4	15.4	10.4	17.6	11.3	16.6	16.4	16.9
College graduate	20.5	20.9	20.7	12.7	23.0	15.0	8.2	20.8	21.2	20.2
Some graduate school	2.6	2.9	2.8	2.0	3.1	2.7	1.8	3.2	3.1	3.5
Graduate degree	7 9	8.2	8.0	8.0	15.1	9.5	5.1	9.1	8.6	9.8
Postsecondary, not college	6.8	7.4	7 1	5.1	5.9	6.7	4.7	8.0	7.8	8.3
Highest degree planned:										
Bachelor's	34.7	40 0	37.3	27.5	17.8	27.8	28.6	27.4	28.5	25.7
Master's	34.9	35.1	35.0	36.0	33.1	31.1	31.9	36.6	37.7	34.7
Doctorate	11.5	9.2	10.4	14.0	18.8	15.3	12.2	16.8	16.3	17.7
Medical	8.3	6 8	7.5	7.7	20.6	9.2	11.1	9.3	8.5	10.5
Law	6.4	4 7	5.6	6.0	3.5	6.7	8.1	6.8	5.9	8.3
Other[4]	4.3	4.2	4 3	8.6	6.2	8.3	8 1	3 1	3.1	3 0

See explanatory information and SOURCE at end of table

Appendix table 3-11. Selected characteristics of American college freshmen, by sex and race/ethnicity: 1982 and 1992

[In percentages]

Page 2 of 2

Year and characteristic	All first-year students[1,2]							First-year students planning a science or engineering major[3]		
	Men	Women	White	Black	Asian	American Indian	Hispanic	Total	Men	Women
1992:										
Average high school grade:										
A to A+	13.8	18.4	16.2	6.7	26.5	15.1	13.4	21.6	20.7	22.8
A-	16.8	19.5	18.2	9.0	23.0	16.6	16.7	19.9	19.5	20.4
B+	18.9	21.8	20.4	18.7	20.3	20.1	20.9	20.9	20.1	21.9
F	23.9	24.7	24.3	23.3	17.7	23.5	23.3	20.4	20.5	20.1
B-	13.7	8.8	11.2	15.8	7.4	11.1	11.2	9.2	10.0	8.2
C+ or below	12.9	6.9	9.8	26.0	5.1	13.6	14.5	8.1	9.2	6.7
Parents' education.										
Father:										
Less than high school	4.6	5.3	4.7	14.1	11.9	13.1	27.5	6.6	5.4	7.6
High school graduate	19.1	20.8	20.0	30.1	11.6	24.8	20.1	18.9	18.5	19.4
Some college	16.3	16.8	16.6	19.8	11.9	19.7	16.8	15.8	15.5	16.1
College graduate	26.5	25.9	26.2	17.0	25.5	18.6	14.9	25.0	25.7	24.1
Some graduate school	3.4	3.6	3.5	1.8	3.4	2.9	1.9	3.8	3.8	3.8
Graduate degree	24.3	23.2	23.7	10.8	32.8	14.7	14.5	24.9	25.4	24.2
Postsecondary, not college	5.6	4.4	5.0	6.3	2.9	6.3	4.2	5.1	5.3	4.9
Mother:										
Less than high school	3.7	3.7	3.8	9.4	17.8	12.3	26.7	5.3	4.9	5.8
High school graduate	27.3	27.5	27.4	26.8	18.3	24.6	26.0	24.3	24.6	24.0
Some college	18.4	19.6	19.0	23.8	12.5	24.3	16.4	18.7	18.0	19.7
College graduate	25.5	25.2	25.3	18.6	28.4	18.7	14.0	25.2	26.3	23.8
Some graduate school	4.3	4.2	4.3	2.6	3.1	3.0	2.6	4.3	4.3	4.4
Graduate degree	13.4	12.0	12.7	11.4	17.0	11.1	8.6	14.5	14.6	14.3
Postsecondary, not college	7.3	7.8	7.5	7.5	4.0	6.0	5.7	7.7	7.4	8.0
Highest degree planned:										
Bachelor's	30.4	30.8	30.6	23.9	17.4	24.8	25.0	19.7	22.4	16.3
Master's	40.3	41.8	41.1	37.7	34.7	36.6	37.8	38.1	39.6	36.3
Doctorate	13.1	12.4	12.8	18.0	18.3	17.7	15.9	22.2	0.5	24.3
Medical	7.2	7.6	7.4	9.1	20.9	10.4	10.1	10.6	9.0	12.5
Law	4.4	4.2	4.3	6.1	4.1	5.2	5.6	6.5	5.1	8.3
Other[4]	4.5	3.1	3.3	5.4	4.6	4.3	5.6	2.8	3.4	2.3

[1] Includes first-year students at all 4-year colleges

[2] Racial and ethnic categories may total to more than 100 because students could select more than one category.

[3] Data by racial/ethnic group are not reliable for students whose intended major is a science or engineering field because of very small sample sizes.

[4] "Other" includes "none," "associate," and "divinity" degrees, and other degrees not listed.

NOTE. Because of rounding, percentages may not add to 100

SOURCE Higher Education Research Institute, University of California at Los Angeles. 1992 *Survey of the American Freshman. National Norms* Los Angeles: University of California Unpublished tabulations.

See figure 3-8

Appendix table 3-12. Scholastic Aptitude Test (SAT) scores of college-bound seniors, by disability status, sex, race/ethnicity, and test component: 1993

Page 1 of 1

Disability status	Total	Male	Female	White	Black	Asian	American Indian	Mexican American	Puerto Rican	Latin American
	Percentage distribution of college-bound seniors									
Disabling condition reported . .	3	4	3	4	3	3	5	3	4	3
No disabling condition reported	97	96	97	96	97	97	95	97	96	97
	SAT verbal scores									
Disabling condition reported . .	392	396	388	406	321	389	374	351	331	354
No disabling condition reported	427	432	423	445	355	418	402	375	369	385
	SAT mathematics scores									
Disabling condition reported . .	434	452	416	444	353	493	417	406	373	400
No disabling condition reported	482	507	460	496	390	538	450	428	411	435

SOURCE: College Entrance Examination Board. 1993. *College Bound Seniors. 1993 SAT Profile. Profile of SAT and Achievement Test Takers*, p. 1 of each of 10 separate reports for each sex and racial/ethnic group. Princeton, NJ: Educational Testing Service.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-13. Percentage of full-time college freshmen reporting disabilities, by type of disability: 1985, 1988, and 1991

Page 1 of 1

Type of disability	1985	1988	1991
Total	7.4	7.0	8.8
Hearing	.9	.8	.9
Speech	.3	.3	.5
Orthopedic	.9	1.0	1.2
Learning	1.1	1.2	2.2
Health-related	1.2	1.2	1.3
Partially sighted or blind	2.1	1.9	2.2
Other	1.2	1.4	1.6

NOTE: The following question was asked: "Do you have a disability? Mark all that apply."

SOURCE: Henderson, Cathy. 1992. *College Freshmen with Disabilities: A Statistical Profile.* Washington, DC: American Council on Education, HEATH Resource Center

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-14. Types of disabilities reported by full-time college freshmen: 1985, 1988 and 1991

[Percentage distribution]

Page 1 of 1

Type of disability	1985	1988	1991
Total	100 0	100.0	100.0
Hearing	12.2	11.6	10.5
Speech	4.0	3.8	5.4
Orthopedic	12.1	13.8	13 5
Learning	14.8	15.3	24.9
Health-related	16.2	15.7	14.6
Partially sighted or blind	28.3	31.7	25.2
Other	16.2	18.5	18.3

NOTE: Because of rounding and multiple disabilities, percentages may not add to 100.

SOURCE: Henderson, Cathy. 1992. *College Freshmen with Disabilities: A Statistical Profile*. Washington, DC: American Council on Education, HEATH Resource Center

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-15. Percentage of full-time college freshmen who had special tutoring or remedial work in high school, by field and disability status: 1991

Field of remedial work or tutoring	Students with disabilities	Students without disabilities
English	13.1	5.9
Reading	11.9	5.6
Mathematics	16.9	10.6
Social studies	7.3	4.3
Science	7.5	4.7
Foreign language	6.7	4.4

SOURCE: Henderson, Cathy. 1992. *College Freshmen with Disabilities: A Statistical Profile.* Washington, DC: American Council on Education, HEATH Resource Center.

Appendix table 3-16. Percentage of full-time college freshmen who anticipate needing special tutoring or remedial work in college, by field and disability status: 1991

Page 1 of 1

Field of remedial work or tutoring	Students with disabilities	Students without disabilities
English	22.9	11.5
Reading	14.3	4.3
Mathematics	38.2	27.8
Social studies	9.1	3.3
Science	18.2	11.1
Foreign language	17.6	10.5

SOURCE: Henderson, Cathy. 1992. *College Freshmen with Disabilities: A Statistical Profile.* Washington, DC: American Council on Education, HEATH Resource Center.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 3-17. Higher education institutions offering selected student services, by level and control of services: 1991–92

Student services	Total	4 years and above			2 years but less than 4 years		
			Private			Private	
		Public	Non-profit	For-profit	Public	Non-profit	For-profit
All institutions	5,233	611	1,842	118	1,240	626	796
Remedial instructional services	3,412	508	1,059	63	1,185	270	327
Academic/career counseling services	4,528	598	1,546	96	1,215	487	586
Employment services	3,732	545	1,209	82	1,084	277	535
Placement services	3,877	562	1,245	83	1,081	250	656
Assistance for the visually impaired	1,874	456	484	6	852	34	42
Assistance for the hearing impaired	1,849	433	439	7	894	44	32
Access for the mobility impaired	3,374	567	1,095	65	1,131	181	335
On-campus day care	1,227	315	248	1	557	79	27
None of the above	258	6	113	11	9	73	46
Did not respond	204	2	99	7	2	29	65
	Percentage offering services						
Remedial instructional services	65.2	83.1	57.5	53.4	95.6	43.1	41.1
Academic/career counseling services	86.5	97.9	83.9	81.4	98.0	77.8	73.6
Employment services	71.3	89.2	65.6	69.5	87.4	44.2	67.2
Placement services	74.1	92.0	67.6	70.3	87.2	39.9	82.4
Assistance for the visually impaired	35.8	74.6	26.3	5.1	68.7	5.4	5.3
Assistance for the hearing impaired	35.3	70.9	23.8	5.9	72.1	7.0	4.0
Access for the mobility impaired	64.5	92.8	59.4	55.1	91.2	28.9	42.1
On-campus day care	23.4	51.6	13.5	.8	44.9	12.6	3.4
None of the above	4.9	1.0	6.1	9.3	.7	11.7	5.8
Did not respond	3.9	.3	5.4	5.9	.2	4.6	8.2

NOTE: Level of institution based on Integrated Postsecondary Education Data System definitions

SOURCE: U.S. Department of Education/NCES. IPEDS Institutional Characteristics Survey, 1991–92.

Appendix table 4-1. Goals of 2-year colleges involved in science technology and engineering technology, by degree of importance: 1993

[In percentages]

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Goal	Importance of goal to mission of institution		
	Not important or somewhat important	Important	More important or very important
A specific commitment to science-based technical occupations	11	22	67
Provision of training in entry-level skills for employment in science-based technical fields	9	17	75
Provision of continuing education for those currently employed in science-based technical fields	22	26	52
Provision of first- and second-year courses in science-based technical fields for students who wish to transfer to 4-year programs	13	18	69
Provision of remediation for students who are not adequately prepared for science-based technical coursework at the college level	11	18	71

SOURCE: National Science Foundation. 1994. Higher Education Survey of Technical Education in 2-Year Institutions.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 4-2. Total and full-time enrollment at 2-year institutions, by sex and race/ethnicity: fall 1980–1991, selected years

Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total enrollment:						
Total:						
All races and ethnicities	4,406,458	4,668,231	4,566,426	4,838,992	5,141,505	5,587,778
Nonresident aliens	62,722	60,333	50,683	60,934	75,060	73,842
White, non-Hispanic	3,450,998	3,613,404	3,482,820	3,675,326	3,875,286	4,138,468
Asian	124,025	159,117	183,889	204,160	215,768	258,498
Underrepresented minorities	768,713	835,376	849,034	898,571	975,391	1,116,970
Black, non-Hispanic	453,428	477,813	457,476	457,570	502,866	567,273
American Indian/Alaskan Native	44,807	46,814	47,279	48,604	51,794	59,326
Hispanic	270,478	310,749	344,279	392,397	420,731	490,371
Men:						
All races and ethnicities	1,994,606	2,122,580	2,009,475	2,079,678	2,194,311	2,378,381
Nonresident aliens	38,741	37,613	29,578	33,067	37,118	38,171
White, non-Hispanic	1,553,640	1,633,430	1,525,256	1,573,066	1,648,592	1,756,575
Asian	62,987	84,563	96,019	103,859	108,400	128,928
Underrepresented minorities	339,238	366,973	358,622	369,686	400,201	454,707
Black, non-Hispanic	190,586	198,257	180,275	174,345	191,726	213,791
American Indian/Alaskan Native	19,664	21,099	20,270	20,203	21,265	24,433
Hispanic	128,989	147,617	158,076	175,139	187,210	216,483
Women:						
All races and ethnicities	2,411,852	2,545,651	2,556,951	2,759,314	2,947,194	3,209,397
Nonresident aliens	23,980	22,720	21,105	27,867	37,942	35,671
White, non-Hispanic	1,897,358	1,979,974	1,957,564	2,102,260	2,226,694	2,381,893
Asian	61,039	74,554	87,870	100,301	107,368	129,570
Underrepresented minorities	429,475	468,403	490,412	528,885	575,190	662,263
Black, non-Hispanic	262,842	279,557	277,201	283,226	311,140	353,482
American Indian/Alaskan Native	25,143	25,714	27,009	28,402	30,529	34,893
Hispanic	141,489	163,132	186,203	217,258	233,521	273,888

See explanatory information and SOURCES at end of table.

Appendix table 4-2. Total and full-time enrollment at 2-year institutions, by sex and race/ethnicity: fall 1980–1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Full-time enrollment:						
Total:						
All races and ethnicities	1,693,744	1,792,316	1,632,688	1,735,859	1,866,869	2,063,705
Nonresident aliens	38,474	35,806	29,014	32,510	39,385	39,797
White, non-Hispanic	1,264,917	1,334,614	1,191,802	1,285,137	1,375,427	1,489,386
Asian	45,772	57,690	66,147	70,856	76,024	92,357
Underrepresented minorities	344,581	364,206	345,724	347,356	376,033	442,165
Black, non-Hispanic	214,011	219,282	197,154	186,549	202,391	234,464
American Indian/Alaskan Native	17,069	17,721	17,654	18,699	20,059	24,214
Hispanic	113,501	127,203	130,917	142,108	153,583	183,487
Men:						
All races and ethnicities	850,741	905,585	792,189	819,377	875,227	958,786
Nonresident aliens	26,567	23,904	17,897	18,615	20,532	21,407
White, non-Hispanic	643,876	684,745	586,807	614,789	655,228	703,931
Asian	25,132	32,883	37,357	38,938	40,747	48,556
Underrepresented minorities	155,166	164,052	150,128	147,034	158,720	184,892
Black, non-Hispanic	93,083	95,079	82,097	75,609	82,324	94,190
American Indian/Alaskan Native	7,999	8,580	8,052	8,382	8,821	10,490
Hispanic	54,084	60,393	59,979	63,043	67,575	80,212
Women:						
All races and ethnicities	843,003	886,731	840,499	916,482	991,642	1,104,919
Nonresident aliens	11,907	11,901	11,117	13,894	18,853	18,390
White, non-Hispanic	621,041	649,869	604,995	670,348	720,199	785,455
Asian	20,640	24,807	28,791	31,918	35,277	43,801
Underrepresented minorities	189,415	200,154	195,596	200,322	217,313	257,273
Black, non-Hispanic	120,928	124,203	115,057	110,940	120,067	140,274
American Indian/Alaskan Native	9,070	9,141	9,602	10,317	11,238	13,724
Hispanic	59,417	66,810	70,938	79,065	86,008	103,275

NOTES: Other/unknown races and ethnicities have been distributed proportionately across groups.
Because of rounding, details may not add to totals.

SOURCES: U.S. Department of Education/NCES. Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 4-3. Full-time and first-time first-year enrollment at 2-year institutions, by sex and race/ethnicity: fall 1980-1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
First-time first-year enrollment:						
Total:						
All races and ethnicities	1,362,908	1,343,984	1,066,044	1,161,891	1,122,167	1,145,700
Nonresident aliens	18.092	15,520	12,209	16,027	16,457	18,056
White, non-Hispanic	1,058.356	1,039.766	818,065	879,926	835,706	833,178
Asian	32,599	39,103	36,696	41,578	43,518	46,719
Underrepresented minorities	253,861	249,595	199,074	224,360	226,486	247.747
Black, non-Hispanic	148,636	140,475	104,678	112,717	115,667	128,637
American Indian/Alaskan Native	14,914	13,729	12,113	12,661	13,281	14,780
Hispanic	90,310	95,391	82,284	98.982	97,538	104,330
Men:						
All races and ethnicities	623,237	628,644	493,000	527,830	509,672	536,897
Nonresident aliens	10,554	9,680	6.898	8,449	8,558	9,394
White, non-Hispanic	483,784	485,912	379,064	400,760	379,256	392,570
Asian	16,988	21,107	19,715	21,333	22,322	23,814
Underrepresented minorities	111,912	111,945	87,323	97,288	99,536	111,119
Black, non-Hispanic	62,966	60,093	43,987	46,964	49,025	56,709
American Indian/Alaskan Native	6,610	6,598	5,564	5,656	5,951	6,637
Hispanic	42,335	45,254	37,772	44,668	44,560	47,773
Women:						
All races and ethnicities	739,671	715,340	573,044	634,061	612,495	608,803
Nonresident aliens	7,538	5,840	5,311	7,578	7,899	8.662
White, non-Hispanic	574,572	553,854	439.002	479,166	456,450	440.608
Asian	15,611	17,996	16.981	20,245	21,196	22,905
Underrepresented minorities	141,949	137,650	111,751	127,072	126,950	136,628
Black, non-Hispanic	85,670	80,383	60,690	65,753	66,642	71,928
American Indian/Alaskan Native	8,304	7.131	6.549	7,005	7,330	8,143
Hispanic	47,975	50,137	44,512	54,314	52,978	56,557

See explanatory information and SOURCES at end of table.

Appendix table 4-3. Full-time and first-time first-year enrollment at 2-year institutions, by sex and race/ethnicity: fall 1980-1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total:						
All races and ethnicities	658,798	649,767	540,454	585,884	587,736	632,698
Nonresident aliens	10,646	10,489	7,629	8,967	9,591	10,583
White, non-Hispanic	500,911	493,294	407,861	443,748	438,323	462,030
Asian	14,308	16,643	17,354	18,734	20,966	22,642
Underrepresented minorities	132,933	129,341	107,610	114,435	118,856	137,443
Black, non-Hispanic	81,658	76,430	60,091	61,632	64,592	76,814
American Indian/Alaskan Native	6,601	6,322	6,011	6,463	6,988	7,999
Hispanic	44,674	46,589	41,509	46,339	47,276	52,630
Men:						
All races and ethnicities	324,267	320,202	260,556	279,630	281,822	314,987
Nonresident aliens	6,865	6,897	4,493	4,991	5,185	5,726
White, non-Hispanic	250,884	246,845	199,584	214,427	212,944	234,615
Asian	7,740	9,230	9,725	10,070	11,165	11,816
Underrepresented minorities	58,777	57,230	46,754	50,143	52,528	62,830
Black, non-Hispanic	34,807	32,525	25,095	26,357	28,132	35,470
American Indian/Alaskan Native	3,178	3,134	2,876	3,023	3,249	3,746
Hispanic	20,793	21,571	18,784	20,763	21,147	23,614
Women:						
All races and ethnicities	334,531	329,565	279,898	306,254	305,914	317,711
Nonresident aliens	3,781	3,593	3,136	3,977	4,406	4,857
White, non-Hispanic	250,027	246,448	208,276	229,321	225,379	227,415
Asian	6,567	7,413	7,629	8,664	9,801	10,826
Underrepresented minorities	74,156	72,111	60,856	64,292	66,328	74,613
Black, non-Hispanic	46,851	43,905	34,996	35,275	36,460	41,344
American Indian/Alaskan Native	3,423	3,188	3,135	3,440	3,739	4,253
Hispanic	23,881	25,018	22,725	25,577	26,129	29,016

NOTES: Other/unknown races and ethnicities have been distributed proportionately across groups.
Because of rounding, details may not add to totals.

SOURCES: U.S. Department of Education/NCES, Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS.

Appendix table 4-4. Associate's degrees, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	78.844	79,925	72.177	68,254	66,852	64.677
Engineering[2]	51.661	55,502	52.022	48.912	47.141	45,105
Science	27.183	24.423	20.155	19.342	19,711	19,572
Natural sciences	NA	18,370	13,903	12,798	12.886	13,070
Physical science	NA	1,065	1,131	1,060	1,248	1,249
Mathematical science	NA	789	667	654	760	670
Computer science	NA	12.890	9.286	8.192	7,840	7,970
Biological science	NA	1,233	995	999	1,055	1,142
Agricultural science	NA	2,393	1.824	1,893	1,983	2.039
Social sciences[3]	27,183	6.053	6,252	6.544	6,825	6,502
Social science	27,183	5,070	5.236	5,431	5,709	5.505
Psychology	NA	983	1.016	1,113	1.116	997
Non-S&E	342.066	379,162	368,639	372,121	392.196	421,620
Grand total	420.910	459.087	440,816	440,375	459.048	486.297
White, non-Hispanic:						
Total science and engineering	61.157	60,550	55.049	49.109	47,120	49,487
Engineering[2]	40,804	43.194	40,618	35,570	33.469	35.659
Science	20.353	17,356	14.431	13.539	13,651	13.828
Natural sciences	NA	13,803	10.438	9,275	9,162	9,628
Physical science	NA	734	917	841	974	968
Mathematical science	NA	525	481	461	538	477
Computer science	NA	9,730	6,879	5.583	5,166	5,577
Biological science	NA	676	590	685	709	759
Agricultural science	NA	2,138	1,571	1.705	1,775	1,847
Social sciences[3]	20.353	3,553	3,993	4,264	4.489	4,200
Social science	20,353	2.873	3,212	3,419	3,649	3,462
Psychology	NA	680	781	845	840	738
Non-S&E	278.026	294,872	290,497	281,448	296.509	327.382
Grand total	339.183	355,422	345.546	330.557	343.629	376.869
Asian:						
Total science and engineering	2,086	2.434	3.083	2,554	2.408	2.408
Engineering[2]	1.641	1,754	2.358	1,857	1.650	1,642
Science	445	680	725	697	758	766
Natural sciences	NA	597	576	521	590	608
Physical science	NA	51	43	62	91	86
Mathematical science	NA	63	69	65	75	65
Computer science	NA	448	395	336	336	323
Biological science	NA	31	59	52	80	126
Agricultural science	NA	4	10	6	8	8
Social sciences[1]	445	83	149	176	168	158
Social science	445	75	130	162	150	134
Psychology	NA	8	19	14	18	24
Non-S&E	6,671	7,731	8.246	9.207	10.279	12.661
Grand total	8,757	10.165	11,329	11.761	12,687	15.069

See explanatory information and SOURCES at end of table.

Appendix table 4-4. Associate's degrees, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	11,177	9,742	10.081	9,106	8.762	9,777
Engineering[2]	5,407	6,031	6.323	5,626	5,312	5.973
Science	5,770	3,711	3,758	3,480	3,450	3,804
Natural sciences	NA	2,123	2,158	1,909	1,957	2,136
Physical science	NA	116	112	81	102	130
Mathematical science	NA	66	81	81	99	95
Computer science	NA	1,604	1,549	1,423	1.452	1,594
Biological science	NA	236	270	170	188	209
Agricultural science	NA	101	146	154	116	108
Social sciences[3]	5,770	1,588	1,600	1,571	1,493	1,668
Social science	5.770	1,469	1,447	1.352	1,261	1,461
Psychology	NA	119	153	219	232	207
Non-S&E	48,825	51,855	49,630	49.656	51,979	60,868
Grand total	60,002	61,597	59,711	58,762	60,741	70,645
Black, non-Hispanic:						
Total science and engineering	6,446	5,422	5,227	4,646	4,572	5,068
Engineering[2]	2,903	3,543	3,349	2,949	2.736	3,156
Science	3,543	1,879	1,878	1,697	1,836	1,912
Natural sciences	NA	1,098	1,159	953	1,029	1.070
Physical science	NA	48	71	45	57	78
Mathematical science	NA	24	38	25	20	27
Computer science	NA	914	923	803	856	894
Biological science	NA	93	100	63	71	57
Agricultural science	NA	19	27	17	25	14
Social sciences[3]	3,543	781	719	744	807	842
Social science	3,543	716	646	661	697	739
Psychology	NA	65	73	83	110	103
Non-S&E	28,884	30,439	28,631	27.539	28.310	32.786
Grand total	35 330	35,861	33,858	32,185	32,882	37,854
Hispanic:						
Total science and engineering	4.228	3,860	4,390	3,976	3.771	4.151
Engineering[2]	2,219	2,210	2.728	2,408	2,396	2,564
Science	2,009	1,650	1,662	1,568	1,375	1.587
Natural sciences	NA	924	901	845	806	909
Physical science	NA	60	37	34	41	45
Mathematical science	NA	38	39	47	65	55
Computer science	NA	638	581	562	526	622
Biological science	NA	135	153	88	104	130
Agricultural science	NA	53	91	114	70	57
Social sciences[3]	2,009	726	761	723	569	678
Social science	2,009	683	697	600	456	590
Psychology	NA	43	64	123	113	88
Non-S&E	17.860	18.923	18.414	19,499	20.798	24.868
Grand total	22.088	22.783	22.804	23.475	24,569	29.019

See explanatory information and SOURCES at end of table.

Appendix table 4-4. Associate's degrees, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
American Indian/Alaskan Native:						
Total science and engineering	503	460	464	484	419	558
Engineering[2]	285	278	246	269	180	253
Science	218	182	218	215	239	305
Natural sciences	NA	101	98	111	122	157
Physical science	NA	8	4	2	4	7
Mathematical science	NA	4	4	9	14	13
Computer science	NA	52	45	58	70	78
Biological science	NA	8	17	19	13	22
Agricultural science	NA	29	28	23	21	37
Social sciences[3]	218	81	120	104	117	148
Social science	218	70	104	91	108	132
Psychology	NA	11	16	13	9	16
Non-S&E	2.081	2,493	2.585	2.618	2.871	3,214
Grand total	2,584	2,953	3,049	3,102	3,290	3.772
U.S. citizens and permanent residents, total:						
Total science and engineering	74,420	72,726	68.213	60.769	58,290	61.672
Engineering[2]	47,852	50.979	49,299	43.053	40.431	43,274
Science	26.568	21,747	18,914	17.716	17,859	18,398
Natural sciences	NA	16,523	13,172	11.705	11,709	12,372
Physical science	NA	901	1,072	981	1,167	1,184
Mathematical science	NA	654	631	607	712	637
Computer science	NA	11,782	8,823	7.342	6,954	7,494
Biological science	NA	943	919	907	977	1,094
Agricultural science	NA	2,243	1,727	1,865	1,899	1,963
Social sciences[3]	26.568	5.224	5.742	6,011	6,150	6,026
Social science	26.568	4.417	4,789	4.933	5,060	5,057
Psychology	NA	807	953	1.078	1,090	969
Non-S&E	333,522	354.458	348.373	340.311	358,767	400,911
Grand total	407.942	427,184	416.586	401,080	417.057	462,583
Nonresident aliens[4]:						
Total science and engineering	1.203	1,313	990	1.005	836	910
Engineering[2]	1,055	836	695	616	537	594
Science	148	477	295	389	299	316
Natural sciences	NA	387	258	302	244	244
Physical science	NA	20	34	39	33	30
Mathematical science	NA	39	12	18	18	16
Computer science	NA	274	165	187	151	155
Biological science	NA	20	35	35	24	22
Agricultural science	NA	34	12	23	18	21
Social sciences[3]	148	90	37	87	55	72
Social science	148	76	29	60	48	64
Psychology	NA	14	8	27	7	8
Non-S&E	5.442	5,113	3,495	4,964	5,101	6,067
Grand total	6.645	6,426	4,485	5,969	5.937	6,977

See explanatory information and SOURCES at end of table.

Appendix table 4-4. Associate's degrees, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Unknown race/ethnicity						
Total science and engineering	3,221	5,886	2,974	6,480	7,726	2,095
Engineering[2]	2,754	3,687	2,028	5,243	6,173	1,237
Science	467	2,199	946	1,237	1,553	858
Natural sciences	NA	1,460	473	791	933	454
Physical science	NA	144	25	37	48	35
Mathematical science	NA	96	24	29	30	17
Computer science	NA	834	298	663	735	321
Biological science	NA	270	41	57	54	26
Agricultural science	NA	116	85	5	66	55
Social sciences[3]	467	739	473	446	620	404
Social science	467	577	418	438	601	384
Psychology	NA	162	55	8	19	20
Non-S&E	3,102	19,591	16,771	26,846	28,328	14,642
Grand total	6,323	25,477	19,745	33,326	36,054	16,737

[1] Because major changes were made within science fields between 1981 and 1985, distribution of degrees across fields for 1981 is not possible.
[2] Data include degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.
[3] For 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."
[4] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

KEY: NA = not available

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completions Surveys, 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 4-5. Associate's degrees awarded to men, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	60,093	61,500	55,797	52,148	50,758	48,[illegible]
Engineering[2]	47,280	49,667	46,215	43,309	41,704	39,[illegible]86
Science	12,813	11,833	9,582	8,839	9,054	8,841
Natural sciences	NA	9,868	7,638	6,742	6,892	6,997
Physical science	NA	705	690	580	721	704
Mathematical science	NA	489	419	415	489	406
Computer science	NA	6,639	4,878	4,148	3,942	4,032
Biological science	NA	554	422	423	444	457
Agricultural science	NA	1,481	1,229	1,176	1,296	1,398
Social sciences[3]	12,813	1,965	1,944	2,097	2,162	1,844
Social science	12,813	1,653	1,650	1,814	1,876	1,587
Psychology	NA	312	294	283	286	257
Non-S&E	130,059	142,825	136,430	134,977	141,675	151,316
Grand total	190,152	204,325	192,227	187,125	192,433	200,043
White, non-Hispanic:						
Total science and engineering	47,096	47,380	43,581	38,101	36,035	38,276
Engineering[2]	37,248	38,797	36,367	31,741	29,739	31,707
Science	9,848	8,583	7,214	6,360	6,296	6,569
Natural sciences	NA	7,483	5,929	5,040	4,942	5,413
Physical science	NA	483	562	440	554	557
Mathematical science	NA	321	299	286	335	278
Computer science	NA	5,067	3,732	2,941	2,578	2,980
Biological science	NA	306	275	293	301	315
Agricultural science	NA	1,306	1,061	1,080	1,174	1,283
Social sciences[3]	9,848	1,100	1,285	1,320	1,354	1,156
Social science	9,848	896	1,068	1,113	1,140	968
Psychology	NA	204	217	207	214	188
Non-S&E	104,148	109,928	107,761	100,730	104,644	116,994
Grand total	151,244	157,308	151,342	138,831	140,679	155,270
Asian:						
Total science and engineering	1,731	1,875	2,369	2,000	1,832	1,842
Engineering[2]	1,498	1,552	2,026	1,657	1,436	1,468
Science	233	323	343	343	396	374
Natural sciences	NA	291	296	282	317	311
Physical science	NA	29	25	44	54	49
Mathematical science	NA	34	44	43	53	43
Computer science	NA	212	194	162	169	168
Biological science	NA	13	24	29	38	48
Agricultural science	NA	3	9	4	3	3
Social sciences[3]	233	32	47	61	79	63
Social science	233	31	41	56	77	52
Psychology	NA	1	6	5	2	11
Non-S&E	2,871	3,742	3,571	3,918	4,173	5,228
Grand total	4,602	5,617	5,940	5,918	6,005	7,070

See explanatory information and SOURCES at end of table

Appendix table 4-5. Associate's degrees awarded to men, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	7.087	6,788	6.908	6,163	5.950	6,442
Engineering[2]	4,873	5,220	5,455	4,781	4,559	5,093
Science	2,214	1,568	1,453	1,382	1,391	1,349
Natural sciences	NA	1,074	967	840	868	904
Physical science	NA	70	61	43	55	60
Mathematical science	NA	50	49	53	70	62
Computer science	NA	795	706	611	603	642
Biological science	NA	83	78	61	67	70
Agricultural science	NA	76	73	72	73	70
Social sciences[3]	2,214	494	486	542	523	445
Social science	2,214	460	438	480	462	398
Psychology	NA	34	48	62	61	47
Non-S&E	18,051	18,206	17,379	16,874	17,545	20,414
Grand total	25,138	24,994	24,287	23,037	23,495	26,856
Black, non-Hispanic:						
Total science and engineering	3,857	3,797	3,593	3,024	2,959	3,294
Engineering[2]	2,573	3,014	2,841	2,427	2,290	2,643
Science	1,284	783	752	597	669	651
Natural sciences	NA	544	504	355	397	403
Physical science	NA	27	36	23	28	31
Mathematical science	NA	17	26	16	17	16
Computer science	NA	452	402	291	313	326
Biological science	NA	37	20	17	26	21
Agricultural science	NA	11	20	8	13	9
Social sciences[3]	1,284	239	248	242	272	248
Social science	1,284	217	221	212	239	217
Psychology	NA	22	27	30	33	31
Non-S&E	10,433	10,408	9,761	8,849	9,037	10,458
Grand total	14,290	14,205	13,354	11,873	11,996	13,752
Hispanic:						
Total science and engineering	2,877	2,690	3,026	2,818	2,732	2,833
Engineering[2]	2,037	1,969	2,407	2,127	2,110	2,235
Science	840	721	619	691	622	598
Natural sciences	NA	480	417	428	414	432
Physical science	NA	38	24	19	24	25
Mathematical science	NA	29	21	31	45	40
Computer science	NA	327	285	298	268	293
Biological science	NA	42	53	36	35	42
Agricultural science	NA	44	34	44	42	32
Social sciences[3]	840	241	202	263	208	166
Social science	840	231	187	236	183	152
Psychology	NA	10	15	27	25	14
Non-S&E	6,863	6,901	6,698	7,133	7,456	8,869
Grand total	9,740	9,591	9,724	9,951	10,188	11,702

See explanatory information and SOURCES at end of table

Appendix table 4-5. Associate's degrees awarded to men, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
American Indian/Alaskan Native:						
Total science and engineering	353	301	289	321	259	315
Engineering[2]	263	237	207	227	159	215
Science	90	64	82	94	100	100
Natural sciences	NA	50	46	57	57	69
Physical science	NA	5	1	1	3	4
Mathematical science	NA	4	2	6	8	6
Computer science	NA	16	19	22	22	23
Biological science	NA	4	5	8	6	7
Agricultural science	NA	21	19	20	18	29
Social sciences[3]	90	14	36	37	43	31
Social science	90	12	30	32	40	29
Psychology	NA	2	6	5	3	2
Non-S&E	755	897	920	892	1.052	1,087
Grand total	1,108	1,198	1,209	1.213	1,311	1,402
U.S. citizens and permanent residents, total:						
Total science and engineering	55,914	56,043	52,858	46,264	43,817	46,560
Engineering[2]	43,619	45,569	43.848	38,179	35,734	38,268
Science	12.295	10,474	9,010	8,085	8,083	8.292
Natural sciences	NA	8.848	7,192	6,162	6,127	6,628
Physical science	NA	582	648	527	663	666
Mathematical science	NA	405	392	382	458	383
Computer science	NA	6,074	4,632	3,714	3,350	3,790
Biological science	NA	402	377	383	406	433
Agricultural science	NA	1,385	1,143	1.156	1,250	1,356
Social sciences[3]	12,295	1,626	1,818	1,923	1,956	1,664
Social science	12,295	1,387	1,547	1.649	1,679	1,418
Psychology	NA	239	271	274	277	246
Non-S&E	125.070	131.876	128,711	121,522	126,362	142,636
Grand total	180.984	187,919	181.569	167,786	170,179	189,196
Nonresident aliens[4]:						
Total science and engineering	1,065	1.034	795	763	631	708
Engineering[2]	997	768	615	545	470	537
Science	68	266	180	218	161	171
Natural sciences	NA	228	164	183	146	141
Physical science	NA	15	26	27	22	17
Mathematical science	NA	24	8	12	11	11
Computer science	NA	148	92	109	80	87
Biological science	NA	12	27	18	17	11
Agricultural science	NA	29	11	17	16	15
Social sciences[3]	68	38	16	35	15	30
Social science	68	33	14	29	14	28
Psychology	NA	5	2	6	1	2
Non-S&E	3,230	2,670	1.654	2,215	2,195	2,592
Grand total	4,295	3,704	2.449	2,978	2.826	3,300

See explanatory information and SOURCES at end of table.

Appendix table 4-5. Associate's degrees awarded to men, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Unknown race/ethnicity:						
Total science and engineering	3,114	4,423	2,144	5,121	6,310	1,459
Engineering[2]	2,664	3,330	1,752	4,585	5,500	1,081
Science	450	1,093	392	536	810	378
Natural sciences	NA	792	282	397	619	228
Physical science	NA	108	16	26	36	21
Mathematical science	NA	60	19	21	20	12
Computer science	NA	417	154	325	512	155
Biological science	NA	140	18	22	21	13
Agricultural science	NA	67	75	3	30	27
Social sciences[3]	450	301	110	139	191	150
Social science	450	233	89	136	183	141
Psychology	NA	68	21	3	8	9
Non-S&E	1,759	8,279	6,065	11,240	13,118	6,088
Grand total	4,873	12,702	8,209	16,361	19,428	7,547

[1] Because major changes were made within science fields between 1981 and 1985, distribution of degrees across fields for 1981 is not possible.
[2] Data include degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.
[3] For 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."
[4] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

KEY: NA = not available

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981–85, and IPEDS Completions Surveys, 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 4-6. Associate's degrees awarded to women, by race/ethnicity and field: 1981-1991, selected years

Page 1 of 4

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	18,751	18,425	16,380	16,106	16.094	15.950
Engineering[2]	4,381	5,835	5,807	5,603	5,437	5.219
Science	14.370	12,590	10,573	10.503	10.657	10.731
Natural sciences	NA	8,502	6.265	6.056	5.994	6,073
Physical science	NA	360	441	480	527	545
Mathematical science	NA	300	248	239	271	264
Computer science	NA	6.251	4.408	4.044	3,898	3.938
Biological science	NA	679	573	576	611	685
Agricultural science	NA	912	595	717	687	641
Social sciences[3]	14,370	4,088	4,308	4.447	4,663	4.658
Social science	14,370	3,417	3,586	3,617	3.833	3,918
Psychology	NA	671	722	830	830	740
Non-S&E	212.007	236,337	232.209	237,144	250.521	270.304
Grand total	230,758	254,762	248.589	253.250	266.615	286.254
White, non-Hispanic:						
Total science and engineering	14,061	13,170	11,468	11,008	11.085	11,211
Engineering[2]	3,556	4.397	4.251	3,829	3.730	3,952
Science	10.505	8,773	7,217	7,179	7,355	7.259
Natural sciences	NA	6,320	4.509	4,235	4.220	4.215
Physical science	NA	251	355	401	420	411
Mathematical science	NA	204	182	175	203	199
Computer science	NA	4,663	3,147	2,642	2,588	2,597
Biological science	NA	370	315	392	408	444
Agricultural science	NA	832	510	625	601	564
Social sciences[3]	10.505	2,453	2,708	2,944	3.135	3,044
Social science	10,505	1.977	2,144	2.306	2,509	2.494
Psychology	NA	476	564	638	626	550
Non-S&E	173,878	184.944	182.736	180.718	191.865	210.388
Grand total	187.939	198,114	194.204	191.726	202.950	221.599
Asian:						
Total science and engineering	355	559	714	554	576	566
Engineering[2]	143	202	332	200	214	174
Science	212	357	382	354	362	392
Natural sciences	NA	306	280	239	273	297
Physical science	NA	22	18	18	37	37
Mathematical science	NA	29	25	22	22	22
Computer science	NA	236	201	174	167	155
Biological science	NA	18	35	23	42	78
Agricultural science	NA	1	1	2	5	5
Social sciences[3]	212	51	102	115	89	95
Social science	212	44	89	106	73	82
Psychology	NA	7	13	9	16	13
Non-S&E	3,800	3.989	4,675	5,289	6.106	7.433
Grand total	4.155	4.548	5.389	5.843	6.682	7.999

See explanatory information and SOURCES at end of table.

Appendix table 4-6. Associate's degrees awarded to women, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	4,090	2,954	3,173	2,943	2,812	3,335
Engineering[2]	534	811	868	845	753	880
Science	3,556	2,143	2,305	2,098	2,059	2,455
Natural sciences	NA	1,049	1,191	1,069	1,089	1,232
Physical science	NA	46	51	38	47	70
Mathematical science	NA	16	32	28	29	33
Computer science	NA	809	843	812	849	952
Biological science	NA	153	192	109	121	139
Agricultural science	NA	25	73	82	43	38
Social sciences[3]	3,556	1,094	1,114	1,029	970	1,223
Social science	3 556	1,009	1,009	872	799	1,063
Psychology	NA	85	105	157	171	160
Non-S&E	30,774	33,649	32,251	32,782	34,434	40,454
Grand total	34,864	36,603	35,424	35,725	37,246	43,789
Black, non-Hispanic:						
Total science and engineering	2,589	1,625	1,634	1,622	1,613	1,774
Engineering[2]	330	529	508	522	446	513
Science	2,259	1,096	1,126	1,100	1,167	1,261
Natural sciences	NA	554	655	598	632	667
Physical science	NA	21	35	22	29	47
Mathematical science	NA	7	12	9	3	11
Computer science	NA	462	521	512	543	568
Biological science	NA	56	80	46	45	36
Agricultural science	NA	8	7	9	12	5
Social sciences[3]	2,259	542	471	502	535	594
Social science	2,259	499	425	449	458	522
Psychology	NA	43	46	53	77	72
Non-S&E	18,451	20,031	18,870	18,690	19,273	22,328
Grand total	21,040	21,656	20,504	20,312	20,886	24,102
Hispanic:						
Total science and engineering	1,351	1,170	1,364	1,158	1,039	1,318
Engineering[2]	182	241	321	281	286	329
Science	1,169	929	1,043	877	753	989
Natural sciences	NA	444	484	417	392	477
Physical science	NA	22	13	15	17	20
Mathematical science	NA	9	18	16	20	15
Computer science	NA	311	296	264	258	329
Biological science	NA	93	100	52	69	88
Agricultural science	NA	9	57	70	28	25
Social sciences[3]	1,169	485	559	460	361	512
Social science	1,169	452	510	364	273	438
Psychology	NA	33	49	96	88	74
Non-S&E	10,997	12,022	11,716	12,366	13,342	15,999
Grand total	12,348	13,192	13,080	13,524	14,381	17,317

See explanatory information and SOURCES at end of table

Appendix table 4-6. Associate's degrees awarded to women, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
American Indian/Alaskan Native:						
Total science and engineering	150	159	175	163	160	243
Engineering[2]	22	41	39	42	21	38
Science	128	118	136	121	139	205
Natural sciences	NA	51	52	54	65	88
Physical science	NA	3	3	1	1	3
Mathematical science	NA	0	2	3	6	7
Computer science	NA	36	26	36	48	55
Biological science	NA	4	12	11	7	15
Agricultural science	NA	8	9	3	3	8
Social sciences[3]	128	67	84	67	74	117
Social science	128	58	74	59	68	103
Psychology	NA	9	10	8	6	14
Non-S&E	1,326	1.596	1,665	1.726	1,819	2,127
Grand total	1,476	1.755	1,840	1.889	1,979	2.370
U.S. citizens and permanent residents, total:						
Total science and engineering	18,506	16,683	15.355	14,505	14,473	15,112
Engineering[2]	4.233	5,410	5,451	4,874	4,697	5,006
Science	14,273	11,273	9,904	9,631	9,776	10,106
Natural sciences	NA	7,675	5.980	5,543	5,582	5,744
Physical science	NA	319	424	457	504	518
Mathematical science	NA	249	239	225	254	254
Computer science	NA	5,708	4,191	3,628	3.604	3,704
Biological science	NA	541	542	524	571	661
Agricultural science	NA	858	584	709	649	607
Social sciences[3]	14.273	3.598	3,924	4,088	4,194	4,362
Social science	14.273	3,030	3.242	3.284	3.381	3,639
Psychology	NA	568	682	804	813	723
Non-S&E	208.452	222,582	219.662	218.789	232.405	258,275
Grand total	226.958	239.265	235.017	233,294	246.878	273.387
Nonresident aliens[4]:						
Total science and engineering	138	279	195	242	205	202
Engineering[2]	58	68	80	71	67	57
Science	80	211	115	171	138	145
Natural sciences	NA	159	94	119	98	103
Physical science	NA	5	8	12	11	13
Mathematical science	NA	15	4	6	7	5
Computer science	NA	126	73	78	71	68
Biological science	NA	8	8	17	7	11
Agricultural science	NA	5	1	6	2	6
Social sciences[3]	80	52	21	52	40	42
Social science	80	43	15	31	34	36
Psychology	NA	9	6	21	6	6
Non-S&E	2.212	2.443	1.841	2.749	2.906	3.475
Grand total	2.350	2,722	2.036	2.991	3.111	3,677

See explanatory information and SOURCES at end of table

Appendix table 4-6. Associate's degrees awarded to women, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981[1]	1985	1987	1989	1990	1991
Unknown race/ethnicity:						
Total science and engineering	107	1,463	830	1,359	1,416	636
Engineering[2]	90	357	276	658	673	156
Science	17	1,106	554	701	743	480
Natural sciences	NA	668	191	394	314	226
Physical science	NA	36	9	11	12	14
Mathematical science	NA	36	5	8	10	5
Computer science	NA	417	144	338	223	166
Biological science	NA	130	23	35	33	13
Agricultural science	NA	49	10	2	36	28
Social sciences[3]	17	438	363	307	429	254
Social science	17	344	329	302	418	243
Psychology	NA	94	34	5	11	11
Non-S&E	1,343	11,312	10,706	15,606	15,210	8,554
Grand total	1,450	12,775	11,536	16,965	16,626	9,190

[1] Because major changes were made within science fields between 1981 and 1985, distribution of degrees across fields for 1981 is not possible.
[2] Data include degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.
[3] For 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."
[4] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

KEY: NA = not available

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys. 1981–85, and IPEDS Completions Surveys. 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 4-7. Science and engineering doctorates awarded to U.S. citizens who attended a 2-year college, by field of doctorate: 1988–92

Field of doctorate and race/ethnicity	Total number of recipients	Recipients who attended 2-year college	
		Number	Percentage
Total, science and engineering	66.657	6,438	9.66
Total, sciences	57,192	5.734	10.03
Physical sciences	10,121	783	7.74
Physics/astronomy	3,576	219	6.12
Chemistry	6.545	564	8.62
Earth, atmos, & ocean sciences	2.624	241	9.18
Biological/agricultural sciences	18.356	1,851	10.08
Agricultural sciences	2,767	428	15.47
Biological sciences	15,589	1,423	9.13
Mathematics	1.941	137	7.06
Computer/info sciences	1.706	129	7.56
Social sciences	9,074	857	9.44
Psychology	13,370	1,736	12.98
Total, engineering	9.465	704	7.44
Chemical engineering	1.582	82	5.18
Civil engineering	750	67	8.93
Electrical/electronics engineering	2,131	184	8.63
Materials science engineering	660	36	5.45
Mechanical engineering	1.407	125	8.88
Total, non-science and engineering	51.165	6,461	12.63
American Indian	242	42	17.36
Asian	2,549	156	6.12
Black	1.386	131	9.45
Hispanic	1.752	262	14.95
White	59,671	5,749	9.63

NOTE: This includes only doctorate recipients for whom attendance at a 2-year college or race/ethnicity was known.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Women. Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 4-8. Full-time first-year students reporting disabilities, by type of disability and type of institution: 1991

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Type of disability	Total	Universities and 4-year colleges	2-year colleges	Historically Black Colleges and Universities
Hearing	14,680	8,142	6,093	445
Speech	7,499	3,208	3,971	320
Orthopedic	18,927	9,461	9,021	445
Learning	34,920	13,794	20,664	462
Health-related	20,500	11,259	8,110	1,131
Partially sighted or blind	35,257	23,241	10,366	1,650
Other	25,644	14,227	10,477	940
	Percentage distribution			
Hearing	100.0	55.5	41.5	3.0
Speech	100.0	42.8	53.0	4.3
Orthopedic	100.0	50.0	47.7	2.4
Learning	100.0	39.5	59.2	1.3
Health-related	100.0	54.9	39.6	5.5
Partially sighted or blind	100.0	65.9	29.4	4.7
Other	100.0	55.5	40.9	3.7

NOTE: Because of rounding and multiple disabilities, details may not add to totals and percentages may not add to 100

SOURCE: American Council on Education, HEATH Resource Center. Based on unpublished data from the Cooperative Institutional Research Program. 1992.

Appendix table 5-1. Population, by race/ethnicity: 1980–1991, selected years, and projections, 1995 and 2000

[In thousands]

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Race/ethnicity	1980[1]	1985	1990	1991	1995[2]	2000[2]
White, non-Hispanic	180,906	184,649	188,160	189,116	192,888	196,406
Black, non-Hispanic	26,142	27,607	29,191	29,667	31,484	33,624
Hispanic[3]	14,609	17,997	22,122	22,950	26,122	30,189
Asian	3,729	5,426	7,345	7,789	9,613	12,038
American Indian/Alaskan Native	1,420	1,687	2,044	2,097	2,231	2,392

[1] Represents data for period April 1, 1980, to December 31, 1980
[2] Based on middle series census projections; see SOURCE.
[3] Persons of Hispanic origin may be of any race.

NOTE: Population figures are for the start of each period.

SOURCE: U.S. Department of Commerce, Bureau of the Census. Current Population Reports, P25-1092 and P25-1095.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-2. Total and full-time undergraduate enrollment at all institutions, by sex and race/ethnicity: fall 1980–1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total undergraduate enrollment.						
Total:						
All races and ethnicities	10.603.579	10.978.407	10.952.167	11.453.788	12.011.657	12.595.492
Nonresident aliens	210,749	224.487	203.108	207.285	227,337	235.205
White, non-Hispanic	8.486,707	8,706,954	8,567,985	8,936,190	9,232,090	9,508,661
Asian	251.720	312,873	391,641	440,900	491,134	565,166
Underrepresented minorities	1,654,403	1,734,092	1,789,433	1,869,413	2,061,096	2,286,460
Black, non-Hispanic	1,020,953	1,025,136	1,000,937	1,024,190	1,125,591	1,231,275
American Indian/Alaskan Native	77,967	81,724	83,135	86,230	95,135	105,839
Hispanic	555,484	627,233	705,361	758,993	840,370	949,346
Men.						
All races and ethnicities	5,052,234	5,232,920	5,078,768	5,192,254	5,396,557	5,632,753
Nonresident aliens	140,227	149,982	129,376	124,960	129,275	133,630
White, non-Hispanic	4,057,606	4,158,965	3,983,385	4,064,399	4,165,862	4,273,366
Asian	129,879	165,937	205,686	226,715	250,287	284,673
Underrepresented minorities	724,523	758,036	760,321	776,179	851,133	941,084
Black, non-Hispanic	428,921	427,989	404,368	402,658	440,209	478,655
American Indian/Alaskan Native	34,792	37,078	36,387	36,380	39,692	44,186
Hispanic	260,809	292,970	319,566	337,142	371,232	418,243
Women:						
All races and ethnicities	5,551,345	5,745,487	5,873,399	6,261,534	6,615,100	6,962,739
Nonresident aliens	70,522	74,505	73,732	82,324	98,062	101,575
White, non-Hispanic	4,429,101	4,547,990	4,584,600	4,871,791	5,066,228	5,235,295
Asian	121,841	146,936	185,955	214,185	240,847	280,493
Underrepresented minorities	929,880	976,056	1,029,112	1,093,234	1,209,963	1,345,376
Black, non-Hispanic	592,031	597,148	596,569	621,532	685,382	752,620
American Indian/Alaskan Native	43,175	44,646	46,748	49,850	55,443	61,653
Hispanic	294,674	334,263	385,795	421,851	469,138	531,103
Full-time undergraduate enrollment:						
Total.						
All races and ethnicities	6,464,633	6,611,771	6,455,051	6,749,171	7,058,865	7,346,415
Nonresident aliens	166,112	176,893	157,631	155,736	167,228	176,693
White, non-Hispanic	5,132,984	5,207,917	5,023,162	5,255,792	5,403,802	5,510,145
Asian	144,695	177,012	230,074	261,122	298,070	339,467
Underrepresented minorities	1,020,842	1,049,948	1,044,184	1,076,521	1,189,765	1,320,110
Black, non-Hispanic	650,756	636,133	604,067	612,822	670,892	733,825
American Indian/Alaskan Native	40,476	42,122	42,899	45,511	50,769	57,339
Hispanic	329,610	371,693	397,218	418,188	468,104	528,946
Men.						
All races and ethnicities	3,268,722	3,351,339	3,185,125	3,249,959	3,367,828	3,484,367
Nonresident aliens	116,470	122,428	103,679	97,300	99,043	103,606
White, non-Hispanic	2,622,108	2,666,316	2,502,664	2,555,807	2,609,128	2,648,634
Asian	77,251	96,203	124,424	138,026	155,377	174,480
Underrepresented minorities	452,893	466,393	454,357	458,826	504,280	557,647
Black, non-Hispanic	279,148	273,453	255,102	252,347	275,249	299,938
American Indian/Alaskan Native	19,178	20,256	19,704	20,315	22,494	25,081
Hispanic	154,567	172,683	179,552	186,164	206,537	232,628
Women						
All races and ethnicities	3,195,911	3,260,432	3,269,926	3,499,212	3,691,037	3,862,048
Nonresident aliens	49,642	54,466	53,951	58,436	68,185	73,087
White, non-Hispanic	2,510,876	2,541,602	2,520,498	2,699,986	2,794,674	2,861,511
Asian	67,443	80,809	105,650	123,095	142,693	164,967
Underrepresented minorities	567,950	583,555	589,827	617,695	685,485	762,463
Black, non-Hispanic	371,608	362,680	348,965	360,475	395,643	433,887
American Indian/Alaskan Native	21,298	21,866	23,195	25,196	28,275	32,258
Hispanic	175,043	199,010	217,666	232,024	261,567	296,318

NOTES Other/unknown races and ethnicities have been distributed proportionately across groups
Because of rounding, details may not add to totals

SOURCES U S Department of Education/NCES Opening Fall Enrollment Survey, tabulations by National Science Foundation/SRS

Appendix table 5-3. Total and full-time undergraduate enrollment at 4-year institutions, by sex and race/ethnicity: fall 1980–1991, selected years

Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total undergraduate enrollment:						
Total:						
All races and ethnicities	6,197,121	6,310,176	6,385,741	6,614,796	6,870,15	7,007,714
Nonresident aliens	148,027	164,154	152,425	146,350	152,277	161,363
White, non-Hispanic	5,035,709	5,093,550	5,085,165	5,260,864	5,356,804	5,370,193
Asian	127,694	153,756	207,752	236,740	275,366	306,668
Underrepresented minorities	885,690	898,716	940,399	970,842	1,085,705	1,169,490
Black, non-Hispanic	567,525	547,323	543,461	566,619	622,725	664,002
American Indian/Alaskan Native	33,160	34,910	35,856	37,626	43,341	46,513
Hispanic	285,006	316,483	361,082	366,597	419,639	458,975
Men:						
All races and ethnicities	3,057,628	3,110,340	3,069,293	3,112,576	3,202,246	3,254,372
Nonresident aliens	101,485	112,369	99,798	91,894	92,157	95,459
White, non-Hispanic	2,503,966	2,525,535	2,458,129	2,491,332	2,517,270	2,516,791
Asian	66,892	81,374	109,667	122,857	141,887	155,745
Underrepresented minorities	385,285	391,063	401,700	406,493	450,932	486,377
Black, non-Hispanic	238,336	229,732	224,093	228,313	248,483	264,864
American Indian/Alaskan Native	15,128	15,978	16,117	16,177	18,427	19,753
Hispanic	131,821	145,353	161,490	162,003	184,022	201,760
Women:						
All races and ethnicities	3,139,493	3,199,836	3,316,448	3,502,220	3,667,906	3,753,342
Nonresident aliens	46,542	51,785	52,627	54,457	60,120	65,904
White, non-Hispanic	2,531,743	2,568,016	2,627,036	2,769,531	2,839,534	2,853,402
Asian	60,802	72,382	98,085	113,884	133,479	150,923
Underrepresented minorities	500,405	507,653	538,699	564,349	634,773	683,113
Black, non-Hispanic	329,189	317,591	319,368	338,306	374,242	399,138
American Indian/Alaskan Native	18,031	18,932	19,739	21,449	24,914	26,760
Hispanic	153,185	171,131	199,592	204,593	235,617	257,215
Full-time undergraduate enrollment:						
Total:						
All races and ethnicities	4,770,889	4,819,455	4,822,363	5,013,312	5,191,996	5,282,710
Nonresident aliens	127,638	141,088	128,616	123,227	127,843	136,896
White, non-Hispanic	3,868,068	3,873,303	3,831,361	3,970,655	4,028,375	4,020,759
Asian	98,922	119,323	163,926	190,266	222,046	247,110
Underrepresented minorities	676,261	685,741	698,460	729,164	813,732	877,945
Black, non-Hispanic	436,745	416,851	406,913	426,273	468,501	499,361
American Indian/Alaskan Native	23,407	24,401	25,245	26,812	30,710	33,125
Hispanic	216,109	244,490	266,301	276,079	314,521	345,459
Men:						
All races and ethnicities	2,417,981	2,445,754	2,392,936	2,430,582	2,492,601	2,525,581
Nonresident aliens	89,903	98,523	85,782	78,685	78,511	82,199
White, non-Hispanic	1,978,232	1,981,570	1,915,857	1,941,018	1,953,900	1,944,703
Asian	52,119	63,320	87,068	99,088	114,630	125,924
Underrepresented minorities	297,727	302,341	304,229	311,791	345,560	372,755
Black, non-Hispanic	186,065	178,374	173,005	176,738	192,925	205,748
American Indian/Alaskan Native	11,178	11,676	11,652	11,933	13,673	14,591
Hispanic	100,483	112,290	119,573	123,120	138,962	152,416
Women:						
All races and ethnicities	2,352,908	2,373,701	2,429,427	2,582,730	2,699,395	2,757,129
Nonresident aliens	37,735	42,564	42,834	44,542	49,332	54,697
White, non-Hispanic	1,889,835	1,891,733	1,915,504	2,029,638	2,074,475	2,076,056
Asian	46,803	56,002	76,859	91,178	107,416	121,186
Underrepresented minorities	378,535	383,401	394,230	417,373	468,172	505,190
Black, non-Hispanic	250,680	238,477	233,908	249,535	275,576	293,613
American Indian/Alaskan Native	12,228	12,724	13,593	14,879	17,037	18,534
Hispanic	115,626	132,200	146,729	152,959	175,559	193,043

NOTES Other/unknown races and ethnicities have been distributed proportionately across groups
Because of rounding, details may not add to totals

SOURCES U S Department of Education/NCES Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-4. Total and full-time first-year enrollment at all institutions, by sex and race/ethnicity: fall 1980–1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total first-year enrollment						
Total:						
All races and ethnicities	2,625,138	2,550,460	2,235,370	2,402,803	2,295,150	2,313,393
Nonresident aliens	41,799	40,084	30,960	36,023	39,395	41,749
White, non-Hispanic	2,070,724	1,999,120	1,742,722	1,848,231	1,715,881	1,691,597
Asian	56,474	68,154	75,144	87,923	97,098	104,021
Underrepresented minorities	456,141	443,102	386,544	430,625	442,776	476,026
Black, non-Hispanic	280,157	257,891	217,596	238,991	244,394	261,408
American Indian/Alaskan Native	21,794	19,686	18,247	19,544	20,956	22,874
Hispanic	154,190	165,525	150,702	172,090	177,426	191,744
Men:						
All races and ethnicities	1,233,446	1,216,647	1,051,677	1,111,176	1,061,145	1,082,974
Nonresident aliens	25,906	25,661	18,574	20,389	22,047	23,298
White, non-Hispanic	979,815	958,686	825,111	861,478	797,656	798,557
Asian	29,209	35,993	39,363	44,833	49,108	51,752
Underrepresented minorities	198,515	196,307	168,629	184,476	192,334	209,367
Black, non-Hispanic	118,446	111,006	91,662	98,675	102,654	112,461
American Indian/Alaskan Native	9,731	9,348	8,387	8,728	9,449	10,211
Hispanic	70,338	75,953	68,580	77,072	80,231	86,695
Women:						
All races and ethnicities	1,391,692	1,333,813	1,183,693	1,291,627	1,234,005	1,230,419
Nonresident aliens	15,892	14,423	12,386	15,635	17,348	18,451
White, non-Hispanic	1,090,908	1,040,434	917,610	986,753	918,225	893,040
Asian	27,265	32,160	35,781	43,090	47,990	52,269
Underrepresented minorities	257,626	246,795	217,915	246,149	250,442	266,659
Black, non-Hispanic	161,711	146,885	125,934	140,316	141,740	148,947
American Indian/Alaskan Native	12,063	10,338	9,860	10,816	11,507	12,663
Hispanic	83,852	89,572	82,121	95,018	97,195	105,049
Full-time first-year enrollment:						
Total:						
All races and ethnicities	1,782,560	1,729,249	1,601,916	1,718,175	1,651,680	1,684,199
Nonresident aliens	31,812	32,832	24,881	27,210	30,470	32,273
White, non-Hispanic	1,408,732	1,355,462	1,252,692	1,331,444	1,238,988	1,236,468
Asian	35,448	42,642	52,368	61,190	70,653	75,677
Underrepresented minorities	306,568	298,313	271,975	298,331	311,569	339,781
Black, non-Hispanic	194,588	178,572	159,474	174,699	180,198	195,434
American Indian/Alaskan Native	12,068	11,278	11,232	12,294	13,483	14,736
Hispanic	99,912	108,463	101,268	111,338	117,888	129,611
Men:						
All races and ethnicities	875,087	852,745	772,361	816,232	786,034	810,772
Nonresident aliens	20,801	21,602	15,322	15,962	17,507	18,475
White, non-Hispanic	701,901	677,426	611,005	640,518	597,180	604,428
Asian	18,575	22,588	27,590	31,589	36,033	37,666
Underrepresented minorities	133,810	131,129	118,444	128,163	135,314	150,203
Black, non-Hispanic	82,774	77,023	67,427	72,942	76,372	85,551
American Indian/Alaskan Native	5,774	5,471	5,304	5,689	6,262	6,766
Hispanic	45,263	48,636	45,713	49,532	52,680	57,886
Women:						
All races and ethnicities	907,473	876,504	829,555	901,943	865,646	873,427
Nonresident aliens	11,011	11,231	9,559	11,248	12,963	13,798
White, non-Hispanic	706,831	678,036	641,687	690,926	641,808	632,040
Asian	16,873	20,054	24,778	29,601	34,620	38,011
Underrepresented minorities	172,757	167,184	153,531	170,168	176,255	189,578
Black, non-Hispanic	111,815	101,550	92,047	101,757	103,826	109,883
American Indian/Alaskan Native	6,294	5,808	5,929	6,605	7,221	7,970
Hispanic	54,649	59,826	55,555	61,806	65,208	71,725

NOTES: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not add to totals.

SOURCES: U.S. Department of Education/NCES, Opening Fall Enrollment Survey, tabulations by National Science Foundation/SRS

Appendix table 5-5. Total and full-time first-time first-year enrollment at 4-year institutions, by sex and race/ethnicity: fall 1980–1991, selected years

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Enrollment status, sex, and race/ethnicity	1980	1982	1986	1988	1990	1991
Total first-time first-year enrollment:						
Total:						
All races and ethnicities	1,262,230	1,206,476	1,169,326	1,240,912	1,172,983	1,167,693
Nonresident aliens	23,707	24,564	18,752	19,996	22,938	23,693
White, non-Hispanic	1,012,368	959,354	924,657	968,306	880,175	858,419
Asian	23,875	29,051	38,448	46,345	53,580	57,302
Underrepresented minorities	202,281	193,507	187,469	206,265	216,290	228,279
Black, non-Hispanic	131,521	117,416	112,918	126,275	128,727	132,771
American Indian/Alaskan Native	6,879	5,957	6,134	6,883	7,675	8,094
Hispanic	63,880	70,134	68,417	73,108	79,888	87,414
Men:						
All races and ethnicities	610,209	588,003	558,677	583,346	551,473	546,077
Nonresident aliens	15,353	15,981	11,676	11,940	13,489	13,904
White, non-Hispanic	496,032	472,774	446,048	460,718	418,400	405,987
Asian	12,221	14,886	19,648	23,500	26,786	27,938
Underrepresented minorities	86,603	84,362	81,305	87,188	92,798	98,248
Black, non-Hispanic	55,480	50,913	47,674	51,712	53,629	55,752
American Indian/Alaskan Native	3,120	2,750	2,823	3,073	3,498	3,574
Hispanic	28,003	30,699	30,808	32,404	35,671	38,922
Women:						
All races and ethnicities	652,021	618,473	610,649	657,566	621,510	621,616
Nonresident aliens	8,354	8,584	7,076	8,057	9,449	9,789
White, non-Hispanic	516,336	486,580	478,609	507,587	461,775	452,432
Asian	11,654	14,165	18,801	22,845	26,794	29,364
Underrepresented minorities	115,677	109,144	106,164	119,077	123,492	130,031
Black, non-Hispanic	76,041	66,503	65,244	74,563	75,098	77,019
American Indian/Alaskan Native	3,759	3,207	3,311	3,810	4,177	4,520
Hispanic	35,878	39,435	37,610	40,704	44,217	48,492
Full-time first-time first-year enrollment:						
Total:						
All races and ethnicities	1,123,762	1,079,482	1,061,462	1,132,291	1,063,944	1,051,501
Nonresident aliens	21,165	22,343	17,252	18,242	20,879	21,690
White, non-Hispanic	907,821	862,168	844,831	887,696	800,665	774,438
Asian	21,141	25,999	35,014	42,457	49,687	53,035
Underrepresented minorities	173,635	168,972	164,364	183,896	192,713	202,338
Black, non-Hispanic	112,930	102,142	99,384	113,067	115,606	118,620
American Indian/Alaskan Native	5,467	4,956	5,221	5,831	6,495	6,737
Hispanic	55,238	61,874	59,759	64,999	70,612	76,981
Men:						
All races and ethnicities	550,820	532,543	511,805	536,602	504,212	495,785
Nonresident aliens	13,935	14,705	10,829	10,971	12,322	12,749
White, non-Hispanic	451,017	430,580	411,420	426,091	384,236	369,813
Asian	10,835	13,358	17,865	21,520	24,868	25,850
Underrepresented minorities	75,033	73,900	71,690	78,020	82,786	87,373
Black, non-Hispanic	47,967	44,497	42,333	46,584	48,240	50,081
American Indian/Alaskan Native	2,596	2,337	2,428	2,666	3,013	3,020
Hispanic	24,470	27,066	26,929	28,770	31,533	34,272
Women:						
All races and ethnicities	572,942	546,939	549,657	595,680	559,732	555,716
Nonresident aliens	7,230	7,638	6,423	7,272	8,557	8,941
White, non-Hispanic	456,804	431,588	433,411	461,604	416,429	404,625
Asian	10,306	12,641	17,149	20,937	24,819	27,185
Underrepresented minorities	98,602	95,072	92,675	105,876	109,927	114,965
Black, non-Hispanic	64,963	57,645	57,051	66,482	67,366	68,539
American Indian/Alaskan Native	2,871	2,619	2,794	3,165	3,482	3,717
Hispanic	30,768	34,808	32,830	36,229	39,079	42,709

NOTES: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not add to totals.

SOURCES: U.S. Department of Education/NCES, Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS.

Appendix table 5-6. Total and full-time lower-division undergraduate enrollment at 4-year institutions, by sex and race/ethnicity: fall 1986–1991, selected years

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Enrollment status, sex, and race/ethnicity	1986	1988	1990	1991
Total lower-division undergraduate enrollment.				
Total.				
All races and ethnicities	3.442.087	3,571.787	3.627.272	3.607.927
Nonresident aliens	71.213	69.033	75.990	81,135
White, non-Hispanic	2.700.319	2.790.080	2.752.596	2.674.392
Asian	106.366	122.157	142.461	155.719
Underrepresented minorities	564.188	590.516	656.224	696.681
Black, non-Hispanic	337,775	354.906	389.434	408.369
American Indian/Alaskan Native	21.208	22.361	25,331	27.196
Hispanic	205.206	213.249	241.459	261.116
Men:				
All races and ethnicities	1.633.008	1.662.344	1.685.401	1.668.418
Nonresident aliens	45.628	41.882	44.702	47,562
White, non-Hispanic	1,291,755	1.311.717	1.294.307	1.251.604
Asian	54.985	62.396	72.119	77,505
Underrepresented minorities	240,641	246.348	274.273	291.746
Black, non-Hispanic	139.986	143.435	157.456	165.534
American Indian/Alaskan Native	9,438	9.464	10.762	11.537
Hispanic	91,217	93.450	106.056	114.675
Women:				
All races and ethnicities	1.809.078	1.909.443	1.941.871	1.939.510
Nonresident aliens	25.586	27.151	31.288	33.573
White, non-Hispanic	1,408,564	1.478.363	1,458.289	1,422.787
Asian	51,381	59.761	70.342	78.214
Underrepresented minorities	323,548	344.168	381,951	404.935
Black, non-Hispanic	197.788	211.471	231.978	242,835
American Indian/Alaskan Native	11.770	12.898	14.569	15,659
Hispanic	113,990	119.799	135.404	146.442
Full-time lower-division undergraduate enrollment.				
Total:				
All races and ethnicities	2.704.622	2.830.066	2.854.908	2,824.868
Nonresident aliens	62.015	59.783	65.556	70.637
White, non-Hispanic	2,116.434	2.203.792	2,154.216	2.076.968
Asian	88.323	103.626	121.275	132.265
Underrepresented minorities	437.851	462.865	513.862	544.997
Black, non-Hispanic	262.025	277.426	305.258	319.538
American Indian/Alaskan Native	15,212	16.231	18.359	19.324
Hispanic	160.614	169.207	190.245	206.135
Men				
All races and ethnicities	1 329.259	1.361.378	1.373.010	1.352.192
Nonresident aliens	40.636	37 069	39.292	42.197
White, non Hispanic	1.052.048	1.073.853	1.052.241	1.010.469
Asian	45.932	53.253	61.804	66.176
Underrepresented minorities	190.643	197.203	219.673	233.350
Black, non-Hispanic	111.877	115.401	127.198	133.744
American Indian/Alaskan Native	6.969	7.224	8.323	8.623
Hispanic	71.796	74.578	84.151	90,983
Women				
All races and ethnicities	1.375.363	1.468.688	1.481.898	1.472.676
Nonresident aliens	21.379	22.714	26.264	28.440
White, non-Hispanic	1.064 386	1.129.939	1 101.974	1.066.499
Asian	42 391	50.374	59 471	66.089
Underrepresented minorities	247.208	265 662	294.189	311.647
Black, non-Hispanic	150.148	162 025	178.060	185.794
American Indian/Alaskan Native	8.243	9.008	10.036	10.701
Hispanic	88.817	94.629	106.094	115.152

NOTES Other/unknown races and ethnicities have been distributed proportionately across groups
Because of rounding, details may not add to totals

SOURCES U S Department of Education/NCES Opening Fall Enrollment Survey. tabulations by National Science Foundation/SRS

Appendix table 5-7. Total and full-time upper-division undergraduate enrollment at 4-year institutions, by sex and race/ethnicity: fall 1986–1991, selected years

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Enrollment status, sex, and race/ethnicity	1986	1988	1990	1991
Total upper-division undergraduate enrollment				
Total:				
All races and ethnicities	2,943,654	3,043,009	3,242,880	3,399,787
Nonresident aliens	81,212	77,317	76,287	80,228
White, non-Hispanic	2,384,846	2,470,783	2,604,208	2,695,801
Asian	101,387	114,583	132,905	150,949
Underrepresented minorities	376,211	380,326	429,481	472,809
Black, non-Hispanic	205,686	211,713	233,291	255,633
American Indian/Alaskan Native	14,648	15,265	18,010	19,317
Hispanic	155,876	153,348	178,180	197,859
Men:				
All races and ethnicities	1,436,285	1,450,232	1,516,845	1,585,954
Nonresident aliens	54,170	50,011	47,455	47,897
White, non-Hispanic	1,166,374	1,179,615	1,222,963	1,265,187
Asian	54,682	60,460	69,768	78,240
Underrepresented minorities	161,059	160,145	176,659	194,631
Black, non-Hispanic	84,106	84,878	91,027	99,330
American Indian/Alaskan Native	6,679	6,713	7,665	8,216
Hispanic	70,273	68,554	77,966	87,085
Women				
All races and ethnicities	1,507,370	1,592,777	1,726,035	1,813,832
Nonresident aliens	27,041	27,306	28,832	32,331
White, non-Hispanic	1,218,472	1,291,168	1,381,244	1,430,615
Asian	46,705	54,122	63,137	72,709
Underrepresented minorities	215,152	220,181	252,822	278,178
Black, non-Hispanic	121,580	126,835	142,264	156,303
American Indian/Alaskan Native	7,969	8,551	10,345	11,101
Hispanic	85,603	84,794	100,213	110,773
Full-time upper-division undergraduate enrollment				
Total:				
All races and ethnicities	2,117,741	2,183,246	2,337,088	2,457,842
Nonresident aliens	66,601	63,443	62,287	66,259
White, non-Hispanic	1,714,927	1,766,863	1,874,159	1,943,791
Asian	75,604	86,640	100,771	114,845
Underrepresented minorities	260,609	266,300	299,870	332,948
Black, non-Hispanic	144,888	148,847	163,243	179,823
American Indian/Alaskan Native	10,033	10,581	12,351	13,801
Hispanic	105,688	106,872	124,276	139,324
Men:				
All races and ethnicities	1,063,677	1,069,204	1,119,591	1,173,389
Nonresident aliens	45,146	41,615	39,219	40,002
White, non-Hispanic	863,809	867,164	901,659	934,234
Asian	41,136	45,835	52,826	59,748
Underrepresented minorities	113,586	114,589	125,887	139,405
Black, non-Hispanic	61,127	61,337	65,727	72,004
American Indian/Alaskan Native	4,683	4,710	5,350	5,968
Hispanic	47,776	48,542	54,811	61,433
Women				
All races and ethnicities	1,054,064	1,114,042	1,217,497	1,284,453
Nonresident aliens	21,455	21,828	23,068	26,257
White, non-Hispanic	851,118	899,699	972,501	1,009,557
Asian	34,468	40,804	47,945	55,097
Underrepresented minorities	147,023	151,711	173,983	193,543
Black, non-Hispanic	83,761	87,510	97,516	107,819
American Indian/Alaskan Native	5,351	5,871	7,001	7,833
Hispanic	57,911	58,330	69,465	77,891

NOTES Other unknown races and ethnicities have been distributed proportionately across groups
Because of rounding details may not add to totals

SOURCES U S Department of Education/NCES Opening Fall Enrollment Survey tabulations by National Science Foundation/SRS

Appendix table 5-8. Student attendance patterns for undergraduate science and engineering (S&E) majors, by sex and race/ethnicity: 1991 bachelor's degree recipients

[In percentages]

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Major and attendance pattern	Total	Men	Women	White	Asian	Black	Hispanic	Other
All fields[1]:								
Traditional	51.5	51.8	51.2	52.6	49.8	49.3	46.5	47.2
Transfer	31.2	30.1	32.1	32.0	32.9	27.0	30.0	23.5
Part-time	18.1	16.5	19.5	16.2	22.8	23.0	26.1	22.1
Intermittent	21.8	22.2	21.6	20.8	14.7	29.1	27.3	28.2
Physical and life sciences:								
Traditional	65.9	64.8	66.9	65.9	72.5	68.8	60.6	51.4
Transfer	19.1	18.4	20.0	19.5	18.4	12.8	26.6	24.9
Part-time	11.9	14.1	9.4	11.4	4.6	9.2	20.7	25.3
Intermittent	16.3	18.2	14.2	16.0	10.0	20.3	10.7	32.2
Mathematics and computer sciences:								
Traditional	47.8	47.1	48.3	50.1	39.0	52.3	46.0	27.3
Transfer	30.5	31.3	29.8	31.4	26.7	21.7	29.0	40.0
Part-time	23.6	22.5	25.3	22.1	35.7	15.9	27.8	41.6
Intermittent	24.0	23.6	25.0	22.4	10.0	33.4	30.1	43.7
Social sciences:								
Traditional	60.1	59.0	60.9	60.7	57.4	53.7	61.7	56.4
Transfer	24.4	24.1	24.8	25.1	29.6	23.3	15.5	20.3
Part-time	10.8	10.1	11.5	9.9	12.9	16.3	18.4	9.9
Intermittent	18.7	20.2	17.5	17.6	17.8	26.9	19.8	24.5
Engineering:								
Traditional	55.5	53.9	62.2	54.9	57.3	59.6	58.7	48.5
Transfer	24.3	25 2	20.4	26.6	24.1	14 0	20.1	24.0
Part-time	17.2	16.8	19.3	15.4	20.7	13.0	19.9	15.0
Intermittent	18 9	19.7	15.4	19.7	9.7	29.7	15.6	32.6

[1] Includes all graduates. both non-S&E and S&E. Students are counted in each applicable attendance pattern. only traditional students are not subject to double counting.

NOTE: Based on estimates from a representative national sample of 81 institutions in 50 States and Puerto Rico.

KEY: Definitions of student attendance patterns:
Traditional-Students who complete their coursework without being identified in any of the other three patterns (i.e.. those who are generally enrolled continuously, full-time).
Transfer-Students identified by their alma maters as transfers or who have transferred in at least 30 percent of the credits needed to graduate.
Part-time-Students whose average course load per term is less than 75 percent of the full course load required by the institution for graduation in 4 years of study.
Intermittent-Students who have no recorded coursework for at least one "regular" term after matriculation.

SOURCE. University of Pennsylvania/Institute for Research on Higher Education. 1994 Report on Women and Minority Students in Mathematics, Science and Engineering. A First Finding from the Curriculum Assessment Service Natinal Database. Philadelphia: University of Pennsylvania.

Appendix table 5-9. Grade point averages (GPA's) for undergraduate students, by major, sex, and race/ethnicity: 1991 bachelor's degree recipients

[In percentages]

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Major and GPA band	Total	Men	Women	White	Asian	Black	Hispanic	Other
All fields[1]:								
Less than 2.0	1.1	1.6	0.8	0.9	0.7	2.9	1.7	1.2
2.0-2.49	14.6	19.0	11.4	12.9	15.6	28.6	20.1	19.6
2.5-2.99	30.4	32.8	28.6	29.7	28.9	37 5	35.6	28.2
3.0-3.49	33.7	30.3	36.1	34.7	37.0	23.8	29.0	33.5
3.5 or higher	20.2	16.3	23.1	21.9	17.7	7.2	13.7	17.5
Physical and life sciences:								
Less than 2.0	1.1	1.5	.8	.7	.9	.6	[illegible]	1.3
2.0-2.49	11.8	12.3	11.2	10.3	7.0	25.0	[illegible]	27.5
2.5-2.99	25.4	26.6	24.1	24.6	18.6	38 0	33.3	22.0
3.0-3.49	36.3	34.7	37.7	36.5	47.2	26.4	35.7	33.[illegible]
3.5 or higher	25.4	24.8	26.2	27.8	26.2	10.0	15.6	15.[illegible]
Mathematics and computer sciences:								
Less than 2.0	1.8	2.1	1.5	1.2	2.8	6.9	1.3	[illegible]
2.0-2.49	15.2	17.6	10.8	12.3	19.4	27.4	24.4	21 5
2.5-2.99	28.5	31.7	22.8	27.7	32.3	29.5	49.9	17.4
3.0-3.49	29.7	27.5	33.4	30.9	25.2	24.3	13.8	24.8
3.5 or higher	24.8	21.1	31.5	27.8	20.3	11.9	10.7	35.2
Social sciences:								
Less than 2.0	1.3	1.8	1.0	.8	.8	5.5	3.8	2.3
2.0-2.49	17.2	21.9	13.5	15.7	14.1	26.7	16.7	24.7
2.5-2.99	29.5	30.7	28.6	29.0	28.7	32.5	44 8	21.8
3.0-3.49	33.4	30.0	36.0	34.5	34.9	28.8	23.1	39 8
3.5 or higher	18.6	15 6	21.0	20.0	21.5	6.5	11.7	11 4
Engineering:								
Less than 2.0	1 0	1.1	.8	1.0	.0	1.8	.7	1.6
2.0-2.49	15.8	17.5	9.1	13.1	11.0	33.7	30.0	27.7
2.5-2 99	31.4	32.3	27.5	31.4	29.5	37.3	25 7	34.6
3.0-3.49	32.4	30.1	41.6	32.9	41.3	25.7	36.5	20.4
3.5 or higher	19.5	19.0	21.0	21.6	18.2	1.5	7.1	15 7

[1] Includes all graduates, both science and engineering (S&E) and non-S&E

NOTE: Based on estimates from a representative national sample of 81 institutions in 50 States and Puerto Rico

SOURCE: University of Pennsylvania/Institute for Research on Higher Education. 1994 Report on Women and Minority Students in Mathematics, Science and Engineering. A First Finding from the Curriculum Assessment Service National Database. Philadelphia: University of Pennsylvania

Appendix table 5-10. Amount of coursework taken in major field by undergraduate science and engineering majors, by sex and race/ethnicity: 1991 bachelor's degree recipients

[In percentages]

Major field	Total	Men	Women	White	Asian	Black	Hispanic	Other
Physical and life sciences:								
None	0.3	0.2	0.5	0.4	0.0	0.6	0.0	0.2
1-4	1.7	1.2	2.3	2.0	.0	2.6	.0	.3
5-8	3.1	3.5	2.7	3.0	1.4	4.8	.4	8.9
9-12	7.2	7.2	7.4	7.6	6.9	1.6	9.1	12.2
13 or more	87.6	87.9	87.4	87.1	91.7	90.4	90.4	78.3
Mathematics and computer sciences:								
None	.1	.1	.1	.1	.0	.0	.0	.0
1-4	2.5	2.6	2.4	2.3	8.8	3.4	.0	3.4
5-8	6.9	7.5	5.9	8.2	11.3	4.4	.9	1.5
9-12	19.0	19.9	17.7	21.4	8.5	15.7	22.8	23.9
13 or more	71.4	69.8	73.9	68.0	71.5	76.4	76.2	71.2
Social sciences:								
None	.3	.3	.2	.2	.6	.0	.0	.5
1-4	.6	.6	.6	.6	.0	.9	.8	1.7
5-8	3.0	3.2	2.9	3.0	7.2	3.8	1.1	2.6
9-12	16.1	16.1	16.2	17.0	14.9	15.0	13.3	10.9
13 or more	80.0	79.9	80.0	79.3	77.3	80.3	84.7	84.4
Engineering[1]:								
None	.3	.3	.6	[illegible]	.0	2.3	.0	.1
1-4	1.6	1.7	1.6	[illegible]	2.3	2.3	.8	2.4
5-8	1.8	1.8	1.7	1.4	.8	1.7	4.1	1.6
9-12	1.6	1.4	2.5	1.5	2.8	.6	.0	1.8
13 or more	94.7	94.9	93.7	95.3	94.1	93.2	95.0	94.1

[1] Estimates for female and black engineering graduates are based on small samples and have rather large associated standard errors: they must be considered unreliable.

NOTES. Based on estimates from a representative national sample of 81 institutions in 50 States and Puerto Rico
Undercounts of courses taken may have occurred because transferred courses were not coded, nor were proficiencies established through Advanced Placement or other examinations. Other factors made coding impossible in some instances.
Because of rounding, percentages may not add to 100.

SOURCE. University of Pennsylvania/Institute for Research on Higher Education 1994. Report on Women and Minority Students in Mathematics, Science and Engineering: A First Finding from the Curriculum Assessment Service National Database. Philadelphia: University of Pennsylvania.

Appendix table 5-11. Amount of coursework taken in science and engineering fields by students not majoring in those fields, by sex and race/ethnicity: 1991 bachelor's degree recipients

[In percentages]

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Field and number of courses	Total	Men	Women	White	Asian	Black	Hispanic	Other
Physical and life sciences:								
None	21.5	21.2	21.8	21.8	19.3	20.9	27.1	25.7
1-4	62.1	59.8	63.6	63.4	52.8	63.5	54.3	56.1
5 or more	16.4	19.0	14.6	14.8	27.9	15.7	18.7	18.1
Non-majors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mathematics and computer sciences:								
None	19.5	16.7	21.5	19.2	20.8	18.4	17.2	22.7
1-4	64.2	59.8	67.5	65.9	57.1	62.7	60.9	56.7
5 or more	16.3	23.5	11.0	15.0	22.1	18.9	21.9	20.6
Non-majors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Social sciences:								
None	6.0	5.7	6.2	5.4	6.1	4.5	7.2	10.1
1-4	39.3	40.8	38.2	39.4	41.5	37.9	40.2	44.0
5 or more	54.7	53.5	55.6	55.2	52.4	57.6	52.6	46.0
Non-majors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Engineering:								
None	92.8	88.6	95.6	91.9	84.4	94.7	96.0	95.8
1-4	5.8	8.5	4.1	6.6	13.4	4.6	3.4	2.5
5 or more	1.4	2.9	.3	1.6	2.2	.8	.6	1.8
Non-majors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTES: Based on estimates from a representative national sample of 81 institutions in 50 States and Puerto Rico
Because of rounding, percentages may not add to 100.

SOURCE: University of Pennsylvania/Institute for Research on Higher Education. 1994. Report on Women and Minority Students in Mathematics, Science and Engineering: A First Finding from the Curriculum Assessment Service National Database. Philadelphia: University of Pennsylvania.

Appendix table 5-12. Selected characteristics of undergraduate students, by disability status: 1989-90

[Percentage distribution]

Page 1 of 1

Student characteristics	Students with disabilities	Students without disabilities
Total	7.68	92.32
Dependency status:		
Dependent	5.31	94.69
Independent	9.91	90.09
Sex:		
Men	9.14	90.86
Women	6.65	93.35
Veteran of U.S. Armed Forces:		
Yes	20.88	79.12
No	7.85	92.15
Age as of December 31, 1989:		
Less than 24	5.48	94.52
24 - 29	7.09	92.91
30 or older	12.85	87.15

SOURCE: U.S. Department of Education/NCES. 1989-90 National Postsecondary Student Aid Study (NPSAS:90), and PEDAR Undergraduate Data Analysis System Plus.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-13. Selected characteristics of students enrolled in postsecondary institutions, by disability status: fall 1989-90

[Percentage distribution]

Page 1 of 1

Student characteristics	Students with disabilities	Students without disabilities
Attendance status:		
Full time	55.3	59.5
Part time	44.7	40.5
Level of study:		
Undergraduate	89.5	86.5
Graduate	9.2	11.5
First-professional	1.3	2.1
Undergraduate:		
Arts and humanities	9.4	8.9
Business	19 1	23.4
Education	7.2	7.0
Engineering	8.2	7.8
Health	7.7	9.3
Liberal/general studies	7.5	7.8
Mathematics/computer sciences	5.5	5.1
Natural sciences[1]	4.3	4.4
Social sciences	6.9	7.5
Trade/industrial	13.3	8.4
Other	11.0	10.3
Graduate:		
Arts and humanities	11.2	11.4
Business	12.0	20.6
Education	27.7	23.0
Engineering	7.2	6.6
Natural sciences[1]	6.1	6.4
Social sciences	14.9	9.6
Other	21.0	22.5

[1] Includes students who majored in life sciences and physical sciences

NOTE: Because of rounding, percentages may not add to 100.
Definitions from National Center for Education Statistics IPEDS Surveys

SOURCE: U.S. Department of Education/NCES. 1989-90 National Postsecondary Student Aid Study. Table generation system.

Women. Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-14. Major fields of study for undergraduate students, by disability status: 1989–90

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Major field	Students with disabilities		Students without disabilities	
	Number	Percentage	Number	Percentage
Total, all fields	107,009	10.4	917,983	89.6
Mathematics	419	5.3	7,510	94.7
Biology/life science	2,365	9.9	21,641	90.2
Physical sciences	382	13.5	2,454	86.5
Physical science technical	807	11.5	6,210	88.5
Psychology	2,240	10.1	20.052	90.0
Economics	277	4.4	5,981	95.6
Other social sciences	1,085	14.9	6,223	85.2
Political science	509	5.0	9.635	95.0
Civil engineering	199	11.6	1.514	88.4
Electrical engineering	375	8.9	3,839	91.1
Other engineering	2,144	7.4	26,675	92.6
Technical engineeering	3,598	13.7	22,591	86.3
Computer science	3,345	12.3	23,897	87.7
Computer technology	1,643	21.4	6,046	78.6

NOTE: Fields shown have sample sizes large enough to permit calculations of national estimates.

SOURCE: U.S. Department of Education/NCES. National Postsecondary Student Aid Study: 1990. Table generation system.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-15. Undergraduate students with disabilities majoring in engineering, by selected characteristic: fall 1992

Page 1 of 1

Student characteristic	Students with disabilities	Total students[1]	Percentage with disabilities	Schools represented
Total enrollment	2,142	279,556	0.8	228
Sex:				
Men	1,756	229.628	.8	226
Women	336	47,785	.7	226
Enrollment category*:				
First year	413	666,486	.6	221
Second year	384	51,161	.8	221
Third year	482	53,572	.9	221
Fourth year and higher	776	72,859	1.1	221
Type of disability:				
Blind/visually impaired	142	273,616	.0	222
Deaf/hearing impaired	141	273,616	.0	222
Learning disabled	833	273,616	.3	222
Orthopedic/mobility impaired	421	273,616	.2	222
All others (multiple disabilities)	558	273,616	.2	222
Race/ethnicity:				
Nonresident aliens	40	14,710	.3	222
Black	101	16,298	.6	222
Hispanic	115	16,728	.7	222
Asian	78	23,930	.3	222
American Indian	36	1,281	2.8	222
White, non-Hispanic	1.676	196.796	.8	222
Engineering specialty:				
Electrical/computer	602	77.989	.8	225
Mechanical/aerospace	514	63.339	.8	225
Civil/environmental	251	34.168	.7	225
Chemical/petroleum	126	22.561	.6	225
Industrial/mgmt/manufacturing	89	10,189	.9	225
Other	538	67,411	.8	225

[1] Total students is the number of undergraduate students enrolled in schools that provided information on students with disabilities. These numbers are further refined to reflect individual schools' ability (or inability) to provide complete data on students reported with disabilities. An enrollee whose gender is unknown is assumed to be male (this applies to total students only).

* Part-time students are not included in the totals for the enrollment category.

NOTE. The number of schools responding with undergraduate engineering enrollment totaled 258. The ability to identify students with disabilities broke down as follows:

	Number	Percentage distribution
Thoroughly	162	62.8
Partially	66	25.6
Not at all	30	11.6

SOURCE: American Association for the Advancement of Science (AAAS) Project on Science, Technology and Disability. 1994 *Final Report of the Data Collection Component of the AAAS Access to Engineering Project.*

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-16. Full-time and part-time teaching faculty (U.S. citizens and permanent residents) for sociology, geology, physics, and engineering, by sex and race/ethnicity: 1991 and 1992

[In percentages]

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Employment status, race/ethnicity, and sex	Sociology total	Public	Private	Geology, total	Public	Private	Physics, total	Public	Private
Total number	9,060	5,380	3,680	3,330	2,530	800	7,450	4,520	2,920
Total full-time faculty, number	6,590	4,010	2,580	2,850	2,160	690	6,500	3,950	2,550
Race/ethnicity:									
Black	8	8	7	1	1	1	2	1	3
White	84	84	84	94	94	97	86	85	89
Hispanic	4	3	5	1	1	*	2	2	1
Asian	3	4	2	2	3	1	8	9	5
American Indian	*	*	*	*	*	0	*	*	*
Sex:									
Men	69	70	65	90	92	91	92	94	92
Women	30	30	35	9	8	9	7	6	8
Total part-time faculty, number	2,470	1,370	1,100	480	370	110	950	570	370
Race/ethnicity:									
Black	9	8	10	1	1	0	2	2	2
White	80	81	79	97	96	95	83	80	89
Hispanic	6	4	8	1	2	1	1	1	1
Asian	3	5	2	1	*	2	7	9	5
American Indian	*	*	0	0	0	0	0	0	0
Sex:									
Men	52	50	56	60	60	59	84	80	90
Women	47	50	44	40	40	41	14	20	10

Employment status, race/ethnicity, and sex	Electrical eng., total	Public	Private	Mechanical eng., total	Public	Private	Civil eng., total	Public	Private
Total number	5,362	3,785	1,572	4,471	3,135	1,332	3,290	2,508	779
Total full-time faculty, number	4,630	3,326	1,299	3,820	2,746	1,071	2,760	2,143	614
Race/ethnicity									
Black	2	3	2	1	2	1	1	1	1
White	75	73	79	77	76	79	79	79	82
Hispanic	2	2	1	2	2	1	3	3	1
Asian	17	18	14	16	17	13	13	14	13
American Indian	*	*	*	*	*	*	*	*	0
Sex									
Men	96	95	96	97	97	97	96	96	97
Women	4	5	4	3	3	3	4	4	3
Total part-time faculty, number	732	459	273	651	389	261	530	365	165
Race/ethnicity									
Black	3	4	*	3	2	3	3	4	*
White	83	79	90	76	7[illegible]	80	80	79	82
Hispanic	2	2	2	2	2	2	2	3	0
Asian	9	12	6	12	11	15	11	12	8
American Indian	*	0	*	0	0	0	*	1	0
Sex									
Men	95	94	96	96	95	97	93	93	93
Women	5	6	4	4	5	3	7	7	7

NOTES: Science fields were surveyed in 1991, engineering fields in 1992. Because of rounding, percentages may not add to 100.

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KEY: * = less than 0.5 percent

SOURCES: National Science Foundation/SRS, Higher Education Surveys, Number 15, Physics, Geology, Sociology; Number 16, Electrical, Mechanical, and Civil Engineering.

Appendix table 5-17. Engineering faculty with disabilities, by selected characteristic: fall 1992

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Faculty characteristic	Faculty with disabilities	Total faculty[1]	Percentage with disabilities	Schools represented
Total faculty	134	24,925	0.5	212
Sex:				
Men	126	23,799	.5	211
Women	5	23,799	--	211
Academic rank:				
Administrator	6	23,735	--	210
Researcher/nonteaching staff	7	23,735	--	210
Instructor	9	23,735	--	210
Assistant professor	21	23,735	.1	210
Associate professor	26	23,735	.1	210
Full professor	61	23,735	.3	210
Type of disability:				
Blind/visually impaired	12	23,299	--	207
Deaf/hearing impaired	19	23,299	.1	207
Learning disabled	4	23,299	--	207
Orthopedic/mobility impaired	68	23,299	.3	207
All others (multiple disabilities)	19	23,299	.1	207
Race/ethnicity:				
Nonresident aliens	5	22,784	--	209
Black	1	22,784	--	209
Hispanic	0	22,784	NA	209
Asian	6	22,784	--	209
American Indian	0	22,784	NA	209
White, non-Hispanic	117	22,784	.5	209
Engineering specialty:				
Electrical/computer	38	24,819	.2	211
Mechanical/aerospace	26	24,819	.1	211
Civil/environmental	15	24,819	.1	211
Chemical/petroleum	2	24,819	--	211
Industrial/mgmt/manufacturing	12	24,819	--	211
Other	27	24,819	.1	211

[1] Total faculty is the number of faculty reported from schools that provided information on faculty with disabilities. All comparisons and percentages are to the total population of engineering faculty, since no information is available on the engineering faculty as a whole with respect to sex, engineering specialty, academic rank, and race/ethnicity.

NOTE The number of schools responding totaled 267 The ability to identify faculty with disabilities broke down as follows:

	Number	Percentage distribution
Thoroughly	133	49 8
Partially	79	29.6
Not at all	55	20.6

KEY NA = not available
-- = larger than zero but less then 0 055 percent

SOURCE American Association for the Advancement of Science (AAAS) Project on Science, Technology and Disability 1994 *Final Report of the Data Collection Component of the AAAS Access to Engineering Project*

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-18. Bachelor's degrees awarded in science and engineering and all other fields, by sex: 1966–1991

Year	Total, all fields			Science and engineering			All other fields		
	Men	Women	Percentage women	Men	Women	Percentage women	Men	Women	Percentage women
1966	301,037	222,971	42.6	138,679	45,634	24.8	162,358	177,337	52.2
1967	324,236	238,133	42.3	149,045	50,787	25.4	175,191	187,346	51.7
1968	359,747	277,116	43.5	165,200	61,397	27.1	194,547	215,719	52.6
1969	412,865	321,138	43.8	189,272	72,917	27.8	223,593	248,221	52.6
1970	453,605	344,465	43.2	204,528	79,702	28.0	249,077	264,763	51.5
1971	478,423	367,687	43.5	209,318	85,039	28.9	269,105	282,648	51.2
1972	503,631	390,479	43.7	216,422	90,037	29.4	287,209	300,442	51.1
1973	521,534	408,738	43.9	225,090	95,995	29.9	296,444	312,743	51.3
1974	530,907	423,469	44.4	223,652	102,578	31.4	307,255	320,891	51.1
1975	508,424	423,239	45.4	210,741	102,814	32.8	297,683	320,425	51.8
1976	508,549	425,894	45.6	205,570	103,921	33.6	302,979	321,973	51.5
1977	499,121	429,107	46.2	198,805	104,993	34.6	300,316	324,114	51.9
1978	491,066	439,135	47.2	195,888	107,667	35.5	295,178	331,468	52.9
1979	481,394	449,946	48.3	193,247	109,915	36.3	288,147	340,031	54.1
1980	477,750	462,501	49.2	191,215	113,480	37.2	286,535	349,021	54.9
1981	474,336	472,541	49.9	190,977	115,815	37.8	283,359	356,726	55.7
1982	477,543	486,500	50.5	193,624	121,399	38.5	283,919	365,101	56.3
1983	483,395	497,284	50.7	194,538	123,337	38.8	288,857	373,947	56.4
1984	486,750	499,595	50.7	199,262	125,221	38.6	287,488	374,374	56.6
1985	486,660	504,217	50.9	203,464	128,958	38.8	283,196	375,259	57.0
1986	490,143	510,061	51.0	204,771	130,689	39.0	285,372	379,372	57.1
1987	485,003	518,529	51.7	199,981	131,545	39.7	285,022	386,984	57.6
1988	481,236	524,797	52.2	191,549	130,933	40.6	289,687	393,864	57.6
1989	487,566	542,605	52.7	189,338	133,483	41.3	298,228	409,122	57.8
1990	495,867	566,284	53.3	189,082	140,012	42.5	306,785	426,272	58.1
1991	508,952	599,045	54.1	189,328	148,347	43.9	319,624	450,698	58.5

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys through 1985; IPEDS Completions Surveys, 1986–91: tabulations by National Science Foundation/SRS.

Appendix table 5-19. Bachelor's degrees, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	374,693	375,786	376,450	371,248	379,392	389,952
Engineering[1]	75,395	98,104	95,000	87,045	83,853	80,480
Science	299,298	277,682	281,450	284,203	295,539	309,472
Natural sciences	116,660	130,058	125,371	109,350	105,234	105,595
Physical science	24,175	23,847	20,155	17,329	16,203	16,407
Mathematical science	11,173	15,267	16,515	15,314	14,674	14,784
Computer science	15,233	39,121	39,927	30,963	27,695	25,410
Biological science	44,046	39,405	39,047	36,949	38,040	40,351
Agricultural science	22,033	12,418	9,727	8,795	8,622	8,643
Social sciences[2]	182,638	147,624	156,079	174,853	190,305	203,877
Social science	141,274	107,387	112,884	125,899	136,287	144,984
Psychology	41,364	40,237	43,195	48,954	54,018	58,893
Non-S&E	572,184	615,091	627,082	658,923	682,759	718,045
Grand total	946,877	990,877	1,003,532	1,030,171	1,062,151	1,107,997
White, non-Hispanic:						
Total science and engineering	313,486	307,061	298,129	293,262	296,140	303,532
Engineering[1]	60,856	77,665	73,032	66,237	62,745	59,441
Science	252,630	229,396	225,097	227,025	233,395	244,091
Natural sciences	100,791	107,076	98,344	84,578	80,210	80,111
Physical science	21,249	20,541	16,653	14,238	13,055	13,145
Mathematical science	9,447	12,163	13,265	12,287	11,765	11,649
Computer science	12,566	31,321	29,181	21,711	18,918	17,349
Biological science	37,292	31,818	30,549	28,404	28,814	30,264
Agricultural science	20,237	11,233	8,696	7,938	7,658	7,704
Social sciences[2]	151,839	122,320	126,753	142,447	153,185	163,980
Social science	117,121	88,361	90,992	101,941	109,049	115,846
Psychology	34,718	33,959	35,761	40,506	44,136	48,134
Non-S&E	494023	519295	521348	547064	560546	588831
Grand total	807,509	826,356	819,477	840,326	856,686	892,363
Asian:						
Total science and engineering	9,572	13,996	17,921	20,222	20,453	21,628
Engineering[1]	3,066	5,024	6,397	6,914	6,767	6,988
Science	6,506	8,972	11,524	13,308	13,686	14,640
Natural sciences	3,467	5,809	7,130	7,260	7,326	7,595
Physical science	599	763	894	922	937	983
Mathematical science	392	885	1,034	1,019	874	915
Computer science	669	2,044	2,455	2,268	2,144	2,010
Biological science	1,493	1,952	2,565	2,907	3,245	3,559
Agricultural science	314	165	182	144	126	128
Social sciences[2]	3,039	3,163	4,394	6,048	6,360	7,045
Social science	2,196	2,318	3,240	4,473	4,730	5,160
Psychology	843	845	1,154	1,575	1,630	1,885
Non-S&E	9,336	11,566	14,000	17,351	17,574	20,097
Grand total	18,908	25,562	31,921	37,573	38,027	41,725

See explanatory information and SOURCES at end of table

Appendix table 5-19. Bachelor's degrees, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	38,304	35,199	35,557	36,758	38,439	41,785
Engineering[1]	4 464	6,340	7,090	6,752	6,782	6,986
Science	33,840	28,859	28,467	30,006	31,657	34,799
Natural sciences	8,915	10,879	11,607	10,830	10,530	10,960
Physical science	1,593	1,588	1,480	1,322	1,245	1,355
Mathematical science	878	1,164	1,207	1,218	1,178	1,334
Computer science	1,220	3,327	4,307	3,742	3,416	3,292
Biological science	4,358	4,277	4,180	4,151	4,243	4,551
Agricultural science	866	523	433	397	448	428
Social sciences[2]	24,925	17,980	16,860	19,176	21,127	23,839
Social science	19,608	13,378	12,527	14,073	15,361	17,170
Psychology	5,317	4,602	4,333	5,103	5,766	6,669
Non-S&E	59,185	63,001	61,608	65,407	68,938	76,737
Grand total	97,489	98,200	97,165	102,165	107,377	118,522
Black, non-Hispanic:						
Total science and engineering	23,767	20,223	20,224	20,481	21,274	23,170
Engineering[1]	2,449	3,316	3,584	3,275	3,272	3,456
Science	21,318	16,907	16,640	17,206	18,002	19,714
Natural sciences	4,932	6,009	6,524	6,005	5,782	5,834
Physical science	911	830	823	697	650	753
Mathematical science	585	770	834	792	720	811
Computer science	786	2,143	2,820	2,457	2,247	1,997
Biological science	2,270	2,047	1,890	1,916	1,994	2,111
Agricultural science	380	219	157	143	171	162
Social sciences[2]	16,386	10,898	10,116	11,201	12,220	13,880
Social science	13,078	8,231	7,665	8,458	9,070	10,192
Psychology	3,308	2,667	2,451	2,743	3,150	3,688
Non-S&E	36,962	37,340	34,879	36,356	38,027	41,839
Grand total	60,729	57,563	55,103	56,837	59,301	65,009
Hispanic:						
Total science and engineering	13,107	13,373	13,846	14,811	15,680	17,021
Engineering[1]	1,820	2,712	3,218	3,195	3,295	3,297
Science	11,287	10,661	10,628	11,616	12,385	13,724
Natural sciences	3,646	4,359	4,660	4,417	4,357	4,705
Physical science	617	660	585	563	522	533
Mathematical science	275	335	321	373	413	480
Computer science	413	1,045	1,375	1,195	1,085	1,215
Biological science	1,951	2,069	2,146	2,090	2,119	2,264
Agricultural science	390	250	233	196	218	213
Social sciences[2]	7,641	6,302	5,968	7,199	8,028	9,019
Social science	5,828	4,568	4,266	5,047	5,623	6,273
Psychology	1,813	1,734	1,702	2,152	2,405	2,746
Non-S&E	20,060	23,018	24,350	26,550	28,184	32,006
Grand total	33,167	36,391	38,196	41,361	43,864	49,027

See explanatory information and SOURCES at end of table

Appendix table 5-19. Bachelor's degrees, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
American Indian/Alaskan Native:						
Total science and engineering	1,430	1,603	1,487	1,466	1,485	1,594
Engineering[1]	195	312	288	282	215	233
Science	1,235	1,291	1,199	1,184	1,270	1,361
Natural sciences	337	511	423	408	391	421
Physical science	65	98	72	62	73	69
Mathematical science	18	59	52	53	45	43
Computer science	21	139	112	90	84	80
Biological science	137	161	144	145	130	176
Agricultural science	96	54	43	58	59	53
Social sciences[2]	898	780	776	776	879	940
Social science	702	579	596	568	668	705
Psychology	196	201	180	208	211	235
Non-S&E	2,163	2,643	2,379	2,501	2,727	2,892
Grand total	3,593	4,246	3,866	3,967	4,212	4,486
U.S. citizens and permanent residents, total.						
Total science and engineering	361,362	356,256	351,607	350,242	355,032	366,945
Engineering[1]	68,386	89,029	86,519	79,903	76,294	73,415
Science	292,976	267,227	265,088	270,339	278,738	293,530
Natural sciences	113,173	123,764	117,081	102,668	98,066	98,666
Physical science	23,441	22,892	19,027	16,482	15,237	15,483
Mathematical science	10,717	14,212	15,506	14,524	13,817	13,898
Computer science	14,455	36,692	35,943	27,721	24,478	22,651
Biological science	43,143	38,047	37,294	35,462	36,302	38,374
Agricultural science	21,417	11,921	9,311	8,479	8,232	8,260
Social sciences[2]	179,803	143,463	148,007	167,671	180,672	194,864
Social science	138,925	104,057	106,759	120,487	129,140	138,176
Psychology	40,878	39,406	41,248	47,184	51,532	56,688
Non-S&E	562,544	593,862	596,956	629,822	647,058	685,665
Grand total	923,906	950,118	948,563	980,064	1,002,090	1,052,610
Nonresident alien[3]:						
Total science and engineering	13,282	15,526	14,824	13,138	13,216	13,591
Engineering[1]	6,963	7,467	6,875	5,731	5,644	5,294
Science	6,319	8,059	7,949	7,407	7,572	8,297
Natural sciences	3,484	5,011	5,019	4,422	4,326	4,556
Physical science	732	780	635	605	595	608
Mathematical science	456	763	655	543	524	578
Computer science	777	2,116	2,578	2,135	2,066	2,037
Biological science	903	915	862	873	867	1,063
Agricultural science	616	437	289	266	274	270
Social sciences[2]	2,835	3,048	2,930	2,985	3,246	3,741
Social science	2,349	2,505	2,436	2,474	2,721	3,050
Psychology	486	543	494	511	525	691
Non-S&E	9,349	13,732	13,768	13,319	13,337	16,066
Grand total	22,631	29,258	28,592	26,457	26,553	29,657

See explanatory information and SOURCES at end of table.

Appendix table 5-19. Bachelor's degrees, by race/ethnicity and field: 1981-1991, selected years

Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Unknown race/ethnicity:						
Total science and engineering	49	4,004	10,019	7,868	11,144	9,416
Engineering[1]	46	1,608	1,606	1,411	1,915	1,771
Science	3	2,396	8,413	6,457	9,229	7,645
Natural sciences	3	1,283	3,271	2,260	2,842	2,373
Physical science	2	175	493	242	371	316
Mathematical science	0	292	354	247	333	308
Computer science	1	313	1,406	1,107	1,151	722
Biological science	0	443	891	614	871	914
Agricultural science	0	60	127	50	116	113
Social sciences[2]	0	1,113	5,142	4,197	6,387	5,272
Social science	0	825	3,689	2,938	4,426	3,758
Psychology	0	288	1,453	1,259	1,961	1,514
Non-S&E	291	7,497	16,358	15,782	22,364	16,314
Grand total	340	11,501	26,377	23,650	33,508	25,730

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

[3] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys 1981–85, and IPEDS Completions Surveys 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 5-20. Bachelor's degrees awarded to men, by race/ethnicity and field: 1981-1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	229,841	231,544	228,995	220,090	220,499	221,196
Engineering[1]	67,662	84,604	81,449	74,758	71,843	68,851
Science	162,179	146,940	147,546	145,332	148,656	152,345
Natural sciences	74,596	78,568	75,630	65,875	62,518	62,091
Physical science	18,195	17,149	14,422	12,157	11,109	11,199
Mathematical science	6,392	8,231	8,833	8,264	7,863	7,804
Computer science	10,280	24,690	26,038	21,418	19,321	17,896
Biological science	24,460	20,435	20,039	18,295	18,631	19,715
Agricultural science	15,269	8,063	6,298	5,741	5,594	5,477
Social sciences[2]	87,583	68,372	71,916	79,457	86,138	90,254
Social science	73,136	55,557	58,517	65,166	70,739	74,099
Psychology	14,447	12,815	13,399	14,291	15,399	16,155
Non-S&E	244,495	255,116	256,008	267,476	275,368	287,756
Grand total	474,336	486,660	485,003	487,566	495,867	508,952
White, non-Hispanics:						
Total science and engineering	193,757	190,426	183,042	175,681	173,922	174,002
Engineering[1]	54,460	67,078	62,948	57,357	54,212	51,511
Science	139,297	123,348	120,094	118,324	119,710	122,491
Natural sciences	65,174	65,695	60,575	52,132	48,848	48,304
Physical science	16,126	14,980	12,139	10,173	9,179	9,203
Mathematical science	5,423	6,509	7,050	6,598	6,253	6,119
Computer science	8,623	20,188	19,793	15,799	13,974	12,916
Biological science	21,092	16,809	15,985	14,377	14,488	15,174
Agricultural science	13,910	7,209	5,608	5,185	4,954	4,892
Social sciences[2]	74,123	57,653	59,519	66,192	70,862	74,187
Social science	61,902	46,784	48,350	54,279	58,230	60,910
Psychology	12,221	10,869	11,169	11,913	12,632	13,277
Non-S&E	212,509	214,770	213,495	222,871	227,102	236,743
Grand total	406,266	405,196	396,537	398,552	401,024	410,745
Asians:						
Total science and engineering	6,169	8,761	11,222	12,401	12,279	12,743
Engineering[1]	2,699	4,133	5,249	5,679	5,506	5,669
Science	3,470	4,628	5,973	6,722	6,773	7,074
Natural sciences	2,078	3,245	4,029	4,073	4,054	4,149
Physical science	413	504	598	626	592	606
Mathematical science	223	474	532	527	491	482
Computer science	410	1,158	1,490	1,420	1,335	1,268
Biological science	830	1,024	1,314	1,442	1,573	1,736
Agricultural science	202	85	95	58	63	57
Social sciences[2]	1,392	1,383	1,944	2,649	2,719	2,925
Social science	1,096	1,098	1,539	2,145	2,228	2,361
Psychology	296	285	405	504	491	564
Non-S&E	3,981	4,872	5,682	6,802	6,818	8,030
Grand total	10,150	13,633	16,904	19,203	19,097	20,773

See explanatory information and SOURCES at end of table.

Appendix table 5-20. Bachelor's degrees awarded to men, by race/ethnicity and field: 1981–1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	19,014	17,681	17,848	17,947	18,337	19,362
Engineering[1]	3,849	5,087	5,527	5,239	5,307	5,346
Science	15,165	12,594	12,321	12,708	13,030	14,016
Natural sciences	4,815	5,515	5,699	5,411	5,043	5,226
Physical science	1,082	963	855	771	655	755
Mathematical science	447	601	627	636	614	657
Computer science	681	1,694	2,111	2,013	1,797	1,758
Biological science	1,973	1,892	1,818	1,734	1,685	1,799
Agricultural science	632	365	288	257	292	257
Social sciences[2]	10,350	7,079	6,622	7,297	7,987	8,790
Social science	8,610	5,711	5,385	5,960	6,438	7,085
Psychology	1,740	1,368	1,237	1,337	1,549	1,705
Non-S&E	22,312	23,506	22,506	23,703	24,710	27,552
Grand total	41,326	41,187	40,354	41,650	43,047	46,914
Black, non-Hispanics:						
Total science and engineering	11,005	9,389	9,272	9,053	9,181	9,815
Engineering[1]	2,020	2,488	2,589	2,338	2,369	2,452
Science	8,985	6,901	6,683	6,715	6,812	7,363
Natural sciences	2,501	2,833	2,939	2,732	2,476	2,538
Physical science	618	457	433	365	292	391
Mathematical science	276	376	399	374	342	380
Computer science	394	1,036	1,284	1,205	1,074	971
Biological science	954	806	723	700	658	696
Agricultural science	259	158	100	88	110	100
Social sciences[2]	6,484	4,068	3,744	3,983	4,336	4,825
Social science	5,444	3,317	3,083	3,338	3,542	3,946
Psychology	1,040	751	661	645	794	879
Non-S&E	13,518	13,651	12,670	12,860	13,409	14,423
Grand total	24,523	23,040	21,942	21,913	22,590	24,238
Hispanics						
Total science and engineering	7,214	7,388	7,738	8,104	8,384	8,743
Engineering[1]	1,656	2,338	2,694	2,667	2,757	2,694
Science	5,558	5,050	5,044	5,437	5,627	6,049
Natural sciences	2,095	2,380	2,516	2,432	2,328	2,458
Physical science	420	441	377	362	311	318
Mathematical science	161	189	196	224	249	259
Computer science	270	582	766	750	669	738
Biological science	952	997	1,018	965	955	1,019
Agricultural science	292	171	159	131	144	124
Social sciences[2]	3,463	2,670	2,528	3,005	3,299	3,591
Social science	2,831	2,128	2,015	2,372	2,612	2,834
Psychology	632	542	513	633	687	757
Non-S&E	7,889	8,761	8,900	9,898	10,299	12,038
Grand total	15,103	16,149	16,638	18,002	18,683	20,781

See explanatory information and SOURCES at end of table

Appendix table 5-20. Bachelor's degrees awarded to men, by race/ethnicity and field: 1981–1991, selected years

Race/ethnicity and field	1981	1985	1987	1989	1990	1991
American Indians or Alaskan Natives:						
Total science and engineering	795	904	838	790	772	804
Engineering[1]	173	261	244	234	181	200
Science	622	643	594	556	591	604
Natural sciences	219	302	244	247	239	230
Physical science	44	65	45	44	52	46
Mathematical science	10	36	32	38	23	18
Computer science	17	76	61	58	54	49
Biological science	67	89	77	69	72	84
Agricultural science	81	36	29	38	38	33
Social sciences[2]	403	341	350	309	352	374
Social science	335	266	287	250	284	305
Psychology	68	75	63	59	68	69
Non-S&E	905	1094	936	945	1,002	1,091
Grand total	1,700	1,998	1,774	1,735	1,774	1,895
U.S. citizens and permanent residents, total:						
Total science and engineering	218,940	216,868	212,112	206,029	204,538	206,107
Engineering[1]	61,008	76,298	73,724	68,275	65,025	62,526
Science	157,932	140,570	138,388	137,754	139,513	143,581
Natural sciences	72,067	74,455	70,303	61,616	57,945	57,679
Physical science	17,621	16,447	13,592	11,570	10,426	10,564
Mathematical science	6,093	7,584	8,209	7,761	7,358	7,258
Computer science	9,714	23,040	23,394	19,232	17,106	15,942
Biological science	23,895	19,725	19,117	17,553	17,746	18,709
Agricultural science	14,744	7,659	5,991	5,500	5,309	5,206
Social sciences[2]	85,865	66,115	68,085	76,138	81,568	85,902
Social science	71,608	53,593	55,274	62,384	66,896	70,356
Psychology	14,257	12,522	12,811	13,754	14,672	15,546
Non-S&E	238,802	243,148	241,683	253,376	258,630	272,325
Grand total	457,742	460,016	453,795	459,405	463,168	478,432
Nonresident aliens[3]:						
Total science and engineering	10,853	12,009	11,279	9,710	9,699	9,702
Engineering[1]	6,608	6,902	6,288	5,215	5,109	4,781
Science	4,245	5,107	4,991	4,495	4,590	4,921
Natural sciences	2,527	3,371	3,320	2,902	2,856	2,995
Physical science	572	580	461	406	415	411
Mathematical science	299	476	421	347	324	374
Computer science	566	1,444	1,776	1,517	1,472	1,463
Biological science	565	504	433	426	431	544
Agricultural science	525	367	229	206	214	203
Social sciences[2]	1,718	1,736	1,671	1,593	1,734	1,926
Social science	1,528	1,541	1,512	1,423	1,574	1,748
Psychology	190	195	159	170	160	178
Non-S&E	5,483	8,102	7,859	7,407	7,209	8,525
Grand total	16,336	20,111	19,138	17,117	16,908	18,227

See explanatory information and SOURCES at end of table

Appendix table 5-20. Bachelor's degrees awarded to men, by race/ethnicity and field: 1981–1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Unknown race/ethnicity:						
Total science and engineering	48	2,667	5,604	4,351	6,262	5,387
Engineering[1]	46	1,404	1,437	1,268	1,709	1,544
Science	2	1,263	4,167	3,083	4,553	3,843
Natural sciences	2	742	2,007	1,357	1,717	1,417
Physical science	2	122	369	181	268	224
Mathematical science	0	171	203	156	181	172
Computer science	0	206	868	669	743	491
Biological science	0	206	489	316	454	462
Agricultural science	0	37	78	35	71	68
Social sciences[2]	0	521	2,160	1,726	2,836	2,426
Social science	0	423	1,731	1,359	2,269	1,995
Psychology	0	98	429	367	567	431
Non-S&E	210	3,866	6,466	6,693	9,529	6,906
Grand total	258	6,533	12,070	11,044	15,791	12,293

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

[3] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys 1981-85, and IPEDS Completions Surveys, 1987-91; tabulations by National Science Foundation/SRS.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 5-21. Bachelor's degrees awarded to women, by race/ethnicity and field: 1981–1991, selected years

Page 1 of 4

Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Total, all recipients:						
Total science and engineering (S&E)	144,852	144,242	147.455	151,158	158.893	168.756
Engineering[1]	7,733	13,500	13,551	12,287	12,010	11.629
Science	137.119	130.742	133,904	138.871	146,883	157.127
Natural sciences	42,064	51,490	49,741	43,475	42,716	43,504
Physical science	5,980	6.698	5,733	5,172	5,094	5.208
Mathematical science	4.781	7,036	7.682	7,050	6,811	6.980
Computer science	4,953	14,431	13.889	9,545	8,374	7.514
Biological science	19,586	18,970	19.008	18,654	19.409	20.636
Agricultural science	6.764	4,355	3,429	3,054	3.028	3,166
Social sciences[2]	95,055	79,252	84,163	95,396	104,167	113.623
Social science	68.138	51,830	54.367	60.733	65.548	70.885
Psychology	26.917	27,422	29.796	34.663	38.619	42.738
Non-S&E	327.689	359.975	371.074	391.447	407.391	430.289
Grand total	472.541	504.217	518.529	542.605	566.284	599.045
White, non-Hispanic:						
Total science and engineering	119.729	116.635	115.087	117.581	122.218	129.530
Engineering[1]	6.396	10.587	10,084	8.880	8.533	7.930
Science	113.333	106.048	105.003	108.701	113.685	121.600
Natural sciences	35.617	41.381	37,769	32.446	31.362	31.807
Physical science	5.123	5,561	4.514	4.065	3.876	3.942
Mathematical science	4.024	5.654	6.215	5.689	5.512	5.530
Computer science	3.943	11.133	9.388	5.912	4.944	4.433
Biological science	16.200	15,009	14,564	14,027	14,326	15.090
Agricultural science	6.327	4.024	3.088	2.753	2.704	2.812
Social sciences[2]	77.716	64.667	67.234	76.255	82.323	89.793
Social science	55.219	41.577	42.642	47.662	50.819	54.936
Psychology	22.497	23.090	24.592	28.593	31.504	34.857
Non-S&E	281.514	304.525	307.853	324.193	333.444	352.088
Grand total	401.243	421.160	422.940	441.774	455,662	481.618
Asian:						
Total science and engineering	3.403	5.235	6.699	7.821	8.174	8.885
Engineering[1]	367	891	1.148	1.235	1.261	1.319
Science	3.036	4,344	5.551	6.586	6.913	7.566
Natural sciences	1.389	2.564	3,101	3.187	3.272	3.446
Physical science	186	259	296	296	345	377
Mathematical science	169	411	502	492	383	433
Computer science	259	886	965	848	809	742
Biological science	663	928	1.251	1.465	1.672	1.823
Agricultural science	112	80	87	86	63	71
Social sciences[2]	1,647	1.780	2.450	3.399	3.641	4.120
Social science	1.100	1.220	1.701	2.328	2.502	2.799
Psychology	547	560	749	1.071	1.139	1.321
Non-S&E	5.355	6.694	8.318	10.549	10.756	12.067
Grand total	8.758	11.929	15.017	18.370	18.930	20.952

See explanatory information and SOURCES at end of table.

Appendix table 5-21. Bachelor's degrees awarded to women, by race/ethnicity and field: 1981–1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Underrepresented minorities, total:						
Total science and engineering	19,290	17,518	17,709	18,811	20,102	22,423
Engineering[1]	615	1,253	1,563	1,513	1,475	1,640
Science	18,675	16,265	16,146	17,298	18,627	20,783
Natural sciences	4,100	5,364	5,908	5,419	5,487	5,734
Physical science	511	625	625	551	590	600
Mathematical science	431	563	580	582	564	677
Computer science	539	1,633	2,196	1,729	1,619	1,534
Biological science	2,385	2,385	2,362	2,417	2,558	2,752
Agricultural science	234	158	145	140	156	171
Social sciences[2]	14,575	10,901	10,238	11,879	13,140	15,049
Social science	10,998	7,667	7,142	8,113	8,923	10,085
Psychology	3,577	3,234	3,096	3,766	4,217	4,964
Non-S&E	36,873	39,495	39,102	41,704	44,228	49,185
Grand total	56,163	57,013	56,811	60,515	64,330	71,608
Black, non-Hispanic:						
Total science and engineering	12,762	10,834	10,952	11,428	12,093	13,355
Engineering[1]	429	828	995	937	903	1,004
Science	12,333	10,006	9,957	10,491	11,190	12,351
Natural sciences	2,431	3,176	3,585	3,273	3,306	3,296
Physical science	293	373	390	332	358	362
Mathematical science	309	394	435	418	378	431
Computer science	392	1,107	1,536	1,252	1,173	1,026
Biological science	1,316	1,241	1,167	1,216	1,336	1,415
Agricultural science	121	61	57	55	61	62
Social sciences[2]	9,902	6,830	6,372	7,218	7,884	9,055
Social science	7,634	4,914	4,582	5,120	5,528	6,246
Psychology	2,268	1,916	1,790	2,098	2,356	2,809
Non-S&E	23,444	23,689	22,209	23,496	24,618	27,416
Grand total	36,206	34,523	33,161	34,924	36,711	40,771
Hispanic:						
Total science and engineering	5,893	5,985	6,108	6,707	7,296	8,278
Engineering[1]	164	374	524	528	538	603
Science	5,729	5,611	5,584	6,179	6,758	7,675
Natural sciences	1,551	1,979	2,144	1,985	2,029	2,247
Physical science	197	219	208	201	211	215
Mathematical science	114	146	125	149	164	221
Computer science	143	463	609	445	416	477
Biological science	999	1,072	1,128	1,125	1,164	1,245
Agricultural science	98	79	74	65	74	89
Social sciences[2]	4,178	3,632	3,440	4,194	4,729	5,428
Social science	2,997	2,440	2,251	2,675	3,011	3,439
Psychology	1,181	1,192	1,189	1,519	1,718	1,989
Non-S&E	12,171	14,257	15,450	16,652	17,885	19,968
Grand total	18,064	20,242	21,558	23,359	25,181	28,246

See explanatory information and SOURCES at end of table.

Appendix table 5-21. Bachelor's degrees awarded to women, by race/ethnicity and field: 1981–1991, selected years

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Race/ethnicity and field	1981	1985	1987	1989	1990	1991
American Indians or Alaskan Natives:						
Total science and engineering	635	699	649	676	713	790
Engineering[1]	22	51	44	48	34	33
Science	613	648	605	628	679	757
Natural sciences	118	209	179	161	152	191
Physical science	21	33	27	18	21	23
Mathematical science	8	23	20	15	22	25
Computer science	4	63	51	32	30	31
Biological science	70	72	67	76	58	92
Agricultural science	15	18	14	20	21	20
Social sciences[2]	495	439	426	467	527	566
Social science	367	313	309	318	384	400
Psychology	128	126	117	149	143	166
Non-S&E	1,258	1,549	1,443	1,556	1,725	1,801
Grand total	1,893	2,248	2,092	2,232	2,438	2,591
U.S. citizens and permanent residents, total:						
Total science and engineering	142,422	139,388	139,495	144,213	150,494	160,838
Engineering[1]	7,378	12,731	12,795	11,628	11,269	10,889
Science	135,044	126,657	126,700	132,585	139,225	149,949
Natural sciences	41,106	49,309	46,778	41,052	40,121	40,987
Physical science	5,820	6,445	5,435	4,912	4,811	4,919
Mathematical science	4,624	6,628	7,297	6,763	6,459	6,640
Computer science	4,741	13,652	12,549	8,489	7,372	6,709
Biological science	19,248	18,322	18,177	17,909	18,556	19,665
Agricultural science	6,673	4,262	3,320	2,979	2,923	3,054
Social sciences[2]	93,938	77,348	79,922	91,533	99,104	108,962
Social science	67,317	50,464	51,485	58,103	62,244	67,820
Psychology	26,621	26,884	28,437	33,430	36,860	41,142
Non-S&E	323,742	350,714	355,273	376,446	388,428	413,340
Grand total	466,164	490,102	494,768	520,659	538,922	574,178
Nonresident aliens[3]:						
Total science and engineering	2,429	3,517	3,545	3,428	3,517	3,889
Engineering[1]	355	565	587	516	535	513
Science	2,074	2,952	2,958	2,912	2,982	3,376
Natural sciences	957	1,640	1,699	1,520	1,470	1,561
Physical science	160	200	174	199	180	197
Mathematical science	157	287	234	196	200	204
Computer science	211	672	802	618	594	574
Biological science	338	411	429	447	436	519
Agricultural science	91	70	60	60	60	67
Social sciences[2]	1,117	1,312	1,259	1,392	1,512	1,815
Social science	821	964	924	1,051	1,147	1,302
Psychology	296	348	335	341	365	513
Non-S&E	3,866	5,630	5,909	5,912	6,128	7,541
Grand total	6,295	9,147	9,454	9,340	9,645	11,430

See explanatory information and SOURCES at end of table

Appendix table 5-21. Bachelor's degrees awarded to women, by race/ethnicity and field: 1981–1991, selected years

Race/ethnicity and field	1981	1985	1987	1989	1990	1991
Unknown race/ethnicitiy:						
Total science and engineering	1	1,337	4,415	3,517	4,882	4,029
Engineering[1]	0	204	169	143	206	227
Science	1	1,133	4,246	3,374	4,676	3,802
Natural sciences	1	541	1,264	903	1,125	956
Physical science	0	53	124	61	103	92
Mathematical science	0	121	151	91	152	136
Computer science	1	107	538	438	408	231
Biological science	0	237	402	298	417	452
Agricultural science	0	23	49	15	45	45
Social sciences[2]	0	592	2,982	2,471	3,551	2,846
Social science	0	402	1,958	1,579	2,157	1,763
Psychology	0	190	1,024	892	1,394	1,083
Non-S&E	81	3,631	9,892	9,089	12,835	9,408
Grand total	81	3,631	9,892	12,606	17,717	13,437

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

[3] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys 1981-85, and IPEDS Completions Surveys, 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 5-22. Bachelor's degrees in all fields, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	946,877	990,877	1,003,532	1,030,171	1,062,151	1,107,997
U.S. citizens and permanent residents, total[1]	923,906	950,118	948,563	980,064	1,002,090	1,052,610
White, non-Hispanic	807,509	826,356	819,477	840,326	856,686	892,363
Asian	18,908	25,562	31,921	37,573	38,027	41,725
Black, non-Hispanic	60,729	57,563	55,103	56,837	59,301	65,009
Hispanic	33,167	36,391	38,196	41,361	43,864	49,027
American Indian/Alaskan Native	3,593	4,246	3,866	3,967	4,212	4,486
Nonresident aliens[2]	22,631	29,258	28,592	26,457	26,553	29,657
Unknown race/ethnicity	340	11,501	26,377	23,650	33,508	25,730
Men:						
Total, all recipients	474,336	486,660	485,003	487,566	495,867	508,952
U.S. citizens and permanent residents, total[1]	457,742	460,016	453,795	459,405	463,168	478,432
White, non-Hispanic	406,266	405,196	396,537	398,552	401,024	410,745
Asian	10,150	13,633	16,904	19,203	19,097	20,773
Black, non-Hispanic	24,523	23,040	21,942	21,913	22,590	24,238
Hispanic	15,103	16,149	16,638	18,002	18,683	20,781
American Indian/Alaskan Native	1,700	1,998	1,774	1,735	1,774	1,895
Nonresident aliens[2]	16,336	20,111	19,138	17,117	16,908	18,227
Unknown race/ethnicity	258	6,533	12,070	11,044	15,791	12,293
Women:						
Total, all recipients	472,541	504,217	518,529	542,605	566,284	599,045
U.S. citizens and permanent residents, total[1]	466,164	490,102	494,768	520,659	538,922	574,178
White, non-Hispanic	401,243	421,160	422,940	441,774	455,662	481,618
Asian	8,758	11,929	15,017	18,370	18,930	20,952
Black, non-Hispanic	36,206	34,523	33,161	34,924	36,711	40,771
Hispanic	18,064	20,242	21,558	23,359	25,181	28,246
American Indian/Alaskan Native	1,893	2,248	2,092	2,232	2,438	2,591
Nonresident aliens[2]	6,295	9,147	9,454	9,340	9,645	11,430
Unknown race/ethnicity	82	4,968	14,307	12,606	17,717	13,437

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.

SOURCES: U.S. Department of Education/NCES HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91; tabulations by National Science Foundation/SRS.

Appendix table 5-23. Bachelor's degrees in science and engineering, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	374,693	375,786	376,450	371,248	379,392	389,952
U.S. citizens and permanent residents, total[1]	361,362	356,256	351,607	350,242	355,032	366,945
White, non-Hispanic	313,486	307,061	298,129	293,262	296,140	303,532
Asian	9,572	13,996	17,921	20,222	20,453	21,628
Black, non-Hispanic	23,767	20,223	20,224	20,481	21,274	23,170
Hispanic	13,107	13,373	13,846	14,811	15,680	17,021
American Indian/Alaskan Native	1,430	1,603	1,487	1,466	1,485	1,594
Nonresident aliens[2]	13,232	15,526	14,824	13,138	13,216	13,591
Unknown race/ethnicity	49	4,004	10,019	7,868	11,144	9,416
Men:						
Total, all recipients	229,841	231,544	228,995	220,090	220,499	221,196
U.S. citizens and permanent residents, total[1]	218,940	216,868	212,112	206,029	204,538	206,107
White, non-Hispanic	193,757	190,426	183,042	175,681	173,922	174,002
Asian	6,169	8,761	11,222	12,401	12,279	12,743
Black, non-Hispanic	11,005	9,389	9,272	9,053	9,181	9,815
Hispanic	7,214	7,388	7,738	8,104	8,384	8,743
American Indian/Alaskan Native	795	904	838	790	772	804
Nonresident aliens[2]	10,853	12,009	11,279	9,710	9,699	9,702
Unknown race/ethnicity	48	2,667	5,604	4,351	6,262	5,387
Women:						
Total, all recipients	144,852	144,242	147,455	151,158	158,893	168,756
U.S. citizens and permanent residents, total[1]	142,422	139,388	139,495	144,213	150,494	160,838
White, non-Hispanic	119,729	116,635	115,087	117,581	122,218	129,530
Asian	3,403	5,235	6,699	7,821	8,174	8,885
Black, non-Hispanic	12,762	10,834	10,952	11,428	12,093	13,355
Hispanic	5,893	5,985	6,108	6,707	7,296	8,278
American Indian/Alaskan Native	635	699	649	676	713	790
Nonresident aliens[2]	2,429	3,517	3,545	3,428	3,517	3,889
Unknown race/ethnicity	1	1,337	4,415	3,517	4,882	4,029

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Data include degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.
In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

SOURCES U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91; tabulations by National Science Foundation/SRS.

Appendix table 5-24. Bachelor's degrees in science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	299,298	277,682	281,450	284,203	295,539	309,472
U.S. citizens and permanent residents, total[1]	292.976	267.227	265,088	270,339	278,738	293,530
White, non-Hispanic	252.630	229.396	225,097	227,025	233,395	244,091
Asian	6,506	8.972	11.524	13,308	13,686	14,640
Black, non-Hispanic	21.318	16,907	16.640	17,206	18,002	19,714
Hispanic	11,287	10.661	10,628	11,616	12.385	13,724
American Indian/Alaskan Native	1,235	1,291	1,199	1,184	1,270	1,361
Nonresident aliens[2]	6,319	8.059	7,949	7.407	7,572	8,297
Unknown race/ethnicity	3	2,396	8,413	6,457	9,229	7,645
Men:						
Total, all recipients	162.179	146,940	147,546	145.332	148,656	152.345
U.S citizens and permanent residents, total[1]	157,932	140,570	138.388	137,754	139,513	143,581
White, non-Hispanic	139,297	123,348	120,094	118,324	119,710	122,491
Asian	3,470	4,628	5,973	6,722	6,773	7,074
Black, non-Hispanic	8,985	6.901	6,683	6,715	6.812	7,363
Hispanic	5,558	5,050	5,044	5,437	5,627	6,049
American Indian/Alaskan Native	622	643	594	556	591	604
Nonresident aliens[2]	4,245	5,107	4,991	4,495	4,590	4,921
Unknown race/ethnicity	2	1,263	4,167	3,083	4,553	3,843
Women:						
Total, all recipients	137,119	130,742	133,904	138,871	146,883	157,127
U.S. citizens and permanent residents, total[1]	135,044	126,657	126,700	132,585	139,225	149,949
White, non-Hispanic	113,333	106,048	105,003	108,701	113,685	121,600
Asian	3,036	4,344	5,551	6,586	6,913	7,566
Black, non-Hispanic	12,333	10,006	9,957	10,491	11,190	12,351
Hispanic	5,729	5,611	5,584	6,179	6,758	7,675
American Indian/Alaskan Native	613	648	605	628	679	757
Nonresident aliens[2]	2.074	2.952	2,958	2,912	2,982	3,376
Unknown race/ethnicity	1	1,133	4,246	3.374	4,676	3,802

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only No racial/ethnic data are collected for this group

NOTES Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.

Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

SOURCES: U.S Department of Education/NCES HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91; tabulations by National Science Foundation/SRS.

Appendix table 5-25. Bachelor's degrees in engineering, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	75,395	77,571	74,423	66,947	64,703	62,186
U.S. citizens and permanent residents, total[1]	68,386	69,909	67,160	60,961	58,235	56,335
White, non-Hispanic	60,856	60,992	56,491	50,081	47,494	45,162
Asian	3,066	4,482	5,590	6,075	6,012	6,220
Black, non-Hispanic	2,449	2,039	2,315	2,067	2,072	2,229
Hispanic	1,820	2,187	2,554	2,561	2,511	2,566
American Indian/Alaskan Native	195	209	210	177	146	158
Nonresident aliens[2]	6,963	6,190	5,889	5,072	4,917	4,582
Unknown race/ethnicity	46	1,472	1,374	914	1,551	1,269
Men:						
Total, all recipients	67,662	66,326	63,020	56,759	54,730	52,522
U.S. citizens and permanent residents, total[1]	61,008	59,319	56,423	51,353	48,934	47,315
White, non-Hispanic	54,460	52,167	48,015	42,779	40,533	38,692
Asian	2,699	3,641	4,522	4,936	4,827	4,969
Black, non-Hispanic	2,020	1,479	1,606	1,397	1,416	1,484
Hispanic	1,656	1,863	2,100	2,100	2,035	2,039
American Indian/Alaskan Native	173	169	180	141	123	131
Nonresident aliens[2]	6,608	5,708	5,368	4,599	4,427	4,112
Unknown race/ethnicity	46	1,299	1,229	807	1,369	1,095
Women:						
Total, all recipients	7,733	11,245	11,403	10,188	9,973	9,664
U.S. citizens and permanent residents, total[1]	7,378	10,590	10,737	9,608	9,301	9,020
White, non-Hispanic	6,396	8,825	8,476	7,302	6,961	6,470
Asian	367	841	1,068	1,139	1,185	1,251
Black, non-Hispanic	429	560	709	670	656	745
Hispanic	164	324	454	461	476	527
American Indian/Alaskan Native	22	40	30	36	23	27
Nonresident aliens[2]	355	482	521	473	490	470
Unknown race/ethnicity	0	173	145	107	182	174

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Data include degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985–1991 only.

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91; tabulations by National Science Foundation/SRS.

Appendix table 5-26. Bachelor's degrees in natural sciences, by sex, citizenship, and race/ethnicity: 1981-1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	116,660	130,058	125,371	109,350	105,234	105,595
U.S. citizens and permanent residents, total[1]	113,173	123,764	117,081	102,668	98,066	98,666
White, non-Hispanic	100,791	107,076	98,344	84,578	80,210	80,111
Asian	3,467	5,809	7,130	7,260	7,326	7,595
Black, non-Hispanic	4,932	6,009	6,524	6,005	5,782	5,834
Hispanic	3,646	4,359	4,660	4,417	4,357	4,705
American Indian/Alaskan Native	337	511	423	408	391	421
Nonresident aliens[2]	3,484	5,011	5,019	4,422	4,326	4,556
Unknown race/ethnicity	3	1,283	3,271	2,260	2,842	2,373
Men:						
Total, all recipients	74,596	78,568	75,630	65,875	62,518	62,091
U.S. citizens and permanent residents, total[1]	72,067	74,455	70,303	61,616	57,945	57,679
White, non-Hispanic	65,174	65,695	60,575	52,132	48,848	48,304
Asian	2,078	3,245	4,029	4,073	4,054	4,149
Black, non-Hispanic	2,501	2,833	2,939	2,732	2,476	2,538
Hispanic	2,095	2,380	2,516	2,432	2,328	2,458
American Indian/Alaskan Native	219	302	244	247	239	230
Nonresident aliens[2]	2,527	3,371	3,320	2,902	2,856	2,995
Unknown race/ethnicity	2	742	2,007	1,357	1,717	1,417
Women:						
Total, all recipients	42,064	51,490	49,741	43,475	42,716	43,504
U.S. citizens and permanent residents, total[1]	41,106	49,309	46,778	41,052	40,121	40,987
White, non-Hispanic	35,617	41,381	37,769	32,446	31,362	31,807
Asian	1,389	2,564	3,101	3,187	3,272	3,446
Black, non-Hispanic	2,431	3,176	3,585	3,273	3,306	3,296
Hispanic	1,551	1,979	2,144	1,985	2,029	2,247
American Indian/Alaskan Native	118	209	179	161	152	191
Nonresident aliens[2]	957	1,640	1,699	1,520	1,470	1,561
Unknown race/ethnicity	1	541	1,264	903	1,125	956

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES. U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-27. Bachelor's degrees in physical science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	24,175	23,847	20,155	17,329	16,203	16,407
U.S. citizens and permanent residents, total[1]	23,441	22,892	19,027	16,482	15,237	15,483
White, non-Hispanic	21,249	20,541	16,653	14,238	13,055	13,145
Asian	599	763	894	922	937	983
Black, non-Hispanic	911	830	823	697	650	753
Hispanic	617	660	585	563	522	533
American Indian/Alaskan Native	65	98	72	62	73	69
Nonresident aliens[2]	732	780	635	605	595	608
Unknown race/ethnicity	2	175	493	242	371	316
Men:						
Total, all recipients	18,195	17,149	14,422	12,157	11,109	11,199
U.S. citizens and permanent residents, total[1]	17,621	16,447	13,592	11,570	10,426	10,564
White, non-Hispanic	16,126	14,980	12,139	10,173	9,179	9,203
Asian	413	504	598	626	592	606
Black, non-Hispanic	618	457	433	365	292	391
Hispanic	420	441	377	362	311	318
American Indian/Alaskan Native	44	65	45	44	52	46
Nonresident aliens[2]	572	580	461	406	415	411
Unknown race/ethnicity	2	122	369	181	268	224
Women:						
Total, all recipients	5,980	6,698	5,733	5,172	5,094	5,208
U.S. citizens and permanent residents, total[1]	5,820	6,445	5,435	4,912	4,811	4,919
White, non-Hispanic	5,123	5,561	4,514	4,065	3,876	3,942
Asian	186	259	296	296	345	377
Black, non-Hispanic	293	373	390	332	358	362
Hispanic	197	219	208	201	211	215
American Indian/Alaskan Native	21	33	27	18	21	23
Nonresident aliens[2]	160	200	174	199	180	197
Unknown race/ethnicity	0	53	124	61	103	92

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys; 1981-85, and IPEDS Completion Surveys, 1987–91; tabulations by National Science Foundation/SRS.

Appendix table 5-28. Bachelor's degrees in mathematical science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	11.173	15,267	16.515	15,314	14,674	14,784
U.S citizens and permanent residents, total[1]	10.717	14,212	15,506	14,524	13,817	13,898
White, non-Hispanic	9,447	12,163	13,265	12,287	11,765	11,649
Asian	392	885	1,034	1,019	874	915
Black, non-Hispanic	585	770	834	792	720	811
Hispanic	275	335	321	373	413	480
American Indian/Alaskan Native	18	59	52	53	45	43
Nonresident aliens[2]	456	763	655	543	524	578
Unknown race/ethnicity	0	292	354	247	333	308
Men:						
Total, all recipients	6.392	8,231	8,833	8 264	7.863	7.804
U.S. citizens and permanent residents, total[1]	6,093	7,584	8,209	7 761	7,353	7,258
White, non-Hispanic	5,423	6,509	7 050	6,598	6,253	6,119
Asian	223	474	532	527	491	482
Black, non-Hispanic	276	376	399	374	342	380
Hispanic	161	189	196	224	249	259
American Indian/Alaskan Native	10	36	32	38	23	18
Nonresident aliens[2]	299	476	421	347	324	374
Unknown race/ethnicity	0	171	203	156	181	172
Women:						
Total, all recipients	4,781	7,036	7,682	7,050	6,811	6,980
U.S. citizens and permanent residents, total[1]	4,624	6,628	7,297	6,763	6,459	6,640
White, non-Hispanic	4,024	5,654	6,215	5,689	5,512	5,530
Asian	169	411	502	492	383	433
Black, non-Hispanic	309	394	435	418	378	431
Hispanic	114	146	125	149	164	221
American Indian/Alaskan Native	8	23	20	15	22	25
Nonresident aliens[2]	157	287	234	196	200	204
Unknown race/ethnicity	0	121	151	91	152	136

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only, therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES: U.S Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987–91, tabulations by National Science Foundation/SRS.

Women, Minorities, and Persons With Disabilities in Science and Engineering, 1994

Appendix table 5-29. Bachelor's degrees in computer science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	15,233	39,121	39,927	30,963	27,695	25,410
U.S. citizens and permanent residents, total[1]	14,455	36,692	35,943	27,721	24,478	22,651
White, non-Hispanic	12,566	31,321	29,181	21,711	18,918	17,349
Asian	669	2,044	2,455	2,268	2,144	2,010
Black, non-Hispanic	786	2,143	2,820	2,457	2,247	1,997
Hispanic	413	1,045	1,375	1,195	1,085	1,215
American Indian/Alaskan Native	21	139	112	90	84	80
Nonresident aliens[2]	777	2,116	2,578	2,135	2,066	2,037
Unknown race/ethnicity	1	313	1,406	1,107	1,151	722
Men:						
Total, all recipients	10,280	24,690	26,038	21,418	19,321	17,896
U.S. citizens and permanent residents, total[1]	9,714	23,040	23,394	19,232	17,106	15,942
White, non-Hispanic	8,623	20,188	19,793	15,799	13,974	12,916
Asian	410	1,158	1,490	1,420	1,335	1,268
Black, non-Hispanic	394	1,036	1,284	1,205	1,074	971
Hispanic	270	582	766	750	669	738
American Indian/Alaskan Native	17	76	61	58	54	49
Nonresident aliens[2]	566	1,444	1,776	1,517	1,472	1,463
Unknown race/ethnicity	0	206	868	669	743	491
Women:						
Total, all recipients	4,953	14,431	13,889	9,545	8,374	7,514
U.S. citizens and permanent residents, total[1]	4,741	13,652	12,549	8,489	7,372	6,709
White, non-Hispanic	3,943	11,133	9,388	5,912	4,944	4,433
Asian	259	886	965	848	809	742
Black, non-Hispanic	392	1,107	1,536	1,252	1,173	1,026
Hispanic	143	463	609	445	416	477
American Indian/Alaskan Native	4	63	51	32	30	31
Nonresident aliens[2]	211	672	802	618	594	574
Unknown race/ethnicity	1	107	538	438	408	231

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group

NOTES. Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981–85, and IPEDS Completion Surveys, 1987–91: tabulations by National Science Foundation/SRS.

Appendix table 5-30. Bachelor's degrees in biological science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	44,046	39,405	39,047	36,949	38,040	40,351
U.S. citizens and permanent residents, total[1]	43,143	38,047	37,294	35,462	36,302	38,374
White, non-Hispanic	37,292	31,818	30,549	28,404	28,814	30,264
Asian	1,493	1,952	2,565	2,907	3,245	3,559
Black, non-Hispanic	2,270	2,047	1,890	1,916	1,994	2,111
Hispanic	1,951	2,069	2,146	2,090	2,119	2,264
American Indian/Alaskan Native	137	915	144	145	130	176
Nonresident aliens[2]	903	915	862	873	867	1,063
Unknown race/ethnicity	0	443	891	614	871	914
Men:						
Total, all recipients	24,460	20,435	20,039	18,295	18,631	19,715
U.S. citizens and permanent residents, total[1]	23,895	19,725	19,117	17,553	17,746	18,709
White, non-Hispanic	21,092	16,809	15,985	14,377	14,488	15,174
Asian	830	1,024	1,314	1,442	1,573	1,736
Black, non-Hispanic	954	806	723	700	658	696
Hispanic	952	997	1,018	965	955	1,019
American Indian/Alaskan Native	67	89	77	69	72	84
Nonresident aliens[2]	565	504	433	426	431	544
Unknown race/ethnicity	0	206	489	316	454	462
Women:						
Total, all recipients	19,586	18,970	19,008	18,654	19,409	20,636
U.S. citizens and permanent residents, total[1]	19,248	18,322	18,177	17,909	18,556	19,665
White, non-Hispanic	16,200	15,009	14,564	14,027	14,326	15,090
Asian	663	928	1,251	1,465	1,672	1,823
Black, non-Hispanic	1,316	1,241	1,167	1,216	1,336	1,415
Hispanic	999	1,072	1,128	1,125	1,164	1,245
American Indian/Alaskan Native	70	72	67	76	58	92
Nonresident aliens[2]	338	411	429	447	436	519
Unknown race/ethnicity	0	237	402	298	417	452

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES. U.S Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-31. Bachelor's degrees in agricultural science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	22,033	12,418	9,727	8,795	8,622	8,643
U.S. citizens and permanent residents, total[1]	21,417	11,921	9,311	8,479	8,232	8,260
White, non-Hispanic	20,237	11,233	8,696	7,938	7,658	7,704
Asian	314	165	182	144	126	128
Black, non-Hispanic	380	219	157	143	171	162
Hispanic	390	250	233	196	218	213
American Indian/Alaskan Native	96	54	43	58	59	53
Nonresident aliens[2]	616	437	289	266	274	270
Unknown race/ethnicity	0	60	127	50	116	113
Men:						
Total, all recipients	15,269	8,063	6,298	5,741	5,594	5,477
U.S. citizens and permanent residents, total[1]	14,744	7,659	5,991	5,500	5,309	5,206
White, non-Hispanic	13,910	7,209	5,608	5,185	4,954	4,892
Asian	202	85	95	58	63	57
Black, non-Hispanic	259	158	100	88	110	100
Hispanic	292	171	159	131	144	124
American Indian/Alaskan Native	81	36	29	38	38	33
Nonresident aliens[2]	525	367	229	206	214	203
Unknown race/ethnicity	0	37	78	35	71	68
Women:						
Total, all recipients	6,764	4,355	3,429	3,054	3,028	3,166
U.S. citizens and permanent residents, total[1]	6,673	4,262	3,320	2,979	2,923	3,054
White, non-Hispanic	6,327	4,024	3,088	2,753	2,704	2,812
Asian	112	80	87	86	63	71
Black, non-Hispanic	121	61	57	55	61	62
Hispanic	98	79	74	65	74	89
American Indian/Alaskan Native	15	18	14	20	21	20
Nonresident aliens[2]	91	70	60	60	60	67
Unknown race/ethnicity	0	23	49	15	45	45

[1] Racial/ethnic categories are as designated on the survey form. These categories include U S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only: therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES: U.S Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS

Appendix table 5-32. Bachelor's degrees in social science, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	141,274	107,387	112,884	125,899	136,287	144,984
U.S. citizens and permanent residents, total[1]	138,925	104,057	106,759	120,487	129,140	138,176
White, non-Hispanic	117,121	88,361	90,992	101,941	109,049	115,846
Asian	2,196	2,318	3,240	4,473	4,730	5,160
Black, non-Hispanic	13,078	8,231	7,665	8,458	9,070	10,192
Hispanic	5,828	4,568	4,266	5,047	5,623	6,273
American Indian/Alaskan Native	702	579	596	568	668	705
Nonresident aliens[2]	2,349	2,505	2,436	2,474	2,721	3,050
Unknown race/ethnicity	0	825	3,689	2,938	4,426	3,758
Men:						
Total, all recipients	73,136	55,557	58,517	65,166	70,739	74,099
U.S. citizens and permanent residents, total[1]	71,608	53,593	55,274	62,384	66,896	70,356
White, non-Hispanic	61,902	46,784	48,350	54,279	58,230	60,910
Asian	1,096	1,098	1,539	2,145	2,228	2,361
Black, non-Hispanic	5,444	3,317	3,083	3,338	3,542	3,946
Hispanic	2,831	2,128	2,015	2,372	2,612	2,834
American Indian/Alaskan Native	335	266	287	250	284	305
Nonresident aliens[2]	1,528	1,541	1,512	1,423	1,574	1,748
Unknown race/ethnicity	0	423	1,731	1,359	2,269	1,995
Women:						
Total, all recipients	68,138	51,830	54,367	60,733	65,548	70,885
U.S. citizens and permanent residents, total[1]	67,317	50,464	51,485	58,103	62,244	67,820
White, non-Hispanic	55,219	41,577	42,642	47,662	50,819	54,936
Asian	1,100	1,220	1,701	2,328	2,502	2,799
Black, non-Hispanic	7,634	4,914	4,582	5,120	5,528	6,246
Hispanic	2,997	2,440	2,251	2,675	3,011	3,439
American Indian/Alaskan Native	367	313	309	318	384	400
Nonresident aliens	821	964	924	1,051	1,147	1,302
Unknown race/ethnicity	0	402	1,958	1,579	2,157	1,763

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS

Appendix table 5-33. Bachelor's degrees in psychology, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	41,364	40,237	43,195	48,954	54,018	58,893
U.S. citizens and permanent residents, total[1]	40,878	39,406	41,248	47,184	51,532	56,688
White, non-Hispanic	34,718	33,959	35,761	40,506	44,136	48,134
Asian	843	845	1,154	1,575	1,630	1,885
Black, non-Hispanic	3,308	2,667	2,451	2,743	3,150	3,688
Hispanic	1,813	1,734	1,702	2,152	2,405	2,746
American Indian/Alaskan Native	196	201	180	208	211	235
Nonresident aliens[2]	486	543	494	511	525	691
Unknown race/ethnicity	0	288	1,453	1,259	1,961	1,514
Men:						
Total, all recipients	14,447	12,815	13,399	14,291	15,399	16,155
U.S. citizens and permanent residents, total[1]	14,257	12,522	12,811	13,754	14,672	15,546
White, non-Hispanic	12,221	10,869	11,169	11,913	12,632	13,277
Asian	296	285	405	504	491	564
Black, non-Hispanic	1,040	751	661	645	794	879
Hispanic	632	542	513	633	687	757
American Indian/Alaskan Native	68	75	63	59	68	69
Nonresident aliens[2]	190	195	159	170	160	178
Unknown race/ethnicity	0	98	429	367	567	431
Women:						
Total, all recipients	26,917	27,422	29,796	34,663	38,619	42,738
U.S. citizens and permanent residents, total[1]	26,621	26,884	28,437	33,430	36,860	41,142
White, non-Hispanic	22,497	23,090	24,592	28,593	31,504	34,857
Asian	547	560	749	1,071	1,139	1,321
Black, non-Hispanic	2,268	1,916	1,790	2,098	2,356	2,809
Hispanic	1,181	1,192	1,189	1,519	1,718	1,989
American Indian/Alaskan Native	128	126	117	149	143	166
Nonresident aliens[2]	296	348	335	341	365	513
Unknown race/ethnicity	0	190	1,024	892	1,394	1,083

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency)

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation

SOURCES. U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-34. Bachelor's degrees in health fields, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	64,673	51,239	51,455	47,389	47,112	47,588
U.S. citizens and permanent residents, total[1]	64,091	49,532	49,356	45,762	44,890	45,495
White, non-Hispanic	56,791	43,152	42,824	39,103	37,779	38,202
Asian	1,312	1,025	1,263	1,429	1,516	1,675
Black, non-Hispanic	3,603	3,082	3,066	3,159	3,320	3,432
Hispanic	2,176	2,066	1,985	1,879	2,070	1,970
American Indian/Alaskan Native	209	207	218	192	205	216
Nonresident aliens[2]	582	637	612	582	605	761
Unknown race/ethnicity	0	1,070	1,487	1,045	1,617	1,332
Men:						
Total, all recipients	10,638	7,353	6,892	6,501	6,767	7,005
U.S. citizens and permanent residents, total[1]	10,431	6,890	6,524	6,208	6,422	6,560
White, non-Hispanic	9,276	5,957	5,555	5,222	5,370	5,388
Asian	299	241	257	321	314	395
Black, non-Hispanic	436	321	340	309	349	365
Hispanic	381	341	339	311	366	377
American Indian/Alaskan Native	39	30	33	35	23	35
Nonresident aliens[2]	207	228	202	169	181	226
Unknown race/ethnicity	0	235	166	124	164	219
Women:						
Total, all recipients	54,035	43,886	44,563	40,888	40,345	40,583
U.S. citizens and permanent residents, total[1]	53,660	42,642	42,832	39,554	38,468	38,935
White, non-Hispanic	47,515	37,195	37,269	33,881	32,409	32,814
Asian	1,013	784	1,006	1,098	1,202	1,280
Black, non-Hispanic	3,167	2,761	2,726	2,850	2,971	3,067
Hispanic	1,795	1,725	1,646	1,568	1,704	1,593
American Indian/Alaskan Native	170	177	185	157	182	181
Nonresident aliens[2]	375	409	410	413	424	535
Unknown race/ethnicity	0	835	1,321	921	1,453	1,113

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-35. Bachelor's degrees in non-science and non-engineering fields, by sex, citizenship, and race/ethnicity: 1981–1991, selected years

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Sex, citizenship, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total:						
Total, all recipients	507,511	563,852	575,627	611,534	635,647	670,457
U.S. citizens and permanent residents, total[1]	498,453	544,330	547,600	584,060	602,168	640,170
White, non-Hispanic	437,232	476,143	478,524	507,961	522,767	550,629
Asian	8,024	10,541	12,737	15,922	16,058	18,422
Black, non-Hispanic	33,359	34,258	31,813	33,197	34,707	38,407
Hispanic	17,884	20,952	22,365	24,671	26,114	30,036
American Indian/Alaskan Native	1,954	2,436	2,161	2,309	2,522	2,676
Nonresident aliens[2]	8,767	13,095	13,156	12,737	12,732	15,305
Unknown race/ethnicity	291	6,427	14,871	14,737	20,747	14,982
Men:						
Total, all recipients	233,857	247,763	249,116	260,975	268,601	280,751
U.S. citizens and permanent residents, total[1]	228,371	236,258	235,159	247,168	252,208	265,765
White, non-Hispanic	203,233	208,813	207,940	217,649	221,732	231,355
Asian	3,682	4,631	5,425	6,471	6,504	7,635
Black, non-Hispanic	13,082	13,330	12,330	12,551	13,060	14,058
Hispanic	7,508	8,420	8,561	9,587	9,933	11,661
American Indian/Alaskan Native	866	1,064	903	910	979	1,056
Nonresident aliens[2]	5,276	7,874	7,657	7,238	7,028	8,299
Unknown race/ethnicity	210	3,631	6,300	6,569	9,365	6,687
Women:						
Total, all recipients	273,654	316,089	326,511	350,559	367,046	389,706
U.S. citizens and permanent residents, total[1]	270,082	308,072	312,441	336,892	349,960	374,405
White, non-Hispanic	233,999	267,330	270,584	290,312	301,035	319,274
Asian	4,342	5,910	7,312	9,451	9,554	10,787
Black, non-Hispanic	20,277	20,928	19,483	20,646	21,647	24,349
Hispanic	10,376	12,532	13,804	15,084	16,181	18,375
American Indian/Alaskan Native	1,088	1,372	1,258	1,399	1,543	1,620
Nonresident aliens[2]	3,491	5,221	5,499	5,499	5,704	7,006
Unknown race/ethnicity	81	2,796	8,571	8,168	11,382	8,295

[1] Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).

[2] Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.

SOURCES: U.S. Department of Education/NCES HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS

Appendix table 5-36. Bachelor's degrees awarded to blacks by Historically Black Colleges and Universities (HBCU's), by field: 1981–1991, selected years

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Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	7,328	6,000	6,154	5,984	6,085	6,531
Engineering[1]	847	916	1,064	910	935	963
Science	6,481	5,084	5,090	5,074	5,150	5,568
Natural sciences	2,080	2,369	2,750	2,513	2,353	2,363
Physical science	364	363	346	320	296	358
Earth science	0	0	0	0	0	0
Mathematical science	298	382	425	381	307	369
Computer science	304	740	1,187	1,048	899	748
Biological science	895	783	714	693	764	792
Agricultural science	219	101	78	71	87	96
Social sciences[2]	4,401	2,715	2,340	2,561	2,797	3,205
Social science	3,633	2,170	1,875	2,011	2,135	2,364
Psychology	768	545	465	550	662	841
Non-S&E	12,225	11,219	10,435	9,941	10,260	11,432
Grand total	19,553	17,219	16,589	15,925	16,345	17,963
Degrees from HBCU's as a percentage of total awarded to blacks:						
Total science and engineering	30.8	29.7	30.4	29.2	28.6	28.2
Engineering[1]	34.6	27.6	29.7	27.8	28.6	27.9
Science	30.4	30.1	30.6	29.5	28.6	28.2
Natural sciences	42.2	39.4	42.2	41.8	40.7	40.5
Physical science	40.0	43.7	42.0	45.9	45.5	47.5
Earth science	.0	.0	.0	.0	.0	.0
Mathematical science	50.9	49.6	51.0	48.1	42.6	45.5
Computer science	38.7	34.5	42.1	42.7	40.0	37.5
Biological science	39.4	38.3	37.8	36.2	38.3	37.5
Agricultural science	57.6	46.1	49.7	49.7	50.9	59.3
Social sciences[2]	26.9	24.9	23.1	22.9	22.9	23.1
Social science	27.8	26.4	24.5	23.8	23.5	23.2
Psychology	23.2	20.4	19.0	20.1	21.0	22.8
Non-S&E	33.1	30.0	29.9	27.3	27.0	27.3
Grand total	32.2	29.9	30.1	28.0	27.6	27.6

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Data for 1981 include engineering and engineering technology. Data for all other years report engineering only.
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy.

SOURCES. U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS

Appendix table 5-37. Bachelor's degrees awarded to black men by Historically Black Colleges and Universities (HBCU's), by field: 1981–1991, selected years

Page 1 of 1

Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	3.416	2.748	2.813	2.544	2.483	2.567
Engineering[1]	723	684	777	646	643	633
Science	2.693	2.064	2.036	1.898	1.840	1.934
Natural sciences	1.036	1.081	1.193	1.056	935	951
Physical science	237	190	156	160	127	163
Earth science	0	0	0	0	0	0
Mathematical science	143	184	213	179	134	164
Computer science	123	328	502	460	377	333
Biological science	383	299	264	206	231	231
Agricultural science	150	80	58	51	66	60
Social sciences[2]	1,657	983	843	842	905	983
Social science	1,439	816	731	715	742	802
Psychology	218	167	112	127	163	181
Non-S&E	4,448	4.034	3.763	3.438	3.583	3.863
Grand total	7.864	6.782	6.576	5.982	6.066	6,430
Degrees from HBCU's as a percentage of total awarded to black men:						
Total science and engineering	31.0	29.3	30.3	28 1	27.0	26.2
Engineering[1]	35.8	27.5	30.0	27.6	27.1	25.8
Science	30.0	29.9	30.5	28.3	27.0	26.3
Natural sciences	41.4	38.2	40.6	38.7	37.8	37.5
Physical science	38.3	41.6	36.0	43.8	43.5	41.7
Earth science	.0	.0	.0	.0	.0	.0
Mathematical science	51.8	48.9	53.4	47.9	39.2	43.2
Computer science	31.2	31.7	39.1	38.2	35.1	34.3
Biological science	40.1	37 1	36 5	29.4	35.1	33.2
Agricultural science	57.9	50 6	58.0	58.0	60.0	60 0
Social sciences[2]	25.6	24.2	22 5	21.1	20.9	20.4
Social science	26 4	24.6	23 7	21.4	20 9	20 3
Psychology	21 0	22.2	16.9	19.7	20.5	20.6
Non-S&E	33.0	29.5	29.7	26.7	26.7	26.8
Grand total	32.1	29 4	30.0	27.3	26.9	26.5

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-91 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

[3] Non-S&E refers to non-science and non-engineering.

NOTES. Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter. but data for 1983 were not released by the National Center for Education Statistics.

Data on race/ethnicity of degree recipients are collected on broad fields of study only: therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation

Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency)

Data for 1981 include engineering and engineering technology Data for all other years report engineering only

Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy

SOURCES. U S Department of Education/NCES HEGIS Earned Degrees Surveys. 1981-85, and IPEDS Completion Surveys. 1987-91. tabulations by National Science Foundation/SRS

Appendix table 5-38. Bachelor's degrees awarded to black women by Historically Black Colleges and Universities (HBCU's), by field: 1981–1991, selected years

Page 1 of 1

Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	3 912	3.252	3.341	3.440	3.602	3.964
Engineering[1]	124	232	287	264	292	330
Science	3.788	3.020	3.054	3.176	3.310	3.634
Natural sciences	1.044	1.288	1.557	1.457	1.418	1,412
Physical science	127	173	190	160	169	195
Earth science	0	0	0	0	0	0
Mathematical science	155	198	212	202	173	205
Computer science	181	412	685	588	522	415
Biological science	512	484	450	487	533	561
Agricultural science	69	21	20	20	21	36
Social sciences[2]	2.744	1.732	1,497	1.719	1,892	2,222
Social science	2.194	1.354	1.144	1.296	1,393	1,562
Psychology	550	378	353	423	499	660
Non-S&E	7.777	7,185	6.672	6.503	6.677	7.569
Grand total	11.689	10.437	10.013	9.943	10.279	11.533
Degrees from HBCU's as a percentage of total awarded to black women:						
Total science and engineering	30.7	30.0	30.5	30.1	29 8	29.7
Engineering[1]	28.9	28.0	28.8	28.2	32.3	32.9
Science	30.7	30.2	30.7	30.3	29.6	29.4
Natural sciences	42.9	40.6	43.4	44.5	42.9	42.8
Physical science	43.3	46.4	48.7	48.2	47.2	53.9
Earth science	.0	.0	0	.0	.0	.0
Mathematical science	50.2	50.3	48.7	48.3	45.8	47.6
Computer science	46 2	37.2	44 6	47.0	44.5	40.4
Biological science	38.9	39 0	38.6	40.0	39.9	39.6
Agricultural science	57 0	34.4	35.1	36.4	34.4	58.1
Social sciences	27 7	25.4	23 5	23.8	24.0	24 5
Social science	28.7	27 6	25.0	25.3	25.2	25.0
Psychology	24 3	19.7	19.7	20.2	21.2	23.5
Non-S&E	33.2	30.3	30.0	27.7	27.1	27.6
Grand total	32.3	30.2	30.2	28.5	28.0	28.3

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

NOTES Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U S. citizens and foreign citizens on permanent visas (i.e . resident aliens who have been admitted for permanent residency).
Data for 1981 include engineering and engineering technology. Data for all other years report engineering only
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy

SOURCES U S. Department of Education NCES HEGIS Earned Degrees Surveys. 1981-85 and IPEDS Completion Surveys 1987-91 tabulations by National Science Foundation/SRS

Appendix table 5-39. Bachelor's degrees awarded to Hispanics by institutions in Puerto Rico, by field: 1981–1991, selected years

Page 1 of 1

Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	3.917	3.427	3.431	3,459	3.462	3,363
Engineering[1]	387	448	679	759	744	691
Science	3,530	2,979	2,752	2,700	2,718	2,672
Natural sciences	1.362	1.442	1,556	1,479	1,447	1,446
Physical science	212	244	173	184	184	154
Earth science	0	0	0	0	0	0
Mathematical science	90	78	58	69	69	108
Computer science	111	219	337	326	261	327
Biological science	807	828	916	858	862	797
Agricultural science	142	73	72	42	71	60
Social sciences[2]	2,168	1,537	1,196	1,221	1.271	1,226
Social science	1,660	1,134	847	796	856	797
Psychology	508	403	349	425	415	429
Non-S&E	7,416	7.086	8,505	8,743	8.697	9,147
Grand total	11.333	10,513	11,936	12.202	12,159	12,510
Degrees from institutions in Puerto Rico as a percentage of total awarded to Hispanics:						
Total science and engineering	29.9	25.6	24.8	23.4	22.1	19.8
Engineering[1]	21.3	16.5	21.1	23.8	22.6	21.0
Science	31.3	27.9	25.9	23.2	21.9	19.5
Natural sciences	37.4	33.1	33.4	33.5	33.2	30.7
Physical science	34.4	37.0	29.6	32.7	35.2	28.9
Earth science	.0	.0	.0	.0	.0	.0
Mathematical science	32.7	23.3	18.1	18.5	16 7	22.5
Computer science	26.9	21 0	24.5	27.3	24.1	26.9
Biological science	41.4	40.0	42.7	41.1	40.7	35.2
Agricultural science	36.4	29 2	30.9	21.4	32.6	28.2
Social sciences[2]	28.4	24.4	20.0	17.0	15.8	13.6
Social science	28.5	24.8	19.9	15.8	15.2	12.7
Psychology	28.0	23.2	20.5	19.7	17.3	15.6
Non-S&E	37.7	31 8	35.3	33.3	31.6	28.6
Grand total	34.2	28.9	31.2	29.5	27.7	25.5

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Data for 1981 include engineering and engineering technology. Data for all other years report engineering only.
N E includes various health fields not part of the National Science Foundation science and engineering taxonomy

SOURCES rtment of Education/NCES. HEGIS Earned Degrees Surveys. 1981-85. and IPEDS Completion Surveys, 1987-91. tabu by National Science Foundation/SRS.

Appendix table 5-40. Bachelor's degrees awarded to Hispanic men by institutions in Puerto Rico, by field: 1981–1991, selected years

Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	1,810	1,539	1,648	1,726	1,647	1,561
Engineering[1]	354	396	539	629	596	529
Science	1,456	1,143	1,109	1,097	1,051	1,032
Natural sciences	663	644	730	671	626	612
Physical science	123	132	98	91	90	70
Earth science	0	0	0	0	0	0
Mathematical science	48	41	30	39	47	50
Computer science	77	98	172	197	143	170
Biological science	304	316	377	322	302	293
Agricultural science	111	57	53	22	44	29
Social sciences[2]	793	499	379	426	425	420
Social science	651	389	310	320	322	310
Psychology	142	110	69	106	103	110
Non-S&E	2,483	2,207	2,454	2,647	2,612	3,008
Grand total	4,293	3,746	4,102	4,373	4,259	4,569
Degrees from institutions in Puerto Rico as a percentage of total awarded to Hispanic men:						
Total science and engineering	25.1	20.8	21.3	21.3	19.6	17.9
Engineering[1]	21.4	16.9	20.0	23.6	21.6	19.6
Science	26.2	22.6	22.0	20.2	18.7	17.1
Natural sciences	31.6	27.1	29.0	27.6	26.9	24.9
Physical science	29.3	29.9	26.0	25.1	28.9	22.0
Earth science	.0	.0	.0	.0	.0	.0
Mathematical science	29.8	21.7	15.3	17.4	18.9	19.3
Computer science	28.5	16.8	22.5	26.3	21.4	23.0
Biological science	31.9	31.7	37.0	33.4	31.6	28.8
Agricultural science	38.0	33.3	33.3	16.8	30.6	23.4
Social sciences[2]	22.9	18.7	15.0	14.2	12.9	11.7
Social science	23.0	18.3	15.4	13.5	12.3	10.9
Psychology	22.5	20.3	13.5	16.7	15.0	14.5
Non-S&E	31.5	25.2	27.6	27.4	25.4	25.9
Grand total	28.4	23.2	24.7	24.3	22.8	22.0

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

NOTES: Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Data for 1981 include engineering and engineering technology. Data for all other years report engineering only.
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-41. Bachelor's degrees awarded to Hispanic women by institutions in Puerto Rico, by field: 1981–1991, selected years

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Field	1981	1985	1987	1989	1990	1991
Degrees awarded:						
Total science and engineering (S&E)	2,107	1,888	1,783	1,733	1,815	1,802
Engineering[1]	33	52	140	130	148	162
Science	2,074	1,836	1,643	1,603	1,667	1,640
Natural sciences	699	798	826	808	821	834
Physical science	89	112	75	93	94	84
Earth science	0	0	0	0	0	0
Mathematical science	42	37	28	30	22	58
Computer science	34	121	165	129	118	157
Biological science	503	512	539	536	560	504
Agricultural science	31	16	19	20	27	31
Social sciences[2]	1,375	1,038	817	795	846	806
Social science	1,009	745	537	476	534	487
Psychology	366	293	280	319	312	319
Non-S&E	4,933	4,879	6,051	6,096	6,085	6,139
Grand total	7,040	6,767	7,834	7,829	7,900	7,941
Degrees from institutions in Puerto Rico as a percentage of total awarded to Hispanic women:						
Total science and engineering	35.8	31.5	29.2	25.8	24.9	21.8
Engineering[1]	20.1	13.9	26.7	24.6	27.5	26.9
Science	36.2	32.7	29.4	25.9	24.7	21.4
Natural sciences	45.1	40.3	38.5	40.7	40.5	37.1
Physical science	45.2	51.1	36.1	46.3	44.5	39.1
Earth science	.0	.0	.0	.0	.0	.0
Mathematical science	36.8	25.3	22.4	20.1	13.4	26.2
Computer science	23.8	26.1	27.1	29.0	28.4	32.9
Biological science	50.4	47.8	47.8	47.6	48.1	40.5
Agricultural science	31.6	20.3	25.7	30.8	36.5	34.8
Social sciences[2]	32.9	28.6	23.7	19.0	17.9	14.8
Social science	33.7	30.5	23.9	17.8	17.7	14.2
Psychology	31.0	24.6	23.5	21.0	18.2	16.0
Non-S&E	40.5	34.2	39.2	37.1	34.0	31.4
Grand total	39.0	33.4	36.3	33.5	31.4	28.1

[1] Engineering includes degrees in engineering technology. Racial/ethnic data for engineering and engineering technology separately are available for 1985-1991 only.

[2] In 1981, social sciences included the specialties of "Afro-American black cultural studies" and "American Indian studies."

NOTES Data on race/ethnicity were collected biennially from 1981 through 1989 and annually thereafter, but data for 1983 were not released by the National Center for Education Statistics.
Data on race/ethnicity of degree recipients are collected on broad fields of study only; therefore, these data could not be adjusted to the exact field taxonomies used by the National Science Foundation.
Racial/ethnic categories are as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident aliens who have been admitted for permanent residency).
Data for 1981 include engineering and engineering technology. Data for all other years report engineering only.
Non-S&E includes various health fields not part of the National Science Foundation science and engineering taxonomy

SOURCES: U.S. Department of Education/NCES, HEGIS Earned Degrees Surveys, 1981-85, and IPEDS Completion Surveys, 1987-91, tabulations by National Science Foundation/SRS.

Appendix table 5-42. Science and engineering bachelor's degrees awarded to black men by leading institutions: 1991

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	Institution		Number of degrees
Science			
	Total, all institutions		6,826
1	Howard University	(DC)	120
2	Morehouse College	(GA)	119
3	Hampton University	(VA)	84
4	University of California-Los Angeles	(CA)	74
5	University of the District of Columbia	(DC)	72
6	Southern University and A & M Col at Baton Rouge	(LA)	70
6	University of Maryland, College Park Campus	(MD)	70
7	University of California-Berkeley	(CA)	69
8	Rutgers University New Brunswick	(NJ)	67
9	North Carolina Central University	(NC)	61
10	Jackson State University	(MS)	59
11	Morgan State University	(MD)	58
12	CUNY City College	(NY)	57
13	Tuskegee University	(AL)	55
14	University of Virginia, main campus	(VA)	53
15	North Carolina Agricultural and Technical State Univ	(NC)	50
16	Grambling State University	(LA)	49
17	Florida Agricultural and Mechanical University	(FL)	47
18	Wayne State University	(MI)	46
19	Harvard University	(MA)	44
20	Saint Augustine's College	(NC)	43
21	Stanford University	(CA)	42
22	University of North Carolina at Chapel Hill	(NC)	41
23	Prairie View A & M University	(TX)	40
24	CUNY Hunter College	(NY)	38
24	University of South Carolina at Columbia	(SC)	38
	All other institutions		5,260
Engineering			
	Total, all institutions		2,406
1	Southern University and A & M Col at Baton Rouge	(LA)	75
2	Prairie View A & M University	(TX)	67
3	North Carolina Agricultural and Technical State Univ	(NC)	63
4	Tuskegee University	(AL)	61
5	Embry-Riddle Aeronautical University	(FL)	53
6	Howard University	(DC)	51
7	CUNY City College	(NY)	49
8	Georgia Institute of Technology, main campus	(GA)	44
9	Southern Illinois University-Carbondale	(IL)	38
9	North Carolina State University at Raleigh	(NC)	38
10	Pratt Institute-main campus	(NY)	35
10	Norfolk State University	(VA)	35
11	New Jersey Institute of Technology	(NJ)	32
12	Massachusetts Institute of Technology	(MA)	30
13	University of the District of Columbia	(DC)	29
13	South Carolina State College	(SC)	29
13	Tennessee State University	(TN)	29
14	De Vry Institute of Technology	(IL)	25
14	Jackson State University	(MS)	25
15	Southern College of Technology	(GA)	24
15	Wentworth Institute of Technology	(MA)	24
16	University of Illinois-Urbana Campus	(IL)	23
16	Morgan State University	(MD)	23
17	University of Maryland, College Park Campus	(MD)	22
18	Mississippi State University	(MS)	21
18	Texas Southern University	(TX)	21
	All other institutions		1,440

SOURCE U S Department of Education NCES IPEDS Completions Survey, 1990-91 and Consolidated Survey, 1991

Appendix table 5-43. Science and engineering bachelor's degrees awarded to black women by leading institutions: 1991

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Institution	Number of degrees
Science	
Total, all institutions	10,569
1 Spelman College (GA)	254
2 Hampton University (VA)	196
3 Howard University (DC)	165
4 University of California-Los Angeles (CA)	148
5 Rutgers University New Brunswick (NJ)	116
6 North Carolina Central University (NC)	115
6 Grambling State University (LA)	115
7 Southern University and A & M Col at Baton Rouge (LA)	114
8 Wayne State University (MI)	103
9 Florida Agricultural and Mechanical University (FL)	93
10 CUNY Hunter College (NY)	85
11 University of South Carolina at Columbia (SC)	82
12 Xavier University (LA)	80
13 Tuskegee University (AL)	78
14 University of Maryland, College Park Campus (MD)	75
14 Morgan State University (MD)	75
15 University of California-Berkeley (CA)	74
16 Norfolk State University (VA)	71
16 Fisk University (TN)	71
17 University of the District of Columbia (DC)	70
18 Jackson State University (MS)	69
19 South Carolina State College (SC)	68
20 North Carolina Agricultural and Technical State Univ (NC)	65
21 CUNY City College (NY)	62
22 Chicago State University (IL)	61
All other institutions	8,074
Engineering	
Total, all institutions	948
1 North Carolina Agricultural and Technical State Univ (NC)	52
2 Prairie View A & M University (TX)	36
3 Howard University (DC)	35
4 Southern University and A & M Col at Baton Rouge (LA)	34
5 Tuskegee University (AL)	31
5 North Carolina State University at Raleigh (NC)	31
6 Georgia Institute of Technology, main campus (GA)	26
7 Tennessee State University (TN)	21
7 Michigan State University (MI)	21
8 Morgan State University (MD)	17
9 Southern College of Technology (GA)	16
10 Northwestern University (IL)	12
11 Memphis State University (TN)	11
11 Norfolk State University (VA)	10
11 Massachusetts Institute of Technology (MA)	10
11 Mississippi State University (MS)	10
11 University of Alabama (AL)	10
11 Drexel University (PA)	10
12 De Vry Institute of Technology (GA)	9
12 Purdue University, main campus (IN)	9
12 Stanford University (CA)	9
12 Clemson University (SC)	9
12 University of South Florida (FL)	9
12 University of Delaware (DE)	9
12 University of California Berkeley (CA)	9
12 Lawrence Institute of Technology (MI)	9
All other institutions	483

SOURCE U S Department of Education/NCES IPEDS Completions Survey, 1990-91 and Consolidated Survey, 1991

Appendix table 5-44. Science and engineering bachelor's degrees awarded to Hispanic men by leading institutions: 1991

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	Institution		Number of degrees
Science			
	Total all institutions		5,742
1	University of Puerto Rico Rio Piedras Campus	(PR)	234
2	University of California-Los Angeles	(CA)	165
3	Florida International University	(FL)	149
4	University of Texas at Austin	(TX)	140
5	Inter American University, Metro Campus	(PR)	121
6	University of Puerto Rico, Mayaguez	(PR)	120
7	Inter American University, San German Campus	(PR)	109
8	University of California-Berkeley	(CA)	106
9	Texas A & M University	(TX)	69
10	University of Texas at San Antonio	(TX)	67
11	University of Puerto Rico, Cayey University College	(PR)	65
12	University of California-San Diego	(CA)	64
12	The University of Texas-Pan American at Edinburg	(TX)	64
13	Rutgers University New Brunswick	(NJ)	57
14	University of California-Irvine	(CA)	56
15	University of Florida	(FL)	53
15	University of New Mexico, main campus	(NM)	53
16	University of Miami	(FL)	52
17	California State University-Fresno	(CA)	50
18	San Diego State University	(CA)	49
18	Saint Mary's University	(TX)	49
18	Inter American Univ Bayamon University College	(PR)	49
19	Arizona State University	(AZ)	48
20	California State University-Northridge	(CA)	47
20	Universidad Del Turabo	(PR)	47
	All other institutions		3,659
Engineering			
	Total, all institutions		2,676
1	University of Puerto Rico, Mayaguez	(PR)	394
2	Texas A & M University	(TX)	84
3	Florida International University	(FL)	80
4	California State Polytechnic University, Pomona	(CA)	69
5	New Mexico State University main campus	(NM)	62
6	University of Texas at El Paso	(TX)	62
7	University of Puerto Rico, Bayamon Tech Univ Col	(PR)	60
8	University of Florida	(FL)	53
9	University of Texas at Austin	(TX)	51
10	Inter American University, Metro Campus	(PR)	44
11	New Jersey Institute of Technology	(NJ)	38
12	California Polytechnic State University-San Luis Obispo	(CA)	36
12	University of New Mexico, main campus	(NM)	36
12	Texas A & I University	(TX)	36
13	California State University-Northridge	(CA)	33
13	Massachusetts Institute of Technology	(MA)	33
14	ITT Technical Institute of West Covina	(CA)	32
15	Embry-Riddle Aeronautical University	(FL)	31
15	University of Miami	(FL)	31
15	De Vry Institute of Technology	(IL)	31
16	California State University-Long Beach	(CA)	29
16	San Diego State University	(CA)	29
17	Georgia Institute of Technology, main campus	(GA)	28
18	California State University-Los Angeles	(CA)	27
18	University of California-Los Angeles	(CA)	27
	All other institutions		1,240

SOURCE U S Department of Education NCES IPEDS Completions Survey, 1990-91 and Consolidated Survey 1991

Appendix table 5-45. Science and engineering bachelor's degrees awarded to Hispanic women by leading institutions: 1991

Institution			Number of degrees
Science:			
Total, all institutions			6,753
1	University of Puerto Rico, Rio Piedras Campus	(PR)	393
2	University of California-Los Angeles	(CA)	206
3	Florida International University	(FL)	181
4	University of Puerto Rico, Mayaguez	(PR)	158
5	Inter American University, Metro Campus	(PR)	154
6	Inter American University, San German Campus	(PR)	152
7	University of Texas at Austin	(TX)	123
7	University of Puerto Rico, Cayey University College	(PR)	123
8	Universidad Del Turabo	(PR)	115
9	University of California-Berkeley	(CA)	108
10	Inter American University, Bayamon University College	(PR)	97
11	CUNY Hunter College	(NY)	93
12	CUNY Lehman College	(NY)	80
13	Texas A & M University	(TX)	75
14	Rutgers University New Brunswick	(NJ)	74
15	University of Texas at San Antonio	(TX)	71
16	University of California-Santa Barbara	(CA)	66
17	University of Texas-Pan American at Edinburg	(TX)	57
18	University of California-San Diego	(CA)	54
18	University of Miami	(FL)	54
19	University of California-Irvine	(CA)	52
20	Laredo State University	(TX)	51
21	University of New Mexico, main campus	(NM)	50
21	New York University	(NY)	50
22	University of Arizona	(AZ)	49
	All other institutions		4,067
Engineering			
Total, all institutions			584
1	University of Puerto Rico, Mayaguez	(PR)	146
2	Florida International University	(FL)	15
2	New Mexico State University, main campus	(NM)	15
3	University of Texas at El Paso	(TX)	14
4	Texas A & M University	(TX)	12
5	California State Polytechnic University, Pomona	(CA)	11
5	University of Texas at Austin	(TX)	11
5	California State University-Northridge	(CA)	11
5	Massachusetts Institute of Technology	(MA)	11
6	University of Puerto Rico, Arecibo Campus	(PR)	10
7	Stevens Institute of Technology	(NJ)	9
8	University of Miami	(FL)	7
8	University of Illinois-Urbana Campus	(IL)	7
8	Cornell University-Endowed Colleges	(NY)	7
9	New Jersey Institute of Technology	(NJ)	6
9	University of California-Los Angeles	(CA)	6
9	Arizona State University	(AZ)	6
9	University of California-Davis	(CA)	6
9	University of Illinois at Chicago	(IL)	6
9	Boston University	(MA)	6
10	University of Puerto Rico, Bayamon Tech Univ Col	(PR)	5
10	University of Florida	(FL)	5
10	California Polytechnic State Univ-San Luis Obispo	(CA)	5
10	University of New Mexico, main campus	(NM)	5
10	California State University-Long Beach	(CA)	5
10	Georgia Institute of Technology, main campus	(GA)	5
10	CUNY City College	(NY)	5
10	Polytechnic University	(NY)	5
10	University of Arizona	(AZ)	5
10	University of California-Santa Barbara	(CA)	5
10	San Jose State University	(CA)	5
10	University of Maryland, College Park Campus	(MD)	5
	All other institutions		202

SOURCE: U.S. Department of Education/NCES, IPEDS Completions Survey, 1990-91 and Consolidated Survey, 1991

Appendix table 5-46. Science and engineering bachelor's degrees awarded to Asian men by leading institutions: 1991

Page 1 of 1

	Institution		Number of degrees
Science.			
	Total, all institutions		6,832
1	University of California-Los Angeles	(CA)	298
2	University of California-Irvine	(CA)	290
3	University of California-Berkeley	(CA)	263
4	University of Hawaii at Manoa	(HI)	222
5	University of California-Davis	(CA)	119
5	Rutgers University New Brunswick	(NJ)	119
6	University of Washington	(WA)	117
7	University of California-San Diego	(CA)	113
8	University of Illinois-Urbana Campus	(IL)	107
9	SUNY at Stony Brook	(NY)	93
10	University of Michigan-Ann Arbor	(MI)	91
11	University of Texas at Austin	(TX)	90
12	Harvard University	(MA)	88
13	San Francisco State University	(CA)	86
14	University of Maryland, College Park Campus	(MD)	85
15	New York University	(NY)	83
16	Stanford University	(CA)	80
17	Cornell University-Endowed Colleges	(NY)	78
18	California State Polytechnic University, Pomona	(CA)	66
19	University of Chicago	(IL)	62
20	Northwestern University	(IL)	59
20	University of Pennsylvania	(PA)	59
21	California State University-Long Beach	(CA)	53
21	University of Illinois at Chicago	(IL)	53
22	University of California-Riverside	(CA)	52
	All other institutions		4,006
Engineering.			
	Total, all institutions		5,658
1	University of California-Berkeley	(CA)	211
2	California State Polytechnic University, Pomona	(CA)	210
3	University of Washington	(WA)	156
4	University of California-Los Angeles	(CA)	123
5	California State University-Long Beach	(CA)	122
6	San Jose State University	(CA)	118
7	University of Hawaii at Manoa	(HI)	108
8	University of Maryland, College Park Campus	(MD)	102
9	University of Illinois, Urbana Campus	(IL)	101
10	California Polytechnic State Univ-San Luis Obispo	(CA)	99
11	University of California-San Diego	(CA)	91
12	University of California-Davis	(CA)	89
13	University of Illinois at Chicago	(IL)	88
14	California State University-Sacramento	(CA)	80
14	University of California-Irvine	(CA)	80
15	Cornell University-Endowed Colleges	(NY)	76
15	Polytechnic University	(NY)	76
16	CUNY City College	(NY)	68
17	University of Texas at Austin	(TX)	65
18	University of Texas at Arlington	(TX)	62
19	Georgia Institute of Technology, main campus	(GA)	60
20	Virginia Polytechnic and State University	(VA)	57
21	California State University-Fullerton	(CA)	55
22	San Diego State University	(CA)	53
22	University of Michigan-Ann Arbor	(MI)	53
22	Rutgers University New Brunswick	(NJ)	53
	All other institutions		3,202

SOURCE: U.S. Department of Education/NCES, IPEDS Completions Survey, 1990-91, and Consolidated Survey, 1991

Appendix table 5-47. Science and engineering bachelor's degrees awarded to Asian women by leading institutions: 1991

Page 1 of 1

	Institution		Number of degrees
Science:			
	Total, all institutions		7,108
1	University of California-Los Angeles	(CA)	390
2	University of California-Berkeley	(CA)	346
3	University of California-Irvine	(CA)	315
4	University of Hawaii at Manoa	(HI)	243
5	University of California-Davis	(CA)	180
6	Rutgers University New Brunswick	(NJ)	138
7	University of Washington	(WA)	136
8	University of California-San Diego	(CA)	119
9	University of Illinois-Urbana Campus	(IL)	114
10	University of Michigan-Ann Arbor	(MI)	89
11	SUNY at Stony Brook	(NY)	86
12	San Francisco State University	(CA)	77
12	University of Maryland, College Park Campus	(MD)	77
13	New York University	(NY)	73
14	University of Texas at Austin	(TX)	68
15	Stanford University	(CA)	66
16	California State University-Fullerton	(CA)	63
17	Boston University	(MA)	62
17	Radcliffe College	(MA)	62
18	University of Illinois at Chicago	(IL)	60
19	University of California-Santa Cruz	(CA)	59
20	California State University-Hayward	(CA)	58
21	University of Pennsylvania	(PA)	57
22	George Mason University	(VA)	56
23	Northwestern University	(IL)	55
23	University of California-Santa Barbara	(CA)	55
	All other institutions		4,004
Engineering:			
	Total, all institutions		1,311
1	University of California-Berkeley	(CA)	67
2	California State Polytechnic University, Pomona	(CA)	45
2	University of Washington	(WA)	45
3	University of Maryland College Park Campus	(MD)	39
4	University of Illinois-Urbana Campus	(IL)	37
5	University of California-Davis	(CA)	34
5	Massachusetts Institute of Technology	(MA)	34
6	University of California-Los Angeles	(CA)	30
7	San Jose State University	(CA)	27
7	University of Hawaii at Manoa	(HI)	27
8	University of Michigan-Ann Arbor	(MI)	26
9	Cornell University-Endowed Colleges	(NY)	25
10	Columbia University in the City of New York	(NY)	24
11	California State University-Northridge	(CA)	21
11	Boston University	(MA)	21
12	University of Illinois at Chicago	(IL)	20
13	California Polytechnic State Univ-San Luis Obispo	(CA)	19
13	Virginia Polytechnic and State University	(VA)	19
14	University of California-San Diego	(CA)	18
15	Polytechnic University	(NY)	17
15	Rutgers University New Brunswick	(NJ)	17
16	California State University-Long Beach	(CA)	15
16	Drexel University	(PA)	15
17	CUNY City College	(NY)	14
17	University of Texas at Austin	(TX)	14
17	University of Texas at Arlington	(TX)	14
17	Georgia Institute of Technology, main campus	(GA)	14
17	Northwestern University	(IL)	14
	All other institutions		599

SOURCE U S Department of Education/NCES. IPEDS Comp[illegible]ions Survey, 1990-91, and Consolidated Survey, 1991

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Appendix table 5-48. Science and engineering bachelor's degrees awarded to American indian/Alaskan Native men by leading institutions: 1991

Page 1 of 2

	Institution		Number of degrees
Science.			
	Total. all institutions		531
1	Pembroke State University	(NC)	18
2	Southeastern Oklahoma State University	(OK)	13
3	University of California-Los Angeles	(CA)	11
3	University of Oklahoma. Norman Campus	(OK)	11
3	University of Texas at Arlington	(TX)	11
4	University of California-Santa Barbara	(CA)	9
4	Oregon State University	(OR)	8
5	California State University-Northridge	(CA)	7
5	California State University-Sacramento	(CA)	7
5	University of California-Berkeley	(CA)	7
5	Northeastern State University	(OK)	7
5	Oklahoma State University. main campus	(OK)	7
6	University of California-Santa Cruz	(CA)	6
6	San Diego State University	(CA)	6
6	Wayne State University	(MI)	6
6	Dartmouth College	(NH)	6
7	Northern Arizona University	(AZ)	5
7	California Polytechnic State Univ-San Luis Obispo	(CA)	5
7	University of Utah	(UT)	5
7	Washington State University	(WA)	5
7	University of Washington	(WA)	5
8	University of Alaska. Fairbanks	(AK)	4
8	University of Arkansas-Fayetteville	(AR)	4
8	California State University-Chico	(CA)	4
8	California State University-Fullerton	(CA)	4
8	Humboldt State University	(CA)	4
8	University of Michigan-Ann Arbor	(MI)	4
8	University of New Mexico. main campus	(NM)	4
8	University of North Carolina at Chapel Hill	(NC)	4
8	East Central University	(OK)	4
8	Trinity University	(TX)	4
8	Central Washington University	(WA)	4
8	University of Wisconsin-Madison	(WI)	4
	All other institutions		318

See explanatory information and SOURCE at end of table

Appendix table 5-48. Science and engineering bachelor's degrees awarded to American Indian/Alaskan Native men by leading institutions: 1991

Page 2 of 2

	Institution		Number of degrees
Engineering:			
	Total all institutions		197
1	Embry-Riddle Aeronautical University	(FL)	11
2	Northern Arizona University	(AZ)	10
3	Southeastern Oklahoma State University	(OK)	8
4	University of New Mexico, main campus	(NM)	7
5	California Polytechnic State Univ-San Luis Obispo	(CA)	5
5	New Mexico State University, main campus	(NM)	5
5	Cleveland State University	(OH)	5
5	University of Washington	(WA)	5
6	University of Illinois-Urbana Campus	(IL)	4
6	Montana State University	(MT)	4
6	East Central University	(OK)	4
6	University of Oklahoma, Norman Campus	(OK)	4
6	University of Tulsa	(OK)	4
7	University of California-Davis	(CA)	3
7	United States Coast Guard Academy	(CT)	3
7	Michigan State University	(MI)	3
7	CUNY City College	(NY)	3
7	North Dakota State University, main campus	(ND)	3
7	Northeastern State University	(OK)	3
7	Oklahoma State University, main campus	(OK)	3
7	Texas A & I University	(TX)	3
7	Stanford University	(CA)	3
8	Auburn University, main campus	(AL)	2
8	Arizona State University	(AZ)	2
8	California State Polytechnic University, Pomona	(CA)	2
8	California State University-Fresno	(CA)	2
8	California State University-Long Beach	(CA)	2
8	University of California-Berkeley	(CA)	2
8	San Diego State University	(CA)	2
8	University of Colorado at Boulder	(CO)	2
8	Colorado School of Mines	(CO)	2
8	Georgia Institute of Technology, main campus	(GA)	2
8	Pittsburg State University	(KS)	2
8	United States Naval Academy	(MD)	2
8	Massachusetts Institute of Technology	(MA)	2
8	Central Michigan University	(MI)	2
8	Lake Superior State University	(MI)	2
8	Lawrence Institute of Technology	(MI)	2
8	Northern Montana College	(MT)	2
8	Clarkson University	(NY)	2
8	Oregon State University	(OR)	2
8	Carnegie Mellon University	(PA)	2
	All other institutions		54

SOURCE U S Department of Education/NCES IPEDS Completions Survey 1990-91, and Consolidated Survey, 1991

Appendix table 5-49. Science and engineering bachelor's degrees awarded to American Indian/Alaskan Native women by leading institutions: 1991

Page 1 of 1

	Institution		Number of degrees
Science:			
	Total, all institutions		606
1	Pembroke State University	(NC)	26
2	Southeastern Oklahoma State University	(OK)	13
2	University of California-Los Angeles	(CA)	13
2	Fort Lewis College	(CO)	13
3	Northern Arizona University	(AZ)	10
3	University of Washington	(WA)	10
4	University of California-Berkeley	(CA)	9
4	University of New Mexico, main campus	(NM)	9
5	Northeastern State University	(OK)	8
5	University of Arizona	(AZ)	8
6	University of California-Santa Barbara	(CA)	7
6	Oklahoma State University, main campus	(OK)	7
6	University of California-Santa Cruz	(CA)	7
6	California State University-Chico	(CA)	7
7	Dartmouth College	(NH)	6
7	University of Texas at Austin	(TX)	6
7	University of Minnesota, Twin Cities	(MN)	6
7	Cameron University	(OK)	6
8	University of Oklahoma, Norman Campus	(OK)	5
8	California State University-Sacramento	(CA)	5
8	San Diego State University	(CA)	5
8	California State University-Fullerton	(CA)	5
8	California State University-Hayward	(CA)	5
8	San Francisco State University	(CA)	5
8	California State University-Fresno	(CA)	5
	All other institutions		400
Engineering:			
	Total, all institutions		33
1	Northern Arizona University	(AZ)	2
1	University of Oklahoma, Norman Campus	(OK)	2
1	Georgia Institute of Technology main campus	(GA)	2
1	University of Michigan-Dearborn	(MI)	2
2	University of New Mexico, main campus	(NM)	1
2	New Mexico State University, main campus	(NM)	1
2	University of Washington	(WA)	1
2	CUNY City College	(NY)	1
2	Northeastern State University	(OK)	1
2	Oklahoma State University main campus	(OK)	1
2	Stanford University	(CA)	1
2	California State University-Fresno	(CA)	1
2	California State University-Long Beach	(CA)	1
2	Carnegie Mellon University	(PA)	1
2	California State University-Sacramento	(CA)	1
2	University of Maryland, College Park Campus	(MD)	1
2	Rensselaer Polytechnic Institute	(NY)	1
2	Cameron University	(OK)	1
2	University of Houston-University Park	(TX)	1
2	University of Alabama	(AL)	1
2	University of South Florida	(FL)	1
2	University of Notre Dame	(IN)	1
2	University of Nevada-Las Vegas	(NV)	1
2	Dartmouth College	(NH)	1
2	Case Western Reserve University	(OH)	1
2	Prairie View A & M University	(TX)	1
2	Brigham Young University	(UT)	1
2	University of Utah	(UT)	1
2	Washington State University	(WA)	1
	All other institutions		0

SOURCE: U S Department of Education/NCES IPEDS Completions Survey 1990-91, and Consolidated Survey, 1991

Appendix table 5-50. Participation rate of 22-year-olds in first university degrees in the natural sciences and engineering (NS&E), by sex and country: most current year

Page 1 of 1

Sex and country	All first univ degrees	Natural sciences[1]	Social sciences	Engineering[2]	22-year-olds: Total number	22-year-olds: Percentage with first univ degree	22-year-olds: Percentage with NS&E degree[3]
Men							
Asia							
Japan[4]	290.253	20.221	138.708	78.705	915.800	31.7	10.8
South Korea	104.627	15.953	[illegible]579	26.763	447.600	23.4	9.5
Taiwan	23.556	4.723	1.167	8.110	190.800	12.4	6.7
Europe							
Austria	5.996	1.071	301	978	62.272	9.6	3.3
Bulgaria	10.296	1.047	201	3.337	61.046	16.9	7.2
France	55.637	10.416	3.925	13.394	435.915	12.8	5.5
Germany[5]	111.894	18.475	20.829	34.634	660.000	16.1	7.6
Greece	8.600	1.731	969	1.547	78.932	10.9	4.2
Italy	46.519	6.779	10.447	7.278	465.783	10.0	3.0
Poland	24.525	3.309	752	6.100	265.441	9.2	3.5
Spain	51.208	7.390	1.495	5.996	338.000	15.2	4.0
Sweden	7.203	897	262	2.018	60.871	11.8	4.8
Switzerland	5.893	1.088	429	751	47.859	11.5	3.6
United Kingdom[6]	46.888	12.963	6.536	8.647	437.232	10.7	4.9
North America							
Canada	56.157	8.235	7.929	7.738	205.200	27.4	7.3
United States	508.952	62.341	74.900	68.851	1.896.959	26.8	6.9
Women							
Asia							
Japan[4]	109.750	4.932	18.519	2.650	871.600	12.6	9
South Korea	61.289	7.242	2.632	1.308	411.400	14.9	2.1
Taiwan	19.396	1.810	2.007	840	180.200	10.8	1.5
Europe							
Austria	4.673	481	457	70	59.590	7.8	9
Bulgaria	13.590	1.341	259	3.211	57.259	23.7	7.8
France	48.200	5.484	3.419	3.195	417.947	11.5	2.1
Germany[5]	69.751	11.425	16.297	4.218	627.400	10.6	2.4
Greece	9.832	1.228	998	450	73.717	13.3	2.3
Italy	49.706	6.369	8.864	622	450.470	11.0	1.6
Poland	30.835	3.551	1.329	1.340	252.900	12.2	1.9
Spain	70.691	5.912	4.024	648	322.400	21.9	2.0
Sweden	9.859	595	938	529	57.994	17.0	1.9
Switzerland	3.272	376	495	26	45.940	7.1	9
United Kingdom	38.005	7.368	6.855	1.398	416.872	9.1	2.1
North America							
Canada	74.007	5.272	13.811	929	198.200	34.2	3.1
United States	599.045	50.542	95.205	11.630	1.829.155	32.8	3.4

[1] Includes degrees in mathematics and computer sciences and agricultural sciences
[2] Includes degrees in engineering technology
[3] Social science degrees not included
[4] Japanese social sciences data are adjusted to delete business administration
[5] Average age for degree in Germany is 27 years
[6] United Kingdom data do not include open universities

NOTE Data for Bulgaria, Germany, Italy, Poland, Switzerland, and the United Kingdom are from 1989. Data for Austria, France, Greece, Japan, Sweden, and the United States are from 1991. All other data are from 1990.

SOURCE Johnson, Jean M. 1994. International comparisons of women in higher education in science and engineering. Paper presented at the annual conference of the Comparative and International Education Society.

Appendix table 5-51. Science and engineering (S&E) degrees as a percentage of total first university degrees, by sex and country: most current year

Sex and country	Total S&E	Natural sciences[1]	Social sciences	Engineering[2]	Non-S&E
Men:					
Asia					
Japan[3]	50	7	16	27	50
Korea	48	15	7	26	52
Taiwan	59	20	5	34	41
Europe					
Austria	38	17	5	16	62
Bulgaria	45	3	2	32	55
France	50	19	7	24	50
Germany[4]	66	17	17	31	35
Greece	49	20	11	18	51
Italy	53	15	22	16	47
Poland	41	13	3	25	59
Spain	29	14	3	12	71
Sweden	44	12	4	28	56
Switzerland	38	18	7	13	62
United Kingdom[5]	60	28	14	18	40
North America					
Canada	44	15	17	12	56
United States	41	12	15	14	59
Women					
Asia					
Japan[3]	17	4	11	2	83
Korea	18	12	4	2	82
Taiwan	23	9	10	4	77
Europe					
Austria	22	10	10	1	78
Bulgaria	35	10	2	24	65
France	25	11	7	7	75
Germany[4]	46	16	22	6	54
Greece	27	12	10	5	73
Italy	32	13	18	1	68
Poland	20	12	4	4	80
Spain	15	8	6	1	85
Sweden	21	6	10	5	79
Switzerland	27	11	15	1	73
United Kingdom[5]	41	19	18	4	59
North America					
Canada	19	7	11	1	81
United States	25	7	16	2	75

[1] Includes degrees in mathematical and computer sciences and agricultural sciences

[2] Includes degrees in engineering technology

[3] Japanese social sciences data are adjusted to delete business administration

[4] Average age for degree in Germany is 27.

United Kingdom data do not include open universities

NOTE Data for Bulgaria, Germany, Italy, Poland, Switzerland, and the United Kingdom are from 1992. Data for Austria France, Greece, Japan, Sweden, and the United States from 1991 All other data are from 1990

SOURCE Johnson, Jean M 1994 International comparisons of women in higher education in science and engineering Paper presented at the annual conference of the Comparative and International Education Society

Appendix table 5-52. Percentage of first university degrees in science and engineering obtained by men and women, by country: most current year

Page 1 of 1

Sex and country	Natural sciences	Agricultural sciences	Math/ computer sciences	Social sciences	Engineering[1]
Men					
Asia:					
Japan[2]	82	80	77	78	97
Korea	62	80	64	74	95
Taiwan	75	59	76	37	91
Europe:					
Austria	65	67	76	40	93
Bulgaria	30	60	27	44	51
France	66	NA	NA	53	81
Germany	60	53	75	56	89
Greece	57	61	59	49	78
Italy	46	71	49	54	92
Poland	29	61	37	36	82
Spain	50	63	60	27	90
Sweden	46	68	70	22	79
Switzerland	73	62	86	46	97
United Kingdom[3]	61	51	74	49	86
North America:					
Canada	56	55	70	40	88
United States	56	69	64	44	85
Women					
Asia:					
Japan[2]	18	20	23	22	3
Korea	38	20	36	26	5
Taiwan	25	41	24	63	9
Europe:					
Austria	35	33	24	60	7
Bulgaria	70	40	73	56	49
France	35	NA	NA	47	19
Germany	40	47	25	44	11
Greece	43	39	41	51	23
Italy	55	29	51	46	8
Poland	71	39	63	64	18
Spain	50	37	40	73	10
Sweden	54	42	30	78	21
Switzerland	27	38	15	54	3
United Kingdom[3]	39	49	26	51	14
North America:					
Canada	44	45	30	60	12
United States	44	31	36	56	15

[1] Includes degrees in engineering technology

[2] Japanese social sciences data are adjusted to delete business administration

[3] United Kingdom data do not include open universities.

NOTE: Data for Bulgaria, Germany, Italy, Poland, Switzerland, and the United Kingdom are from 1992. Data for Austria, France, Greece, Japan, Sweden, and the United States are from 1991. All other data are from 1990.

KEY: NA = not available

SOURCE: Johnson, Jean M. 1994. International comparisons of women in higher education in science and engineering. Paper presented at the annual conference of the Comparative and International Education Society.

Appendix table 6-1. Graduate students in all institutions, by sex and major area of study: fall 1981–1992

Page 1 of 1

Sex and year	Total, all fields	Science & engineering	Science fields	Engineering fields	Total, other fields
Total:					
1981	1,349,575	332,827	253,198	79,629	1,016,748
1982	1,329,644	339,598	255,828	83,770	990,046
1983	1,347,973	347,910	256,735	91,175	1,000,063
1984	1,353,554	350,402	257,508	92,894	1,003,152
1985	1,384,862	359,185	262,971	96,214	1,025,677
1986	1,444,369	368,706	266,571	102,135	1,075,663
1987	1,461,239	373,930	269,826	104,104	1,087,309
1988	1,481,582	375,847	272,710	103,137	1,105,735
1989	1,527,990	383,448	279,298	104,150	1,144,542
1990	1,583,389	398,146	290,418	107,728	1,185,243
1991	1,648,952	413,566	300,266	113,300	1,235,386
1992	NA	431,613	313,566	118,047	NA
Men:					
1981	676,741	232,685	160,805	71,880	440,056
1982	672,635	235,763	160,782	74,981	436,872
1983	680,455	241,093	159,723	81,370	439,362
1984	675,007	242,612	160,079	82,533	432,395
1985	679,910	247,975	162,937	85,038	431,935
1986	696,498	254,039	164,373	89,666	442,459
1987	696,404	256,476	165,370	91,106	439,928
1988	700,919	254,382	164,461	89,921	446,537
1989	712,435	257,161	166,671	90,490	455,274
1990	736,142	263,858	170,848	93,010	472,284
1991	764,426	272,243	174,615	97,628	492,183
1992	NA	281,202	180,313	100,889	NA
Women:					
1981	672,834	100,142	92,323	7,749	572,692
1982	657,009	103,835	95,046	8,789	553,174
1983	667,518	106,817	97,012	9,805	560,701
1984	678,547	107,790	97,429	10,361	570,757
1985	704,952	111,210	100,034	11,176	593,742
1986	747,871	114,667	102,198	12,469	633,204
1987	764,835	117,454	104,456	12,998	647,381
1988	780,663	121,465	108,249	13,216	659,198
1989	815,555	126,287	112,627	13,660	689,268
1990	847,247	134,288	119,570	14,718	712,959
1991	884,526	141,323	125,651	15,672	743,203
1992	NA	150,411	133,253	17,158	NA

KEY: NA = not available

SOURCES: U.S. Department of Education/NCES, Opening Fall Enrollment Survey; National Science Foundation/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-2. Science and engineering graduate students in all institutions, by sex and field: fall 1982–1992

Page 1 of 2

Sex and year	Science and engineering total	Science: Sciences, total	Physical sciences	Earth, atmospheric, and ocean sciences	Mathematical sciences	Computer sciences	Agricultural sciences	Biological sciences	Psychology	Social sciences total	Economics	Political science	Sociology
Total enrollment													
1982	339.598	255.828	28.187	15.174	17.178	19.812	12.389	46.084	40.073	76.931	15.896	29.887	8.412
1983	347 910	256.735	29.456	15.590	17.380	23.437	12.264	45.727	40.905	71.976	15.224	28.050	8.149
1984	350.402	257.508	30 056	15.655	17.459	25.620	12.057	45.837	40.931	69.893	14.786	25.809	7.836
1985	359 185	262.971	30.981	15.591	17.591	29.602	11.364	46.201	41.173	70.468	14.698	27.012	7.620
1986	368 706	266.571	32.248	15.210	17.967	31.175	11.281	46.873	41.417	70.400	14.351	27.251	7.553
1987	373.930	269.826	32.730	14.522	18.524	31.901	10.942	46.901	42.750	71.556	14.223	27.601	7.968
1988	375.847	272.710	32.962	14.067	19.103	32.053	10.940	47.682	44.127	71.776	14.295	27.859	8.078
1989	383.448	279 298	33.619	13.830	19.308	32.320	10.979	48.970	46.003	74.269	14.419	29.291	8.415
1990	398 146	290.418	34.135	14.195	19.801	34.349	11.125	50.090	48.678	78.045	14.579	30.595	8.996
1991	413 566	300.266	34.799	14.720	19.978	34.788	11.315	51.875	51.791	81.000	15.092	31.887	9.324
1992	431 613	313 566	35 496	15.609	20.375	36.396	11.609	54.437	53.820	85.824	15.779	33.770	9.984
Men													
1982	235 763	160.782	22.768	11.393	12.100	14.366	9.381	26 861	16.976	46.937	11.971	18.616	3.939
1983	241 093	159.723	23 578	11.632	12.176	16.812	9.190	26.343	16.648	43.344	11.603	17.277	3.850
1984	242 612	160 079	23.898	11.726	12.288	18.740	8.980	26.294	16.180	41.973	11.278	16.129	3.648
1985	247 975	162.937	24.474	11.606	12.220	22.145	8.445	26.258	15.738	42.051	11.134	16.492	3.583
1986	254 039	164 373	25.385	11.215	12.492	23.423	8.391	26.360	15.432	41.675	10.842	16.512	3.454
1987	256.476	165 370	25.614	10.708	12.929	23.989	8.047	26.362	15.708	42.013	10.696	16.665	3.616
1988	254 382	164 461	25.465	10.188	13.329	23.972	7.917	26.357	15.552	41.681	10.651	16.399	3.691
1989	257.161	166.671	25.817	9 900	13.318	24.432	7.912	26.692	15.813	42.787	10.598	17.060	3.850
1990	263 858	170 648	26.053	9.997	13.601	26.180	7.865	27.008	15.963	44.181	10.615	17.409	4.009
1991	272 243	174 615	26.219	10.178	13.675	26.566	7.819	27.694	16.671	45.793	10.898	18.059	4.195
1992	281 202	180.313	26.651	10.685	13.823	27.998	7.925	28.898	16.761	47.572	11.286	18.825	4.293
Women													
1982	103.835	95 046	5.419	3.781	5.078	5.446	3.008	19.223	23.097	29.994	3.925	11.271	4.473
1983	106 817	97 012	5 878	3.958	5 204	6.625	3.074	19.384	24.257	28.632	3.621	10.773	4.299
1984	107 790	97 429	6 158	3.929	5.171	6.880	3.077	19.543	24.751	27.920	3.508	9.680	4.188
1985	111 210	100 034	6 507	3 985	5.371	7.457	2.919	19.943	25.435	28.417	3.564	10.520	4.037
1986	114 667	102.198	6.863	3.995	5.475	7 752	2.890	20.513	25.985	28.725	3 509	10.739	4 099
1987	117 454	104.456	7.116	3 814	5.595	7.912	2.895	20.539	27.042	29.543	3.527	10.936	4.352
1988	121.465	108 249	7.497	3.879	5.774	8.081	3.023	21.325	28.575	30.095	3.644	11.460	4.387
1989	126 287	112 627	7.802	3.930	5.990	7.888	3.067	22.278	30.190	31.482	3.821	12.231	4.565
1990	134 288	119 570	8.082	4.198	6.200	8.169	3.260	23.082	32.715	33.864	3.964	13.186	4.987
1991	141 323	125 651	8 580	4 542	6.303	8.222	3.496	24.181	35.120	35.207	4.194	13.828	5.129
1992	150 411	133 253	8.845	4.924	6.552	8.398	3.684	25.539	37.059	38.252	4.493	14.945	5.691

See explanatory information and SOURCE at end of table

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Appendix table 6-2. Science and engineering graduate students in all institutions, by sex and field: fall 1982-1992

Page 2 of 2

Sex and year	Engineering								
	Engineering, total	Aerospace engineering	Chemical engineering	Civil engineering	Electrical engineering	Industrial engineering	Mechanical engineering	Metallurgical and materials engineering	Other engineering
Total enrollment									
1982	83 770	1.941	7.189	14.146	21.927	3.641	11.467	3.124	14.335
1983	91.175	2.305	7.563	14.921	25.295	9.373	12.911	3.447	15.360
1984	92.894	2.340	7.373	15.203	26.388	9.535	13.855	3.657	14.543
1985	96 214	2.538	7.150	14.916	28.203	10.805	14.157	3.943	14.502
1986	102 135	2.804	7.012	14.987	29.969	11.843	15.713	4.208	15.599
1987	104 104	3.015	7.111	14.718	31.399	12.416	16.366	4.366	14.713
1988	103 137	3.223	6.618	14.822	32.035	11.638	16.186	4.335	14.280
1989	104 150	3.454	6.460	14.919	33.257	11.328	16.212	4.589	13.931
1990	107 728	3.866	6.735	15.553	33.722	11.505	16.788	4.946	14.613
1991	113 300	4.052	7 127	17.356	34.973	12.832	17.647	5.164	14.149
1992	118 047	4 036	7.415	19.385	36.272	13.735	18.768	5.470	12.966
Men									
1982	74.981	1.831	6.288	12.394	20.376	8.010	10.748	2.704	12.630
1983	81 370	2 182	6 547	13.061	23.227	7 829	12.106	2.999	13.419
1984	82 533	2 208	6.401	13.175	24 175	7.844	12.899	3.189	12.642
1985	85.038	2.375	6.146	12.767	25.768	8.906	13.146	3.340	12.590
1986	89 666	2.604	5.973	12.836	27.061	9.625	14.554	3.533	13.480
1987*	91.106	2 791	5.957	12.605	28.301	10.121	15.070	3.637	12.624
1988	89 921	2 996	5 543	12.525	28.757	9.457	14.774	3.579	12,290
1989	90.490	3 214	5 431	12.481	29.742	9.161	14.814	3.780	11.867
1990	93 010	3.579	5 589	12 861	30.007	9.299	15.349	4.049	12,277
1991	97 628	3 727	5.870	14.266	31.130	10.455	16.143	4.173	11.864
1992	100.889	3 688	6.020	15.780	32.026	11.071	17.068	4.413	10.823
Women									
1982	8 789	110	901	1.752	1.551	1.631	719	420	1,705
1983	9 805	123	1,016	1.860	2.068	1.544	805	448	1.941
1984	10 361	132	972	2.028	2.213	1.691	956	468	1.901
1985	11 176	163	1.004	2.149	2.435	1.899	1.011	603	1.912
1986	12 469	200	1.039	2.151	2.908	2 218	1.159	675	2.119
1987*	12.998	224	1.154	2.113	3.098	2 295	1.296	729	2.089
1988	13 216	227	1.075	2 297	3 278	2.181	1.412	756	1.990
1989	13 660	240	1 029	2 438	3 515	2 167	1.398	809	2 064
1990	14 718	287	1.146	2.692	3.715	2.206	1 439	897	2.336
1991	15 672	325	1.257	3.090	3.843	2.377	1.504	991	2,285
1992	17.158	348	1.395	3.605	4.246	2.664	1,700	1.057	2.143

* Includes estimated data for master's degree granting institutions, which were surveyed on a sample basis from 1984 through 1987

SOURCE: National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-3. Science and engineering graduate students in all institutions, by sex and detailed field: fall 1985–1992

Sex and detailed field	1985[1]	1986	1987[1]	1988	1989	1990	1991	1992
Both sexes, science and engineering	359.185	368.706	373.930	375.847	383.448	398.146	413.566	431.613
Science, total	262 971	266.571	269.826	272 710	279.298	290.418	300.266	313.566
Physical sciences	30 981	32.248	32.730	32.962	33.619	34.135	34.799	35.496
Astronomy	671	689	722	731	789	810	829	869
Chemistry	18.300	18 737	18.819	18 572	18 812	19.101	19.388	19.904
Physics	11.672	12.439	12 807	13.308	13 657	13.868	14.140	14.264
Physical sciences n e c	338	383	382	351	361	356	442	459
Earth, atmospheric. & ocean sciences	15 591	15 210	14.522	14 067	13.830	14.195	14.720	15 609
Atmospheric sciences	964	961	952	940	912	929	968	1.089
Geosciences	10.294	9 819	8 998	8.463	8.052	7.694	7 583	7.759
Oceanography	2.081	2.128	2.127	2 033	2.207	2.333	2 386	2.530
Earth, atmos & ocean sci n e c	2 252	2.302	2.445	2.631	2.659	3.239	3 783	4.231
Mathematical sciences	17.591	17 967	18.524	19.103	19.308	19 801	19.978	20.375
Mathematics & applied math	15.465	15 633	16.031	16.516	16.784	17.123	17.232	17 426
Statistics	2.126	2.334	2.493	2.587	2.524	2.678	2.746	2.949
Computer sciences	29.602	31.175	31 901	32.053	32 320	34.349	34.788	36.396
Agricultural sciences	11.364	11 281	10 942	10.940	10.979	11.125	11.315	11.609
Biological sciences	46 201	46 873	46 901	47.682	48.970	50.090	51.875	54.437
Anatomy	993	973	1.016	1.056	1.078	996	1.051	1.031
Biochemistry	4.656	4.875	4.813	4.921	5 082	5.053	5.207	5.386
Biology	12.710	12.678	12.331	12.393	12.761	13.035	13.299	13.897
Biometry/epidemiology	1.360	1 434	1.556	1.682	1.722	1.871	2.032	2.369
Biophysics	441	547	591	592	655	642	697	751
Botany	3.188	3.149	3 005	2.936	2.844	2 720	2.675	2.690
Cell biology	1.429	1.716	1.964	2.078	2.234	2.555	2.809	3.093
Ecology	1.028	1.022	963	999	1.084	1.136	1.180	1.301
Entomology parasitology	1 342	1.306	1.244	1.240	1.181	1.173	1.171	1.193
Genetics	1.120	1 262	1.314	1.289	1.365	1.408	1 520	1.643
Microbiol immunology & virology	4 446	4.372	4.452	4 773	4.827	4.872	4.936	5.008
Nutrition	4.314	4 321	4.288	4.228	4 259	4.268	4.251	4.245
Pathology	1.321	1.362	1.397	1 357	1.393	1.386	1 492	1.517
Pharmacology	2 107	2.078	2 072	2 124	2.267	2.352	2.432	2.545
Physiology	2 211	2 220	2.213	2 220	2.206	2.236	2.332	2.319
Zoology	2 135	2.083	2.113	2.034	2 088	2.109	2.196	2.203
Biosciences, n e c	1 400	1 475	1.569	1.760	1.924	2.278	2.595	3.246
Psychology	41 173	41.417	42 750	44 127	46.003	48.678	51 791	53.820
Psychology general	NA	NA	NA	15.479	17.126	18 524	21.230	23 117
Clinical psychology	NA	NA	NA	20.842	19.726	20 383	19.855	18.738
Psychology n e c	NA	NA	NA	7 806	9.151	9 771	10 706	11.965
Social sciences	70 468	70 400	71 556	71 776	74 269	78 045	81.000	85.824
Agricultural economics	2 268	2.248	2 203	2.259	2.276	2.273	2 364	2.513
Anthropology (cultural & social)	5 631	5 805	5.835	5.945	6 128	6 494	6.729	7 129
Economics (except agricultural)	12.430	12 103	12.020	12.036	12 143	12 306	12 728	13.266
Geography	2 936	3.055	3.223	3 208	3 479	3 530	3.760	4.097
History and philosophy of science	272	266	294	288	304	331	337	360
Linguistics	3.055	3 109	3.282	3 243	3 286	3.404	3.425	3.288
Political science	27 012	27 251	27 601	27 859	29.291	30 595	31.887	33 770
Sociology	6 586	6 532	6.986	7.087	7 393	7.784	3.292	8.861
Sociology anthropology	1.034	1.021	982	991	1 022	1.212	1.032	1.123
Social sciences n e c	9 244	9 010	9.130	8.860	8.947	10.116	10 446	11 417
Engineering total	96 214	102 135	104 104	103 137	104 150	107 728	113.300	118 047
Aerospace engineering	2 538	2 804	3 015	3 223	3 454	3 866	4.052	4.036
Agricultural engineering	941	1 054	1 063	1 039	1 031	936	978	989
Biomedical engineering	1.373	1 549	1 689	1 755	1.919	2.130	2.233	2.479
Chemical engineering	7 150	7 012	7 111	6 618	6.460	6.735	7 127	7.415
Civil engineering	14 916	14 987	14 718	14 822	14.919	15.553	17.356	19.385
Electrical engineering	28 203	29 969	31.399	32 035	33.257	33.722	34 973	36.272
Engineering science	2 098	2 362	2 343	2 386	2 077	2.020	2 154	2.218
Industrial eng management sci	10 805	11 843	12 416	11 638	11 328	11 505	12.832	13.735
Mechanical engineering	14 157	15 713	16 366	16 186	16 212	16 788	17.647	18.768
Metallurgical/materials eng	3 943	4 208	4 366	4 335	4 589	4 946	5 164	5.470
Mining engineering	489	512	513	489	418	437	489	479
Nuclear engineering	1.220	1 265	1 279	1.303	1.323	1 278	1 282	1.286
Petroleum engineering	782	747	818	742	665	670	705	737
Engineering n e c	7 599	8 110	7 008	6.566	6 498	7 142	6 308	4 778

See explanatory information and SOURCE at end of table

Appendix table 6-3. Science and engineering graduate students in all institutions, by sex and detailed field: fall 1985–1992

Sex and detailed field	1985	1986	1987	1988	1989	1990	1991	1992
Men science and engineering	247.975	254.039	256.476	254.382	257.161	263.858	272.243	281.202
Science total	162.937	164.373	165.370	164.461	166.671	170.848	174.615	180.313
Physical sciences	24.474	25.385	25.614	25 465	25.817	26.053	26 219	26.651
Astronomy	563	568	602	591	649	645	657	683
Chemistry	13 513	13.713	13.645	13.108	13.150	13.240	13 135	13.383
Physics	10 175	10.862	11.134	11 557	11 789	11.943	12 147	12.292
Physical sciences. n e c	223	242	233	209	229	225	280	293
Earth atmospheric & ocean sciences	11 606	11.215	10 708	10 188	9 900	9 997	10.178	10.685
Atmospheric sciences	807	782	784	777	734	744	778	848
Geosciences	7 810	7.463	6.834	6.368	6.089	5 772	5.572	5.690
Oceanography	1.471	1.461	1.493	1.388	1.482	1.552	1.540	1.571
Earth. atmos . & ocean sci n e c	1.518	1 509	1 597	1.655	1.595	1.929	2.288	2.576
Mathematical sciences	12 220	12.492	12.929	13.329	13.318	13.601	13.675	13.823
Mathematics & applied math	10.745	10.930	11.269	11.611	11.648	11.635	11.891	11.934
Statistics	1.475	1 562	1.660	1.718	1.670	1.766	1.784	1.889
Computer sciences	22 145	23.423	23.989	23.972	24.432	26.180	26.566	27.998
Agricultural sciences	8.445	8.391	8.047	7.917	7.912	7.865	7.819	7.925
Biological sciences	26 258	26.360	26.362	26.357	26.692	27.008	27.694	28.898
Anatomy	569	560	578	598	598	541	550	538
Biochemistry	2.919	2.991	2.923	2.925	3.064	2.982	3 070	3.160
Biology	7.221	7.148	7.060	6.939	7.009	7.084	7.082	7,324
Biometry/epidemiology	640	666	746	768	738	874	920	1.037
Biophysics	331	410	450	443	493	478	515	549
Botany	1 993	2.014	1.854	1.614	1 754	1.652	1.619	1.640
Cell biology	911	1.044	1.199	1.233	1.290	1.435	1.528	1.687
Ecology	661	638	588	602	644	667	662	713
Entomology parasitology	992	948	906	881	817	815	830	839
Genetics	597	665	673	660	675	681	761	799
Microbiology. immunology. & virology	2.489	2 428	2.454	2.616	2 588	2.552	2.579	2.636
Nutrition	1 349	1.307	1.341	1.232	1.252	1.286	1.294	1.258
Pathology	758	800	802	795	809	791	845	838
Pharmacology	1.302	1.265	1 229	1.277	1.298	1.329	1.302	1.380
Physiology	1.375	1.365	1.378	1.357	1.313	1.303	1.366	1.367
Zoology	1 372	1 307	1.316	1.246	1.295	1.273	1.312	1.349
Biosciences. n e c	779	804	865	971	1.055	1.265	1.459	1 784
Psychology	15.738	15.432	15 708	15.552	15.813	15.963	16.671	16.761
Psychology general	NA	NA	NA	4.868	5.364	5.651	6 349	6.911
Clinical psychology	NA	NA	NA	7.888	7.310	7.166	7.012	6.371
Psychology. n e c	NA	NA	NA	2 796	3.139	3.146	3.310	3.479
Social sciences	42.051	41 675	42.013	41 681	42.787	44.181	45 793	47.572
Agricultural economics	1 761	1 747	1 696	1 713	1.694	1 674	1.728	1.803
Anthropology (cultural & social)	2.510	2 460	2 482	2.499	2.548	2.694	2.776	2 888
Economics (except agricultural)	9 373	9.095	9 000	8.938	8.904	8.941	9 170	9 483
Geography	1 988	2 071	2 130	2 153	2.295	2.326	2.442	2.669
History and philosophy of science	180	169	198	184	192	213	205	230
Linguistics	1 198	1 252	1 305	1.296	1 334	1.398	1.512	1.279
Political science	16 492	16 512	16.665	16 399	17.060	17.409	18 059	18.825
Sociology	3 087	2 972	3 144	3 248	3 396	3 503	3.731	3.784
Sociology anthropology	496	482	472	443	454	506	464	509
Social sciences n e c	4 966	4.915	4 921	4 808	4.910	5 517	5 706	6.102
Engineering total	85 038	89 666	91 106	89 921	90 490	93 010	97 628	100.889
Aerospace engineering	2 375	2 604	2 791	2.996	3.214	3.579	3 727	3.688
Agricultural engineering	863	970	967	953	944	836	854	848
Biomedical engineering	1 082	1 203	1.292	1 316	1 450	1.587	1 649	1 865
Chemical engineering	6 146	5 973	5 957	5.543	5.431	5.589	5 870	6.020
Civil engineering	12 767	12 836	12 605	12.525	12.481	12 861	14.266	15 780
Electrical engineering	25 768	27 061	28 301	28.757	29 742	30 007	31 130	32.026
Engineering science	1 858	2 065	2.056	2.119	1.829	1 721	1.866	1.913
Industrial eng management sci	8 906	9 625	10 121	9 457	9 161	9.299	10 455	11 071
Mechanical engineering	13 146	14 554	15 070	14 774	14 814	15 349	16.143	17.068
Metallurgical/materials eng	3 340	3 533	3 637	3.579	3.780	4.049	4 173	4 413
Mining engineering	459	476	473	441	372	379	439	431
Nuclear engineering	1 113	1 142	1 151	1 176	1 182	1 123	1 105	1 103
Petroleum engineering	716	699	764	693	637	637	653	672
Engineering n e c	6 499	6 925	5 921	5 592	5 453	5 994	5 298	3 991

See explanatory information and SOURCE at end of table.

Appendix table 6-3. Science and engineering graduate students in all institutions, by sex and detailed field: fall 1985–1992

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Sex and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Women science and engineering	111.210	114.667	117.454	121 465	126.287	134.288	141.323	150.411
Science, total	100.034	102.198	104.456	108.249	112.627	119 570	125.651	133.253
Physical sciences	6.507	6.863	7.116	7.497	7.802	8.082	8.580	8.845
Astronomy	108	121	120	140	140	165	172	186
Chemistry	4 787	5.024	5.174	5.454	5.662	5.861	6.253	6.521
Physics	1 497	1 577	1.673	1.751	1.868	1.925	1.993	1.972
Physical sciences, n e c	115	141	149	142	132	131	162	166
Earth, atmospheric, & ocean sciences	3.985	3.995	3.814	3.879	3.930	4.198	4.542	4.924
Atmospheric sciences	157	179	168	163	178	185	190	241
Geosciences	2 484	2.356	2.164	2.095	1.963	1.922	2.011	2.069
Oceanography	610	667	634	645	725	781	846	959
Earth, atmos & ocean sci, n.e c	734	793	848	976	1.064	1.310	1.495	1.655
Mathematical sciences	5.371	5.475	5.595	5.774	5.990	6.200	6 303	6.552
Mathematics & applied math	4.720	4.703	4 762	4.905	5.136	5.288	5.341	5.492
Statistics	651	772	833	869	854	912	962	1.060
Computer sciences	7.457	7.752	7.912	8.081	7.888	8.169	8.222	8.398
Agricultural sciences	2.919	2.890	2 895	3.023	3.067	3.260	3.496	3.684
Biological sciences	19.943	20.513	20.539	21.325	22.278	23.082	24.181	25.539
Anatomy	424	413	438	458	480	455	501	493
Biochemistry	1.737	1.884	1.890	1.996	2.018	2.071	2.137	2.226
Biology	5.489	5.530	5.271	5 454	5.752	5.951	6.217	6.573
Biometry/epidemiology	720	768	810	914	984	997	1.112	1.332
Biophysics	110	137	141	149	162	164	182	202
Botany	1.195	1.135	1.151	1.122	1.090	1.068	1.056	1.050
Cell biology	518	672	765	845	944	1.120	1.281	1.406
Ecology	367	384	375	397	440	469	518	588
Entomology/parasitology	350	358	338	359	364	358	341	354
Genetics	523	597	641	629	690	727	759	844
Microbiology immunology & virology	1.957	1.944	1.998	2.157	2.239	2.320	2.357	2.372
Nutrition	2.965	3.014	2.947	2.996	3.007	2.982	2.957	2.987
Pathology	563	562	595	562	584	595	647	679
Pharmacology	805	813	843	847	969	1.023	1.130	1.165
Physiology	836	855	835	863	893	933	966	952
Zoology	753	776	797	788	793	836	884	854
Biosciences, n e c	621	671	704	789	869	1.013	1 136	1.462
Psychology	25 435	25.985	27.042	28.575	30.190	32.715	35.120	37.059
Psychology general	NA	NA	NA	10 611	11.762	12.873	14.881	16.206
Clinical psychology	NA	NA	NA	12.954	12 416	13.217	12 843	12.367
Psychology, n e c	NA	NA	NA	5 010	6.012	6.625	7.396	8 486
Social sciences	28 417	28.725	29.543	30 095	31.482	33.864	35.207	38.252
Agricultural economics	507	501	507	546	582	599	636	710
Anthropology (cultural & social)	3 121	3 345	3 353	3 446	3 580	3.800	3.953	4.241
Economics (except agricultural)	3.057	3 008	3 020	3 098	3.239	3.365	3 558	3 783
Geography	948	984	1 093	1.055	1.184	1.204	1.318	1.428
History and philosophy of science	92	97	96	104	112	118	132	130
Linguistics	1.857	1.857	1.977	1 947	1 952	2.006	1.913	2 009
Political science	10 520	10.739	10.936	11.460	12.231	13 186	13.828	14.945
Sociology	3 499	3.560	3.642	3.839	3.997	4.281	4.561	5.077
Sociology/anthropology	538	539	510	548	568	706	568	614
Social sciences, n e c	4 278	4.095	4 209	4.052	4 037	4.599	4.740	5.315
Engineering total	11 176	12.469	12 998	13.216	13 660	14 718	15 672	17.158
Aerospace engineering	163	200	224	227	240	287	325	348
Agricultural engineering	78	84	96	86	87	100	124	141
Biomedical engineering	291	346	397	439	469	543	584	614
Chemical engineering	1.004	1.039	1 154	1 075	1 029	1.146	1.257	1.395
Civil engineering	2 149	2.151	2.113	2.297	2.438	2.692	3.090	3.605
Electrical engineering	2.435	2 908	3.098	3 278	3.515	3.715	3 843	4.246
Engineering science	240	297	287	267	248	299	288	305
Industrial eng /management sci	1 899	2 218	2 295	2 181	2.167	2 206	2.377	2 664
Mechanical engineering	1 011	1 159	1.296	1 412	1 398	1.439	1.504	1.700
Metallurgical/materials eng	603	675	729	756	809	897	991	1.057
Mining engineering	30	36	40	48	46	58	50	48
Nuclear engineering	107	123	128	127	141	155	177	183
Petroleum engineering	66	48	54	49	28	33	52	65
Engineering n e c	1 100	1 185	1.087	974	1.045	1.148	1.010	787

See explanatory information and SOURCE at end of table

Appendix table 6-3. Science and engineering graduate students in all institutions, by sex and detailed field: fall 1985–1992

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Sex and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Women as a percentage of total	31.0	31.1	31.4	32.3	32.9	33.7	34.2	34.8
Science, total	38.0	38.3	38.7	39.7	40.3	41.2	41.8	42.5
Physical sciences	21.0	21.3	21.7	22.7	23.2	23.7	24.7	24.9
Astronomy	16.1	17.6	16.6	19.2	17.7	20.4	20.7	21.4
Chemistry	26.2	26.8	27.5	29.4	30.1	30.7	32.3	32.8
Physics	12.8	12.7	13.1	13.2	13.7	13.9	14.1	13.8
Physical sciences n e c	34.0	36.8	39.0	40.5	36.6	36.8	36.7	36.2
Earth, atmospheric, & ocean sciences	25.6	26.3	26.3	27.6	28.4	29.6	30.9	31.5
Atmospheric sciences	16.3	18.6	17.6	17.3	19.5	19.9	19.6	22.1
Geosciences	24.1	24.0	24.0	24.8	24.4	25.0	26.5	26.7
Oceanography	29.3	31.3	29.8	31.7	32.9	33.5	35.5	37.9
Earth, atmos., & ocean sci., n e c	32.6	34.4	34.7	37.1	40.0	40.4	39.5	39.1
Mathematical sciences	30.5	30.5	30.2	30.2	31.0	31.3	31.5	32.2
Mathematics & applied math	30.[illegible]	30.1	29.7	29.7	30.6	30.9	31.0	31.5
Statistics	30.6	33.1	33.4	33.6	33.8	34.1	35.0	35.9
Computer sciences	25.2	24.9	24.8	25.2	24.4	23.8	23.6	23.1
Agricultural sciences	25.7	25.6	26.5	27.6	27.9	29.3	30.9	31.7
Biological sciences	43.2	43.8	43.8	44.7	45.5	46.1	46.6	46.9
Anatomy	42.7	42.4	43.1	43.4	44.5	45.7	47.7	47.8
Biochemistry	37.3	38.6	39.3	40.6	39.7	41.0	41.0	41.3
Biology	43.2	43.6	42.7	44.0	45.1	45.7	46.7	47.3
Biometry/epidemiology	52.9	53.6	52.1	54.3	57.1	53.3	54.7	56.2
Biophysics	24.9	25.0	23.9	25.2	24.7	25.5	26.1	26.9
Botany	37.5	36.0	38.3	38.2	38.3	39.3	39.5	39.0
Cell biology	36.2	39.2	39.0	40.7	42.3	43.8	45.6	45.5
Ecology	35.7	37.6	38.9	39.7	40.6	41.3	43.9	45.2
Entomology/parasitology	26.1	27.4	27.2	29.0	30.8	30.5	29.1	29.7
Genetics	46.7	47.3	48.8	48.8	50.5	51.6	49.9	51.4
Microbiology, immunology & virology	44.0	44.5	44.9	45.2	46.4	47.6	47.8	47.4
Nutrition	68.7	69.8	68.7	70.9	70.6	69.9	69.6	70.4
Pathology	42.6	41.3	42.6	41.4	41.9	42.9	43.4	44.8
Pharmacology	38.2	39.1	40.7	39.9	42.7	43.5	46.5	45.8
Physiology	37.8	38.5	37.7	38.9	40.5	41.7	41.4	41.1
Zoology	35.7	37.3	37.7	38.7	38.0	39.6	40.3	38.8
Biosciences n e c	44.4	45.5	44.9	44.8	45.2	44.5	43.8	45.0
Psychology	61.8	62.7	63.3	64.8	65.6	67.2	67.8	68.9
Psychology, general	NA	NA	NA	68.6	68.7	69.5	70.1	70.1
Clinical psychology	NA	NA	NA	62.2	62.9	64.8	64.7	66.0
Psychology, n e c	NA	NA	NA	64.2	65.7	67.8	69.1	70.9
Social sciences	40.3	40.8	41.3	41.9	42.4	43.4	43.5	44.6
Agricultural economics	22.4	22.3	23.0	24.2	25.6	26.4	26.9	28.3
Anthropology (cultural & social)	55.4	57.6	57.5	58.0	58.4	58.5	58.7	59.5
Economics (except agricultural)	24.6	24.9	25.1	25.7	26.7	27.3	28.0	28.5
Geography	32.3	32.2	33.9	32.9	34.0	34.1	35.1	34.9
History and philosophy of science	33.8	36.5	32.7	36.1	36.8	35.6	39.2	36.1
Linguistics	60.8	59.7	60.2	60.0	59.4	58.9	55.9	61.1
Political science	38.9	39.4	39.6	41.1	41.8	43.1	43.4	44.3
Sociology	53.1	54.5	55.0	54.2	54.1	55.0	55.0	57.3
Sociology/anthropology	52.0	52.8	51.9	55.3	55.6	58.3	55.0	54.7
Social sciences n e c	46.3	45.4	46.1	45.7	45.1	45.5	45.4	46.6
Engineering, total	11.6	12.2	12.5	12.8	13.1	13.7	13.8	14.5
Aerospace engineering	6.4	7.1	7.4	7.0	6.9	7.4	8.0	8.6
Agricultural engineering	8.3	8.0	9.0	8.3	8.4	10.7	12.7	14.3
Biomedical engineering	21.2	22.3	23.5	25.0	24.4	25.5	26.2	24.8
Chemical engineering	14.0	14.8	16.2	16.2	15.9	17.0	17.6	18.8
Civil engineering	14.4	14.4	14.4	15.5	16.3	17.3	17.8	18.6
Electrical engineering	8.6	9.7	9.9	10.2	10.6	11.0	11.0	11.7
Engineering science	11.4	12.6	12.2	11.2	11.9	14.8	13.4	13.8
Industrial eng /management sci	17.6	18.7	18.5	18.7	19.1	19.2	18.5	19.4
Mechanical engineering	7.1	7.4	7.9	8.7	8.6	8.6	8.5	9.1
Metallurgical/materials eng	15.3	16.0	16.7	17.4	17.6	18.1	19.2	19.3
Mining engineering	6.1	7.0	7.8	9.8	11.0	13.3	10.2	10.0
Nuclear engineering	8.8	9.7	10.0	9.7	10.7	12.1	13.8	14.2
Petroleum engineering	8.4	6.4	6.6	6.6	4.2	4.9	7.4	8.8
Engineering n e c	14.5	14.6	15.5	14.8	16.1	16.1	16.0	16.5

* Includes estimated data for master's degree granting institutions which were surveyed on a sample basis from 1985 through 1987.

KEY NA not available
n e c not elsewhere classified

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

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Enrollment status sex and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982–1992
Full time both sexes								
Total science and engineering	221 979	247 520	250.966	257 155	265.760	277.351	290.993	31 1
Science. total	172 192	185 537	187 849	192 707	199.706	206.580	216.527	25 7
Physical sciences	24 038	28.414	28 574	29 207	29.497	30 109	30 730	27 8
Astronomy	590	681	705	762	790	810	840	42 4
Chemistry	14.285	16.235	16.088	16.272	16.377	16.722	16.990	18 9
Physics	9.072	11.304	11.638	12 040	12 198	12 432	12.745	40.5
Physical sciences n e c	91	194	143	133	132	145	155	70 3
Earth atmospheric & ocean sciences	11 436	10.543	10.305	10.138	10 377	10.518	11.150	-2 5
Atmospheric sciences	779	824	829	810	828	859	959	23 1
Geosciences	7.521	6 666	6.310	5.983	5.801	5.692	5.889	-21 7
Oceanography	1.593	1 651	1.629	1.799	1 934	1.991	2.133	33 9
Earth, atmos. & ocean sci n e c	1.543	1 402	1.537	1.546	1.814	1.976	2 169	40 6
Mathematical sciences	10 814	13 044	13 514	13 695	13.868	14.262	14.663	35 6
Mathematics & applied math	9.233	11.112	11.482	11.709	11.783	12.122	12 370	34 0
Statistics	1.581	1.932	2.032	1.986	2 085	2.140	2.293	45 0
Computer sciences	9 171	15 308	15.088	15.558	16.729	16.652	17 617	92 1
Agricultural sciences	9 957	8.964	8.967	8.900	8 955	9.151	9.280	-6.8
Biological sciences	36.810	38.359	39.301	40 459	41.028	42 769	44.518	20 9
Anatomy	937	929	973	999	907	961	961	2 6
Biochemistry	3.806	4.604	4.731	4.810	4.839	4.960	5.055	32 8
Biology	9.034	8.539	8.726	9.169	9 175	9 446	9.683	7 2
Biometry/epidemiology	919	1.166	1.213	1.211	1.231	1.431	1.627	77 0
Biophysics	423	468	544	610	605	679	728	72.1
Botany	3.052	2.596	2.556	2 456	2.333	2.291	2.308	-24 4
Cell biology	1.110	1 886	2 023	2.177	2.463	2.716	2.956	166.3
Ecology	910	796	830	873	884	919	997	9 6
Entomology/parasitology	1.340	1.062	1.061	1.009	997	1 014	1.016	-24 2
Genetics	924	1.208	1 187	1.254	1.297	1 412	1.530	65.6
Microbiology immunology & virology	3.517	4.016	4 308	4.329	4 363	4.408	4.482	27 4
Nutrition	3.120	3 014	2.876	2 874	2.918	2.959	2.943	-5 7
Pathology	1 009	1 093	1 084	1.126	1.108	1.149	1.209	19.8
Pharmacology	1.940	1.922	1 986	2.135	2.208	2.304	2.401	23 8
Physiology	1.805	1.996	2 008	2.057	2.076	2.163	2.162	19 8
Zoology	2.136	1 787	1.719	1.773	1 682	1.787	1.793	-16 1
Biosciences n e c	828	1.277	1.476	1.597	1.920	2.190	2.667	222 1
Psychology	25.667	27 317	28 242	29.505	30.828	32.393	34.386	34 0
Psychology. general	NA	NA	8 531	9.497	10.216	11.380	12.912	NA
Clinical psychology	NA	NA	13 963	13.323	13 670	13 406	13.288	NA
Psychology. n e c	NA	NA	5 748	6 685	6 942	7 607	8 186	NA
Social sciences	44.299	43 588	43 858	45.245	48.424	50.706	54.183	22 3
Agricultural economics	1 978	1 857	1 909	1.912	1 961	2 011	2 106	6.5
Anthropology (cultural & social)	4 105	4 108	4.276	4 411	4.807	5 077	5 323	29 7
Economics (except agricultural)	9.406	8 985	9.021	9.088	9 283	9.871	10.213	8 6
Geography	2.139	2.290	2 215	2.358	2 374	2 539	2 792	30 5
History and philosophy of science	223	267	266	273	308	303	328	47 1
Linguistics	2.157	2 449	2 519	2.465	2.586	2.549	2 473	14 6
Political science	13 693	13 017	13 277	14.020	15.291	16.149	17 689	29 2
Sociology	4 885	5 033	5.090	5.273	5 680	5 886	6 328	29 5
Sociology anthropology	657	560	566	633	782	691	741	12 8
Social sciences n e c	5 056	5 022	4 719	4 812	5 352	5.630	6 190	22 4
Engineering total	49 787	61 983	63.117	64 448	66 054	70.771	74.466	49 6
Aerospace engineering	1 522	2 372	2 533	2.772	3 010	3 325	3.306	117 2
Agricultural engineering	739	924	879	851	790	821	829	12 2
Biomedical engineering	931	1 392	1 455	1 611	1 798	1 921	2 110	126 6
Chemical engineering	5 608	5.674	5 759	5.282	5 443	5.788	5 943	6 0
Civil engineering	9 398	9 651	9.957	9 974	10 139	11.340	12 379	31 7
Electrical engineering	11 533	17 101	17 706	18.466	18.675	19 719	20 991	82 0
Engineering science	1 277	1 373	1 418	1 259	1 252	1 364	1 415	10 8
Industrial eng /management sci	3 827	4 210	4 361	4 725	4.860	5 571	6 092	59 2
Mechanical engineering	7 267	10 230	10 426	10 464	10 816	11 580	12 425	71 0
Metallurgical/materials eng	2 478	3 436	3 464	3 715	3 934	4 062	4 289	73 1
Mining engineering	373	435	415	338	334	336	305	-18 2
Nuclear engineering	1 042	1 044	1 105	1 112	1 080	1 080	1 081	4 0
Petroleum engineering	476	644	599	606	484	515	572	20 2
Engineering n e c	3 316	3 497	3 440	3 373	3 439	3 349	2 726	17 8

See explanatory information and SOURCE at end of table

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

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Enrollment status, sex and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982-1992
Full time men								
Total, science and engineering	156 429	172.274	172.501	175.191	178.849	185 091	192 230	22.9
Science, total	111.896	117.586	117 028	118.910	121.512	123 978	128 401	14.8
Physical sciences	19 641	22.384	22.208	22.547	22 671	22 839	23 242	18.3
Astronomy	496	566	569	626	629	641	659	32.9
Chemistry	10 937	11 849	11 433	11.419	11 417	11 400	11 507	5.2
Physics	8.144	9.861	10.119	10.425	10.550	10 719	10 984	34.9
Physical sciences, n.e.c	64	108	87	77	75	79	92	43.8
Earth, atmospheric, & ocean sciences	8.608	7.826	7.515	7.343	7 403	7 297	7 710	-10.4
Atmospheric sciences	663	676	682	648	653	682	760	14.6
Geosciences	5.733	5.074	4.779	4.547	4.379	4 157	4 309	-24.8
Oceanography	1.149	1 159	1.104	1.220	1.294	1 306	1 357	18.1
Earth, atmos., & ocean sci., n.e.c	1 063	917	950	928	1.077	1 152	1.284	20.8
Mathematical sciences	8.023	9.489	9.803	9.762	9.829	10 044	10 244	27.7
Mathematics & applied math	6.899	8.195	8.444	8 443	8.458	8 656	8 773	27.2
Statistics	1 124	1.294	1.359	1 319	1 371	1.388	1 471	30.9
Computer sciences	6.860	11.992	11.772	12.331	13 251	13 173	14 059	104.[illegible]
Agricultural sciences	7.483	6.632	6.544	6.447	6.365	6.330	6 343	-15.2
Biological sciences	22.213	22.141	22 453	22.808	22.844	23 551	24 368	9.7
Anatomy	580	533	549	558	499	507	510	12.1
Biochemistry	2.448	2.808	2.836	2.897	2.860	2.923	2 981	21.8
Biology	5.514	5.033	5.064	5.231	5.212	5 204	5 276	4.3
Biometry/epidemiology	453	554	566	550	593	649	724	59.8
Biophysics	316	355	406	464	452	498	528	67.1
Botany	1 944	1.600	1.581	1.509	1.424	1.392	1 407	-27.6
Cell biology	704	1.155	1.201	1.259	1.394	1 480	1 623	130.5
Ecology	597	502	518	531	538	531	558	-6.5
Entomology/parasitology	1 021	776	752	693	694	720	714	30.1
Genetics	441	620	610	625	631	711	746	69.[illegible]
Microbiology, immunology, & virology	2.011	2.244	2.400	2 358	2.310	2 339	2 387	18.7
Nutrition	1 153	1 089	991	991	1.005	1 041	1 001	13.2
Pathology	630	647	658	691	653	683	677	7.5
Pharmacology	1.266	1.136	1.182	1.215	1.240	1.230	1 304	3.[illegible]
Physiology	1.202	1.253	1.246	1.234	1.226	1 288	1 296	7.8
Zoology	1.438	1 116	1.044	1.089	1.007	1.075	1 103	23.3
Biosciences, n.e.c	495	720	849	913	1.106	1 280	1 533	209.[illegible]
Psychology	11 223	10 422	10.241	10.513	10.712	10 990	11 257	[illegible]
Psychology, general	NA	NA	2.821	3.254	3.443	3 682	4 165	NA
Clinical psychology	NA	NA	5.375	4 988	5 033	4 961	4 663	NA
Psychology, n.e.c	NA	NA	2.045	2 271	2 236	2 347	2 429	NA
Social sciences	27.845	26.700	26 492	27 159	28 437	29 754	31 178	[illegible]
Agricultural economics	1 581	1.429	1.449	1 419	1 442	1 477	1 514	4.2
Anthropology (cultural & social)	1 903	1 831	1.856	1 880	2 052	2 121	2 197	15.4
Economics (except agricultural)	7 183	6.880	6 836	6 794	6.836	7 196	7 381	[illegible]
Geography	1 502	1 546	1 485	1 567	1 585	1 667	1 853	23.4
History and philosophy of science	149	184	169	172	200	185	207	38.9
Linguistics	946	1 033	1 060	1 075	1 142	1 151	1 023	8.1
Political science	9 112	8 475	8 402	8 719	9 237	9 752	10 443	14.6
Sociology	2 335	2 352	2 389	2 508	2.647	2 782	2 843	21.8
Sociology/anthropology	328	278	269	297	327	318	329	[illegible]
Social sciences, n.e.c	2 806	2.692	2 577	2 728	2 969	3 105	3 388	[illegible]
Engineering, total	44 533	54 688	55 473	56 281	57 337	61 113	63 829	[illegible]
Aerospace engineering	1 449	2 205	2.365	2.592	2 811	3 071	3 043	[illegible]
Agricultural engineering	689	839	807	782	708	713	704	[illegible]
Biomedical engineering	751	1 046	1 080	1 221	1 342	1 423	1 586	111.2
Chemical engineering	4 936	4 800	4 567	4 486	4 547	4 803	4 851	[illegible]
Civil engineering	8 155	8.247	8 389	8.322	8 355	9 318	10 081	[illegible]
Electrical engineering	10 715	15 552	16 024	16 644	16 719	17 577	18 [illegible]	[illegible]
Engineering science	1 154	1 246	1 290	1 120	1 075	1 182	1 230	[illegible]
Industrial eng management sci	3 056	3.460	3 611	3 804	3 932	4 532	4 917	[illegible]
Mechanical engineering	6 834	9.498	9 591	9 609	9 968	10 647	11 442	[illegible]
Metallurgical/materials eng	2 170	2 867	2 885	3.077	3 240	3 316	[illegible]	[illegible]
Mining engineering	338	400	373	298	287	404	281	[illegible]
Nuclear engineering	969	940	1 004	993	952	[illegible]	[illegible]	[illegible]
Petroleum engineering	413	601	558	486	[illegible]	[illegible]	[illegible]	[illegible]
Engineering n.e.c	2 874	2 987	2 919	2 847	2 941	2 815	2 250	[illegible]

See explanatory information and SOURCE at end of table

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

Enrollment status, sex and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982–1992
Full time women								
Total, science and engineering	65.550	75.246	78.465	81.964	85.911	92.260	98 763	50 7
Science, total	60.296	67.951	70 821	73.797	78.194	82.602	88.126	46.2
Physical sciences	4 397	6.030	6 366	6 660	6.826	7.270	7.488	70.3
Astronomy	94	115	136	136	161	169	181	92.6
Chemistry	3 348	4.386	4 655	4.853	4 960	5.322	5.483	63 8
Physics	928	1.443	1.519	1 615	1 648	1 713	1.761	89 8
Physical sciences, n e c	27	86	56	56	57	66	63	133 3
Earth, atmospheric, & ocean sciences	2.828	2.717	2 790	2 795	2.974	3.221	3.440	21 6
Atmospheric sciences	116	148	147	162	175	177	199	71.6
Geosciences	1 788	1.592	1 531	1.436	1.422	1.535	1.580	-11 6
Oceanography	444	492	525	579	640	685	776	74 8
Earth, atmos. & ocean sci., n e c	480	485	587	618	737	824	885	84 4
Mathematical sciences	2.791	3 555	3.711	3.933	4.039	4.218	4.419	58 3
Mathematics & applied math	2.334	2.917	3.038	3.266	3 325	3.466	3.597	54 1
Statistics	457	638	673	667	714	752	822	79.9
Computer sciences	2 311	3 316	3.316	3.227	3 478	3.479	3.558	54.0
Agricultural sciences	2 474	2.332	2 423	2 453	2.590	2.821	2.937	18 7
Biological sciences	14 597	16.218	16.848	17.651	18.184	19 238	20 150	38 0
Anatomy	357	396	424	441	408	454	451	26 3
Biochemistry	1.358	1.796	1.895	1.913	1.979	2 037	2.074	52.7
Biology	3.520	3 506	3.662	3.938	3.963	4.242	4 407	25 2
Biometry/epidemiology	466	612	647	661	638	782	903	93 8
Biophysics	107	113	138	146	153	181	200	86 9
Botany	1 108	996	975	947	909	899	901	-18 7
Cell biology	406	731	822	918	1 091	1 236	1.333	228 3
Ecology	313	294	312	342	346	388	439	40.3
Entomology parasitology	319	286	309	316	303	294	302	-5 3
Genetics	483	588	577	629	666	701	784	62 3
Microbiology immunology, & virology	1 506	1 772	1 908	1.971	2.053	2.069	2.095	39 1
Nutrition	1.967	1 925	1 985	1.883	1 913	1 918	1 942	-1 3
Pathology	379	446	425	435	455	466	532	40 4
Pharmacology	674	786	804	920	968	1 074	1 097	62 8
Physiology	603	743	762	823	850	875	866	43 6
Zoology	698	671	675	684	675	712	690	-1 1
Biosciences, n e c	333	557	627	684	814	910	1.134	240 5
Psychology	14.444	16 895	18 001	18 992	20 116	21.403	23.129	60 1
Psychology, general	NA	NA	5 710	6.243	6 773	7 698	8 747	NA
Clinical psychology	NA	NA	8.588	8 335	8.637	8.445	8 625	NA
Psychology, n e c	NA	NA	3 703	4 414	4 706	5.260	5.757	NA
Social sciences	16.454	16 888	17.366	18.086	19.987	20.952	23.005	39.8
Agricultural economics	397	428	460	493	519	534	592	49 1
Anthropology (cultural & social)	2 202	2.277	2.420	2.531	2 755	2 956	3.126	42 0
Economics (except agricultural)	2.223	2.105	2.185	2 294	2.447	2.675	2 832	27.4
Geography	637	744	730	791	789	872	939	47 4
History and philosophy of science	74	83	97	101	108	118	121	63 5
Linguistics	1 211	1.416	1 459	1 390	1.444	1.398	1.450	19 7
Political science	4 581	4 542	4 875	5 301	6.054	6.397	7.246	58 2
Sociology	2 550	2.681	2 701	2.765	3.033	3.104	3 485	36.7
Sociology/anthropology	329	282	297	336	455	373	412	25 2
Social sciences, n e c	2.250	2 330	2 142	2 084	2 383	2 525	2.802	24 5
Engineering total	5.254	7 295	7 644	8.167	8 717	9 658	10.637	102 5
Aerospace engineering	73	167	168	180	199	254	263	260 3
Agricultural engineering	50	85	72	69	82	108	124	148 0
Biomedical engineering	180	346	375	390	456	498	524	191 1
Chemical engineering	672	874	792	796	896	985	1 092	62 5
Civil engineering	1 243	1 404	1.568	1.652	1.784	2.022	2.298	84 9
Electrical engineering	818	1 549	1 682	1.822	1.956	2.142	2.414	195 1
Engineering science	123	127	128	139	177	182	185	50 4
Industrial eng./management sci	771	750	750	921	928	1 039	1 175	52 4
Mechanical engineering	433	732	835	855	848	933	1.083	150 1
Metallurgical/materials eng	308	569	579	638	694	746	812	163 6
Mining engineering	35	35	42	40	47	32	24	-31 4
Nuclear engineering	73	104	101	119	128	145	146	100 0
Petroleum engineering	33	43	31	20	24	38	51	54 5
Engineering, n e c	442	510	521	526	498	534	446	9

See explanatory information and SOURCE at end of table

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

Enrollment status, sex, and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982–1992
Part time, both sexes								
Total, science and engineering	117.619	126.410	124.881	126.293	132.386	136.215	140.620	19.6
Science, total	83 636	84.289	84.861	86.591	90.712	93.686	97.039	16 0
Physical sciences	4.149	4.316	4.388	4.412	4.638	4.690	4 766	14 9
Astronomy	42	41	26	27	20	19	29	-31 0
Chemistry	2 724	2.584	2.484	2,540	2.724	2.666	2.914	7 0
Physics	1.228	1.503	1 670	1 617	1.670	1.708	1.519	23.7
Physical sciences, n e c	155	188	208	228	224	297	304	96.1
Earth, atmospheric, & ocean sciences	3.738	3.979	3.762	3.692	3.818	4.202	4.459	19.3
Atmospheric sciences	110	128	111	102	101	109	130	18.2
Geosciences	2.100	2 332	2.153	2.069	1.893	1.891	1.870	-11.0
Oceanography	498	476	404	408	399	395	397	-20.3
Earth, atmos., & ocean sci n e c	1.030	1.043	1.094	1.113	1.425	1.807	2 062	100.2
Mathematical sciences	6.364	5 480	5.589	5.613	5.933	5.716	5.712	-10.2
Mathematics & applied math	5.891	4.919	5.034	5.075	5.340	5.110	5.056	-14.2
Statistics	473	561	555	538	593	606	656	38.7
Computer sciences	10.641	16.593	16.965	16.762	17 620	18.136	18.779	76.5
Agricultural sciences	2.432	1.978	1.973	2.079	2.170	2.164	2.329	-4 2
Biological sciences	9.274	8.542	8.381	8.511	9.062	9.086	9.919	7 0
Anatomy	137	87	83	79	89	90	70	-48 9
Biochemistry	274	209	190	272	214	247	331	20.8
Biology	4 345	3.792	3.667	3.592	3.860	3.853	4.214	-3.0
Biometry/epidemiology	247	390	469	511	640	601	742	200 4
Biophysics	17	123	48	45	37	18	23	35 3
Botany	442	409	380	388	387	384	382	-13 6
Cell biology	33	78	55	57	70	93	137	315.2
Ecology	141	167	169	211	252	261	304	115.6
Entomology/parasitology	200	182	179	172	176	157	177	-11 5
Genetics	66	106	102	111	111	108	113	71 2
Microbiology, immunology & virology	613	436	465	498	509	528	526	-14 2
Nutrition	1.239	1.274	1 352	1.385	1 350	1 292	1.302	5 1
Pathology	436	304	273	267	278	343	308	-29 4
Pharmacology	144	150	138	132	144	128	144	.0
Physiology	253	217	212	149	160	169	157	-37.9
Zoology	367	326	315	315	427	409	410	11 7
Biosciences, n e c	320	292	284	327	358	405	579	80 9
Psychology	14.406	15.433	15.885	16.498	17.850	19.398	19.434	34.9
Psychology, general	NA	NA	6 948	7.629	8.308	9.850	10.205	NA
Clinical psychology	NA	NA	6.879	6.403	6.713	6.449	5 450	NA
Psychology, n e c	NA	NA	2.058	2 466	2.829	3.099	3.779	NA
Social sciences	32.632	29 768	27.918	29.024	29.621	30.294	31.641	-3 0
Agricultural economics	289	346	350	364	312	353	407	40 8
Anthropology (cultural & social)	1.843	1 727	1.669	1.717	1.687	1.652	1.806	-2 0
Economics (except agricultural)	4 223	3 035	3.015	3 055	3.023	2 857	3.053	-27 7
Geography	1 027	933	993	1.121	1 156	1.221	1.305	27 1
History and philosophy of science	33	27	22	31	23	34	32	-3 0
Linguistics	646	833	724	821	818	876	815	26 2
Political science	16.194	14.584	14.582	15.271	15 304	15.738	16.081	- 7
Sociology	2 394	1.953	1.997	2 120	2 104	2.406	2.533	5.8
Sociology/anthropology	476	422	425	389	430	341	382	-19 7
Social sciences, n e c	5.507	4.108	4.141	4.135	4 764	4.815	5.227	-5 1
Engineering, total	33.983	42 121	40.020	39.702	41.674	42.529	43.581	28 2
Aerospace engineering	419	643	690	682	856	727	730	74 2
Agricultural engineering	136	139	160	180	146	157	160	17 6
Biomedical engineering	185	297	300	308	332	312	369	99 5
Chemical engineering	1 581	1 437	1.259	1.178	1.292	1.339	1.472	-6 9
Civil engineering	4 748	5 067	4.865	4.945	5 414	6.016	7.006	47 6
Electrical engineering	10.394	14 298	14.329	14.791	15 047	15.254	15.281	47.0
Engineering science	853	970	968	818	768	790	803	-5 9
Industrial eng /management sci	5 814	8 206	7 277	6.603	6.645	7.261	7.643	31 5
Mechanical engineering	4.200	6 136	5 760	5 748	5 972	6.067	6.343	51 0
Metallurgical/materials eng	646	930	871	874	1.012	1.102	1 181	82 8
Mining engineering	76	78	74	80	103	153	174	128 9
Nuclear engineering	259	235	198	211	198	202	202	-22 0
Petroleum engineering	110	174	143	159	186	190	165	50 0
Engineering, n e c	4 562	3 511	3 126	3 125	3 703	2.959	2.052	-55 0

See explanatory information and SOURCE at end of table

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

Enrollment status sex and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982–1992
Part time men								
Total science and engineering	79.334	84.202	81.881	81.970	85.009	87 152	88.972	12.1
Science total	48.886	47 784	47 433	47 761	49 336	50.637	51.912	6 2
Physical sciences	3.127	3.230	3.257	3.270	3.382	3.380	3.409	9 0
Astronomy	35	36	22	23	16	16	24	-31 4
Chemistry	1.915	1.796	1.675	1.731	1.823	1.735	1.876	-2 0
Physics	1.089	1.273	1 438	1.364	1.393	1 428	1.308	20 1
Physical sciences n e c	88	125	122	152	150	201	201	128 4
Earth. atmospheric & ocean sciences	2.785	2.882	2 673	2.557	2 594	2.881	2.975	6 8
Atmospheric sciences	101	108	95	86	91	96	88	-12.9
Geosciences	1.585	1.760	1.589	1.542	1.393	1.415	1.381	-12.9
Oceanography	365	334	284	262	258	234	214	-41 4
Earth. atmos & ocean sci n e c	734	680	705	667	852	1.136	1.292	76.0
Mathematical sciences	4.077	3.440	3.526	3.556	3 772	3.631	3.579	-12 2
Mathematics & applied math	3.733	3.074	3.167	3.205	3.377	3.235	3.161	-15.3
Statistics	344	366	359	351	395	396	418	21.5
Computer sciences	7.506	11 997	12.200	12 101	12.929	13.393	13.939	85 7
Agricultural sciences	1.898	1.415	1.373	1.465	1.500	1.489	1.582	-16.6
Biological sciences	4.648	4.221	3.904	3 884	4.164	4.143	4.530	-2 5
Anatomy	89	45	49	40	42	43	28	-68.5
Biochemistry	154	115	89	167	122	147	179	16.2
Biology	2.349	2.027	1.875	1 778	1.872	1.878	2.048	-12 8
Biometry/epidemiology	108	192	202	188	281	271	313	189.8
Biophysics	14	95	37	29	26	17	21	50 0
Botany	275	254	233	245	228	227	233	-15 3
Cell biology	22	44	32	31	41	48	64	190.9
Ecology	87	86	84	113	129	131	155	78.2
Entomology parasitology	137	130	129	124	121	110	125	-8 8
Genetics	20	53	50	50	50	50	53	165 0
Microbiology immunology & virology	307	210	216	230	242	240	249	-18 9
Nutrition	215	252	241	261	281	253	257	19.5
Pathology	229	155	137	118	138	162	161	-29 7
Pharmacology	90	93	95	83	89	72	76	-15.6
Physiology	165	125	111	79	77	78	71	-57 0
Zoology	213	200	202	206	266	237	246	15 5
Biosciences n e c	174	145	122	142	159	179	251	44.3
Psychology	5 753	5.286	5.311	5.300	5.251	5.681	5.504	-4.3
Psychology general	NA	NA	2.047	2.110	2.206	2.667	2.746	NA
Clinical psychology	NA	NA	2.513	2.322	2.133	2.051	1 708	NA
Psychology n e c	NA	NA	751	868	910	963	1.050	NA
Social sciences	19.092	15.313	15.189	15.628	15.744	16.039	16.394	-14 1
Agricultural economics	223	287	264	275	232	251	289	29 6
Anthropology (cultural & social)	774	651	643	688	642	655	691	-10 7
Economics (except agricultural)	2.984	2.120	2.102	2.110	2.105	1.974	2.102	-29 6
Geography	693	584	668	728	741	775	816	17 7
History and philosophy of science	18	14	15	20	13	20	23	27 8
Linguistics	234	272	236	259	256	361	256	9.4
Political science	9 504	8.190	7.997	8.341	8.172	8.307	8.382	-11.8
Sociology	1 051	792	859	888	856	949	941	-10 5
Sociology anthropology	225	194	174	157	179	146	180	-20 0
Social sciences n e c	3 386	2.229	2.231	2.182	2.548	2.601	2.714	-19 8
Engineering total	30 448	36 418	34.448	34.209	35.673	36.515	37.060	21 7
Aerospace engineering	382	586	631	622	768	656	645	68 8
Agricultural engineering	129	128	146	162	128	141	143	10 9
Biomedical engineering	146	246	236	229	245	226	279	91 1
Chemical engineering	1.352	1 157	976	945	1.042	1.067	1.169	-13 5
Civil engineering	4 239	4.358	4.136	4.159	4.506	4 948	5.699	34 4
Electrical engineering	9 661	12.749	12 733	13.098	13.288	13 553	13.449	39 2
Engineering science	710	810	829	709	646	684	683	-3 8
Industrial eng management sci	4.954	6 661	5 846	5.357	5.367	5.923	6.154	24 2
Mechanical engineering	3.914	5 572	5 183	5.205	5 381	5.496	5.726	46 3
Metallurgical materials eng	534	770	694	703	809	857	936	75.3
Mining engineering	71	73	68	74	92	135	150	111.3
Nuclear engineering	246	211	172	189	171	170	165	-32 9
Petroleum engineering	101	163	125	151	177	176	151	49 5
Engineering n e c	4 009	2 934	2 673	2 606	3 053	2.483	1 711	-57.3

See explanatory information and SOURCE at end of table

Appendix table 6-4. Science and engineering graduate students in all institutions, by enrollment status, sex, and detailed field: fall 1982 and 1987–1992

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Enrollment status sex. and detailed field	1982	1987	1988	1989	1990	1991	1992	Percentage change 1982-1992
Part time. women								
Total science and engineering	38.285	42.208	43.000	44.323	47 377	49 063	51 648	34 9
Science total	34 750	36 505	37 428	38.830	41.376	43.049	45 127	29 9
Physical sciences	1 022	1 086	1 131	1 142	1.256	1 310	1 357	32 8
Astronomy	7	5	4	4	4	3	5	28 6
Chemistry	809	788	809	809	901	931	1 038	28 3
Physics	139	230	232	253	277	280	211	51 8
Physical sciences n e c	67	63	86	76	74	96	103	53 7
Earth. atmospheric. & ocean sciences	953	1.097	1.089	1.135	1 224	1.321	1.484	55 7
Atmospheric sciences	9	20	16	16	10	13	42	366 7
Geosciences	515	572	564	527	500	476	489	-5.0
Oceanography	133	142	120	146	141	161	183	37 6
Earth. atmos & ocean sci n e c	296	363	389	446	573	671	770	160 1
Mathematical sciences	2.287	2.040	2.063	2 057	2.161	2.085	2.133	-6 7
Mathematics & applied math	2 158	1.845	1.867	1.870	1.963	1 875	1.895	-12 2
Statistics	129	195	196	187	198	210	238	84 5
Computer sciences	3 135	4.596	4 765	4.661	4 [illegible]91	4 743	4 840	54 4
Agricultural sciences	534	563	600	614	670	675	74[illegible]	39 9
Biological sciences	4.626	4 321	4.477	4.627	4.898	4 943	5.389	16 5
Anatomy	48	42	34	39	47	47	42	-12 5
Biochemistry	120	94	101	105	92	100	152	26 7
Biology	1.996	1.765	1.792	1 814	1.988	1.975	2.166	8 5
Biometry-epidemiology	139	198	267	323	359	330	429	208 6
Biophysics	3	28	11	16	11	1	2	-33 3
Botany	167	155	147	143	159	157	149	-10 8
Cell biology	11	34	23	26	29	45	73	563 6
Ecology	54	81	85	98	123	130	149	175 9
Entomology parasitology	63	52	50	48	55	47	52	-17 5
Genetics	46	53	52	61	61	58	60	30 4
Microbiology immunology & virology	306	226	249	268	267	288	277	-9 5
Nutrition	1 024	1.022	1.111	1.124	1.069	1.039	1 045	2 1
Pathology	207	149	136	149	140	181	147	-29 0
Pharmacology	54	57	43	49	55	56	68	25 9
Physiology	88	92	101	70	83	91	86	-2 3
Zoology	154	126	113	109	161	172	164	6 5
Biosciences. n e c	146	147	162	185	199	226	328	124 7
Psychology	8.653	10.147	10.574	11 198	12.599	13 717	13.930	61 0
Psychology. general	NA	NA	4.901	5.519	6.100	7.183	7.459	NA
Clinical psychology	NA	NA	4 366	4.081	4 580	4.398	3 742	NA
Psychology. n e c	NA	NA	1.307	1.598	1.919	2.136	2.729	NA
Social sciences	13 540	12 655	12.729	13.396	13.877	14.255	15 247	12 6
Agricultural economics	66	79	86	89	80	102	118	78 8
Anthropology (cultural & social)	1 069	1 076	1 026	1.049	1.045	997	1.115	4 3
Economics (except agricultural)	1.239	915	913	945	918	883	951	23.2
Geography	334	349	325	393	415	446	489	46 4
History and philosophy of science	15	13	7	11	10	14	9	-40 0
Linguistics	412	561	488	562	562	515	559	35 7
Political science	6.690	6.394	6 585	6.930	7.132	7.431	7.699	15 1
Sociology	1.343	1.161	1 138	1.232	1.248	1.457	1 592	18 5
Sociology/anthropology	251	228	251	232	251	195	202	19 5
Social sciences n e c	2 121	1 879	1.910	1.953	2.216	2.215	2.513	18 5
Engineering. total	3.535	5.703	5.572	5 493	6 001	6.014	6.521	84 5
Aerospace engineering	37	57	59	60	88	71	85	129 7
Agricultural engineering	7	11	14	18	18	16	17	14[illegible] 9
Biomedical engineering	39	51	64	79	87	86	90	130 8
Chemical engineering	229	280	283	233	250	272	303	32 3
Civil engineering	509	709	729	786	908	1 068	1 307	156 8
Electrical engineering	733	1 549	1 596	1 693	1.759	1.701	1 832	149 9
Engineering science	143	160	139	109	122	106	120	-16 1
Industrial eng /management sci	860	1 545	1.431	1.246	1.278	1 338	1 489	73 1
Mechanical engineering	286	564	577	543	591	571	617	115 7
Metallurgical/materials eng	112	160	177	171	203	245	245	118 8
Mining engineering	5	5	6	6	11	18	24	380 0
Nuclear engineering	13	24	26	22	27	32	37	184 6
Petroleum engineering	[illegible]	11	18	8	9	14	14	55 6
Engineering. n e.c	553	577	453	519	650	476	341	38 3

KEY NA not available
n e c - not elsewhere classified

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-5. Full-time and full-time first-year science and engineering graduate students in all institutions, by detailed field and sex: fall 1985 and 1992

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Enrollment status and detailed field	1985' Total	1985' Men	1985' Women	1985' Percentage women	1992 Total	1992 Men	1992 Women	1992 Percentage women
Full time.								
Total. science and engineering	234.495	164.436	70.059	29 9	290.993	192.230	98.763	33 9
Science. total	178.584	114.810	63.774	35 7	216.527	128.401	88.126	40.7
Physical sciences	26.669	21.241	5.428	20.4	30.730	23.242	7.488	24.4
Astronomy	635	531	104	16.4	840	659	181	21 5
Chemistry	15.580	11.592	3.988	25 6	16.990	11.507	5.483	32 3
Physics	10.287	9.002	1.285	12 5	12.74[illegible]	10.984	1.761	13.8
Physical sciences. n e.c	167	116	51	30 5	155	92	63	40.6
Earth. atmospheric. & ocean sciences	11.458	8.587	2.871	25.1	11.150	7.710	3.440	30.9
Atmospheric sciences	872	733	139	15 9	959	760	199	20 8
Geosciences	7.703	5.842	1.861	24 2	5.889	4.309	1.580	26.8
Oceanography	1.562	1.114	448	28.7	2.133	1.357	776	36.4
Earth. atmos. & ocean sci . n e c	1.321	898	423	32 0	2.169	1.284	885	40.8
Mathematical sciences	11.828	8.617	3.211	27.1	14.663	10.244	4.419	30.1
Mathematics & applied math	10.208	7.480	2.728	26 7	12.370	8.773	3.597	29.1
Statistics	1.620	1.137	483	29 8	2.293	1.471	822	35.8
Computer sciences	13.824	10.793	3.031	21.9	17.617	14.059	3.558	20.2
Agricultural sciences	9.096	6.751	2.345	25.8	9.280	6.343	2.937	31 6
Biological sciences	37.086	21.847	15.239	41.1	44.518	24.368	20 150	45.3
Anatomy	891	509	382	42 9	961	510	451	46 9
Biochemistry	4.453	2.802	1.651	37.1	5.055	2.981	2 074	41.0
Biology	8.519	5.068	3,451	40 5	9.683	5.276	4.407	45.5
Biometry/epidemiology	996	458	538	54.0	1.627	724	903	55.5
Biophysics	381	287	94	24 7	728	528	200	27 5
Botany	2 717	1.717	1 000	36 8	2.308	1.407	901	39.0
Cell biology	1.406	895	511	36 3	2.956	1.623	1.333	45 1
Ecology	876	561	315	36 0	997	558	439	44 0
Entomology/parasitology	1.138	853	285	25 0	1.016	714	302	29 7
Genetics	1.057	567	490	46.4	1.530	746	784	51.2
Microbiology immunology. & virology	3.878	2.223	1.655	42 7	4.482	2 387	2.095	46.7
Nutrition	3.040	1.119	1.921	63 2	2.943	1.001	1.942	66 0
Pathology	1 003	605	398	39 7	1.209	677	532	44.0
Pharmacology	1.993	1 237	756	37 9	2.401	1.304	1.097	45 7
Physiology	1.986	1 245	741	37 3	2.162	1.296	866	40 1
Zoology	1.718	1 112	606	35.3	1.793	1.103	690	38 5
Biosciences n e c	1.034	589	445	43 0	2.667	1.533	1.134	42.5
Psychology	25 621	10.315	15.306	59 7	34.386	11.257	23 129	67.3
Psychology general	NA	NA	NA	NA	12.912	4.165	8.747	67 7
Clinical psychology	NA	NA	NA	NA	13.288	4.663	8.625	64 9
Psychology. n e c	NA	NA	NA	NA	8.186	2.429	5.757	70.3
Social sciences	43.002	26.659	16.343	38 0	54 183	31.178	23.005	42.5
Agricultural economics	1.990	1.554	436	21 9	2.106	1.514	592	28.1
Anthropology (cultural & social)	3.916	1.789	2.127	54 3	5.323	2.197	3.126	58 7
Economics (except agricultural)	8.938	6.881	2.057	23 0	10.213	7.381	2.832	27 7
Geography	2.124	1 433	691	32 5	2.792	1.853	939	33.6
History and philosophy of science	227	155	72	31 7	328	207	121	36 9
Linguistics	2 337	981	1.356	58 0	2.473	1.023	1.450	58.6
Political science	13.171	8.565	4.606	35 0	17.689	10.443	7.246	41 0
Sociology	4.649	2.268	2.381	51 2	6.328	2.843	3 485	55 1
Sociology/anthropology	565	271	294	52 0	741	329	412	55 6
Social sciences. n e c	5 085	2.762	2.323	45 7	6.190	3.388	2.802	45 3
Engineering. total	55.911	49.626	6.285	11 2	74.466	63 829	10 637	14 3
Aerospace engineering	1.994	1.868	126	6 3	3.306	3.043	263	8 0
Agricultural engineering	767	709	58	7 6	829	705	124	15.0
Biomedical engineering	1 129	884	245	21 7	2.110	1.586	524	24.8
Chemical engineering	5.546	4.792	754	13.6	5.943	4.851	1.092	18 4
Civil engineering	9.760	8.266	1 494	15 3	12.379	10.081	2.298	18.6
Electrical engineering	14.799	13 591	1 208	8 2	20.991	18.577	2.414	11 5
Engineering science	1.264	1.146	118	9 3	1.415	1 230	185	13 1
Industrial eng /management sci	3.494	2.849	645	18 5	6.092	4.917	1.175	19.3
Mechanical engineering	8.875	8.316	559	6 3	12 425	11.342	1 083	8 7
Metallurgical/materials eng	3.093	2.654	439	14 2	4.289	3.477	812	18.9
Mining engineering	391	363	28	7 2	305	[illegible]	24	7 9
Nuclear engineering	1 030	939	91	8 8	1.084	938	146	13 5
Petroleum engineering	577	530	47	8 1	572	521	51	8 9
Engineering n e c	3 192	2 719	473	14 8	2 726	[illegible] 280	446	16 4

See explanatory information and SOURCE at end of table

Appendix table 6-5. Full-time and full-time first-year science and engineering graduate students in all institutions, by detailed field and sex: fall 1985 and 1992

Enrollment status and detailed field	1985*				1992			
	Total	Men	Women	Percentage women	Total	Men	Women	Percentage women
Full time first year								
Total, science and engineering	71,395	48,088	23,307	32.6	82,481	52,312	30,169	36.6
Science, total	53,137	32,193	20,944	39.4	60,570	33,916	26,654	44.0
Physical sciences	6,645	5,099	1,546	23.3	6,948	5,029	1,919	27.6
Astronomy	155	125	30	19.4	161	119	42	26.1
Chemistry	3,880	2,762	1,118	28.8	3,904	2,495	1,409	36.1
Physics	2,550	2,167	383	15.0	2,812	2,374	438	15.6
Physical sciences, n.e.c	60	45	15	25.0	71	41	30	42.3
Earth, atmospheric, & ocean sciences	3,286	2,372	914	27.8	3,049	1,991	1,058	34.7
Atmospheric sciences	286	219	67	23.4	233	185	48	20.6
Geosciences	2,135	1,585	550	25.8	1,507	1,048	459	30.5
Oceanography	392	263	129	32.9	498	296	202	40.6
Earth, atmos., & ocean sci., n.e.c	473	305	168	35.5	811	462	349	43.0
Mathematical sciences	3,982	2,730	1,252	31.4	4,404	2,927	1,477	33.5
Mathematics & applied math	3,469	2,401	1,068	30.8	3,700	2,509	1,191	32.2
Statistics	513	329	184	35.9	704	418	286	40.6
Computer sciences	4,698	3,566	1,132	24.1	5,464	4,286	1,178	21.6
Agricultural sciences	2,400	1,712	688	28.7	2,169	1,390	779	35.9
Biological sciences	9,830	5,325	4,505	45.8	10,885	5,497	5,388	49.5
Anatomy	197	100	97	49.2	231	122	109	47.2
Biochemistry	1,093	667	426	39.0	1,033	559	474	45.9
Biology	2,412	1,322	1,090	45.2	2,767	1,435	1,332	48.1
Biometry/epidemiology	367	151	216	58.9	601	236	365	60.7
Biophysics	64	41	23	35.9	145	104	41	28.3
Botany	652	387	265	40.6	546	316	230	42.1
Cell biology	345	209	136	39.4	655	343	312	47.6
Ecology	207	119	88	42.5	212	110	102	48.1
Entomology/parasitology	249	178	71	28.5	216	143	73	33.8
Genetics	271	121	150	55.4	304	109	195	64.1
Microbiology, immunology, & virology	965	517	448	46.4	861	423	438	50.9
Nutrition	947	301	646	68.2	783	215	568	72.5
Pathology	252	134	118	46.8	275	132	143	52.0
Pharmacology	497	287	210	42.3	558	298	260	46.6
Physiology	629	397	232	36.9	589	349	240	40.7
Zoology	406	251	155	38.2	396	214	182	46.0
Biosciences, n.e.c	277	143	134	48.4	713	389	324	45.4
Psychology	7,798	2,885	4,913	63.0	9,944	3,134	6,810	68.5
Psychology, general	NA	NA	NA	NA	4,013	1,217	2,796	69.7
Clinical psychology	NA	NA	NA	NA	3,827	1,304	2,523	65.9
Psychology, n.e.c	NA	NA	NA	NA	2,104	613	1,491	70.9
Social sciences	14,498	8,504	5,994	41.3	17,707	9,662	8,045	45.4
Agricultural economics	663	513	150	22.6	680	465	215	31.6
Anthropology (cultural & social)	986	432	554	56.2	1,291	495	796	61.7
Economics (except agricultural)	2,674	1,963	711	26.6	2,998	2,081	917	30.6
Geography	717	470	247	34.4	869	569	300	34.5
History and philosophy of science	53	38	15	28.3	76	52	24	31.6
Linguistics	685	281	404	59.0	639	232	407	63.7
Political science	5,191	3,114	2,077	40.0	6,736	3,683	3,053	45.3
Sociology	1,182	533	649	54.9	1,715	685	1,030	60.1
Sociology/anthropology	198	83	115	58.1	224	92	132	58.9
Social sciences, n.e.c	2,149	1,077	1,072	49.9	2,479	1,308	1,171	47.2
Engineering, total	18,258	15,895	2,363	12.9	21,911	18,396	3,515	16.0
Aerospace engineering	722	657	65	9.0	1,009	909	100	9.9
Agricultural engineering	238	220	18	7.6	188	153	35	18.6
Biomedical engineering	359	275	84	23.4	599	439	160	26.7
Chemical engineering	1,533	1,276	257	16.8	1,482	1,153	329	22.2
Civil engineering	3,543	2,965	576	16.3	4,350	3,440	910	20.9
Electrical engineering	4,892	4,439	453	9.3	5,960	5,202	758	12.7
Engineering science	336	291	45	13.4	347	300	47	13.5
Industrial eng./management sci	1,201	952	249	20.7	1,894	1,514	380	20.1
Mechanical engineering	3,030	2,794	236	7.8	3,692	3,341	351	9.5
Metallurgical/materials eng	800	649	151	16.9	973	760	213	21.9
Mining engineering	116	107	9	7.8	83	76	7	8.4
Nuclear engineering	274	244	30	10.9	283	238	45	15.9
Petroleum engineering	132	119	13	9.8	133	114	19	14.3
Engineering, n.e.c	1,082	907	175	16.2	918	757	161	17.5

* Includes estimated data for master's degree granting institutions, which were surveyed on a sample basis from 1985 through 1987

KEY NA - not available
n.e.c. - not elsewhere classified

SOURCE: National Science Foundation/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering

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Appendix table 6-6. Primary source of support for full-time science and engineering graduate students in all institutions, by sex and field: fall 1985 and 1992

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Field and primary source of support	1985 Total students	1985 Men	1985 Women	1985 Percentage women	1992 Total students	1992 Men	1992 Women	1992 Percentage women
Total. science and engineering								
Total. all sources	234.495	164.436	70.059	29 9	290.993	192.230	98.763	33 9
Federal. total	42.831	32.057	10 774	25 2	58.309	41.057	17.252	29.6
Dept of Defense	7 052	6.302	750	10 6	8 742	7.517	1.225	14.0
Dept of HHS. total	11 176	6.741	4 435	39 7	16 202	9.098	7 104	43.8
NIH	10.012	6.144	3.868	38 6	14.916	8 470	6.446	43 2
Other HHS	1.164	597	567	48 7	1.286	628	658	51 2
NSF	10.138	8.044	2.094	20 7	13.229	9 920	3.309	25 0
USDA	2 149	1.507	642	29 9	3.162	2.145	1 017	32 2
All other Federal	12 316	9.463	2.853	23 2	16 974	12.377	4.597	27.1
Institutional support	98.631	67.496	31.135	31 6	120 243	77.912	42.331	35 2
Other outside support. total	24.929	19.833	5.096	20 4	26.117	19.588	6.529	25 0
All other U S	17.670	13.502	4.168	23.6	20.150	14.712	5.438	27.0
Foreign	7.259	6.331	928	12 8	5.967	4.876	1.091	18 3
Self-support	68.104	45.050	23.054	33 9	86.324	53.673	32.651	37.8
Science. total								
Total. all sources	178.584	114.810	63.774	35 7	216.527	128.401	88 126	40 7
Federal. total	31.566	21.914	9.652	30 6	41.834	27 115	14 719	35 2
Dept of Defense	3.276	2 768	508	15.5	3.857	3 138	719	18.6
Dept of HHS. total	10.651	6.339	4.312	40 5	15.239	8.366	6.873	45 1
NIH	9.557	5.791	3.766	39 4	14.059	7.823	6.236	44 4
Other HHS	1.094	548	546	49 9	1.180	543	637	54 0
NSF	7,450	5.668	1.782	23.9	8.671	6.227	2.444	28 2
USDA	1.985	1.361	624	31 4	2.795	1.831	964	34.5
All other Federal	8.204	5.778	2.426	29 6	11.272	7.553	3.719	33 0
Institutional support	80.236	51.309	28.927	36 1	95.438	56.764	38.674	40 5
Other outside support. total	15.276	11.141	4.135	27 1	15 643	10.523	5.120	32.7
All other U S.	10.224	6.918	3.306	32 3	11.670	7.487	4 183	35 8
Foreign	5.052	4.223	829	16 4	3.973	3.036	937	23 6
Self-support	51.506	30.446	21 060	40 9	63 612	33 999	29.613	46 6
Physical sciences								
Total. all sources	26.669	21 241	5.428	20 4	30 730	23.242	7.488	24.4
Federal. total	8.821	7.184	1.637	18 6	10 956	8 487	2.469	22 5
Dept. of Defense	1.024	885	139	13 6	1.188	998	190	16 0
Dept of HHS. total	1.796	1.308	488	27 2	2.166	1 473	693	32 0
NIH	1.635	1.186	449	27.5	2 034	1 391	643	31 6
Other HHS	161	122	39	24 2	132	82	50	37 9
NSF	3 516	2 906	610	17 3	3.603	2 834	769	21 3
USDA	35	27	8	22 9	68	49	19	27 9
All other Federal	2.450	2.058	392	16 0	3 931	3 133	798	20 3
Institutional support	13.962	10.895	3.067	22 0	15 359	11 361	3.998	26 0
Other outside support total	2.091	1.724	367	17 6	2.444	1.868	576	23 6
All other U.S	1.656	1 355	301	18 2	2 112	1.589	523	24 8
Foreign	435	369	66	15 2	332	279	53	16 0
Self-support	1 795	1.438	357	19 9	1.971	1.526	445	22 6
Earth. atmos . & ocean sciences								
Total. all sources	11.458	8.587	2 871	25 1	11.150	7.710	3 440	30 9
Federal. total	2.960	2.242	718	24 3	3 449	2.416	1.033	30 0
Dept of Defense	418	349	69	16 5	472	361	111	23 5
Dept of HHS total	41	35	6	14 6	49	28	21	42 9
NIH	26	21	5	19 2	43	23	20	46 5
Other HHS	15	14	1	6 7	6	5	1	16 7
NSF	1.374	1.033	341	24 8	1.323	930	393	29 7
USDA	42	28	14	33 3	91	61	30	33 0
All other Federal	1 085	797	288	26 5	1 514	1.036	478	31 6
Institutional support	4 170	2 998	1.172	28 1	4 375	2 975	1 400	32 0
Other outside support total	1.397	1.107	290	20 8	1 032	784	248	24 0
All other U S	1 034	773	261	25 2	787	581	206	26 2
Foreign	363	334	29	8 0	245	203	42	17 1
Self-support	2.931	2 240	691	23 6	2 294	1 535	759	33 1
Mathematical sciences								
Total all sources	11 828	8 617	3 211	27 1	14 663	10.244	4 419	30 1
Federal. total	935	775	160	17 1	1.499	1.148	351	23 4
Dept of Defense	386	345	41	10 6	386	327	59	15 3
Dept of HHS. total	21	15	6	28 6	68	54	14	20 6
NIH	18	13	5	27 8	61	50	11	18 0
Other HHS	3	2	1	33 3	7	4	3	42 9
NSF	321	266	55	17 1	457	347	110	24 1
USDA	13	12	1	7 7	25	17	8	32 0
All other Federal	194	137	57	29 4	563	403	160	28 4
Institutional support	8 111	5.819	2.292	28 3	9.547	6 623	2 924	30 6
Other outside support total	549	449	100	18 2	642	478	164	25 5
All other U S	257	208	49	19 1	354	252	102	28 8
Foreign	292	241	51	17 5	288	226	62	21 5
Self support	2 233	1 574	659	29 5	2 975	1 995	980	32 9

See explanatory information and SOURCE at end of table

Appendix table 6-6. Primary source of support for full-time science and engineering graduate students in all institutions, by sex and field: fall 1985 and 1992

Field and primary source of support	1985 Total students	1985 Men	1985 Women	1985 Percentage women	1992 Total students	1992 Men	1992 Women	1992 Percentage women
Computer sciences								
Total, all sources	13,824	10,793	3,031	21.9	17,617	14,059	3,558	20.2
Federal, total	1,633	1,414	219	13.4	2,635	2,248	387	14.7
Dept of Defense	858	766	92	10.7	1,194	1,028	166	13.9
Dept of HHS, total	20	17	3	15.0	101	80	21	20.8
NIH	20	17	3	15.0	98	78	20	20.4
Other HHS	0	0	0	.0	3	2	1	33.3
NSF	500	431	69	13.8	956	824	132	13.8
USDA	4	4	0	0	6	6	0	.0
All other Federal	251	196	55	21.9	378	310	68	18.0
Institutional support	4,284	3,373	911	21.3	5,583	4,512	1,071	19.2
Other outside support, total	1,357	1,097	260	19.2	1,359	1,125	234	17.2
All other U.S.	1,007	803	204	20.3	1,034	850	184	17.8
Foreign	350	294	56	16.0	325	275	50	15.4
Self-support	6,550	4,909	1,641	25.1	8,040	6,174	1,866	23.2
Agricultural sciences								
Total, all sources	9,096	6,751	2,345	25.8	9,280	6,343	2,937	31.6
Federal, total	1,543	1,167	376	24.4	1,961	1,389	572	29.2
Dept of Defense	28	25	3	10.7	18	15	3	16.7
Dept of HHS, total	17	10	7	41.2	31	23	8	25.8
NIH	17	10	7	41.2	30	22	8	26.7
Other HHS	0	0	0	0	1	1	0	.0
NSF	96	74	22	22.9	84	45	39	46.4
USDA	679	511	168	24.7	1,079	763	316	29.3
All other Federal	723	547	176	24.3	749	543	206	27.5
Institutional support	3,451	2,490	961	27.8	3,589	2,373	1,216	33.9
Other outside support, total	1,891	1,559	332	17.6	1,642	1,202	440	26.8
All other U.S.	1,013	760	253	25.0	1,064	730	334	31.4
Foreign	878	799	79	9.0	578	472	106	18.3
Self-support	2,211	1,535	676	30.6	2,088	1,379	709	34.0
Biological sciences								
Total, all sources	37,086	21,847	15,239	41.1	44,518	24,368	20,150	45.3
Federal, total	10,695	6,426	4,269	39.9	15,141	8,386	6,755	44.6
Dept. of Defense	220	146	74	33.6	234	143	91	38.9
Dept of HHS, total	7,382	4,379	3,003	40.7	11,032	6,023	5,009	45.4
NIH	7,025	4,201	2,824	40.2	10,562	5,788	4,774	45.2
Other HHS	357	178	179	50.1	470	235	235	50.0
NSF	1,072	654	418	39.0	1,339	763	576	43.0
USDA	810	488	322	39.8	1,112	650	462	41.5
All other Federal	1,211	759	452	37.3	1,424	807	617	43.3
Institutional support	17,034	9,891	7,143	41.9	19,765	10,703	9,062	45.8
Other outside support, total	3,248	2,189	1,059	32.6	3,878	2,401	1,477	38.1
All other U.S.	2,319	1,463	856	36.9	3,201	1,908	1,293	40.4
Foreign	929	726	203	21.9	677	493	184	27.2
Self-support	6,109	3,341	2,768	45.3	5,734	2,878	2,856	49.8
Psychology								
Total, all sources	25,621	10,315	15,306	59.7	34,386	11,257	23,129	67.3
Federal, total	2,048	910	1,138	55.6	2,785	1,058	1,727	62.0
Dept of Defense	140	93	47	33.6	135	74	61	45.2
Dept of HHS, total	1,053	437	616	58.5	1,376	519	857	62.3
NIH	619	263	356	57.5	939	359	580	61.8
Other HHS	434	174	260	59.9	437	160	277	63.4
NSF	235	93	142	60.4	284	126	158	55.6
USDA	13	2	11	84.6	19	5	14	73.7
All other Federal	607	285	322	53.0	971	334	637	65.6
Institutional support	10,509	4,308	6,201	59.0	12,863	4,347	8,516	66.2
Other outside support, total	1,378	601	777	56.4	1,166	445	721	61.8
All other U.S.	1,321	567	754	57.1	1,109	418	691	62.3
Foreign	57	34	23	40.4	57	27	30	52.6
Self-support	11,686	4,496	7,190	61.5	17,572	5,407	12,165	69.2
Social sciences, total								
Total, all sources	43,002	26,659	16,343	38.0	54,183	31,178	23,005	42.5
Federal, total	2,931	1,796	1,135	38.7	3,408	1,983	1,425	41.8
Dept of Defense	202	159	43	21.3	230	192	38	16.5
Dept of HHS, total	321	138	183	57.0	416	166	250	60.1
NIH	197	80	117	59.4	292	112	180	61.6
Other HHS	124	58	66	53.2	124	54	70	56.5
NSF	336	211	125	37.2	625	358	267	42.7
USDA	389	289	100	25.7	395	280	115	29.1
All other Federal	1,683	999	684	40.6	1,742	987	755	43.3
Institutional support	18,715	11,535	7,180	38.4	24,357	13,870	10,487	43.1
Other outside support, total	3,365	2,415	950	28.2	3,480	2,220	1,260	36.2
All other U.S.	1,617	989	628	38.8	2,009	1,159	850	42.3
Foreign	1,748	1,426	322	18.4	1,471	1,061	410	27.9
Self-support	17,991	10,913	7,078	39.3	22,938	13,105	9,833	42.9

planatory information and SOURCE at end of table

Appendix table 6-6. Primary source of support for full-time science and engineering graduate students in all institutions, by sex and field: fall 1985 and 1992

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Field and primary source of support	1985' Total students	1985' Men	1985' Women	1985' Percentage women	1992 Total students	1992 Men	1992 Women	1992 Percentage women
Economics								
Total, all sources	10.928	8.435	2.493	22 8	12.319	8.895	3.424	27 8
Federal, total	816	629	187	22 9	803	579	224	27 9
Dept of Defense	14	11	3	21 4	4	4	0	0
Dept of HHS, total	30	20	10	33 3	53	27	26	49 1
NIH	18	11	7	38 9	32	18	14	43 8
Other HHS	12	9	3	25 0	21	9	12	57 1
NSF	98	84	14	14 3	127	93	34	26 8
USDA	313	237	76	24 3	321	231	90	28.0
All other Federal	361	277	84	23.3	298	224	74	24.8
Institutional support	5.227	3.972	1.255	24.0	6.109	4.359	1.750	28 6
Other outside support, total	1 232	1.026	206	16 7	1.038	796	242	23.3
All other U S	486	373	113	23 3	393	292	101	25.7
Foreign	746	653	93	12 5	645	504	141	21.9
Self-support	3.653	2.808	845	23.1	4.369	3.161	1.208	27 6
Political science								
Total, all sources	13.171	8.565	4 606	35.0	17.689	10.443	7.246	41 0
Federal, total	632	360	272	43.0	805	494	311	38.6
Dept. of Defense	73	52	21	28 8	98	81	17	17 3
Dept. of HHS, total	40	16	24	60 0	52	22	30	57.7
NIH	1	0	1	100.0	19	10	9	47 4
Other HHS	39	16	23	59 0	33	12	21	63.6
NSF	35	18	17	48 6	107	73	34	31 8
USDA	11	5	6	54 5	9	6	3	33.3
All other Federal	473	269	204	43 1	539	312	227	42.1
Institutional support	4 871	3.160	1.711	35 1	6.720	3.959	2.761	41.1
Other outside support, total	850	606	244	28 7	1.186	733	453	38.2
All other U S	354	207	147	41.5	741	420	321	43.3
Foreign	496	399	97	19 6	445	313	132	29 7
Self-support	6.818	4 439	2.379	34 9	8.978	5.257	3.721	41 4
Sociology								
Total all sources	5.214	2.539	2.675	51.3	7 069	3.172	3.897	55 1
Federal, total	459	238	221	48 1	457	201	256	56 0
Dept of Defense	4	3	1	25 0	4	3	1	25.0
Dept of HHS, total	178	73	105	59 0	206	76	130	63 1
NIH	131	55	76	58 0	161	57	104	64.6
Other HHS	47	18	29	61 7	45	19	26	57.8
NSF	53	26	27	50 9	98	45	53	54.1
USDA	49	34	15	30 6	26	19	7	26 9
All other Federal	175	102	73	41 7	123	58	65	52 8
Institutional support	2.854	1.342	1 512	53 0	3 861	1.670	2.191	56.7
Other outside support total	377	216	161	42 7	351	198	153	43.6
All other U S	248	126	122	49.2	260	135	125	48.1
Foreign	129	90	39	30 2	91	63	28	30 8
Self-support	1 524	743	781	51 2	2 400	1.103	1.297	54 0
Engineering, total								
Total all sources	55.911	49 626	6.285	11 2	74.466	63.829	10.637	14 3
Federal total	11 265	10.143	1 122	10 0	16.475	13.942	2 533	15 4
Dept of Defense	3.776	3.534	242	6 4	4.885	4.379	506	10.4
Dept of HHS total	525	402	123	23 4	963	732	231	24 0
NIH	455	353	102	22 4	857	647	210	24 5
Other HHS	70	49	21	30 0	106	85	21	19 8
NSF	2.688	2 376	312	11 6	4.558	3.693	865	19 0
USDA	164	146	18	11 0	367	314	53	14 4
All other Federal	4.112	3 685	427	10 4	5.702	4 824	878	15 4
Institutional support	18.395	16.187	2.208	12 0	24 805	21.148	3.657	14 7
Other outside support, total	9.653	8 692	961	10 0	10.474	9.065	1.409	13 5
All other U S	7 446	6.584	862	11 6	8.480	7.225	1.255	14 8
Foreign	2.207	2.108	99	4 5	1.994	1.840	154	7 7
Self-support	16 598	14.604	1.994	12 0	22.712	19.674	3.038	13 4
Chemical engineering								
Total all sources	5 546	4 792	754	13 6	5 943	4.851	1 092	18 4
Federal total	1 289	1 111	178	13 8	1.650	1.318	332	20 1
Dept of Defense	90	80	10	11 1	122	103	19	15 6
Dept of HHS, total	53	41	12	22 6	180	134	46	25 6
NIH	52	40	12	23 1	160	118	42	26 3
Other HHS	1	1	0	0	20	16	4	20 0
NSF	622	538	84	13 5	682	529	153	22 4
USDA	9	9	0	0	38	35	3	7 9
All other Federal	515	443	72	14 0	628	517	111	17 7
Institutional support	2 022	1 723	299	14 8	[illegible]	1.849	402	17 9
Other outside support total	1 342	1 186	156	11 6	1.191	972	219	18 4
All other U S	1 193	1 047	146	12 2	1.093	889	204	18 7
Foreign	149	139	10	6 7	98	83	15	15 3
Self-support	893	772	121	13 5	851	712	139	16 3

See explanatory information and SOURCE at end of table

Appendix table 6-6. Primary source of support for full-time science and engineering graduate students in all institutions, by sex and field: fall 1985 and 1992

Field and primary source of support	1985*				1992			
	Total students	Men	Women	Percentage women	Total students	Men	Women	Percentage women
Civil engineering								
Total, all sources	9.760	8.266	1.494	15 3	12.379	10 081	2 298	18.6
Federal total	1 304	1 128	176	13 5	1.908	1 546	362	19 0
Dept of Defense	256	239	17	6 6	313	273	40	12 8
Dept of HHS total	18	13	5	27 8	42	27	15	35 7
NIH	9	9	0	0	37	22	15	40 5
Other HHS	9	4	5	55 6	5	5	0	0
NSF	356	307	49	13.8	509	411	98	19 3
USDA	6	6	0	0	80	63	17	21.3
All other Federal	668	563	105	15 7	964	772	192	19 9
Institutional support	3 155	2.655	500	15 8	4 286	3.498	788	18 4
Other outside support, total	1 311	1.157	154	11 7	1 430	1.182	248	17 3
All other U S	875	743	132	15.1	984	780	204	20.7
Foreign	436	414	22	5 0	446	402	44	9 9
Self-support	3 990	3.326	664	16 6	4.755	3.855	900	18 9
Electrical engineering								
Total, all sources	14 799	13.591	1.208	8 2	20.991	18 577	2.414	11 5
Federal, total	2.396	2.212	184	7 7	4.096	3.540	556	13 6
Dept of Defense	1 300	1 225	75	5.8	1.681	1.512	169	10.1
Dept of HHS, total	82	65	17	20 7	117	98	19	16 2
NIH	62	50	12	19 4	105	89	16	15 2
Other HHS	20	15	5	25.0	12	9	3	25.0
NSF	558	494	64	11 5	1.379	1.157	222	16 1
USDA	5	5	0	0	29	29	0	0
All other Federal	451	423	28	6 2	890	744	146	16 4
Institutional support	4.950	4.555	395	8 0	6.833	6.062	771	11.3
Other outside support, total	2.452	2.234	218	8 9	2.875	2.562	313	10 9
All other U S	1.865	1.675	190	10 2	2.418	2.131	287	11 9
Foreign	587	559	28	4 8	457	431	26	5 7
Self-support	5.001	4.590	411	8 2	7.187	6.413	774	10 8
Industrial engineering								
Total, all sources	3.494	2.849	645	18 5	6.092	4.917	1 175	19 3
Federal total	395	336	59	14 9	671	516	155	23 1
Dept of Defense	187	175	12	6 4	276	233	43	15 6
Dept of HHS, total	4[illegible]	25	20	44 4	53	33	20	37 7
NIH	30	18	12	40 0	22	10	12	54 5
Other HHS	15	7	8	53.3	31	23	8	25 8
NSF	41	35	6	14 6	165	120	45	27 3
USDA	1	1	0	0	5	4	1	20 0
All other Federal	121	100	21	17 4	172	126	46	26 7
Institutional support	1 220	981	239	19 6	1 893	1 487	406	21 4
Other outside support, total	413	339	74	17 9	569	480	89	15 6
All other U S	311	245	66	21 2	431	351	80	18 6
Foreign	102	94	8	7 8	138	129	9	6 5
Self-support	1 466	1 193	273	18 6	2.959	2 434	525	17 7
Mechanical engineering								
Total, all sources	8 875	8.316	559	6 3	12.425	11 342	1.083	8 7
Federal total	1 907	1.792	115	6 0	2.751	2 490	261	9 5
Dept of Defense	540	516	24	4 4	709	657	52	7 3
Dept of HHS total	89	75	14	15 7	86	75	11	12 8
NIH	72	61	11	15 3	76	65	11	14 5
Other HHS	17	14	3	17 6	10	10	0	0
NSF	439	410	29	6 6	790	680	110	13 9
USDA	19	14	5	26 3	26	22	4	15 4
All other Federal	820	777	43	5 2	1.140	1.056	84	7 4
Institutional support	3 133	2.904	229	7 3	4 398	3 973	425	9 7
Other outside support total	1 607	1 517	90	5 6	1.621	1.482	139	8 6
All other U S	1 354	1.271	83	6 1	1 406	1.274	132	9 4
Foreign	253	246	7	2 8	215	208	7	3 3
Self-support	2 228	2 103	125	5 6	3 655	3 397	258	7 1
Metallurgical materials engineering								
Total all sources	3 093	2.654	439	14 2	4 289	3 477	812	18 9
Federal total	1 219	1.041	178	14 6	1 629	1.309	320	19 6
Dept of Defense	328	281	47	14 3	514	428	86	16 7
Dept of HHS total	19	18	1	5 3	21	17	4	19 0
NIH	19	18	1	5 3	15	12	3	20 0
Other HHS	0	0	0	..	6	5	1	16 7
NSF	[illegible]	334	58	14 8	456	344	112	24 6
USDA	0	0	0		20	17	3	15 0
All other Federal	480	408	72	15 0	618	503	115	18 6
Institutional support	668	564	104	15 6	1 160	903	257	22 2
Other outside support total	784	666	118	15 1	890	737	153	17 2
All other U S	672	560	112	16 7	766	630	136	17 8
Foreign	112	106	6	5 4	124	107	17	13 7
Self-support	422	383	39	9 2	610	528	82	13 4

*...des estimated data for master's degree granting institutions which were surveyed on a sample basis in 1985

HHS - U S Department of Health and Human Services NIH - National Institutes of Health NSF National Science Foundation USDA U S Department of Agriculture

...CE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-7. Female science and engineering graduate students in all institutions, by geographic division and State: fall 1992

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Geographic division and State	Science and engineering			Science			Engineering		
	Total	Women	Percentage women	Total	Women	Percentage women	Total	Women	Percentage women
Total, all institutions	431.613	150.411	34 8	313.566	133.253	42 5	118.047	17.158	14.5
New England	31.119	10.624	34 1	21.926	8.997	41 0	9.193	1.627	17 7
Connecticut	6.262	2.206	35 2	4.749	1 996	42 0	1.513	210	13.9
Maine	814	242	29 7	636	215	33 8	178	27	15.2
Massachusetts	20.103	6.735	33 5	13.481	5.488	40 7	6.622	1.247	18.8
New Hampshire	1.182	368	31 1	879	324	36 9	303	44	14.5
Rhode Island	2.079	809	38 9	1.616	728	45.0	463	81	17.5
Vermont	679	264	38 9	565	246	43 5	114	18	15.8
Middle Atlantic	73.905	26.768	36 2	55 871	24.079	43.1	18.034	2.689	14 9
New Jersey	11.270	3.708	32.9	8 066	3.229	40 0	3.204	479	15 0
New York	42.843	16.292	38.0	34.096	15.013	44 0	8 747	1.279	14 6
Pennsylvania	19 792	6.768	34.2	13.709	5.837	42.6	6.083	931	15.3
East North Central	75.019	25.511	34.0	53.757	22.582	42.0	21.262	2.929	13 8
Illinois	22.295	8.026	36 0	17.542	7.333	41 8	4.753	693	14 6
Indiana	8.905	2.973	33.4	6.704	2.708	40 4	2.201	265	12.0
Michigan	16.168	4.974	30 8	10.277	4.122	40 1	5.891	852	14.5
Ohio	18.844	6.567	34.8	13.013	5.824	44 8	5.831	743	12.7
Wisconsin	8.807	2.971	33 7	6.221	2.595	41 7	2.586	376	14.5
West North Central	27.356	9.519	34 8	20.594	8.674	42 1	6.762	845	12 5
Iowa	4 840	1.528	31 6	3.533	1.331	37 7	1.307	197	15 1
Kansas	4.835	1.708	35 3	3.536	1.535	43 4	1.299	173	13.3
Minnesota	6.786	2.904	42 8	5.554	2.716	48 9	1.232	188	15.3
Missouri	6.293	1.964	31 2	4.392	1.788	40 7	1.901	176	9.3
Nebraska	2.709	908	33 5	2.228	853	38 3	481	55	11.4
North Dakota	940	254	27.0	757	241	31 8	183	13	7.1
South Dakota	953	253	26.5	594	210	35.4	359	43	12 0
South Atlantic	66.994	24.207	36 1	48.256	21.259	44 1	18.738	2.948	15 7
Delaware	1.453	457	31 5	1.075	396	36 8	378	61	16 1
District of Columbia	8 582	3 470	40 4	6.494	3.081	47 4	2.088	389	18.6
Florida	13 574	4.721	34 8	9 300	4.146	44 6	4.274	575	13 5
Georgia	8.437	2.924	34.7	5.572	2.402	43 1	2.865	522	18.2
Maryland	9.020	3.653	40 5	6 890	3.329	48.3	2.130	324	15.2
North Carolina	9.300	3.465	37 3	7.269	3.123	43 0	2 031	342	16 8
South Carolina	3.861	1.158	30 0	2.650	998	37 7	1.211	160	13 2
Virginia	10.756	3.640	33 8	7.551	3.148	41 7	3.205	492	15.4
West Virginia	2.011	719	35 8	1.455	636	43 7	556	83	14 9
East South Central	18.178	6.047	33 3	13 192	5.303	40 2	4 986	744	14.9
Alabama	5 480	1.662	30 3	3 670	1.376	37 5	1 810	286	15 8
Kentucky	3.844	1.354	35 2	2.895	1.204	41 6	949	150	15.8
Mississippi	2 522	780	30 9	2.071	743	35 9	451	37	8 2
Tennessee	6.332	2 251	35 5	4.556	1.980	43 5	1.776	271	15.3
West South Central	41.778	13.407	32 1	29.401	11.808	40 2	12.377	1.599	12.9
Arkansas	1.767	707	40 0	1.384	665	48 0	383	42	11 0
Louisiana	5.361	1 606	30 0	3.885	1.437	37 0	1.476	169	11 4
Oklahoma	4.454	1.404	31 5	3.018	1.216	40 3	1.436	188	13 1
Texas	30 196	9.690	32 1	21.114	8.490	40 2	9 082	1.200	13 2
Mountain	27 909	8.470	30 3	19.890	7 491	37 7	8.019	979	12 2
Arizona	7.151	2.347	32 8	5.059	2.058	40 7	2 092	289	13 8
Colorado	8.674	2.704	31 2	6.011	2 388	39 7	2.663	316	11 9
Idaho	1 354	342	25 3	965	304	31.5	389	38	9 8
Montana	1.257	393	31 3	1.060	367	34 6	197	26	13.2
Nevada	1.356	433	31 9	991	362	36.5	365	71	19 5
New Mexico	3 303	953	28 9	2.340	829	35 4	963	124	12 9
Utah	4.020	1.077	26 8	2.851	986	34.6	1.169	91	7.8
Wyoming	794	221	27 8	613	197	32 1	181	24	13 3
Pacific	67 307	24.793	36 8	48 841	22.032	45 1	18.466	2.761	15 0
Alaska	762	263	34 5	529	230	43 5	233	33	14 2
California	54 574	20.414	37 4	39.066	18.166	46 5	15 508	2.248	14 5
Hawaii	1.689	589	34 9	1.462	558	38 2	227	31	13 7
Oregon	4.121	1.261	30 6	3 223	1 105	34 3	898	156	17 4
Washington	6.161	2.266	36 8	4 561	1.973	43 3	1 600	293	18 3
Outlying Areas	2 048	1.065	52 0	1.838	1 028	55 9	210	37	17.6
Guam	32	14	43 8	32	14	43 8	0	0	..
Puerto Rico	2.016	1.051	52 1	1 806	1 014	56 1	210	37	17 6

NOTES Includes medical schools
A table listing institutions within each State is available from the National Science Foundation

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorales in Science and Engineering

Appendix table 6-8. Top 50 institutions enrolling female graduate students in science and engineering (S&E), ranked by 1992 total number of women enrolled in S&E: fall 1985–1992

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Academic institution	1985	1986	1987	1988	1989	1990	1991	1992
Total, all academic institutions	111,210	114,667	117,454	121,465	126,287	134,288	141,323	150,411
1 University of Minnesota, all campuses	1,496	1,562	1,545	1,613	1,748	1,711	1,791	1,862
2 University of Wisconsin-Madison	1,263	1,327	1,359	1,415	1,475	1,565	1,639	1,720
3 Rutgers, the State University, all campuses	1,298	1,347	1,309	1,319	1,408	1,437	1,465	1,564
4 George Washington University	818	1,155	1,479	1,388	1,373	1,440	1,468	1,545
5 University of California-Berkeley	1,283	1,318	1,327	1,295	1,293	1,398	1,377	1,410
6 Texas A & M University, all campuses	900	939	1,024	1,102	1,202	1,305	1,286	1,391
7 University of Michigan, all campuses	1,014	1,035	1,114	1,168	1,179	1,247	1,251	1,382
8 University of Washington	1,003	1,058	1,085	1,143	1,188	1,284	1,320	1,372
9 University of Southern California	1,668	1,729	1,675	1,616	1,500	1,228	1,238	1,367
10 University of Colorado, all campuses	847	899	959	907	982	1,124	1,220	1,345
Subtotal, first 10 institutions	11,590	12,369	12,876	12,966	13,348	13,739	14,055	14,958
11 Indiana University, all campuses	587	643	702	705	912	1,252	1,331	1,344
12 University of Illinois at Urbana-Champaign	945	1,015	1,147	1,171	1,199	1,178	1,202	1,337
13 New York University	1,374	1,290	1,241	1,094	1,301	1,252	1,386	1,329
14 Ohio State University, all campuses	1,000	1,067	1,149	1,164	1,160	1,129	1,327	1,322
15 Cornell University, all campuses	883	969	982	1,010	1,034	1,051	1,097	1,308
16 Harvard University	899	915	791	892	854	946	1,025	1,250
17 University of Maryland at College Park	1,070	1,059	1,071	1,109	1,155	1,197	1,173	1,248
18 Pennsylvania State University, all campuses	923	1,027	1,002	1,124	1,144	1,165	1,207	1,218
19 Antioch University, main campus	0	0	0	843	758	846	1,152	1,184
20 University of Texas at Austin	1,045	1,081	900	898	931	923	1,047	1,104
Subtotal, first 20 institutions	20,316	21,435	21,861	22,976	23,796	24,678	26,002	27,602
21 University of Pittsburgh, all campuses	708	672	697	713	740	845	883	1,093
22 University of California-Los Angeles	838	837	856	875	916	924	1,027	1,074
23 American University	690	635	648	620	690	765	846	1,052
24 Stanford University	717	707	762	865	919	892	949	1,032
25 University of Houston-University Park	326	422	368	430	536	749	974	1,021
26 University of Massachusetts, all campuses	703	745	694	913	890	959	975	996
27 Arizona State University	529	505	565	672	690	792	844	989
28 University of North Carolina at Chapel Hill	742	731	767	832	913	943	913	980
29 Purdue University, all campuses	833	803	762	889	896	896	894	970
30 Massachusetts Institute of Technology	769	774	761	794	853	942	961	967
Subtotal, first 30 institutions	27,171	28,266	28,741	30,579	31,839	33,385	35,268	37,776
31 Michigan State University	755	816	753	767	863	854	900	958
32 Columbia University, Teachers College	806	782	833	956	926	881	939	957
33 SUNY at Buffalo, all campuses	653	685	828	825	785	840	921	933
34 North Carolina State University at Raleigh	664	728	719	799	826	809	837	918
35 University of Arizona	879	935	839	871	880	857	881	906
36 University of Florida	721	725	740	797	757	804	830	890
37 Boston University	594	659	667	685	688	817	825	877
38 University of California-Davis	823	899	819	852	861	925	859	868
39 Virginia Polytechnic Institute and State University	798	788	790	683	805	848	850	857
40 Nova University	306	139	644	707	663	673	762	845
Subtotal, first 40 institutions	34,170	35,422	36,373	38,521	39,893	41,693	43,872	46,785
41 Iowa State University	693	697	746	796	793	828	821	838
42 University of Illinois at Chicago	635	673	673	638	714	760	807	838
43 SUNY at Albany	430	417	420	430	459	505	534	828
44 Pepperdine University	318	387	452	510	540	581	730	818
45 Louisiana State University, all campuses	633	638	634	625	605	664	732	809
46 University of Connecticut, all campuses	570	590	634	621	636	694	749	803
47 George Mason University	362	361	499	638	681	752	759	801
48 Saint Mary's College of Minnesota	0	0	0	256	336	418	669	786
49 University of Pennsylvania	775	755	747	759	817	790	797	785
50 Wayne State University	526	586	519	552	702	766	712	785
Total, first 50 institutions	39,112	40,526	41,697	44,346	46,176	48,451	51,182	54,876
All other institutions	72,098	74,141	75,757	77,119	80,111	85,837	90,141	95,535

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-9. Top 50 institutions enrolling female graduate students in science, ranked by total number of women enrolled in science, by broad science field: fall 1992

	Academic institution	Total science	Physical sciences	Earth atmospheric. & ocean sciences	Mathematical sciences	Computer sciences	Agricultural sciences	Biological sciences	Psychology	Social sciences
	Total. all institutions	133 253	8.845	4.924	6.552	8 398	3.684	25.539	37.059	3[illegible].252
1	University of Minnesota. all campuses	1 674	120	27	55	43	88	475	428	438
2	University of Wisconsin-Madison	1 565	105	105	84	25	120	443	261	422
3	Rutgers. the State University all campuses	1 436	119	89	89	41	20	444	115	519
4	Indiana University. all campuses	1.333	97	24	38	29	0	213	130	802
5	New York University	1.329	26	16	33	50	0	135	287	782
6	Harvard University	1.216	54	13	24	0	0	355	74	696
7	George Washington University	1.206	17	17	48	172	0	124	151	677
8	Ohio State University. all campuses	1 187	108	72	87	38	54	320	149	359
9	Texas A & M University. all campuses	1.183	104	73	43	52	319	191	190	211
10	University of Colorado. all campuses	1 180	93	71	57	49	0	233	139	538
	Subtotal. first 10 institutions	13.309	843	507	558	499	601	2.933	1.924	5.444
11	Cornell University. all campuses	1.169	106	28	42	21	105	381	40	446
12	University of Washington	1.139	73	105	51	30	129	349	95	307
13	University of Illinois at Urbana-Champaign	1 129	103	20	80	50	68	285	144	379
14	Antioch University. Main Campus	1.113	0	99	0	0	38	0	931	45
15	University of California-Berkeley	1 073	111	37	49	30	82	281	79	407
16	University of Maryland at College Park	1.054	90	100	70	37	58	185	87	427
17	American University	1.052	45	0	20	119	0	12	78	778
18	University of Michigan. all campuses	993	70	155	45	0	0	232	158	333
19	University of Southern California	989	42	15	30	96	0	126	70	610
20	Pennsylvania State University. all campuses	983	133	63	48	14	57	239	177	252
	Subtotal. first 20 institutions	24.006	1.616	1.129	993	896	1.138	5.023	3.783	9.428
21	University of California-Los Angeles	969	84	39	72	25	0	358	121	270
22	University of North Carolina at Chapel Hill	967	99	106	40	12	0	442	72	196
23	University of Pittsburgh. all campuses	959	84	5	33	120	0	246	65	406
24	Columbia University. Teachers College	957	0	0	95	0	0	0	652	210
25	University of Massachusetts all campuses	901	97	48	29	44	35	208	178	262
26	Michigan State University	873	71	46	56	25	136	204	104	231
27	University of Texas at Austin	861	126	44	46	24	0	156	76	389
28	Nova University	845	0	26	0	33	0	0	777	9
29	SUNY at Albany	828	31	23	24	36	0	60	253	401
30	University of Arizona	822	82	134	36	37	22	200	70	241
	Subtotal first 30 institutions	32.988	2.290	1.600	1 424	1.252	1 331	6.897	6.151	12 043
31	Pepperdine University	818	0	0	0	0	0	0	818	0
32	University of California-Davis	790	47	33	19	4	110	383	28	166
33	Saint Mary's College of Minnesota	786	0	0	0	0	0	0	786	0
34	University of Houston-University Park	785	62	25	39	67	0	142	303	147
35	Arizona State University	784	68	20	47	74	11	79	69	416
36	Boston University	769	35	5	23	74	0	240	209	183
37	Purdue University. all campuses	763	136	16	61	24	62	209	145	110
38	SUNY at Buffalo. all campuses	756	91	18	22	24	0	178	274	149
39	CUNY Graduate School and University Center	743	69	0	21	0	0	150	131	372
40	University of Florida	740	60	9	32	29	111	200	124	175
	Subtotal first 40 institutions	40.722	2 858	1 726	1 688	1.548	1 625	8.478	9 038	13.761
41	University of Chicago	737	69	11	21	12	0	143	151	330
42	George Mason University	736	6	0	53	230	0	84	136	227
43	SUNY at Stony Brook all campuses	718	75	53	60	31	0	167	107	225
44	North Carolina State University at Raleigh	710	48	33	80	24	83	214	78	150
45	Louisiana State University all campuses	709	64	45	35	26	48	164	75	252
46	Iowa State University	701	62	6	61	12	76	228	124	132
47	University of Connecticut all campuses	699	51	11	55	16	7	180	174	205
48	University of Georgia	673	44	14	44	19	42	261	116	133
49	Stanford University	671	79	41	75	71	0	138	25	242
50	John F Kennedy University	670	0	0	0	0	0	0	670	0
	Total. first 50 institutions	47.746	3 356	1 940	2.172	1.989	1.881	10.057	10.694	15.657
	All other institutions	85.507	5.489	2.984	4.380	6.409	1 803	15.482	26.365	22.595

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-10. Top 50 institutions enrolling female graduate students in engineering, ranked by total number of women enrolled in engineering, by field: fall 1992

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Academic institution	Total engineering	Aerospace engineering	Chemical engineering	Civil engineering	Electrical engineering	Industrial engineering	Materials engineering	Mechanical engineering	Other engineering
Total all institutions	17 158	348	1 395	3.605	4.246	2.664	1.057	1 700	2 143
1 Georgia Inst of Technology, all campuses	486	10	27	105	75	145	37	50	[illegible]
2 Massachusetts Institute of Technology	451	31	45	131	105	0	58	46	35
3 University of Michigan, all campuses	389	11	15	14	105	93	28	54	69
4 University of Southern California	378	9	12	58	191	74	9	6	17
5 Stanford University	361	18	21	70	78	[illegible]	31	72	[illegible]
6 George Washington University	339	0	0	54	51	234	0	0	[illegible]
7 University of California-Berkeley	334	0	28	163	53	18	32	29	[illegible]
8 University of Texas at Austin	243	22	20	71	49	0	10	47	[illegible]
9 University of Houston-University Park	236	0	45	78	56	24	1	23	[illegible]
10 Virginia Polytechnic Inst and State Univ	236	9	8	48	37	71	10	8	[illegible]
Subtotal, first 10 institutions	3.453	110	221	792	800	678	216	337	299
11 Pennsylvania State University, all campuses	235	10	23	21	35	35	15	20	76
12 University of Washington	233	4	16	58	32	0	13	12	98
13 Texas A & M University, all campuses	208	6	15	43	44	38	0	19	43
14 University of Illinois at Urbana-Champaign	208	2	27	45	53	0	25	21	35
15 North Carolina State University at Raleigh	208	0	23	21	38	28	69	12	17
16 Purdue University, all campuses	207	12	12	47	56	38	3	22	17
17 Arizona State University	205	2	7	49	58	47	1	18	[illegible]
18 Northeastern University	203	0	7	29	61	85	0	21	[illegible]
19 University of Illinois at Chicago	200	0	12	63	86	0	0	31	8
20 University of Maryland at College Park	194	19	17	42	48	10	12	25	21
Subtotal, first 20 institutions	5 554	165	380	1 210	1311	959	354	538	637
21 Rensselaer Polytechnic Institute	193	0	5	51	32	25	42	21	[illegible]
22 University of Minnesota, all campuses	188	6	38	47	29	0	0	52	[illegible]
23 SUNY at Buffalo, all campuses	177	0	9	93	36	22	0	17	[illegible]
24 Wayne State University	173	0	19	20	56	30	0	46	[illegible]
25 University of Lowell	171	0	51	23	45	41	0	8	[illegible]
26 University of Cincinnati, all campuses	167	20	9	54	23	0	25	36	[illegible]
27 University of Colorado, all campuses	165	35	11	55	60	0	0	4	
28 University of Tennessee at Knoxville	157	6	14	38	10	49	9	8	[illegible]
29 University of Wisconsin-Madison	155	0	27	21	24	40	21	15	[illegible]
30 University of Florida	150	10	5	50	20	15	16	8	[illegible]
Subtotal, first 30 institutions	7.250	242	568	1.662	1.646	1 181	467	753	731
31 Cornell University, all campuses	139	2	20	34	21	0	31	10	[illegible]
32 San Jose State University	138	0	5	19	63	11	7	8	[illegible]
33 Iowa State University	137	7	16	34	25	10	29	6	[illegible]
34 Ohio State University, all campuses	135	5	10	29	18	26	5	11	[illegible]
35 University of Pittsburgh, all campuses	134	0	21	17	16	41	12	24	[illegible]
36 Rutgers The State University, all campuses	128	0	17	8	21	12	26	14	[illegible]
37 University of Pennsylvania	128	0	13	0	16	18	20	[illegible]	[illegible]
38 Syracuse University, all campuses	127	0	9	22	83	0	0	10	[illegible]
39 Northwestern University	125	0	11	13	16	21	28	7	[illegible]
40 Drexel University	123	0	9	18	34	8	12	14	28
Subtotal, first 40 institutions	8 564	256	699	1.856	1 959	1 328	637	864	[illegible]
41 University of South Florida	121	0	5	23	42	49	0	2	[illegible]
42 University of Virginia, all campuses	121	0	20	17	23	25	16	15	[illegible]
43 New Jersey Institute Technology	121	0	8	42	23	23	0	11	14
44 Polytechnic University	117	1	5	28	59	14	7	3	
45 Clemson University	109	0	4	44	20	7	6	7	[illegible]
46 Boston University	108	4	0	0	46	6	0	0	[illegible]
47 University of Alabama in Huntsville	107	0	2	0	34	40	6	25	
48 University of California-Los Angeles	105	1	7	27	41	0	14	[illegible]	[illegible]
49 University of Connecticut, all campuses	104	0	8	26	17	0	40	13	[illegible]
50 Columbia University, main campus	103	0	6	19	40	16	0	4	[illegible]
Total first 50 institutions	9 680	262	764	2 082	2.304	1 510	726	954	[illegible]
All other institutions	7 478	86	631	1 523	1 942	1,154	331	746	[illegible]

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorales in Science and Engineering

Appendix table 6-11. U.S. citizens and permanent residents enrolled for graduate study in all institutions, by race/ethnicity: fall 1981–1991, selected years

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Race/ethnicity	1982	1984	1986	1988	1990	1991
U S. citizens and permanent residents	1.224.593	1,240.542	1,311.939	1.331.353	1,418.097	1,471.742
White, non-Hispanic	1.074.883	1,052.480	1,101.598	1,120.186	1.221.180	1,258.159
Black, non-Hispanic	69.027	63.882	70.391	73.111	83.824	89,097
American Indian/Alaskan Native	5,446	4,554	5.332	5,376	6.361	6.638
Asian	35.175	35.419	42.015	44.040	51,770	57,752
Hispanic	38.610	37.115	52.950	46.628	54.962	60.096
Other or unknown	1.452	47.092	39.653	42.012	0	0

NOTES: Excludes foreign citizens on temporary visas
Includes enrollment in all disciplines
Treatment of enrollment reported as other and unknown varies for each year

SOURCE: U.S. Department of Education/NCES. IPEDS Fall Enrollment Survey.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-12. Science and engineering graduate students in all institutions, by enrollment status, citizenship, and race/ethnicity of U.S. citizens: fall 1985–1992

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Enrollment status, citizenship, and race/ethnicity	1985[1]	1986[1]	1987[1]	1988	1989	1990	1991	1992
Total enrollment	359.185	368.706	373.930	375.847	383.448	398.146	413.566	431.613
Total U.S. citizens	282.328	284.689	285.057	282.127	285.335	295.297	305.105	322.449
Black, non-Hispanic	10,522	10.489	10.454	11.190	11.768	12.771	13.687	15.370
American Indian/Alaskan Native	740	744	787	923	864	1,060	1,123	1.253
Asian	12.016	12.784	14.592	15,169	15.662	17.078	18.064	21.967
Hispanic	8.621	8.661	8.825	9.090	9,448	10.184	11,070	12.243
White, non-Hispanic	224.171	228.043	229.230	229.487	230.295	239.208	244.401	253.968
Other or unknown	26.256	23.968	21.169	16.268	17.298	14.996	16.760	17.648
Non-U.S. citizens	76.857	84,017	88.873	93.720	98.113	102.849	108.461	109,164
Full-time enrollment	234.495	243.108	247.520	250.966	257.155	265.760	277.351	290.993
Total U.S. citizens	168.737	170.670	171.423	170.462	173.627	178.071	185.785	198.198
Black, non-Hispanic	5.584	5,567	5.618	6.064	6.577	7.015	7.681	8.831
American Indian/Alaskan Native	479	491	520	571	552	660	720	843
Asian	7.260	7.907	9,085	9.446	9.786	10.561	11.214	13.554
Hispanic	5.146	5.246	5.195	5.505	5.933	6.398	6.955	7.593
White, non-Hispanic	138.218	141.539	141.121	141.165	142.655	146.941	151.170	158.623
Other or unknown	12.050	9.920	9.884	7.711	8.124	6.496	8.045	8.754
Non-U.S citizens	65.758	72.438	76.097	80.504	83.528	87.689	91.566	92.795
Part-time enrollment	124.690	125.598	126.410	124.881	126.293	132.386	136.215	140.620
Total U.S. citizens	113.591	114.019	113.634	111.665	111.708	117.226	119.320	124.251
Black, non-Hispanic	4.938	4.922	4.836	5.126	5.191	5.756	6.006	6.539
American Indian/Alaskan Native	261	253	267	352	312	400	403	410
Asian	4.758	4.877	5.507	5.723	5.876	6.517	6.850	8.413
Hispanic	3.475	3.415	3.630	3.585	3.515	3.786	4.115	4.650
White, non-Hispanic	85.953	86.504	88.109	88.322	87.640	92.267	93.231	95,345
Other or unknown	14.206	14.048	11.285	8.557	9.174	8.500	8.715	8.894
Non-U.S. citizens	11.099	11.579	12.776	13.216	14.585	15.160	16.895	16.369

[1] Includes estimated data for master's degree-granting institutions, which were surveyed on a sample basis from 1985 through 1987

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates Science and Engineering.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-13. Science and engineering (S&E) graduate students with U.S. citizenship in all institutions, by race/ethnicity: 1982–1992

Year	U S citizens, total			White, non-Hispanic			Minorities, total			Black, non-Hispanic		
	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering
	Number											
1982	274.745	216.050	58.695	215.754	172.464	43.290	27.238	22.083	5.155	10.402	9.260	1.142
1983	277.584	213.906	63.678	225.192	176.575	48.617	30.090	23.675	6.415	10.947	9.556	1.391
1984	278.129	213.154	64.975	223.358	173.991	49.367	30.419	23.453	6.966	10.718	9.258	1.460
1985	282.328	214.966	67.362	224.171	173.856	50.315	31.901	24.084	7.817	10 522	3.117	1.405
1986	284.689	214.536	70.153	228.043	174.916	53.127	32.678	24.348	8.330	10.489	9.016	1.473
1987	285.057	214.374	70.683	229.230	175.334	53.896	34.658	25.519	9.139	10.454	9.033	1.421
1988	282.127	214.276	67.851	229.487	176.966	52.521	36.372	27.062	9.310	11.190	9.674	1.516
1989	284.535	217.105	67.430	230.295	178.784	51,511	37.742	28.264	9.478	11.768	10.132	1.636
1990	295.297	225.793	69.504	239.208	185.992	53.216	41.093	30.572	10.521	12,771	10.976	1.795
1991	305.105	232.900	72.205	244.401	189.695	54.706	43.944	32.505	11.439	13.687	11.662	2.025
1992	322.449	245.600	76.849	253.976	196.608	57.368	50.833	37.258	13.575	15.370	12.998	2.372
	Index (1982 = 100)											
1982	100.00	100 00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1983	101.03	99.01	108.49	104.37	102.38	112.31	110.47	107.21	124.44	105.24	103.20	121.80
1984	101.23	98.66	110 70	103.52	100.89	114.04	111.68	106.20	135.13	103.04	99.98	127.85
1985	102.76	99.50	114.77	103.90	100.81	116.23	117.12	109.06	151.64	101.15	98.46	123.03
1986	103 62	99.30	119.52	105.70	101.42	122.72	119.97	110.26	161.59	100.84	97.37	128.98
1987	103 75	99 22	120.42	106.25	101.66	124.50	127.24	115.56	177.28	100.50	97.55	124.43
1988	102.69	99.18	115.60	106.37	102.61	121.32	133.53	122.55	180.60	107.58	104.47	132.75
1989	103.56	100.49	114.88	106 74	103.66	118.99	138.56	127.99	183.86	113.13	109.42	143.26
1990	107.48	104.51	118.42	110.87	107.84	122.93	150.87	138.44	204.09	122.77	118.53	157 18
1991	111.05	107.80	123.02	113.28	109 39	126.37	161.33	147.19	221.90	131.58	125.94	177.32
1992	117.36	113 68	130.93	117.72	114.00	132.52	186.63	168.72	263.34	147.76	140.37	207 71

Year	American Indian/Alaskan Native			Asian			Hispanic			Other or unknown race/ethnicity		
	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering	Total, S&E	Science	Engi-neering
	Number											
1982	910	739	171	8.150	5.404	2.746	7.776	6.680	1.096	31.753	21.503	10.250
1983	916	735	181	9.359	5.955	3,404	8.868	7.429	1.439	22.302	13.656	8.646
1984	829	637	192	10.180	6.366	3.814	8.692	7.192	1.500	24.352	15.710	8.642
1985	740	618	122	12.018	7.208	4.810	8.621	7.141	1.480	26.256	17.026	9.230
1986	744	614	130	12.784	7.659	5.125	8.661	7.059	1.602	23.867	15.171	8.696
1987	787	663	124	14.592	8.728	5.864	8.825	7.095	1.730	22.969	15.321	7.648
1988	923	779	144	15.169	9.240	5.929	9.090	7.369	1.721	16.268	10.248	6.020
1989	864	740	124	15.662	9.654	6.008	9.448	7.738	1.710	17.298	10.857	6.441
1990	1.060	907	153	17.078	10.390	6.688	10.184	8.299	1.885	14.996	9.229	5.767
1991	1.123	937	186	18,064	10.958	7.106	11.070	8.948	2.122	16.760	10.700	6.060
1992	1.253	1.076	177	21.967	13.391	8.576	12.243	9.793	2.450	17 648	11.742	5.906
	Index (1982 = 100)											
1982	100 00	100 00	100 00	100 00	100 00	100.00	100 00	100.00	100 00	100 00	100.00	100 00
1983	100 66	99 46	105 85	114 83	110 20	123 96	114 04	111.21	131.30	70.24	63.51	84.35
1984	91 10	86 20	112 28	124 91	117 80	138.89	111.78	107 66	136.86	76.69	73.06	84 31
1985	81 32	83 63	71.35	147 46	133.38	175 16	110 87	106.90	135 04	82.69	79 18	90 05
1986	81 76	83 09	76 02	156 86	141 73	186 64	111 38	105.67	146.17	75 16	70.55	84 84
1987	86 48	89 72	72 51	179 04	161 51	213 55	113 49	106.21	157 85	72 34	71 25	74 61
1988	101 43	105 41	84 21	186 12	170 98	215.91	116 90	110.31	157 03	51 23	47.66	58 73
1989	94 95	100 14	72 51	192 17	178 65	218 79	121.50	115.84	156 02	54 48	50 49	62 84
1990	116 48	122 73	89 47	209 55	192.26	243 55	130.97	124.24	171.99	47 23	42 92	56 26
1991	123 41	126 79	108 77	221 64	202.78	258.78	142.36	133.95	193.61	52 78	49 76	59 12
1992	137 69	145 60	103 51	269 53	247 80	312 31	157 45	146.60	223 54	55 58	54 61	57.62

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-14. White graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Full time and part time								
Total, science and engineering	224 171	228 043	229 230	229 487	230 295	239.208	244 401	253.968
Science, total	173 856	174.916	175.334	176 966	178.784	185 992	189 695	196.600
Physical sciences	18.324	18 553	18.090	18 282	18.320	18.483	18.477	18.632
Astronomy	472	483	489	509	553	548	544	576
Chemistry	11.377	11.350	10.763	10 596	10 498	10.522	10.413	10.593
Physics	6 227	6 459	6 561	6 925	7.003	7 157	7.216	7.160
Physical sciences, n e c	248	261	277	252	266	256	304	303
Earth, atmospheric, & ocean sciences	11 897	11 691	11.035	10.558	10.285	10.546	10 733	11.118
Atmospheric sciences	708	702	657	623	594	597	589	682
Geosciences	7 916	7.700	7.099	6.565	6.125	5 748	5.519	5.399
Oceanography	1.507	1.501	1.425	1 380	1.468	1.580	1 550	1.653
Earth, atmos., & ocean sci n e c	1.766	1.788	1 854	1 990	2.098	2.621	3.075	3.384
Mathematical sciences	9.800	9.528	9.650	10.153	10.105	10 628	10.480	10.853
Mathematics & applied math	8.709	8.341	8 475	8.956	8.999	9.390	9.212	9.402
Statistics	1.091	1.187	1.175	1.197	1 106	1.238	1 268	1.451
Computer sciences	15 615	16.415	17.067	17.242	16.397	17.299	16.519	16.958
Agricultural sciences	7.736	7 658	7.301	7.169	7.158	7.115	7.342	7.535
Biological sciences	34.065	33.853	32.751	32.805	32.412	32.714	33.094	34.394
Anatomy	761	738	726	752	749	670	685	614
Biochemistry	3.241	3.288	3.108	3.089	3.030	2.897	2.918	2.907
Biology	9.660	9.423	6.893	8.865	8.823	9.088	9 067	9.369
Biometry/epidemiology	985	1.001	1.060	1.119	1.128	1.224	1.238	1.472
Biophysics	279	325	318	359	367	368	398	414
Botany	2.322	2.223	2 020	1.859	1 718	1.655	1.608	1.641
Cell biology	1.037	1.297	1 467	1.485	1.542	1 734	1.873	2.006
Ecology	870	856	751	813	878	905	932	1.038
Entomology/parasitology	1.003	920	812	828	752	707	702	735
Genetics	860	939	976	923	941	988	1.030	1.106
Microbiology, immunology, & virology	3.271	3 120	3.035	3,244	3.160	3.095	3.078	3.196
Nutrition	2 816	2.839	2.717	2.719	2 622	2.586	2.482	2.480
Pathology	940	938	976	965	951	894	960	925
Pharmacology	1.611	1.539	1.468	1 457	1.453	1.437	1.454	1.521
Physiology	1 694	1.599	1.573	1.463	1 383	1.326	1 333	1.267
Zoology	1.743	1.729	1.735	1.603	1.611	1.633	1.697	1.717
Biosciences, n e c	972	1.079	1 116	1.262	1 304	1 507	1.639	1.986
Psychology	32.784	33.324	34.901	36.058	37.657	39.676	41.356	42.593
Psychology, general	NA	NA	NA	12.932	14.089	15.055	16.853	18.208
Clinical psychology	NA	NA	NA	16.432	15.941	16.404	15.951	14.750
Psychology, n e c	NA	NA	NA	6.694	7.627	8.217	8.552	9.635
Social sciences	43.635	43 894	44.539	44.699	46.450	49 531	51 694	54.517
Agricultural economics	1.289	1 242	1 166	1.129	1.085	1.077	1.118	1.179
Anthropology (cultural & social)	4.553	4.645	4 448	4.457	4.631	4.938	5.115	5 340
Economics (except agricultural)	5 877	5.850	5 516	5.369	5 436	5.473	5.736	5.907
Geography	2.288	2.345	2.359	2.419	2.654	2.673	2.907	3.167
History and philosophy of science	210	216	223	222	227	271	269	280
Linguistics	1 672	1.595	1.720	1.683	1 670	1.728	1 697	1.760
Political science	17 049	17 324	18 271	18 742	19.656	20 927	21 824	22.961
Sociology	4 143	4.091	4.305	4.267	4.565	4.815	5.279	5.624
Sociology/anthropology	653	562	578	579	690	837	693	760
Social sciences, n e c	5 901	6.024	6 003	5 832	5.836	6 792	7.056	7.539
Engineering, total	50.315	53.127	53.896	52.521	51.511	53 216	54 706	57.368
Aerospace engineering	1 342	1.520	1 631	1 753	1 950	2.180	2.134	2.233
Agricultural engineering	417	530	545	484	436	380	402	442
Biomedical engineering	972	1 027	1 088	1.044	1.102	1.222	1 225	1 367
Chemical engineering	3.865	3.886	3.827	3 362	3.097	3.151	3.140	3.265
Civil engineering	7.336	7 264	7 088	7.377	7.344	7 735	8.666	10.072
Electrical engineering	13 461	13 992	14.922	15 404	15 818	15 662	15 525	15.841
Engineering science	1 304	1 462	1 402	1.426	1.216	1.223	1.240	1.269
Industrial eng./management sci	7.262	7.674	8 038	7.300	6 685	6 560	7.112	7.518
Mechanical engineering	7.159	7 864	7 984	7.857	7 597	8 183	8 408	9.139
Metallurgical/materials eng	2 092	2 101	2 247	2 136	2 193	2 322	2.503	2 603
Mining engineering	277	283	267	237	188	172	200	217
Nuclear engineering	659	722	707	700	723	672	671	692
Petroleum engineering	410	339	411	311	295	265	231	225
Engineering, n e c	3 679	4 463	3 739	3 110	2 867	3 489	3 249	2 485

See explanatory information and SOURCE at end of table

Appendix table 6-14. White graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985'	1986'	1987'	1988	1989	1990	1991	1992
Full time								
Total, science and engineering	138 218	141 539	141 121	141 165	142.655	146.941	151.170	158.623
Science, total	113 841	115.461	115.059	115 029	116 594	120 134	123.158	128 635
Physical sciences	15 219	15.368	15 098	15 135	15 230	15.384	15.412	15.593
Astronomy	441	451	461	490	533	534	532	556
Chemistry	9 427	9 478	9 032	8.843	8.770	8.783	8.745	8.843
Physics	5 233	5.343	5.474	5 715	5.849	5 992	6.061	6.115
Physical sciences, n e c	118	96	131	87	78	75	74	79
Earth atmospheric, & ocean sciences	8.494	8 473	7.699	7.388	7.184	7.238	7.155	7 431
Atmospheric sciences	634	608	554	531	512	517	510	588
Geosciences	5.802	5.681	5.109	4.704	4.359	4.095	3.911	3.852
Oceanography	1.081	1 143	1 033	1 038	1.142	1.234	1.228	1.324
Earth atmos & ocean sci , n e c	977	1 041	1 003	1.115	1.171	1 392	1.506	1.667
Mathematical sciences	5 652	5.869	5.930	6.297	6 326	6.533	6 765	7.138
Mathematics & applied math	4 930	5.060	5.160	5.513	5.558	5.677	5.876	6.106
Statistics	722	809	770	784	768	856	889	1.032
Computer sciences	5.974	6.588	6 578	6.201	6.242	6.447	5.958	6.147
Agricultural sciences	6.007	6 005	5.762	3.600	5.503	5.375	5 641	5.713
Biological sciences	26 938	26.986	26.335	26.282	25.939	25.764	26.310	27.133
Anatomy	688	670	657	679	687	600	614	561
Biochemistry	3.088	3.125	2.983	2.959	2.865	2.762	2.762	2.731
Biology	6.333	6.197	5.975	6.038	6 100	6.142	6.206	6.275
Biometry/epidemiology	680	696	743	759	735	717	775	903
Biophysics	263	287	274	317	327	337	385	398
Botany	1.937	1.908	1.703	1.573	1 432	1 368	1.340	1.358
Cell biology	1.018	1.253	1.403	1.441	1.497	1 686	1.810	1.897
Ecology	744	725	607	664	694	681	708	785
Entomology/parasitology	847	776	691	692	626	583	584	605
Genetics	806	866	886	843	857	902	957	1.028
Microbiology, immunology & virology	2.845	2 751	2.740	2.885	2.799	2.718	2.693	2.830
Nutrition	1.834	1 883	1.775	1.665	1.570	1.562	1.538	1.550
Pathology	718	727	763	748	744	688	696	701
Pharmacology	1.529	1 444	1.356	1.352	1.358	1.327	1.356	1.410
Physiology	1.510	1 438	1.402	1.284	1.261	1.202	1.202	1.163
Zoology	1.376	1.425	1.458	1.348	1 362	1.275	1.360	1 379
Biosciences, n e c	722	815	919	1.035	1.025	1.214	1 324	1.559
Psychology	20.495	21.171	22 332	22.934	24.025	25.016	25 715	26.947
Psychology, general	NA	NA	NA	7.052	7.759	8.292	8.977	9.958
Clinical psychology	NA	NA	NA	11.002	10.738	10.942	10 715	10.441
Psychology n.e c	NA	NA	NA	4.880	5.528	5.782	6.023	6.548
Social sciences	25.062	25 001	25.325	25.192	26.145	28.377	30.202	32.533
Agricultural economics	1 109	1 047	961	920	867	899	917	962
Anthropology (cultural & social)	3.130	3.218	3.098	3.152	3.298	3.599	3 809	3.915
Economics (except agricultural)	3.954	3.983	3 773	3.599	3.680	3.766	4.169	4.264
Geography	1.612	1.565	1 623	1.620	1.733	1.702	1.905	2.107
History and philosophy of science	170	190	200	201	200	248	237	249
Linguistics	1 215	1 141	1.246	1 244	1.188	1.267	1.238	1.268
Political science	7 598	7.814	8.009	8.260	8 809	9.722	10 363	11.506
Sociology	2 802	2.776	2.972	2.941	3.114	3.407	3 609	3.894
Sociology anthropology	340	343	328	325	391	509	449	496
Social sciences, n e c	3 132	2.924	3 115	2.930	2.865	3.258	3.506	3.872
Engineering, total	24 377	26 078	26.062	26.136	26 061	26 307	28.012	29.988
Aerospace engineering	967	1.079	1.171	1.309	1 497	1.574	1.666	1.731
Agricultural engineering	379	414	451	372	319	285	297	344
Biomedical engineering	811	870	884	859	887	1 010	1.023	1.143
Chemical engineering	2.818	2.846	2.766	2.435	2.236	2.195	2.193	2.331
Civil engineering	4 275	4.371	4 125	4,334	4.207	4.426	5.039	5 627
Electrical engineering	5 733	6.234	6 411	6.583	6.900	6.839	6.819	7 079
Engineering science	622	700	641	699	622	668	673	666
Industrial eng ,management sci	1 470	1.599	1 619	1.660	1.826	1 836	1.973	2.166
Mechanical engineering	3 469	4 037	4 046	4.058	3 933	4 414	4 572	5.210
Metallurgical/materials eng	1 467	1 503	1 569	1 519	1 570	1 646	1 731	1 828
Mining engineering	210	231	219	181	128	116	111	108
Nuclear engineering	51[illegible]	54[illegible]	519	546	553	516	519	536
Petroleum engineering	268	236	286	211	176	129	100	123
Engineering n e c	1 377	1 416	1 355	1 370	1 207	1 153	1.296	1 096

See explanatory information and SOURCE at end of table

Appendix table 6-14. White graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985[1]	1986[1]	1987[1]	1988	1989	1990	1991	1992
Part time								
Total science and engineering	85 953	86 504	88.109	88.322	87 640	92.267	93 231	95.345
Science, total	60.015	59.455	60 275	61 937	62 90	65.858	66.537	67 965
Physical sciences	3.105	3.185	2.992	3.147	3.090	3 099	3 065	3.039
Astronomy	31	32	28	19	20	14	12	20
Chemistry	1.950	1.872	1 731	1.753	1 728	1.739	1.668	1 750
Physics	994	1 116	1.087	1 210	1.154	1 165	1.155	1.045
Physical sciences, n e c	130	165	146	165	188	181	230	224
Earth atmospheric & ocean sciences	3.403	3.218	3 336	3 170	3.101	3 308	3.578	3.687
Atmospheric sciences	74	94	103	92	82	80	79	94
Geosciences	2.114	2.019	1.990	1 861	1.766	1.653	1 608	1.547
Oceanography	426	358	392	342	326	346	322	329
Earth, atmos., & ocean sci n e c	789	747	851	875	927	1 229	1 569	1.717
Mathematical sciences	4.148	3.659	3 720	3.856	3.779	4.095	3.715	3.715
Mathematics & applied math	3.779	3.281	3 315	3.443	3.441	3 713	3 336	3.296
Statistics	369	378	405	413	338	382	379	419
Computer sciences	9 641	9.827	10.489	11 041	10.155	10.852	10 561	10.811
Agricultural sciences	1.729	1.653	1.539	1.569	1.655	1 740	1 701	1.822
Biological sciences	7.127	6 867	6.416	6.523	6.473	6.950	6.784	7.261
Anatomy	73	68	69	73	62	70	71	53
Biochemistry	153	163	125	130	165	135	156	176
Biology	3.327	3.226	2.918	2.827	2 723	2.946	2 861	3.094
Biometry epidemiology	305	305	317	360	393	507	463	569
Biophysics	16	38	44	42	40	31	13	16
Botany	385	315	317	286	286	287	268	283
Cell biology	19	44	64	44	45	48	63	109
Ecology	126	131	144	149	184	224	224	253
Entomology parasitology	156	144	121	136	126	124	118	130
Genetics	54	73	90	80	84	86	73	78
Microbiology, immunology, & virology	426	369	295	359	361	377	385	366
Nutrition	982	956	942	1.054	1.052	1.024	944	930
Pathology	222	211	213	217	207	206	264	224
Pharmacology	82	95	112	105	95	110	98	111
Physiology	184	161	171	179	122	124	131	104
Zoology	367	304	277	255	249	358	337	338
Biosciences, n e c	250	264	197	227	279	293	315	427
Psychology	12.289	12.153	12.569	13.124	13.632	14.660	15.641	15.646
Psychology, general	NA	NA	NA	5.880	6.330	6.763	7.876	8.250
Clinical psychology	NA	NA	NA	5.430	5.203	5.462	5.236	4.309
Psychology, n e c	NA	NA	NA	1.814	2 099	2.435	2 529	3.087
Social sciences	18.573	18.893	19.214	19.507	20.305	21.154	21.492	21.984
Agricultural economics	180	195	205	209	218	178	201	217
Anthropology (cultural & social)	1.423	1.427	1.350	1 305	1.333	1.339	1.306	1.425
Economics (except agricultural)	1.923	1.867	1 743	1.770	1.756	1.707	1.567	1.643
Geography	676	780	736	799	921	971	1.002	1.060
History and philosophy of science	40	26	23	21	27	23	32	31
Linguistics	457	454	474	439	482	461	459	492
Political science	9 451	9 510	10.262	10 482	10 847	11.205	11.461	11.455
Sociology	1 341	1.315	1.333	1.326	1 451	1 408	1.670	1 730
Sociology anthropology	313	219	200	254	299	328	244	264
Social sciences n e c	2 769	3 100	2.888	2.902	2.971	3.534	3.550	3.667
Engineering total	25.938	27.049	27.834	26 385	25 450	26 409	26 694	27.380
Aerospace engineering	375	441	460	444	453	606	468	502
Agricultural engineering	118	116	94	112	117	95	105	98
Biomedical engineering	161	157	204	185	215	212	202	224
Chemical engineering	1.047	1.040	1.061	947	861	956	947	934
Civil engineering	3 061	2 893	2 963	3 043	3 137	3.309	3.627	4.445
Electrical engineering	7 728	7.758	8.511	8.821	8 918	8 823	8 706	8.762
Engineering science	682	762	761	727	594	555	567	603
Industrial eng./management sci	5.792	6 075	6.419	5 640	4 859	4 724	5 139	5.352
Mechanical engineering	3 690	3 827	3 938	3.799	3 664	3.769	3 836	3 929
Metallurgical materials eng	625	598	678	617	623	676	772	775
Mining engineering	67	52	48	56	60	56	89	109
Nuclear engineering	148	180	188	154	170	156	152	156
Petroleum engineering	142	103	125	100	119	136	131	102
Engineering, n e c	2 302	3 047	2 384	1 740	1.660	2 336	1 953	1.389

[1] Includes estimated data for master's degree granting institutions which were surveyed on a sample basis from 1985 through 1987

KEY NA not available
n e c not elsewhere classified

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-15. Black graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Full time and part time								
Total, science and engineering	10.522	10.489	10.454	11 190	11.768	12.771	13.687	15.370
Science total	9.117	9 016	9.033	9.674	10.132	10 976	11.662	12.998
Physical sciences	535	524	536	569	633	654	699	805
Astronomy	6	5	6	6	6	8	11	10
Chemistry	381	356	373	371	440	452	477	566
Physics	121	125	136	171	173	177	189	210
Physical sciences n e c	27	38	21	21	14	17	22	20
Earth atmospheric & ocean sciences	128	100	95	112	98	127	144	207
Atmospheric sciences	7	5	2	7	7	9	6	13
Geosciences	70	46	49	50	43	51	57	75
Oceanography	18	18	14	19	21	21	24	28
Earth. atmos & ocean sci n.e c	33	31	30	36	27	46	57	91
Mathematical sciences	409	449	441	422	463	512	524	578
Mathematics & applied math	388	418	410	397	426	469	482	525
Statistics	21	31	31	25	37	43	42	53
Computer sciences	610	685	751	815	830	965	1 088	1.050
Agricultural sciences	137	119	132	142	151	154	144	179
Biological sciences	1.183	1 108	1.056	1.153	1.213	1.251	1.317	1.491
Anatomy	24	23	25	28	29	25	24	29
Biochemistry	52	65	70	81	69	74	77	86
Biology	534	461	405	395	438	426	453	507
Biometry/epidemiology	60	56	65	84	86	75	74	96
Biophysics	4	9	7	7	4	5	6	13
Botany	38	32	33	32	38	48	39	36
Cell biology	17	22	20	20	22	32	40	48
Ecology	11	11	12	9	14	12	11	15
Entomology/parasitology	21	18	13	10	16	16	19	21
Genetics	21	20	15	22	26	25	29	32
Microbiology, immunology, & virology	68	59	63	78	80	87	94	129
Nutrition	114	109	122	139	124	132	131	138
Pathology	22	31	40	42	43	42	37	46
Pharmacology	38	43	38	51	60	73	82	84
Physiology	58	62	44	61	61	66	87	84
Zoology	44	34	32	32	42	44	37	18
Biosciences n e c	57	53	52	62	61	69	77	109
Psychology	1 792	1.791	1.808	1 951	2.075	2.252	2.482	2 788
Psychology, general	NA	NA	NA	562	676	783	990	1.181
Clinical psychology	NA	NA	NA	1 134	1 043	1 086	1.073	1.095
Psychology, n e c	NA	NA	NA	255	356	383	419	512
Social sciences	4.323	4.240	4 214	4.510	4.669	5.061	5.264	5.899
Agricultural economics	55	58	57	54	59	47	65	79
Anthropology (cultural & social)	95	95	101	106	116	128	132	174
Economics (except agricultural)	337	334	323	314	300	321	300	376
Geography	64	56	57	59	70	67	82	87
History and philosophy of science	2	4	5	3	3	5	5	6
Linguistics	119	123	142	146	151	143	145	46
Political science	2 199	2.255	2.140	2 368	2 483	2 692	2.806	3.169
Sociology	462	404	448	484	500	575	638	736
Sociology/anthropology	118	110	109	103	98	118	114	135
Social sciences n e c	872	801	832	873	889	965	977	1.091
Engineering, total	1 405	1 473	1 421	1 516	1.636	1.795	2.025	2.372
Aerospace engineering	24	25	25	24	27	38	44	47
Agricultural engineering	9	11	7	8	6	4	4	8
Biomedical engineering	18	19	20	18	25	30	38	43
Chemical engineering	71	85	87	84	79	84	119	146
Civil engineering	183	172	161	189	244	232	278	338
Electrical engineering	455	390	422	514	564	612	663	765
Engineering science	33	41	36	35	25	23	34	38
Industrial eng management sci	253	295	281	283	272	303	393	450
Mechanical engineering	161	161	187	200	200	247	246	322
Metallurgical/materials eng	33	32	23	26	36	55	55	60
Mining engineering	0	3	2	2	3	2	1	3
Nuclear engineering	15	12	11	13	12	7	16	17
Petroleum engineering	9	5	4	3	6	6	2	4
Engineering n e c	141	222	155	117	137	152	132	131

See explanatory information and SOURCE at end of table

Appendix table 6-15. Black graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Full time								
Total. science and engineering	5 584	5.567	5.618	6 064	6.577	7.015	7 681	8 831
Science. total	4.908	4.837	4.916	5.247	5.633	6.066	6.545	7.479
Physical sciences	379	391	406	442	483	488	529	629
Astronomy	5	5	5	5	6	7	11	9
Chemistry	277	276	285	296	331	327	345	436
Physics	91	94	107	137	142	146	165	176
Physical sciences n e c	6	16	9	4	4	8	8	8
Earth. atmospheric & ocean sciences	90	67	68	77	69	89	100	132
Atmospheric sciences	6	3	2	7	7	8	6	12
Geosciences	49	32	38	36	29	38	37	55
Oceanography	13	12	8	14	16	14	17	19
Earth atmos & ocean sci . n e c	22	20	20	20	17	29	40	46
Mathematical sciences	198	244	257	217	254	264	276	331
Mathematics & applied math	183	224	235	203	229	236	247	293
Statistics	15	20	22	14	25	28	29	38
Computer sciences	202	287	298	325	338	365	450	383
Agricultural sciences	103	89	100	118	123	130	112	134
Biological sciences	810	765	763	815	885	932	997	1.110
Anatomy	23	22	21	26	26	23	22	29
Biochemistry	51	58	66	77	66	68	71	80
Biology	297	264	245	222	284	276	288	316
Biometry/epidemiology	48	37	54	59	57	52	53	62
Biophysics	4	7	5	6	3	5	5	12
Botany	31	25	27	25	26	25	25	30
Cell biology	17	22	19	19	22	32	40	47
Ecology	8	8	9	6	9	8	7	7
Entomology/parasitology	18	16	12	10	16	16	18	21
Genetics	21	20	15	18	18	20	24	24
Microbiology. immunology. & virology	60	53	58	75	72	78	89	114
Nutrition	61	56	70	68	60	76	74	78
Pathology	14	23	21	25	23	26	24	31
Pharmacology	34	39	36	46	55	68	78	80
Physiology	50	54	41	54	57	64	85	79
Zoology	34	25	24	25	37	35	30	14
Biosciences. n e c	39	36	40	54	54	60	64	86
Psychology	1.058	1.089	1.073	1.175	1 233	1.275	1.433	1.681
Psychology. general	NA	NA	NA	260	325	346	462	607
Clinical psychology	NA	NA	NA	721	640	641	647	702
Psychology n e c	NA	NA	NA	194	268	288	324	372
Social sciences	2 068	1 905	1 951	2.078	2.248	2.523	2.648	3.079
Agricultural economics	48	52	43	42	44	41	53	62
Anthropology (cultural & social)	68	70	72	76	90	106	101	140
Economics (except agricultural)	167	176	178	176	188	187	190	244
Geography	32	27	30	28	29	46	53	60
History and philosophy of science	1	4	5	3	3	5	5	6
Linguistics	70	73	85	85	71	67	75	29
Political science	905	881	814	888	991	1 149	1 210	1.447
Sociology	289	226	266	297	341	380	415	478
Sociology/anthropology	62	53	55	47	55	78	82	79
Social sciences n e c	426	343	403	436	436	464	464	534
Engineering total	676	730	702	817	944	949	1.136	1.352
Aerospace engineering	20	19	21	16	24	31	41	41
Agricultural engineering	8	10	7	6	4	3	2	7
Biomedical engineering	18	17	18	16	21	23	35	40
Chemical engineering	52	61	63	59	60	65	95	110
Civil engineering	101	93	73	101	151	117	153	187
Electrical engineering	216	233	237	291	321	322	365	433
Engineering science	10	11	9	6	7	7	16	15
Industrial eng /management sci	67	72	72	99	100	115	156	189
Mechanical engineering	84	96	102	122	120	151	149	199
Metallurgical/materials eng	25	20	16	21	30	47	41	41
Mining engineering	0	3	1	1	3	2	1	3
Nuclear engineering	13	12	10	10	8	5	14	14
Petroleum engineering	5	3	3	1	3	3	2	4
Engineering n e c	57	80	70	68	92	58	66	69

See explanatory information and SOURCE at end of table

Appendix table 6-15. Black graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985-1992

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Enrollment status and detailed field	1985	1986*	1987*	1988	1989	1990	1991	1992
Part time								
Total, science and engineering	4 938	4 922	4,836	5 126	5,191	5,756	6,006	6 539
Science total	4,209	4,179	4 117	4,427	4,499	4,910	5,117	5,519
Physical sciences	156	133	130	127	150	166	170	177
Astronomy	1	0	1	1	0	1	0	1
Chemistry	104	80	88	75	109	125	132	130
Physics	30	31	29	34	31	31	24	34
Physical sciences, n e c	21	22	12	17	10	9	14	12
Earth, atmospheric, & ocean sciences	38	33	27	35	29	38	44	75
Atmospheric sciences	1	2	0	0	0	1	0	1
Geosciences	21	14	11	14	14	13	20	20
Oceanography	5	6	6	5	5	7	7	9
Earth, atmos., & ocean sci., n e c	11	11	10	16	10	17	17	45
Mathematical sciences	211	205	184	205	209	248	248	247
Mathematics & applied math	205	194	175	194	197	233	235	232
Statistics	6	11	9	11	12	15	13	15
Computer sciences	408	398	453	490	492	600	638	667
Agricultural sciences	34	30	32	24	28	24	32	45
Biological sciences	373	343	293	338	328	319	320	381
Anatomy	1	1	4	2	3	2	2	0
Biochemistry	1	7	4	4	3	6	6	6
Biology	237	197	160	173	154	150	165	191
Biometry/epidemiology	12	19	11	25	29	23	21	34
Biophysics	0	2	2	1	1	0	1	1
Botany	7	7	6	7	12	23	14	6
Cell biology	0	0	1	1	0	0	0	1
Ecology	3	3	3	3	5	4	4	8
Entomology/parasitology	3	2	1	0	0	0	1	0
Genetics	0	0	0	4	8	5	5	8
Microbiology, immunology, & virology	8	6	5	3	8	9	5	15
Nutrition	53	53	52	71	64	56	57	60
Pathology	8	8	19	17	20	16	13	15
Pharmacology	4	4	2	5	5	5	4	4
Physiology	8	8	3	7	4	2	2	5
Zoology	10	9	8	7	5	9	7	4
Biosciences, n e c.	18	17	12	8	7	9	13	23
Psychology	734	702	735	776	842	977	1 049	1 107
Psychology, general	NA	NA	NA	302	351	437	528	574
Clinical psychology	NA	NA	NA	413	403	445	426	393
Psychology, n e c	NA	NA	NA	61	88	95	95	140
Social sciences	2 255	2 335	2 263	2,432	2 421	2,538	2 616	2 820
Agricultural economics	7	6	14	12	15	6	12	17
Anthropology (cultural & social)	27	25	29	30	26	22	31	34
Economics (except agricultural)	170	158	145	138	112	134	110	132
Geography	32	29	27	31	41	21	29	27
History and philosophy of science	1	0	0	0	0	0	0	0
Linguistics	49	50	57	61	80	76	70	17
Political science	1 294	1 374	1,326	1 480	1,492	1,543	1,596	1,722
Sociology	173	178	182	187	159	195	223	258
Sociology/anthropology	56	57	54	56	43	40	32	56
Social sciences n e c	446	458	429	437	453	501	513	557
Engineering total	729	743	719	699	692	846	889	1,020
Aerospace engineering	4	6	4	8	3	7	3	6
Agricultural engineering	1	1	0	2	2	1	2	1
Biomedical engineering	0	2	2	2	4	7	3	3
Chemical engineering	19	24	24	25	19	19	24	36
Civil engineering	82	79	88	88	93	115	125	151
Electrical engineering	239	157	185	223	243	290	298	332
Engineering science	23	30	27	29	18	16	18	23
Industrial eng/management sci	186	223	209	184	172	188	237	261
Mechanical engineering	77	65	85	78	80	96	97	123
Metallurgical/materials eng	8	12	7	5	6	8	14	19
Mining engineering	0	0	1	1	0	0	0	0
Nuclear engineering	2	0	1	3	4	2	2	3
Petroleum engineering	4	2	1	2	3	3	0	0
Engineering n e c	84	142	85	49	45	94	66	62

* Includes estimated data for master's degree granting institutions which were surveyed on a sample basis from 1985 through 1987

KEY NA not available
n e c not elsewhere classified

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-16. Hispanic graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985	1986	1987	1988	1989	1990	1991	1992
Full time and part time								
Total science and engineering	8 621	8 661	8 825	9 090	9 448	10 184	11 070	12.243
Science, total	7 141	7 059	7 095	7 369	7 738	8 299	8 948	9 793
Physical sciences	599	629	591	624	680	645	652	680
Astronomy	7	7	8	6	13	7	11	11
Chemistry	438	463	419	438	463	425	395	423
Physics	151	153	159	178	195	206	230	230
Physical sciences n e c	3	6	5	2	9	7	10	16
Earth atmospheric & ocean sciences	241	239	228	212	213	244	252	312
Atmospheric sciences	11	13	10	9	8	9	24	12
Geosciences	105	98	99	112	110	130	116	141
Oceanography	98	101	90	68	68	61	59	65
Earth. atmos & ocean sci n e c	27	27	29	23	27	44	53	94
Mathematical sciences	262	270	266	328	305	351	349	377
Mathematics & applied math	244	257	251	303	289	328	316	342
Statistics	18	13	15	25	16	23	33	35
Computer sciences	481	446	543	511	540	568	629	695
Agricultural sciences	319	299	220	276	292	268	276	283
Biological sciences	934	954	1 032	1.116	1.206	1 225	1 381	1.484
Anatomy	22	22	21	21	20	16	23	34
Biochemistry	82	73	77	92	76	87	84	108
Biology	377	397	423	475	488	452	546	571
Biometry epidemiology	28	19	38	53	57	70	90	72
Biophysics	3	2	15	3	8	7	5	9
Botany	34	29	29	21	34	30	36	33
Cell biology	16	22	39	46	53	86	71	73
Ecology	12	15	18	12	18	25	25	34
Entomology parasitology	16	23	23	29	30	32	37	32
Genetics	21	18	12	10	16	12	20	30
Microbiology, immunology, & virology	107	96	113	108	116	114	118	132
Nutrition	62	74	49	67	89	73	89	84
Pathology	20	26	27	24	19	21	18	30
Pharmacology	36	29	39	30	46	51	65	59
Physiology	50	61	57	42	36	41	49	53
Zoology	27	26	25	29	38	33	34	39
Biosciences n e c	21	22	27	54	62	75	71	91
Psychology	1 614	1 710	1 670	1 724	1.755	2 177	2 395	2.378
Psychology, general	NA	NA	NA	578	588	758	861	967
Clinical psychology	NA	NA	NA	835	788	951	772	742
Psychology, n e c	NA	NA	NA	311	379	468	762	669
Social sciences	2 691	2.512	2 545	2 578	2 747	2 821	3 014	3 584
Agricultural economics	36	59	43	35	48	37	45	47
Anthropology (cultural & social)	151	136	152	150	162	173	207	222
Economics (except agricultural)	279	250	250	286	258	243	291	334
Geography	33	44	60	59	58	60	82	97
History and philosophy of science	2	1	3	5	3	4	4	3
Linguistics	68	68	93	113	128	136	132	167
Political science	1 456	1 408	1 256	1 330	1 391	1 358	1 446	1 769
Sociology	197	175	237	231	256	290	322	369
Sociology anthropology	34	12	12	14	20	26	32	34
Social sciences n e c	435	359	439	355	423	494	453	542
Engineering total	1 480	1 602	1 730	1 721	1 710	1 885	2 122	2 450
Aerospace engineering	33	24	37	45	49	51	54	68
Agricultural engineering	8	9	8	4	7	17	8	8
Biomedical engineering	22	22	16	25	31	28	40	53
Chemical engineering	107	116	117	135	111	143	159	175
Civil engineering	251	252	264	263	275	302	382	475
Electrical engineering	443	464	521	528	558	576	660	746
Engineering science	15	20	22	25	15	16	26	27
Industrial eng management sci	255	278	282	281	246	231	254	296
Mechanical engineering	181	243	282	217	214	282	339	397
Metallurgical materials eng	37	44	48	48	53	71	56	72
Mining engineering	5	5	7	5	2	3	7	2
Nuclear engineering	15	11	15	30	28	24	25	32
Petroleum engineering	9	13	15	15	15	11	10	15
Engineering n e c	99	101	96	100	106	130	102	84

See explanatory information and SOURCE at end of table

Appendix table 6-16. Hispanic graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985-1992

Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Full time								
Total science and engineering	5 146	5 246	5 195	5 505	5 933	6.398	6 955	7.593
Science total	4 409	4 431	4 349	4 572	4.930	5 324	5.795	6.233
Physical sciences	530	549	514	549	581	530	562	572
Astronomy	7	7	7	6	13	7	10	9
Chemistry	399	407	372	392	397	350	344	363
Physics	122	133	134	150	167	170	203	194
Physical sciences n e c	2	2	1	1	4	3	5	6
Earth, atmospheric & ocean sciences	184	179	183	167	.72	188	196	226
Atmospheric sciences	11	12	10	9	8	8	23	10
Geosciences	85	76	76	78	84	100	90	115
Oceanography	71	75	82	64	61	56	53	58
Earth, atmos & ocean sci, n e c	17	16	15	16	19	22	30	43
Mathematical sciences	165	165	192	219	221	244	225	231
Mathematics & applied math	152	157	183	201	210	229	197	210
Statistics	13	8	9	18	11	15	28	21
Computer sciences	129	161	161	161	197	189	196	227
Agricultural sciences	267	250	182	233	249	237	233	236
Biological sciences	756	751	828	902	966	965	1 107	1,187
Anatomy	20	22	21	20	19	15	22	28
Biochemistry	73	68	65	77	64	78	73	94
Biology	281	289	312	366	368	317	401	408
Biometry/epidemiology	20	15	26	38	42	51	63	53
Biophysics	2	2	15	3	7	7	5	9
Botany	32	25	25	19	30	25	30	30
Cell biology	16	19	36	45	53	81	69	70
Ecology	10	13	14	10	16	21	22	28
Entomology parasitology	14	20	23	25	24	26	32	29
Genetics	20	15	11	9	12	11	18	29
Microbiology immunology & virology	98	85	106	99	104	107	110	124
Nutrition	42	49	31	41	49	36	54	54
Pathology	17	21	14	18	14	14	12	24
Pharmacology	35	26	36	28	44	51	62	58
Physiology	39	44	49	40	32	38	47	47
Zoology	25	22	23	26	35	30	30	32
Biosciences n e c	12	16	21	38	53	57	57	70
Psychology	1 008	1 141	1 100	1,115	1,238	1,415	1,604	1,642
Psychology general	NA	NA	NA	357	382	431	528	600
Clinical psychology	NA	NA	NA	505	544	640	495	532
Psychology n e c	NA	NA	NA	253	312	344	581	510
Social sciences	1 370	1 235	1 189	1,226	1,306	1 556	1,672	1,912
Agricultural economics	30	51	34	27	40	35	39	42
Anthropology (cultural & social)	104	97	111	114	125	137	164	185
Economics (except agricultural)	154	151	162	196	175	176	201	237
Geography	28	28	44	41	41	42	55	55
History and philosophy of science	2	1	3	5	2	4	2	3
Linguistics	33	34	51	68	72	85	83	97
Political science	583	555	387	435	480	562	616	740
Sociology	134	121	161	155	159	207	228	267
Sociology anthropology	20	11	9	9	13	20	19	22
Social sciences n e c	282	186	227	176	199	288	265	264
Engineering total	737	815	846	933	1 003	1 074	1 160	1 360
Aerospace engineering	21	15	25	31	40	35	44	59
Agricultural engineering	4	8	7	4	6	15	7	5
Biomedical engineering	18	20	13	18	26	21	30	44
Chemical engineering	74	86	91	110	93	111	110	129
Civil engineering	141	154	159	154	154	182	227	274
Electrical engineering	213	250	255	269	299	294	330	378
Engineering science	7	9	8	14	9	9	11	16
Industrial eng management sci	84	98	90	107	120	109	103	121
Mechanical engineering	95	100	108	110	120	158	194	207
Metallurgical/materials eng	27	31	30	36	35	62	44	55
Mining engineering	4	3	5	4	2	3	6	2
Nuclear engineering	11	8	12	24	24	19	20	23
Petroleum engineering	6	6	10	11	11	9	8	12
Engineering n e c	32	27	33	41	64	47	26	35

See explanatory information and SOURCE at end of table.

Appendix table 6-16. Hispanic graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

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Enrollment status and detailed field	1985	1986¹	1987	1988	1989	1990	1991	1992
Part time								
Total, science and engineering	3,475	3,415	3,630	3,585	3,515	3,786	4,115	4,650
Science, total	2,732	2,628	2,746	2,797	2,808	2,975	3,153	3,560
Physical sciences	69	80	77	75	99	115	90	108
Astronomy	0	0	1	0	0	0	1	2
Chemistry	39	56	47	46	66	75	51	60
Physics	29	20	25	28	28	36	33	36
Physical sciences, n e c	1	4	4	1	5	4	5	10
Earth, atmospheric, & ocean sciences	57	60	45	45	41	56	56	86
Atmospheric sciences	0	1	0	0	0	1	1	2
Geosciences	20	22	23	34	26	30	26	26
Oceanography	27	26	8	4	7	3	6	7
Earth atmos & ocean sci n e c	10	11	14	7	8	22	23	51
Mathematical sciences	97	105	74	109	84	107	124	146
Mathematics & applied math	92	100	68	102	79	99	119	132
Statistics	5	5	6	7	5	8	5	14
Computer sciences	352	285	382	350	343	379	433	468
Agricultural sciences	52	49	38	43	43	31	43	47
Biological sciences	178	203	204	214	240	260	274	297
Anatomy	2	0	0	1	1	1	1	6
Biochemistry	9	5	12	15	12	9	11	14
Biology	96	108	111	109	120	135	145	163
Biometry epidemiology	8	4	12	15	15	19	27	19
Biophysics	1	0	0	0	1	0	0	0
Botany	2	4	4	2	4	5	6	3
Cell biology	0	3	3	1	0	5	2	3
Ecology	2	2	4	2	2	4	3	6
Entomology parasitology	2	3	0	4	6	6	5	3
Genetics	1	3	1	1	4	1	2	1
Microbiology, immunology & virology	9	11	7	9	12	7	8	8
Nutrition	20	25	18	26	40	37	35	30
Pathology	3	5	13	6	5	7	6	6
Pharmacology	1	3	3	2	2	0	3	1
Physiology	11	17	8	2	4	3	2	6
Zoology	2	4	2	3	3	3	4	7
Biosciences, n e c	9	6	6	16	9	18	14	21
Psychology	606	569	570	609	517	762	791	736
Psychology, general	NA	NA	NA	221	206	327	333	367
Clinical psychology	NA	NA	NA	330	244	311	277	210
Psychology n e c	NA	NA	NA	58	67	124	181	159
Social sciences	1,321	1,277	1,356	1,352	1,441	1,265	1,342	1,672
Agricultural economics	6	8	9	8	8	2	6	5
Anthropology (cultural & social)	47	39	41	36	37	36	43	37
Economics (except agricultural)	125	99	88	90	83	67	90	97
Geography	5	16	16	18	17	18	27	42
History and philosophy of science	0	0	0	0	1	0	2	0
Linguistics	35	34	42	45	56	51	49	70
Political science	873	853	869	895	911	796	830	1,029
Sociology	63	54	76	76	97	83	94	102
Sociology anthropology	14	1	3	5	7	6	13	12
Social sciences n e c	153	173	212	179	224	206	188	278
Engineering, total	743	787	884	788	707	811	962	1,090
Aerospace engineering	12	9	12	14	9	[illegible]	10	9
Agricultural engineering	4	1	1	0	1	[illegible]	1	3
Biomedical engineering	4	2	3	7	5	7	10	9
Chemical engineering	33	30	26	25	18	32	49	46
Civil engineering	110	98	105	109	121	120	155	201
Electrical engineering	230	214	266	259	259	282	330	368
Engineering science	8	11	14	11	6	7	15	11
Industrial eng /management sci	171	180	192	174	126	122	151	175
Mechanical engineering	86	143	174	107	94	124	145	190
Metallurgical/materials eng	10	13	18	12	18	9	12	17
Mining engineering	1	2	2	1	0	0	1	0
Nuclear engineering	4	3	3	6	4	5	5	9
Petroleum engineering	3	7	5	4	4	2	2	3
Engineering, n e c	67	74	63	59	42	83	76	49

¹ Includes estimated data for master's degree granting institutions which were surveyed on a sample basis from 1985 through 1987

KEY NA not available

n e c not elsewhere classified

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-17. Asian graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Page 1 of 3

Enrollment status and detailed field	1985*	1986*	1987	1988	1989	1990	1991	1992
Full time and part time								
Total science and engineering	12 018	12 784	14.592	15 169	15 662	17 078	18 064	21.967
Science total	7 208	7.659	8 728	9.240	9 654	10 390	10 958	13.391
Physical sciences	937	912	1.047	1.213	1 136	1 165	1.372	1.613
Astronomy	6	12	14	37	36	38	30	25
Chemistry	660	631	715	720	680	653	802	891
Physics	265	261	304	441	413	466	517	670
Physical sciences n e c	6	8	14	15	7	8	23	27
Earth atmospheric & ocean sciences	194	154	181	214	212	261	268	394
Atmospheric sciences	25	27	37	47	45	26	28	52
Geosciences	110	67	69	82	96	116	137	162
Oceanography	27	32	43	48	30	43	36	70
Earth, atmos. & ocean sci n e c	32	28	32	37	41	76	67	110
Mathematical sciences	623	706	769	756	709	822	866	943
Mathematics & applied math	558	625	634	675	656	752	801	840
Statistics	65	81	135	[illegible]	53	70	65	103
Computer sciences	1 859	2.056	2.458	2 668	2.716	2.842	2 829	3.494
Agricultural sciences	135	129	165	212	230	235	220	216
Biological sciences	1.449	1.569	1.664	1 804	1.995	2.242	2.381	2.842
Anatomy	29	40	41	60	50	64	62	105
Biochemistry	202	213	222	246	273	274	300	413
Biology	345	351	380	416	485	546	619	698
Biometry/epidemiology	50	56	74	67	84	85	98	139
Biophysics	15	29	41	36	61	57	36	61
Botany	80	56	64	48	75	65	37	60
Cell biology	75	68	74	85	99	119	152	174
Ecology	10	15	14	15	8	16	18	20
Entomology/parasitology	20	26	23	34	41	42	32	45
Genetics	34	47	37	41	47	71	110	98
Microbiology, immunology & virology	152	174	205	204	187	230	239	255
Nutrition	131	147	158	137	166	167	132	177
Pathology	47	45	38	48	48	61	66	89
Pharmacology	98	111	94	100	128	155	137	138
Physiology	79	[illegible]	120	166	127	147	170	200
Zoology	25	26	22	20	31	35	27	43
Biosciences n e c.	57	53	57	81	85	108	146	127
Psychology	559	619	727	749	821	973	1 054	1.297
Psychology, general	NA	NA	NA	227	[illegible]	312	349	434
Clinical psychology	NA	NA	NA	346	[illegible]	409	449	490
Psychology n e c	NA	NA	NA	176	213	252	256	373
Social sciences	1.452	1.514	1.717	1 624	[illegible]	1.850	1 968	2.592
Agricultural economics	12	37	30	32	[illegible]	55	38	27
Anthropology (cultural & social)	53	69	98	107	[illegible]	114	117	172
Economics (except agricultural)	302	353	384	331	394	[illegible]	392	571
Geography	37	50	52	59	60	72	79	99
History and philosophy of science	3	3	10	12	15	5	7	8
Linguistics	45	53	109	108	83	84	91	140
Political science	687	596	653	598	715	691	781	941
Sociology	135	142	181	186	201	207	210	262
Sociology/anthropology	20	7	10	8	11	9	10	6
Social sciences, n e c	158	204	190	183	215	22	243	366
Engineering, total	4 810	5 125	5 864	5 929	6.008	6.688	7.106	8.576
Aerospace engineering	84	101	109	125	143	152	196	179
Agricultural engineering	22	17	12	12	18	23	17	17
Biomedical engineering	71	79	82	113	89	137	136	202
Chemical engineering	277	287	357	313	248	329	426	438
Civil engineering	437	444	583	601	597	760	831	999
Electrical engineering	1.966	2 071	2 453	2 587	2 703	3.050	3 047	3 815
Engineering science	74	91	97	112	99	103	115	134
Industrial eng/management sci	337	410	449	470	459	463	589	808
Mechanical engineering	794	811	883	776	802	805	933	1 186
Metallurgical-materials eng	219	235	241	250	273	224	260	327
Mining engineering	9	8	4	9	17	16	4	7
Nuclear engineering	40	35	38	50	36	27	30	39
Petroleum engineering	11	28	25	27	22	18	12	43
Engineering n e c	469	508	531	484	502	581	510	382

See explanatory information and SOURCE at end of table

Appendix table 6-17. Asian graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Page 2 of 3

Enrollment status and detailed field	1985[*]	1986[*]	1987[*]	1988	1989	1990	1991	1992
Full time:								
Total science and engineering	7 260	7 907	9.085	9 446	9 786	10 561	11 214	13.554
Science total	4 701	5 142	5 890	6 196	6.498	7.006	7 387	8 980
Physical sciences	790	766	896	1.039	984	982	1 162	1.334
Astronomy	6	12	14	37	36	38	30	25
Chemistry	552	524	604	593	572	528	687	727
Physics	227	228	268	399	370	408	436	572
Physical sciences, n e c	5	2	10	10	6	8	9	10
Earth atmospheric & ocean sciences	155	125	143	173	166	191	200	298
Atmospheric sciences	21	25	35	45	42	25	24	41
Geosciences	91	59	58	74	76	98	109	122
Oceanography	23	27	36	43	25	35	32	64
Earth atmos. & ocean sci n e c	20	14	14	11	23	33	35	71
Mathematical sciences	412	467	503	470	434	494	555	610
Mathematics & applied math	367	406	399	412	393	443	510	535
Statistics	45	61	104	58	41	51	45	75
Computer sciences	734	879	1 058	1.135	1.104	1.182	1.185	1.507
Agricultural sciences	108	113	151	186	205	205	193	175
Biological sciences	1 237	1 335	1.422	1.560	1 734	1 946	2 016	2.378
Anatomy	27	36	36	56	47	59	58	102
Biochemistry	197	201	207	236	254	263	289	393
Biology	239	262	279	310	378	428	431	462
Biometry/epidemiology	41	44	60	49	67	61	81	102
Biophysics	14	24	31	34	58	54	36	59
Botany	76	54	60	44	70	62	34	52
Cell biology	75	65	73	85	98	117	148	169
Ecology	10	15	12	14	6	12	13	17
Entomology/parasitology	13	17	13	32	37	41	32	43
Genetics	32	46	35	38	43	64	104	93
Microbiology immunology & virology	137	159	185	186	174	216	222	232
Nutrition	98	98	121	87	109	108	81	114
Pathology	42	39	34	44	41	49	49	77
Pharmacology	94	107	93	96	123	145	134	132
Physiology	75	104	114	158	125	142	163	191
Zoology	20	21	21	19	29	31	22	40
Biosciences, n e c	47	43	48	72	75	94	119	100
Psychology	381	445	555	578	638	732	756	952
Psychology general	NA	NA	NA	152	198	227	225	308
Clinical psychology	NA	NA	NA	273	256	301	330	359
Psychology n e c	NA	NA	NA	153	184	204	201	285
Social sciences	884	1 012	1 162	1 055	1 233	1 274	1 320	1 726
Agricultural economics	10	30	28	28	31	51	35	24
Anthropology (cultural & social)	41	61	79	86	85	92	96	144
Economics (except agricultural)	203	274	282	246	300	288	284	400
Geography	29	35	33	42	42	52	54	81
History and philosophy of science	3	3	8	12	13	5	7	8
Linguistics	36	43	88	90	69	69	60	82
Political science	354	314	369	299	384	400	444	545
Sociology	100	109	141	140	156	163	169	196
Sociology/anthropology	8	6	7	6	10	7	5	3
Social sciences n e c	100	137	127	106	143	147	166	243
Engineering total	2 559	2 765	3 195	3 250	3 288	3 555	3 827	4 574
Aerospace engineering	36	53	72	76	99	101	112	132
Agricultural engineering	13	16	10	11	16	22	16	15
Biomedical engineering	61	76	69	87	73	116	117	164
Chemical engineering	200	230	287	253	184	251	324	318
Civil engineering	278	271	343	324	324	409	459	555
Electrical engineering	920	984	1 239	1.332	1.351	1 513	1 521	1.806
Engineering science	29	41	36	48	44	49	58	73
Industrial eng /management sci	125	178	174	195	202	182	234	347
Mechanical engineering	451	481	524	462	471	468	524	716
Metallurgical/materials eng	179	194	167	192	213	173	202	232
Mining engineering	7	7	4	8	14	14	3	6
Nuclear engineering	36	30	31	44	35	25	[illegible]	28
Petroleum engineering	10	8	11	10	14	11	0	33
Engineering n e c	214	196	228	208	248	221	234	149

See explanatory information and SOURCE at end of table

Appendix table 6-17. Asian graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Page 3 [illegible]

Enrollment status and detailed field	1985	1986	1987[a]	1988	1989	1990	1991	1992
Part time								
Total science and engineering	4 758	4 877	5 507	5 723	5 876	6 517	6 851	8 413
Science total	2 507	2 517	2 838	3 044	3 156	3 384	3 571	4 4[illegible]
Physical sciences	147	146	151	174	152	183	210	[illegible]
Astronomy	0	0	0	0	0	0		
Chemistry	108	107	111	127	108	125	115	164
Physics	38	33	36	42	43	58	81	48
Physical sciences n e c	1	6	4	5	1	0	14	[illegible]
Earth, atmospheric & ocean sciences	39	29	38	41	46	70	68	46
Atmospheric sciences	4	2	2	2	3	1	4	[illegible]
Geosciences	19	8	11	8	20	18	28	4
Oceanography	4	5	7	5	5	8	4	6
Earth, atmos & ocean sci n e c	12	14	18	26	18	43	32	34
Mathematical sciences	21[illegible]	239	266	286	275	328	311	333
Mathematics & applied math	191	219	235	263	263	309	291	305
Statistics	20	20	31	23	12	19	20	28
Computer sciences	1 125	1 177	1 400	1 533	1 612	1 660	1 644	[illegible] 987
Agricultural sciences	27	16	14	26	25	30	27	41
Biological sciences	212	234	242	244	261	296	365	464
Anatomy	2	4	5	4	3	5	4	3
Biochemistry	5	12	15	10	19	11	11	25
Biology	106	89	101	106	107	118	188	236
Biometry/epidemiology	9	12	14	18	17	24	17	37
Biophysics	1	5	10	2	3	3	0	2
Botany	4	2	4	4	5	3	3	8
Cell biology	0	3	1	0	1	2	4	[illegible]
Ecology	0	0	2	1	2	4	5	[illegible]
Entomology/parasitology	7	9	10	2	4	[illegible]	0	[illegible]
Genetics	2	1	2	3	4	7	6	5
Microbiology, immunology & virology	15	15	20	18	13	14	17	23
Nutrition	33	49	37	50	57	59	51	63
Pathology	5	6	4	4	7	12	17	12
Pharmacology	4	4	1	4	5	10	3	6
Physiology	4	8	6	8	2	5	7	[illegible]
Zoology	5	5	1	1	2	4	5	[illegible]
Biosciences, n e c	10	10	9	9	10	14	27	[illegible]
Psychology	178	174	172	171	183	241	298	345
Psychology, general	NA	NA	NA	75	63	85	124	126
Clinical psychology	NA	NA	NA	73	91	108	119	[illegible]
Psychology n e c	NA	NA	NA	23	29	48	55	88
Social sciences	568	502	555	569	602	576	648	86[illegible]
Agricultural economics	2	7	2	4	1	4	3	[illegible]
Anthropology (cultural & social)	12	8	19	21	24	22	[illegible]	[illegible]
Economics (except agricultural)	99	79	102	85	94	103	108	[illegible]
Geography	8	15	19	17	18	20	25	18
History and philosophy of science	0	0	2	0	2	0	[illegible]	[illegible]
Linguistics	9	10	21	18	14	15	31	[illegible]
Political science	333	282	284	299	331	291	337	[illegible]
Sociology	35	33	40	46	45	44	41	66
Sociology/anthropology	12	1	3	2	1	2	6	[illegible]
Social sciences n e c	58	67	63	77	72	75	77	[illegible]
Engineering total	2 251	2 360	2 669	2 679	2 720	3 133	3 27[illegible]	4 [illegible]
Aerospace engineering	48	48	37	49	44	51	84	4[illegible]
Agricultural engineering	9	1	2	1	2	1	1	[illegible]
Biomedical engineering	10	3	13	26	16	21	19	[illegible]
Chemical engineering	77	57	70	60	64	78	[illegible]	[illegible]
Civil engineering	159	173	240	277	273	351	37[illegible]	444
Electrical engineering	1 046	1 087	1 214	1 255	1 352	1 537	1 5[illegible]	[illegible]
Engineering science	45	50	61	64	55	[illegible]4	[illegible]	[illegible]
Industrial eng management sci	212	232	275	275	257	[illegible]81	[illegible]	4[illegible]
Mechanical engineering	343	339	359	314	331	337	[illegible]	4[illegible]
Metallurgical/materials eng	40	41	74	[illegible]	60	[illegible]1	[illegible]8	[illegible]
Mining engineering	2	1	0	1	3	[illegible]	[illegible]	[illegible]
Nuclear engineering	4	5	7	6	1	[illegible]	[illegible]	[illegible]
Petroleum engineering	1	20	14	17	8	[illegible]	[illegible]	[illegible]
Engineering n e c	255	312	303	[illegible]76	254	[illegible]	[illegible]	[illegible]

[a] Includes estimated data for master's degree granting institutions, which were surveyed on a sample basis from 1985 through [illegible]

KEY NA = not available
n e c = not elsewhere classified

SOURCE National Science Foundation SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-18. American Indian/Alaskan Native graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Enrollment status and detailed field	1985*	1986*	1987	1988	1989	1990	1991	1992
Full time and part time								
Total science and engineering	740	744	787	923	864	1 060	1 123	1 253
Science total	618	614	663	779	740	907	937	1 076
Physical sciences	35	48	46	52	44	63	62	67
Astronomy	1	1	1	0	0	2	2	4
Chemistry	25	33	29	30	25	44	43	37
Physics	9	13	16	20	19	16	15	26
Physical sciences n e c	0	1	0	2	0	1	2	0
Earth atmospheric & ocean sciences	25	21	19	29	27	31	29	37
Atmospheric sciences	0	1	0	0	0	0	0	1
Geosciences	17	14	16	24	19	22	20	25
Oceanography	2	2	1	0	0	1	3	4
Earth, atmos . & ocean sci n e c	6	4	2	5	8	8	6	7
Mathematical sciences	22	31	48	32	34	20	20	26
Mathematics & applied math	21	30	48	32	31	19	18	21
Statistics	1	1	0	0	3	1	2	5
Computer sciences	57	21	28	41	41	44	42	82
Agricultural sciences	20	22	28	31	24	19	31	39
Biological sciences	88	105	90	104	85	142	129	139
Anatomy	3	1	5	3	1	1	2	2
Biochemistry	11	25	19	10	5	6	13	10
Biology	21	20	18	30	24	33	43	45
Biometry epidemiology	8	7	10	7	5	4	6	10
Biophysics	0	0	0	1	1	2	2	1
Botany	3	4	5	6	10	7	6	7
Cell biology	1	3	1	2	5	4	5	13
Ecology	1	1	0	1	1	3	5	7
Entomology parasitology	0	0	3	2	1	8	1	1
Genetics	2	3	2	1	2	1	0	2
Microbiology immunology & virology	8	11	5	11	6	20	6	7
Nutrition	9	9	4	5	7	19	11	12
Pathology	3	1	1	1	1	5	3	1
Pharmacology	3	5	4	7	5	11	14	12
Physiology	8	6	1	5	4	5	2	1
Zoology	6	7	8	7	5	7	7	6
Biosciences, n e c	1	2	4	5	2	6	3	2
Psychology	135	134	152	178	181	236	253	291
Psychology, general	NA	NA	NA	66	65	104	90	112
Clinical psychology	NA	NA	NA	77	72	87	95	95
Psychology n e c	NA	NA	NA	35	44	45	68	84
Social sciences	236	232	252	312	304	352	371	395
Agricultural economics	4	4	4	3	3	0	4	13
Anthropology (cultural & social)	21	27	36	45	53	66	68	74
Economics (except agricultural)	13	24	16	82	67	68	53	22
Geography	4	2	4	6	11	12	18	26
History and philosophy of science	0	0	0	0	0	[illegible]	0	1
Linguistics	8	9	13	6	10	8	7	3
Political science	111	90	100	97	91	100	116	125
Sociology	32	27	36	30	36	45	54	64
Sociology anthropology	2	2	2	0	1	5	1	1
Social sciences, n e c	41	47	41	43	32	47	50	66
Engineering total	122	130	124	144	124	153	186	177
Aerospace engineering	2	8	5	3	5	6	5	6
Agricultural engineering	1	0	0	0	0	1	1	1
Biomedical engineering	6	5	2	6	3	2	3	3
Chemical engineering	8	5	26	24	10	5	22	15
Civil engineering	16	28	9	22	22	37	34	30
Electrical engineering	30	43	18	39	37	49	39	38
Engineering science	4	3	[illegible]	5	5	3	4	2
Industrial eng management sci	11	10	[illegible]	15	17	24	40	43
Mechanical engineering	25	15	23	12	13	15	21	24
Metallurgical/materials eng	6	3	2	4	5	[illegible]	1	4
Mining engineering	1	4	[illegible]	0	[illegible]	0	0	0
Nuclear engineering	2	1	2	3	2	2	2	1
Petroleum engineering	0	[illegible]	1	1	[illegible]	[illegible]	4	1
Engineering n e c	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	10	9

See explanatory information and SOURCE at end of table

Appendix table 6-18. American Indian/Alaskan Native graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985–1992

Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Full time								
Total, science and engineering	479	491	520	571	552	660	720	843
Science, total	411	415	454	493	487	595	613	737
Physical sciences	28	35	36	43	39	56	56	63
Astronomy	1	1	1	0	0	2	2	4
Chemistry	19	22	22	27	22	40	41	33
Physics	8	12	13	16	17	14	12	26
Physical sciences, n e c	0	0	0	0	0	0	1	0
Earth, atmospheric & ocean sciences	21	17	15	23	21	26	18	25
Atmospheric sciences	0	1	0	0	0	0	0	1
Geosciences	13	11	12	18	15	18	13	17
Oceanography	2	1	1	0	0	1	2	3
Earth, atmos. & ocean sci. n e c	6	4	2	5	6	7	3	4
Mathematical sciences	6	9	21	16	20	13	12	20
Mathematics & applied math	5	8	21	16	18	12	10	15
Statistics	1	1	0	0	2	1	2	5
Computer sciences	45	10	15	12	16	18	18	25
Agricultural sciences	14	17	15	19	18	16	27	31
Biological sciences	73	88	76	77	70	111	91	113
Anatomy	3	1	2	2	1	1	1	2
Biochemistry	10	24	18	9	5	5	12	10
Biology	16	13	11	16	18	21	24	34
Biometry epidemiology	5	3	9	6	3	4	2	8
Biophysics	0	0	0	1	1	2	2	1
Botany	3	4	5	5	10	5	6	6
Cell biology	1	3	1	2	5	4	5	13
Ecology	1	0	0	1	1	3	5	6
Entomology/parasitology	0	0	3	2	1	8	1	1
Genetics	2	3	2	1	2	1	0	2
Microbiology, immunology & virology	6	11	5	11	4	19	6	7
Nutrition	6	5	3	3	5	10	7	5
Pathology	2	1	1	1	1	4	2	0
Pharmacology	3	5	4	7	5	11	13	11
Physiology	8	6	1	4	4	5	2	1
Zoology	6	7	7	4	2	4	2	5
Biosciences, n e c	1	2	4	2	2	4	1	1
Psychology	88	98	112	120	129	151	181	208
Psychology, general	NA	NA	NA	40	35	51	58	68
Clinical psychology	NA	NA	NA	51	54	63	68	73
Psychology n e c	NA	NA	NA	29	40	37	55	67
Social sciences	136	141	164	183	174	204	210	252
Agricultural economics	3	2	3	2	3	0	3	9
Anthropology (cultural & social)	17	22	29	34	39	53	50	58
Economics (except agricultural)	6	16	8	40	24	27	8	15
Geography	3	2	3	6	8	9	16	20
History and philosophy of science	0	0	0	0	0	1	0	1
Linguistics	7	8	9	6	9	7	4	3
Political science	48	38	50	40	38	43	58	71
Sociology	25	23	28	24	27	35	40	39
Sociology anthropology	1	2	1	0	1	4	1	0
Social sciences n e c	26	28	33	31	25	25	30	36
Engineering total	68	76	66	78	65	65	107	106
Aerospace engineering	1	5	4	2	3	3	5	5
Agricultural engineering	1	0	0	0	0	1	1	1
Biomedical engineering	6	5	2	4	2	2	2	3
Chemical engineering	6	2	26	22	5	1	22	11
Civil engineering	9	15	5	13	14	17	20	20
Electrical engineering	16	33	5	16	19	18	26	26
Engineering science	2	2	2	2	2	1	2	1
Industrial eng /management sci	5	2	4	4	8	7	9	14
Mechanical engineering	11	5	12	8	6	6	9	14
Metallurgical/materials eng	5	3	2	2	2	2	1	4
Mining engineering	1	3	0	0	0	0	0	0
Nuclear engineering	1	1	2	2	1	2	2	1
Petroleum engineering	0	0	1	0	0	0	3	1
Engineering n e c	4	0	1	3	3	5	5	5

See explanatory information and SOURCE at end of table

Appendix table 6-18. American Indian/Alaskan Native graduate students in science and engineering in all institutions, by enrollment status and detailed field: fall 1985-1992

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Enrollment status and detailed field	1985*	1986*	1987*	1988	1989	1990	1991	1992
Part time								
Total science and engineering	261	253	267	352	312	400	403	410
Science total	207	199	209	286	253	312	324	339
Physical sciences	7	13	10	9	5	7	6	4
Astronomy	0	0	0	0	0	0	0	0
Chemistry	6	11	7	3	3	4	2	4
Physics	1	1	3	4	2	2	3	0
Physical sciences n e c	0	1	0	2	0	1	1	0
Earth atmospheric & ocean sciences	4	4	4	6	6	5	11	12
Atmospheric sciences	0	0	0	0	0	0	0	0
Geosciences	4	3	4	6	4	4	7	8
Oceanography	0	1	0	0	0	0	1	1
Earth atmos., & ocean sci n e c	0	0	0	0	2	1	3	3
Mathematical sciences	16	22	27	16	14	7	8	6
Mathematics & applied math	16	22	27	16	13	7	8	6
Statistics	0	0	0	0	1	0	0	0
Computer sciences	12	11	13	29	25	26	24	57
Agricultural sciences	6	5	13	12	6	3	4	8
Biological sciences	15	17	14	27	15	31	38	26
Anatomy	0	0	3	1	0	0	1	0
Biochemistry	1	1	1	1	0	1	1	0
Biology	5	7	7	14	6	12	19	11
Biometry/epidemiology	3	4	1	1	2	0	4	2
Biophysics	0	0	0	0	0	0	0	0
Botany	0	0	0	1	0	[illegible]	0	1
Cell biology	0	0	0	0	0	0	0	0
Ecology	0	1	0	0	0	0	0	1
Entomology/parasitology	0	0	0	0	0	0	0	0
Genetics	0	0	0	0	0	0	0	0
Microbiology, immunology, & virology	2	0	0	0	2	1	0	0
Nutrition	3	4	1	2	2	9	4	7
Pathology	1	0	0	0	0	1	1	1
Pharmacology	0	0	0	0	0	0	1	1
Physiology	0	0	0	1	0	0	0	0
Zoology	0	0	1	3	3	3	5	1
Biosciences, n e c	0	0	0	3	0	2	2	1
Psychology	47	36	40	58	52	85	72	83
Psychology general	NA	NA	NA	26	30	53	32	44
Clinical psychology	NA	NA	NA	26	18	24	27	22
Psychology n e c	NA	NA	NA	6	4	8	13	17
Social sciences	100	91	88	129	130	148	161	143
Agricultural economics	1	2	1	1	0	0	1	4
Anthropology (cultural & social)	4	5	7	11	14	13	18	16
Economics (except agricultural)	7	8	8	42	43	41	45	7
Geography	1	0	1	0	3	3	2	6
History and philosophy of science	0	0	0	0	0	0	0	0
Linguistics	1	1	4	0	1	1	3	0
Political science	63	52	50	57	53	57	58	54
Sociology	7	4	8	6	9	10	14	25
Sociology/anthropology	1	0	1	0	0	1	0	1
Social sciences, n e c	15	19	8	12	7	22	20	30
Engineering, total	54	54	58	66	59	88	79	71
Aerospace engineering	1	3	1	1	2	3	0	1
Agricultural engineering	0	0	0	0	0	0	0	0
Biomedical engineering	0	0	0	2	1	0	1	0
Chemical engineering	2	3	0	2	5	4	0	4
Civil engineering	7	13	4	9	8	20	14	10
Electrical engineering	14	10	13	23	18	31	13	12
Engineering science	1	1	4	3	3	2	2	1
Industrial eng /management sci	6	8	21	11	9	17	31	29
Mechanical engineering	14	10	11	4	7	9	12	10
Metallurgical/materials eng	1	0	0	2	3	0	0	0
Mining engineering	0	1	0	0	0	0	0	0
Nuclear engineering	1	0	0	1	1	0	0	0
Petroleum engineering	0	0	0	1	0	0	1	0
Engineering, n e c	7	5	4	7	2	2	5	4

*Includes estimated data for masters degree granting institutions, which were surveyed on a sample basis from 1985 through 1987

KEY NA - not available
n e c - not elsewhere classified

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-19. Science and engineering graduate students in all institutions, by geographic division, State, citizenship, and race/ethnicity of U.S. citizens: fall 1992

Geographic division and State	Total, all students	U.S. citizens, total[1]	Black	American Indian	Asian	Hispanic	White	Other or unknown	Non-U.S. citizens
Total, all institutions	431.613	322.449	15 370	1.253	21.967	12.243	253.968	17 648	109.164
New England	31.119	22.531	551	79	1.334	489	17.949	2.129	8 588
Connecticut	6.262	4.609	128	13	226	99	3.752	391	1.653
Maine	814	595	6	1	9	2	558	19	219
Massachusetts	20.103	14.247	377	58	929	342	10.972	1.569	5.856
New Hampshire	1.182	918	9	3	24	6	756	120	264
Rhode Island	2.079	1.581	23	4	131	22	1.371	30	498
Vermont	679	581	8	0	15	18	540	0	98
Middle Atlantic	73.905	54.543	2.729	117	3.827	1.800	41.017	5 053	19.362
New Jersey	11.270	8 385	352	14	873	228	6.166	752	2.885
New York	42.843	31.419	1.852	83	2.168	1.332	22.175	3.809	11.424
Pennsylvania	19.792	14.739	525	20	786	240	12.676	492	5.053
East North Central	75.019	53.803	2.797	174	3.214	1.265	44.529	1.824	21.216
Illinois	22 295	16.292	1.100	41	1.438	462	12.855	396	6.003
Indiana	8.905	6.326	206	9	232	128	5.511	240	2.579
Michigan	16.168	11.304	779	49	692	262	9.082	440	4.864
Ohio	18.844	13.479	564	38	655	273	11.235	714	5.365
Wisconsin	8.807	6.402	148	37	197	140	5.846	34	2.405
West North Central	27.356	19.135	452	70	758	285	16.195	1 375	8.221
Iowa	4 840	2.845	75	5	53	46	2.474	192	1.995
Kansas	4.835	3.353	64	13	114	61	2.658	443	1.482
Minnesota	6.786	5.134	78	17	187	44	4.238	570	1.652
Missouri	6.293	4.437	173	16	223	95	3.861	69	1.856
Nebraska	2.709	2.038	45	4	80	23	1.830	56	671
North Dakota	940	739	10	10	70	13	604	32	201
South Dakota	953	589	7	5	31	3	530	13	364
South Atlantic	66.994	51 938	4 191	120	2 661	1.588	42.302	1 076	15 056
Delaware	1.453	987	62	2	24	8	880	11	466
District of Columbia	8.582	6.572	794	24	383	220	4.630	521	2.010
Florida	13.574	10.397	639	17	454	806	8.328	153	3.177
Georgia	8.437	6.792	915	14	338	155	5.294	76	1.645
Maryland	9.020	6.702	573	15	428	115	5.406	165	2 318
North Carolina	9.300	7.317	506	32	302	101	6.358	18	1.983
South Carolina	3.861	2.754	125	2	164	47	2.375	41	1.107
Virginia	10.756	8.837	543	14	532	125	7.534	89	1 919
West Virginia	2.011	1 580	34	0	36	11	1.497	2	431
East South Central	18.178	13.804	1.171	42	614	139	11.634	204	4.374
Alabama	5 480	3.883	343	12	161	49	3.301	17	1.597
Kentucky	3.844	3.053	99	10	166	43	2.704	31	791
Mississippi	2.522	1.739	318	7	130	20	1 253	11	783
Tennessee	6.332	5 129	411	13	157	27	4.376	145	1 203
West South Central	41.778	29.153	1.432	192	1.948	1.605	23.584	392	12.625
Arkansas	1.767	1 419	98	6	34	7	1.267	7	348
Louisiana	5.361	3.429	373	3	257	57	2 568	171	1.932
Oklahoma	4 454	2 925	102	96	145	62	2.443	77	1 529
Texas	30 196	21.380	859	87	1.512	1 479	17.306	137	8.816
Mountain	27 909	21.434	255	188	847	897	18.667	580	6 475
Arizona	7 151	4.999	68	66	217	272	4.314	62	2 152
Colorado	8.674	7 339	122	37	316	233	6.427	204	1 335
Idaho	1.354	1.075	5	6	17	17	1 022	8	279
Montana	[illegible]	1.083	4	10	27	6	1.020	16	174
Nevada	1 356	1.086	14	13	106	24	791	[illegible]	270
New Mexico	3 303	2 538	35	31	53	323	1 999	97	765
Utah	4.020	2 727	6	23	92	17	2.548	41	1.293
Wyoming	794	587	1	2	19	5	546	14	207
Pacific	67 307	54 315	1 785	271	6.747	2 564	37 946	5.002	12 992
Alaska	762	649	3	7	29	5	568	37	113
California	54 574	44 925	1 657	215	6 010	2 419	30 119	4 505	9 649
Hawaii	1 689	997	10	0	270	11	680	26	692
Oregon	4 121	2 820	38	14	146	44	2.331	247	1 301
Washington	6 161	4.924	77	35	292	85	4 248	187	1.237
Outlying areas	2 048	1 793	7	0	17	1 611	145	13	255
American Samoa	0	0	0	0	0	0	0	0	0
Guam	32	27	0	0	13	0	14	0	5
Puerto Rico	2 016	1 766	7	0	4	1 611	131	13	250
Virgin Islands	0	0	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table

Appendix table 6-19. Science and engineering graduate students in all institutions, by geographic division, State, citizenship, and race/ethnicity of U.S. citizens: fall 1992

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Geographic division and State	Total all students	U.S. citizens total*	Black	American Indian	Asian	Hispanic	White	Other or unknown	Non-U.S. citizens
[Percentage distribution]									
Total all institutions	100.0	74.7	3.6	0.3	5.1	2.8	58.8	4.1	25.3
New England	100.0	72.4	1.8	3	4.3	1.6	57.7	6.8	27.6
Connecticut	100.0	73.6	2.0	2	3.6	1.6	59.9	6.2	26.4
Maine	100.0	73.1	7	1	1.1	2	68.6	2.3	26.9
Massachusetts	100.0	70.9	1.9	3	4.6	1.7	54.6	7.8	29.1
New Hampshire	100.0	77.7	8	3	2.0	5	64.0	10.2	22.3
Rhode Island	100.0	76.0	1.1	2	6.3	1.1	65.9	1.4	24.0
Vermont	100.0	85.6	1.2	0	2.2	2.7	79.5	0.0	14.4
Middle Atlantic	100.0	73.8	3.7	2	5.2	2.4	55.5	6.8	26.2
New Jersey	100.0	74.4	3.1	1	7.7	2.0	54.7	6.7	25.6
New York	100.0	73.3	4.3	2	5.1	3.1	51.8	8.9	26.7
Pennsylvania	100.0	74.5	2.7	1	4.0	1.2	64.0	2.5	25.5
East North Central	100.0	71.7	3.7	2	4.3	1.7	59.4	2.4	28.3
Illinois	100.0	73.1	4.9	2	6.4	2.1	57.7	1.8	26.9
Indiana	100.0	71.0	2.3	1	2.6	1.4	61.9	2.7	29.0
Michigan	100.0	69.9	4.8	3	4.3	1.6	56.2	2.7	30.1
Ohio	100.0	71.5	3.0	2	3.5	1.4	59.6	3.8	28.5
Wisconsin	100.0	72.7	1.7	4	2.2	1.6	66.4	4	27.3
West North Central	100.0	69.9	1.7	3	2.8	1.0	59.2	5.0	30.1
Iowa	100.0	58.8	1.5	1	1.1	1.0	51.1	4.0	41.2
Kansas	100.0	69.3	1.3	3	2.4	1.3	55.0	9.2	30.7
Minnesota	100.0	75.7	1.1	3	2.8	6	62.5	8.4	24.3
Missouri	100.0	70.5	2.7	3	3.5	1.5	61.4	1.1	29.5
Nebraska	100.0	75.2	1.7	1	3.0	8	67.6	2.1	24.8
North Dakota	100.0	78.6	1.1	1.1	7.4	1.4	64.3	3.4	21.4
South Dakota	100.0	61.8	7	5	3.3	3	55.6	1.4	38.2
South Atlantic	100.0	77.5	6.3	.2	4.0	2.4	63.1	1.6	22.5
Delaware	100.0	67.9	4.3	1	1.7	6	60.6	8	32.1
District of Columbia	100.0	76.6	9.3	3	4.5	2.6	54.0	6.1	23.4
Florida	100.0	76.6	4.7	1	3.3	5.9	61.4	1.1	23.4
Georgia	100.0	80.5	10.8	2	4.0	1.8	62.7	9	19.5
Maryland	100.0	74.3	6.4	2	4.7	1.3	59.9	1.8	25.7
North Carolina	100.0	78.7	5.4	3	3.2	1.1	68.4	2	21.3
South Carolina	100.0	71.3	3.2	1	4.2	1.2	61.5	1.1	28.7
Virginia	100.0	82.2	5.0	1	4.9	1.2	70.0	8	17.8
West Virginia	100.0	78.6	1.7	0	1.8	5	74.4	1	21.4
East South Central	100.0	75.9	6.4	2	3.4	8	64.0	1.1	24.1
Alabama	100.0	70.9	6.3	2	2.9	9	60.2	3	29.1
Kentucky	100.0	79.4	2.6	3	4.3	1.1	70.3	8	20.6
Mississippi	100.0	69.0	12.6	3	5.2	8	49.7	4	31.0
Tennessee	100.0	81.0	6.5	2	2.5	4	69.1	2.3	19.0
West South Central	100.0	69.8	3.4	5	4.7	3.8	56.5	9	30.2
Arkansas	100.0	80.3	5.5	3	1.9	4	71.7	4	19.7
Louisiana	100.0	64.0	7.0	1	4.8	1.1	47.9	3.2	36.0
Oklahoma	100.0	65.7	2.3	2.2	3.3	1.4	54.8	1.7	34.3
Texas	100.0	70.8	2.8	3	5.0	4.9	57.3	5	29.2
Mountain	100.0	76.8	9	7	3.0	3.2	66.9	2.1	23.2
Arizona	100.0	69.9	1.0	9	3.0	3.8	60.3	9	30.1
Colorado	100.0	84.6	1.4	4	3.6	2.7	74.1	2.4	15.4
Idaho	100.0	79.4	4	4	1.3	1.3	75.5	6	20.6
Montana	100.0	86.2	3	8	2.1	5	81.1	1.3	13.8
Nevada	100.0	80.1	1.0	1.0	7.8	1.8	58.3	10.2	19.9
New Mexico	100.0	76.8	1.1	9	1.6	9.8	60.5	2.9	23.2
Utah	100.0	67.8	1	6	2.3	4	63.4	1.0	32.2
Wyoming	100.0	73.9	1	3	2.4	6	68.8	1.8	26.1
Pacific	100.0	80.7	2.7	4	10.0	3.8	56.4	7.4	19.3
Alaska	100.0	85.2	4	9	3.8	7	74.5	4.9	14.8
California	100.0	82.3	3.0	4	11.0	4.4	55.2	8.[illegible]	17.7
Hawaii	100.0	59.0	6	0	16.0	7	40.3	1.5	41.0
Oregon	100.0	68.4	9	3	3.5	1.1	56.6	6.0	31.6
Washington	100.0	79.9	1.2	6	4.7	1.4	68.9	3.0	20.1
Outlying areas	100.0	87.5	3	0	8	78.7	7.1	6	12.5
American Samoa									
Guam	100.0	84.4	0	0	40.6	0	43.8	0	15.6
Puerto Rico	100.0	87.6	3	0	2	79.9	6.5	6	12.4
Virgin Islands	..	..	.				..		..

* Includes permanent residents

NOTE: Because of rounding, percentages may not add to 100

KEY: · too small to report

SOURCE: National Science Foundation SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering

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Appendix table 6-20. Science graduate students in all institutions, by geographic division, State, citizenship, and race/ethnicity of U.S. citizens: fall 1992

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Geographic division and State	Total, all students	U S citizens, total*	Black non-Hispanic	American Indian/Alaskan Native	Asian	Hispanic	White non-Hispanic	Other or unknown	Non-U S citizens
Total, all institutions	313.566	245.600	12.998	1.076	13.391	9.793	196.600	11.742	67.966
New England	21 926	16.224	432	65	852	379	13.189	1.307	5.702
Connecticut	4.749	3.584	110	12	190	78	2.929	265	1.165
Maine	636	491	5	1	7	2	463	13	145
Massachusetts	13.481	9.671	281	47	530	262	7.661	890	3.810
New Hampshire	879	706	9	3	16	5	560	113	173
Rhode Island	1.616	1.291	19	2	97	19	1 128	26	325
Vermont	565	481	8	0	12	13	448	0	84
Middle Atlantic	55.871	42.836	2.365	101	2.556	1.469	32.552	3.793	13.035
New Jersey	8.066	6.393	326	14	557	171	4.715	610	1.673
New York	34.096	25.775	1 630	73	1.559	1.133	18.568	2.812	8.321
Pennsylvania	13 709	10.668	409	14	440	165	9.269	371	3.041
East North Central	53 757	40 363	2 420	155	1.982	1.022	34.003	781	13.394
Illinois	17 542	13.322	1.028	40	985	397	10.612	260	4.220
Indiana	6 704	4.935	186	9	157	97	4.374	112	1 769
Michigan	10.277	7.540	634	42	369	206	6.042	247	2.737
Ohio	13.013	9.818	470	31	372	220	8.582	143	3.195
Wisconsin	6.221	4.748	102	33	99	102	4.393	19	1.473
West North Central	20.594	15.435	399	63	535	251	13.235	952	5.159
Iowa	3.533	2.155	63	5	40	38	1.873	136	1.378
Kansas	3.536	2.611	54	11	60	54	2.082	350	925
Minnesota	5.554	4 404	76	16	143	39	3.790	340	1.150
Missouri	4 392	3,449	149	15	172	85	2.983	45	943
Nebraska	2.228	1.742	42	3	56	20	1.565	56	486
North Dakota	757	613	8	8	43	12	517	25	144
South Dakota	594	461	7	5	21	3	425	0	133
South Atlantic	48.256	39.228	3.408	100	1.642	1.149	32.297	632	9.028
Delaware	1.075	767	54	2	15	7	679	10	308
District of Columbia	6 494	5.039	655	14	229	175	3.665	301	1,455
Florida	9.300	7 661	516	16	256	586	6.229	58	1,639
Georgia	5.572	4 542	741	12	138	71	3.534	46	1.030
Maryland	6.890	5.453	492	13	289	93	4,431	135	1,437
North Carolina	7 269	5 995	369	31	199	80	5.311	5	1.274
South Carolina	2.650	2.061	110	1	144	41	1 734	31	589
Virginia	7.551	6.482	443	11	351	90	5.543	44	1.069
West Virginia	1 455	1 228	28	0	21	6	1.171	2	227
East South Central	13 192	10.552	1 051	34	393	107	8 777	190	2.640
Alabama	3 670	2 750	302	9	73	35	2.316	15	920
Kentucky	2 895	2 416	81	7	126	36	2.137	29	479
Mississippi	2 071	1 513	309	6	99	19	1.069	11	558
Tennessee	4.556	3 873	359	12	95	17	3.255	135	683
West South Central	29 401	22 414	1 225	160	1 171	1 217	18.401	240	6 987
Arkansas	1 384	1 196	93	6	25	7	1.058	7	188
Louisiana	3 885	2.795	343	3	180	38	2.168	63	1 090
Oklahoma	3.018	2.334	87	78	105	48	1.947	69	684
Texas	21 114	16 089	702	73	861	1 124	13 228	101	5.025
Mountain	19 890	16.151	197	169	429	675	14.278	403	3.739
Arizona	5 059	3.846	52	58	107	221	3.368	40	1.213
Colorado	6.011	5 227	93	30	162	188	4 635	119	784
Idaho	965	790	3	6	17	11	753	5	175
Montana	1 060	936	3	10	19	4	884	16	124
Nevada	991	858	11	12	29	19	650	137	133
New Mexico	2 340	1 870	28	28	43	214	1.525	32	470
Utah	2 851	2 122	6	23	44	14	1 995	40	729
Wyoming	613	502	1	2	13	4	468	14	111
Pacific	48 841	40 717	1 494	229	3 815	2.025	29 723	3 431	8.124
Alaska	529	457	1	3	9	5	411	28	72
California	39 066	33.241	1 382	183	3 303	1 900	23 408	3 065	5 825
Hawaii	1 462	911	10	0	224	11	641	25	551
Oregon	3.223	2 342	32	12	107	40	1 953	198	881
Washington	4 561	3.766	69	31	172	69	3.310	115	795
Outlying areas	1 838	1 680	7	0	16	1 499	145	13	158
Guam	32	27	0	0	13	0	14	0	5
Puerto Rico	1 806	1 653	7	0	3	1 499	131	13	153

* Includes permanent residents

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-21. Engineering graduate students in all institutions, by geographic division, State, citizenship, and race/ethnicity of U.S. citizens: fall 1992

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Geographic division and State	Total, all students	U.S. citizens, total[1]	Black non-Hispanic	American Indian/Alaskan Native	Asian	Hispanic	White non-Hispanic	Other or unknown	Non-U.S. citizens
Total, all institutions	118,047	76,849	2,372	177	8,576	2,450	57,368	5,906	41,198
New England	9,193	6,307	119	14	482	110	4,760	822	2,886
Connecticut	1,513	1,025	18	1	36	21	823	126	488
Maine	178	104	1	0	2	0	95	6	74
Massachusetts	6,622	4,576	96	11	399	80	3,311	679	2,046
New Hampshire	303	212	0	0	8	1	196	7	91
Rhode Island	463	290	4	2	34	3	243	4	173
Vermont	114	100	0	0	3	5	92	0	14
Middle Atlantic	18,034	11,707	364	16	1,271	331	8,465	1,260	6,327
New Jersey	3,204	1,992	26	0	316	57	1,451	142	1,212
New York	8,747	5,644	222	10	609	199	3,607	997	3,103
Pennsylvania	6,083	4,071	116	6	346	75	3,407	121	2,012
East North Central	21,262	13,440	377	19	1,232	243	10,526	1,043	7,822
Illinois	4,753	2,970	72	1	453	65	2,243	136	1,783
Indiana	2,201	1,391	20	0	75	31	1,137	128	810
Michigan	5,891	3,764	145	7	323	56	3,040	193	2,127
Ohio	5,831	3,661	94	7	283	53	2,653	571	2,170
Wisconsin	2,586	1,654	46	4	98	38	1,453	15	932
West North Central	6,762	3,700	53	7	223	34	2,960	423	3,062
Iowa	1,307	690	12	0	13	8	601	56	617
Kansas	1,299	742	10	2	54	7	576	93	557
Minnesota	1,232	730	2	1	44	5	448	230	502
Missouri	1,901	988	24	1	51	10	878	24	913
Nebraska	481	296	3	1	24	3	265	0	185
North Dakota	183	126	2	2	27	1	87	7	57
South Dakota	359	128	0	0	10	0	105	13	231
South Atlantic	18,738	12,710	783	20	1,019	439	10,005	444	6,028
Delaware	378	220	8	0	9	1	201	1	158
District of Columbia	2,088	1,533	139	10	154	45	965	220	555
Florida	4,274	2,736	123	1	198	220	2,099	95	1,538
Georgia	2,865	2,250	174	2	200	84	1,760	30	615
Maryland	2,130	1,249	81	2	139	22	975	30	881
North Carolina	2,031	1,322	137	1	103	21	1,047	13	709
South Carolina	1,211	693	15	1	20	6	641	10	518
Virginia	3,205	2,355	100	3	181	35	1,991	45	850
West Virginia	556	352	6	0	15	5	326	0	204
East South Central	4,986	3,252	120	8	221	32	2,857	14	1,734
Alabama	1,810	1,133	41	3	88	14	985	2	677
Kentucky	949	637	18	3	40	7	567	2	312
Mississippi	451	226	9	1	31	1	184	0	225
Tennessee	1,776	1,256	52	1	62	10	1,121	10	520
West South Central	12,377	6,739	207	32	777	388	5,183	152	5,638
Arkansas	383	223	5	0	9	0	209	0	160
Louisiana	1,476	634	30	0	77	19	400	108	842
Oklahoma	1,436	591	15	18	40	14	496	8	845
Texas	9,082	5,291	157	14	651	355	4,078	36	3,791
Mountain	8,019	5,283	58	19	418	222	4,389	177	2,736
Arizona	2,092	1,153	16	8	110	51	946	22	939
Colorado	2,663	2,112	29	7	154	45	1,792	85	551
Idaho	389	285	2	0	5	6	269	3	104
Montana	197	147	1	0	8	2	136	0	50
Nevada	365	228	3	1	77	5	141	1	137
New Mexico	963	668	7	3	10	109	474	65	295
Utah	1,169	605	0	0	48	3	553	1	564
Wyoming	181	85	0	0	6	1	78	0	96
Pacific	18,466	13,598	291	42	2,932	539	8,223	1,571	4,868
Alaska	233	192	2	4	20	0	157	9	41
California	15,508	11,684	275	32	2,707	519	6,711	1,440	3,824
Hawaii	227	86	0	0	46	0	39	1	141
Oregon	898	478	6	2	39	4	378	49	420
Washington	1,600	1,158	8	4	120	16	938	72	442
Outlying areas	210	113	0	0	1	112	0	0	97
Puerto Rico	210	113	0	0	1	112	0	0	97

[1] Includes permanent residents

SOURCE: National Science Foundation/SRS, Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-22. Top 50 institutions enrolling black graduate students in science and engineering (S&E), ranked by 1992 total number of black graduate students enrolled: fall 1982 and 1992

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	Academic institution	1982 Total, S&E	1982 Science	1982 Engineering	1992 Total, S&E	1992 Science	1992 Engineering
	Total, all institutions	10,402	9,260	1,142	15,370	12,998	2,372
1	Howard University	386	362	24	372	328	44
2	Clark Atlanta University	247	247	0	286	286	0
3	Georgia Institute of Technology, all campuses	87	20	67	246	76	170
4	University of Michigan, all campuses	101	94	7	225	164	61
5	New York University	166	166	0	201	201	0
6	George Washington University	82	36	46	191	109	82
7	Southern University and A & M Col, all campuses	44	44	0	178	178	0
8	Jackson State University	158	158	0	175	175	0
9	Wayne State University	93	80	13	169	139	30
10	Rutgers, the State University, all campuses	146	139	7	167	161	6
	Subtotal, first 10 institutions	1,510	1,346	164	2,210	1,817	393
11	University of Maryland at College Park	126	116	10	161	115	46
12	California State University-Dominguez Hills	109	109	0	160	155	5
13	American University	79	79	0	153	153	0
14	Long Island University, all campuses	101	101	0	153	153	0
15	CUNY John Jay College of Criminal Justice	0	0	0	146	146	0
16	University of Southern California	595	495	100	141	85	56
17	Ohio State University, all campuses	99	88	11	135	122	13
18	North Carolina State University at Raleigh	98	81	17	133	85	48
19	Georgia State University	36	36	0	129	129	0
20	CUNY City College	99	53	46	128	76	52
	Subtotal, first 20 institutions	2,852	2,504	348	3,649	3,036	613
21	Chicago State University	27	27	0	127	127	0
22	Louisiana State University, all campuses	47	42	5	124	101	23
23	De Paul University	88	88	0	123	123	0
24	Michigan State University	63	61	2	123	106	17
25	Columbia University, Teachers College	29	29	0	122	122	0
26	Governors State University	84	84	0	121	121	0
27	University of California-Berkeley	89	63	26	121	77	44
28	North Carolina Agricultural and Technical St Univ	43	34	9	116	32	84
29	Indiana University, all campuses	27	27	0	111	110	1
30	University of Florida	65	61	4	110	81	29
	Subtotal, first 30 institutions	3,414	3,020	394	4,847	4,036	811
31	Virginia Commonwealth University	57	57	0	110	110	0
32	University of Houston-University Park	29	23	6	109	78	31
33	University of Illinois at Chicago	68	61	7	104	89	15
34	Harvard University	63	56	7	103	101	2
35	Texas Southern University	10	10	0	101	101	0
36	University of North Carolina at Chapel Hill	84	84	0	101	99	2
37	California State University-Long Beach	0	0	0	99	79	20
38	Massachusetts Institute of Technology	82	50	32	98	46	52
39	Pennsylvania State Univ, all campuses	55	45	10	95	66	29
40	Cornell University, all campuses	60	43	17	90	69	21
	Subtotal, first 40 institutions	3,922	3,449	473	5,857	4,874	983
41	University of Baltimore	76	76	0	87	87	0
42	Florida Agricultural and Mechanical University	1	1	0	85	71	14
43	Roosevelt University	18	18	0	85	85	0
44	California State University-Los Angeles	76	72	4	84	76	8
45	Florida State University	35	35	0	83	73	10
46	Texas A & M University, all campuses	19	13	6	83	58	25
47	University of Illinois at Urbana-Champaign	59	48	11	83	68	15
48	Memphis State University	62	53	9	82	77	5
49	CUNY Graduate School and University Center	50	42	8	81	67	14
50	George Mason University	9	9	0	81	68	13
	Total, first 50 institutions	4,327	3,816	511	6,691	5,604	1,087

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-23. Top 50 institutions enrolling Hispanic graduate students in science and engineering (S&E), ranked by 1992 total number of Hispanic graduate students enrolled: fall 1982 and 1992

	Academic institution	1982			1992		
		Total, S&E	Science	Engineering	Total, S&E	Science	Engineering
	Total, all institutions	7,776	6,680	1,096	12,243	9,793	2,450
1	University of Puerto Rico, Rio Piedras Campus	871	871	0	1,068	1,068	0
2	University of Puerto Rico, Mayaguez	284	223	61	279	167	112
3	Florida International University	4	4	0	216	158	58
4	Texas A & M University, all campuses	74	60	14	207	150	57
5	University of California-Berkeley	74	56	18	194	138	56
6	University of Southern California	460	384	76	189	105	84
7	University of Texas at El Paso	169	132	37	184	108	76
8	University of New Mexico, all campuses	59	46	13	170	116	54
9	Center For Adv Stud on Puerto Rico and Caribbean	358	358	0	162	162	0
10	University of Texas at Austin	148	119	29	154	95	59
	Subtotal, first 10 institutions	2,501	2,253	248	2,823	2,267	556
11	University of Colorado, all campuses	102	95	7	142	115	27
12	California State University-Los Angeles	90	80	10	138	124	14
13	University of Miami	118	71	47	136	105	31
14	California State University-Long Beach	0	0	0	134	93	41
15	University of Michigan, all campuses	66	51	15	132	96	36
16	University of Houston-University Park	37	22	15	123	71	52
17	Texas A & I University	42	35	7	122	82	40
18	Stanford University	47	20	27	121	53	68
19	University of California-Los Angeles	75	70	5	121	101	20
20	New Mexico State University, all campuses	69	50	19	118	64	54
	Subtotal, first 20 institutions	3,147	2,747	400	4,110	3,171	939
21	Arizona State University	36	27	9	115	81	34
22	San Diego State University	38	27	11	113	100	13
23	George Washington University	43	21	22	107	75	32
24	Long Island University, all campuses	70	70	0	106	106	0
25	University of Arizona	33	27	6	106	89	17
26	Nova University	21	21	0	102	102	0
27	California State University-Northridge	13	6	7	101	51	50
28	Georgia Institute of Technology, all campuses	39	4	35	99	17	82
29	New York University	105	105	0	99	99	0
30	University of South Florida	21	20	1	99	51	48
	Subtotal, first 30 institutions	3,566	3,075	491	5,157	3,942	1,215
31	Harvard University	46	35	11	98	97	1
32	University of Florida	54	42	12	97	58	39
33	University of California-Davis	38	27	11	94	66	28
34	CUNY City College	77	45	32	89	55	34
35	University of Puerto Rico, Medical Sciences Campus	38	38	0	89	89	0
36	University of Wisconsin-Madison	50	42	8	87	69	18
37	Columbia University, Teachers College	25	25	0	80	80	0
38	Rutgers, the State University, all campuses	64	59	5	80	66	14
39	Massachusetts Institute of Technology	42	17	25	77	32	45
40	CUNY John Jay College of Criminal Justice	0	0	0	74	74	0
	Subtotal, first 40 institutions	4,000	3,405	595	6,022	4,628	1,394
41	University of California-San Diego	18	17	1	74	60	14
42	San Jose State University	49	38	11	72	43	29
43	University of Texas at San Antonio	26	26	0	71	60	11
44	Ohio State University, all campuses	30	22	8	70	63	7
45	University of Illinois at Chicago	38	30	8	69	57	12
46	American University	70	70	0	68	68	0
47	Cornell University, all campuses	41	30	11	66	50	16
48	CUNY Graduate School and University Center	28	26	2	65	60	5
49	University of Illinois at Urbana-Champaign	34	25	9	65	41	24
50	Southwest Texas State University	23	23	0	62	62	0
	Total, first 50 institutions	4,357	3,712	645	6,704	5,192	1,512

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-24. Top 50 institutions enrolling Asian graduate students in science and engineering (S&E), ranked by 1992 total number of Asian graduate students enrolled: fall 1982 and 1992

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	Academic institution	1982			1992		
		Total, S&E	Science	Engineering	Total, S&E	Science	Engineering
	Total, all institutions	8,150	5,404	2,746	21,967	13,391	8,576
1	San Jose State University	93	56	37	805	306	499
2	University of Southern California	372	210	162	647	239	408
3	University of California-Los Angeles	195	144	51	535	329	206
4	University of Houston-University Park	40	7	33	526	253	273
5	California State University-Long Beach	0	0	0	418	194	224
6	Stanford University	125	49	76	416	167	249
7	New Jersey Institute of Technology	27	10	17	407	234	173
8	University of California-Berkeley	216	113	103	389	198	191
9	Massachusetts Institute of Technology	138	32	106	317	123	194
10	University of Illinois at Urbana-Champaign	120	73	47	304	177	127
	Subtotal, first 10 institutions	1,326	694	632	4,764	2,220	2,544
11	Santa Clara University	41	16	25	284	114	170
12	University of Hawaii at Manoa	267	236	31	270	224	46
13	George Washington University	113	31	82	248	116	132
14	University of Washington	118	93	25	242	136	106
15	Columbia University, main campus	125	48	77	237	94	143
16	Louisiana State University, all campuses	36	27	9	223	155	68
17	California State University-Northridge	67	6	61	219	85	134
18	Georgia Institute of Technology, all campuses	45	13	32	215	20	195
19	University of Illinois at Chicago	72	53	19	215	69	146
20	University of Michigan, all campuses	112	79	33	210	97	113
	Subtotal, first 20 institutions	2,322	1,296	1,026	7,127	3,330	3,797
21	University of California-Davis	83	55	28	209	129	80
22	Rutgers, the State University, all campuses	98	57	41	203	145	58
23	De Paul University	103	103	0	199	199	0
24	Ohio State University, all campuses	35	20	15	197	175	22
25	Wayne State University	54	24	30	197	102	95
26	University of Maryland at College Park	100	61	39	195	83	112
27	University of California-Irvine	75	39	36	179	67	112
28	Pennsylvania State University, all campuses	43	25	18	178	51	127
29	University of Minnesota, all campuses	31	29	2	175	131	44
30	George Mason University	18	15	3	167	131	36
	Subtotal, first 30 institutions	2,962	1 724	1,238	9,026	4,543	4,483
31	University of Colorado, all campuses	46	40	6	165	75	90
32	CUNY City College	134	62	72	162	79	83
33	Cornell University, all campuses	56	31	25	158	113	45
34	San Diego State University	68	35	33	157	113	44
35	Texas A & M University, all campuses	40	13	27	157	109	48
36	California State University-Los Angeles	106	59	47	150	75	75
37	University of California-San Diego	22	17	5	147	85	62
38	Harvard University	85	67	18	146	144	2
39	Illinois Institute of Technology	205	86	119	144	95	49
40	University of Texas at Arlington	77	33	44	141	55	86
	Subtotal, first 40 institutions	3,801	2,167	1 634	10,553	5,486	5 067
41	Polytechnic University	57	29	28	140	61	79
42	Cleveland State University	10	5	5	139	12	127
43	SUNY at Stony Brook, all campuses	35	33	2	137	110	27
44	University of South Carolina, all campuses	12	9	3	137	130	7
45	University of Wisconsin-Madison	66	57	9	135	82	53
46	California State University-Fullerton	56	38	18	131	82	49
47	Purdue University, all campuses	72	19	53	130	62	68
48	University of Texas at Austin	36	15	21	127	34	93
49	Virginia Polytechnic Institute and State Univ	31	16	15	126	51	75
50	San Francisco State University	33	33	0	125	125	0
	Total, first 50 institutions	4,209	2,421	1,788	11,880	6,235	5,645

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-25. Top 50 institutions enrolling American Indian/Alaskan Native graduate students in science and engineering (S&E), ranked by 1992 total number of American Indian/Alaskan Native graduate students enrolled: fall 1982 and 1992

	Academic institution	1982			1992		
		Total, S&E	Science	Engineering	Total, S&E	Science	Engineering
	Total, all institutions	910	739	171	1,253	1,076	177
1	University of Oklahoma, all campuses	24	24	0	42	36	6
2	Northern Arizona University	20	20	0	30	30	0
3	Northeastern State University	0	0	0	25	16	9
4	Oklahoma State University, all campuses	16	14	2	24	22	2
5	George Washington University	4	3	1	22	12	10
6	University of Arizona	10	10	0	21	15	6
7	Harvard University	13	12	1	20	20	0
8	University of New Mexico, all campuses	5	4	1	20	20	0
9	Utah State University	3	0	3	20	20	0
10	University of Colorado, all campuses	12	8	4	19	17	2
	Subtotal, first 10 institutions	107	95	12	243	208	35
11	CUNY College of Staten Island	0	0	0	18	18	0
12	University of Washington	8	8	0	17	14	3
13	Cornell University, all campuses	4	3	1	16	14	2
14	Stanford University	10	6	4	16	9	7
15	University of California-Los Angeles	2	2	0	16	14	2
16	University of Houston-University Park	5	2	3	16	12	4
17	Arizona State University	6	4	2	15	13	2
18	Boston University	5	4	1	15	13	2
19	University of Michigan, all campuses	1	1	0	14	11	3
20	University of California-Berkeley	11	8	3	13	8	5
	Subtotal, first 20 institutions	159	133	26	399	334	65
21	Humboldt State University	0	0	0	12	10	2
22	San Diego State University	2	2	0	12	10	2
23	University of Minnesota, all campuses	21	16	5	12	11	1
24	University of Nevada-Reno	2	1	1	12	12	0
25	University of North Carolina at Chapel Hill	4	4	0	12	12	0
26	University of Wisconsin-Madison	10	10	0	12	11	1
27	Yale University	6	6	0	12	12	0
28	California State University-Fullerton	7	5	2	10	10	0
29	Massachusetts Institute of Technology	6	6	0	10	6	4
30	Rutgers, the State University, all campuses	8	8	0	10	10	0
	Subtotal, first 30 institutions	225	191	34	513	438	75
31	University of Akron, all campuses	11	10	1	10	7	3
32	California School of Prof Psych at Los Angeles	0	0	0	9	9	0
33	John F Kennedy University	2	2	0	9	9	0
34	Marquette University	0	0	0	9	8	1
35	New Mexico State University, all campuses	6	6	0	9	6	3
36	New York Institute of Technology, all campuses	0	0	0	9	7	2
37	Texas A & M University, all campuses	5	2	3	9	7	2
38	University of Texas Health Sci Center at Houston	0	0	0	9	9	0
39	University of Wisconsin-Milwaukee	3	3	0	9	7	2
40	Auburn University, All Campuses	1	1	0	8	6	2
	Subtotal, first 40 institutions	253	215	38	603	513	90
41	George Mason University	4	4	0	8	6	2
42	Michigan State University	6	6	0	8	8	0
43	Ohio State University, all campuses	4	4	0	8	8	0
44	University of California-Davis	3	3	0	8	8	0
45	University of Kansas, all campuses	8	8	0	8	7	1
46	University of Maryland at College Park	3	3	0	8	6	2
47	University of Missouri, Kansas City	7	7	0	8	8	0
48	Washington State University	2	2	0	8	7	1
49	Antioch University, main campus	5	5	0	7	7	0
50	Colorado State University	1	1	0	7	5	2
	Total first 50 institutions	296	258	38	681	583	98

SOURCE National Science Foundation/SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 6-26. Black graduate students in science and engineering (S&E) at Historically Black Colleges and Universities and as a percentage of the total at all institutions: fall 1982 and 1992

Academic institution	1982 Total. S&E	1982 Science	1982 Engineering	1992 Total. S&E	1992 Science	1992 Engineering
Total. all institutions	10,402	9.260	1,142	15,370	12,998	2.372
Total. all Historically Black Colleges and Universities	1.406	1.362	44	2.033	1,856	177
1 Howard University	386	362	24	372	328	44
2 Clark Atlanta University	247	247	0	286	286	0
3 Southern University and A & M Col. all campuses	44	44	0	178	178	0
4 Jackson State University	158	158	0	175	175	0
5 North Carolina Agricultural & Technical State Univ	43	34	9	116	32	84
6 Texas Southern University	10	10	0	101	101	0
7 Florida Agricultural and Mechanical University	1	1	0	85	71	14
8 Alabama Agricultural and Mechanical University	79	79	0	75	75	0
9 Tennessee State University	26	24	2	74	67	7
10 Prairie View A & M University	109	109	0	71	52	19
11 Morgan State University	28	28	0	67	67	0
12 North Carolina Central University	71	71	0	57	57	0
13 Fort Valley State College	0	0	0	50	50	0
14 Meharry Medical College	27	27	0	50	50	0
15 University of the District of Columbia	49	49	0	45	45	0
16 Virginia State University	11	11	0	45	45	0
17 Hampton University	21	21	0	41	41	0
18 Coppin State College	24	24	0	32	32	0
19 Fisk University	24	24	0	26	26	0
20 Tuskegee University	37	28	9	26	17	9
21 University of Maryland Eastern Shore	0	0	0	18	18	0
22 Grambling State University	0	0	0	13	13	0
23 Alabama State University	11	11	0	12	12	0
24 Lincoln University	0	0	0	10	10	0
25 Delaware State College	0	0	0	8	8	0
26 Cheyney University of Pennsylvania	0	0	0	0	0	0
27 Savannah State College	0	0	0	0	0	0
28 Xavier University	0	0	0	0	0	0
Percentage of total in Historically Black Colleges and Universities	13.5	14 7	3.9	13.2	14.3	7.5

SOURCE: National Science Foundation/SRS. Survey of Graduate Students and Postdoctorates in Science and Engineering

Women. Minorities. and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-27. Hispanic graduate students in science and engineering (S&E) at Hispanic Association institutions and as a percentage of the total at all institutions: fall 1982 and 1992

Academic institution	1982 Total, S&E	1982 Science	1982 Engineering	1992 Total, S&E	1992 Science	1992 Engineering
Total, all institutions	7,776	6.680	1,096	12.243	9,793	2.450
Total, all Hispanic Association institutions	1.676	1.531	145	2.375	2.046	329
1 University of Puerto Rico, Rio Piedras Campus	871	871	0	1,068	1,068	0
2 University of Puerto Rico, Mayagüez	284	223	61	279	167	112
3 University of Texas at El Paso	169	132	37	184	108	76
4 California State University-Los Angeles	90	80	10	138	124	14
5 Texas A & I University	42	35	7	122	82	40
6 New Mexico State University, all campuses	69	50	19	118	64	54
7 San Diego State University	38	27	11	113	100	13
8 University of Puerto Rico, Medical Sciences Campus	38	38	0	89	89	0
9 CUNY John Jay College of Criminal Justice	0	0	0	74	74	0
10 University of Texas at San Antonio	26	26	0	71	60	11
11 Saint Mary's University of San Antonio	5	5	0	54	45	9
12 New Mexico Highlands University	2	2	0	16	16	0
13 Incarnate Word College	3	3	0	15	15	0
14 University of Texas-Pan American	11	11	0	11	11	0
15 CUNY Herbert H. Lehman College	0	0	0	10	10	0
16 Eastern New Mexico University, all campuses	22	22	0	7	7	0
17 Sul Ross State University	6	6	0	6	6	0
18 Inter American Univ of Puerto Rico, Metro Campus	0	0	0	0	0	0
19 Western New Mexico University	0	0	0	0	0	0
Percentage of total in Hispanic Association institutions	21.6	22 9	13.2	19.4	20.9	13.4

SOURCE. National Science Foundation/SRS. Survey of Graduate Students and Postdoctorates in Science and Engineering.

Appendix table 6-28. Science and engineering (S&E) graduate students enrolled in Puerto Rican institutions as a percentage of all graduate students who are U.S. citizens and as a percentage of Hispanic graduate students: fall 1992

Page 1 of 1

Academic institution	Total, S&E	Science	Engineering
Total, all institutions	322,449	245,600	76 849
Total, Puerto Rico	1766	1653	113
Center For Adv Stud On Puerto Rico and Caribbean	292	292	0
Ponce School of Medicine	13	13	0
University of Puerto Rico, Mayaguez	302	189	113
University of Puerto Rico, Medical Sciences Campus	89	89	0
University of Puerto Rico, Rio Piedras Campus	1,070	1,070	0
Percentage of total in Puerto Rican institutions	0.55	0 67	0 15
Hispanic graduate students in all institutions	12,243	9,793	2,450
Total, Puerto Rico	1611	1499	112
Center For Adv Stud On Puerto Rico and Caribbean	162	162	0
Ponce School of Medicine	13	13	0
University of Puerto Rico, Mayaguez	279	167	112
University of Puerto Rico, Medical Sciences Campus	89	89	0
University of Puerto Rico, Rio Piedras Campus	1,068	1,068	0
Percentage of total in Puerto Rican Institutions	13 16	15 31	4 57
Hispanic graduate students as a percentage of total—U.S.	3.80	3 99	3 19
Total, Puerto Rico	91.22	90.68	99 12
Center For Adv Stud On Puerto Rico and Caribbean	55 48	55 48	--
Ponce School of Medicine	100.00	100.00	--
University of Puerto Rico, Mayaguez	92.38	88.36	99 12
University of Puerto Rico, Medical Sciences Campus	100 00	100 00	--
University of Puerto Rico, Rio Piedras Campus	99.81	99.81	--

KEY -- = too small to report

SOURCE: National Science Foundation/SRS. Survey of Graduate Students and Postdoctorates in Science and Engineering.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-29. Intended area of study of Graduate Record Exam (GRE) test takers, by race/ethnicity: 1982 and 1992

[Percentage distribution]

Area of study	All U.S. citizens				American Indian[1]				Black			
	1982		1992		1982		1992		1982		1992	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Social sciences	26.736	20.5	47.285	20.2	233	22.3	218	23.4	2.035	24.8	3,642	22.8
Education	19.795	15.2	39.954	17.1	192	18.4	190	20.4	1589	19.4	3,340	20.9
Other/disciplinary fields	17.806	13.6	31,643	13.5	152	14.6	150	16.1	1,602	19.5	2,829	17.7
Art/humanities	16.346	12.5	30.255	12.9	99	9.5	105	11.3	576	7.0	1.183	7.4
Health sci services	15.265	11.7	31.373	13.4	154	14.8	97	10.4	918	11.2	1,820	11.4
Biological sciences	12.641	9.7	16.492	7.1	89	8.5	55	5.9	497	6.1	717	4.5
Physical sciences	11 437	8.8	14.338	6.1	48	4.6	47	5.0	410	5.0	916	5.7
Engineering	7 762	5.9	17.469	7.5	39	3.7	48	5.1	288	3.5	911	5.7
Business	2.842	2.2	4.824	2.1	37	3.5	23	2.5	284	3.5	646	4.0
Total	130 630	100.0	233 633	100.0	1.043	100.0	933	100.0	8.199	100.0	16.004	100.0

Area of study	Mexican American				Asian				Puerto Rican			
	1982		1992		1982		1992		1982		1992	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Social sciences	339	19.4	838	22.0	437	17.5	1,304	17.1	292	22.3	445	21.1
Education	511	29.3	838	22.0	153	6.1	594	7.8	174	13.3	241	11.4
Other disciplinary fields	292	16.7	610	16.0	276	11.1	788	10.3	130	9.9	297	14.1
Art humanities	142	8.1	420	11.0	179	7.2	681	8.9	141	10.8	224	10.6
Health sci services	136	7.8	388	10.2	294	11.8	856	11.2	109	8.3	226	10.7
Biological sciences	95	5.4	181	4.8	262	10.5	633	8.3	202	15.5	216	10.2
Physical sciences	68	3.9	150	3.9	334	13.4	844	11.1	124	9.5	158	7.5
Engineering	95	5.4	307	8.1	510	20.4	1,762	23.1	93	7.1	253	12.0
Business	66	3.8	73	1.9	50	2.0	157	2.1	42	3.2	53	2.5
Total	1 744	100.0	3.805	100.0	2.495	100.0	7.619	100.0	1,307	100.0	2,113	100.0

[1] See explanatory information and SOURCE at end of table.

Appendix table 6-29. Intended area of study of Graduate Record Exam (GRE) test takers, by race/ethnicity: 1982 and 1992

[Percentage distribution]

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Area of study	Other Hispanic				White				All other			
	1982		1992		1982		1992		1982		1992	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Social sciences	321	26 9	922	25.5	22,549	20.0	39,058	19.9	530	24.7	858	24.8
Education	166	13 9	594	16.4	16.826	15 0	33.797	17 2	184	8 6	360	10 4
Other interdisciplinary fields	172	14 4	500	13 8	14.904	13 2	25.968	13 2	278	12.9	501	14.5
Art humanities	146	12 2	486	13 4	14.685	13.1	26.472	13.5	378	17.6	684	19.8
Health sci services	115	9.6	358	9 9	13,338	11 9	27,314	13 9	201	9.3	314	9 1
Biological sciences	110	9 2	196	5 4	11.183	9 9	14,258	7 3	203	9.4	236	6.8
Physical sciences	68	5 7	169	4.7	10.174	9 0	11.869	6 1	211	9.8	185	5 4
Engineering	71	5 9	317	8 8	6.546	5 8	13.614	6 9	120	5.6	257	7.4
Business	26	2 2	78	2 2	2.292	2 0	3.733	1 9	45	2 1	61	1 8
Total	1.195	100 0	3.620	100 0	112.497	100.0	196.083	100 0	2.150	100.0	3.456	100.0

Recent statistics for American Indians are based on 1990 data

Physical sciences includes mathematics, physical sciences, and computer sciences

SOURCE Educational Testing Service 1994 *Graduate Record Examination. Trends & Profiles.* supplementary tables Princeton, NJ Educational Testing Service

Appendix table 6-30. Selected characteristics of graduate students, by disability status: 1989–90

[Percentage distribution]

Page 1 of 1

Student characteristic	Students with disabilities	Students without disabilities
Total	5.52	94.48
Sex:		
Men	5.83	94.17
Women	5.36	94.64
Veteran of U.S. Armed Forces:		
Yes	12.87	87.13
No	5.80	94.20
Age as of December 31, 1989:		
Less than 24	3.35	96.65
24–29	4.19	95.81
30 or older	6.92	93.08

SOURCE: U.S. Department of Education/NCES. 1989-90 National Postsecondary Student Aid Study (NPSAS:90). Graduate/First Professional 6/6/94.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-31. Major fields of study for graduate students, by disability status: 1989–90

Page 1 of 1

Major field of study	Students with disabilities		Students without disabilities	
	Number	Percentage	Number	Percentage
Total, all fields	11,755	7.5	144,976	92.5
Mathematics	76	4.7	1,562	95.3
Biology life science	381	7.2	4,908	92.8
Physical sciences	55	5.1	1,013	94.9
Psychology	654	12.6	4,537	87.4
Other social sciences	207	11.6	1,587	88.4
Political science	84	9.7	784	90.3
Engineering	304	6.7	4,199	93.3
Engineering technical	289	10.3	2,511	89.7
Computer science	328	7.1	4,330	93.0

NOTE: Fields shown have sample sizes large enough to permit calculations of national estimates.

SOURCE: U.S. Department of Education/NCES. National Postsecondary Student Aid Study. 1990. Table generation system.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 6-32. Graduate students with disabilities majoring in engineering, by selected characteristic: fall 1992

Page 1 of 1

Student characteristic	Students with disabilities	Total students[1]	Percentage with disabilities	Schools represented
Total enrollment	222	86.130	0.3	169
Sex:				
Men	173	71.031	.2	168
Women	38	12.692	.3	168
Enrollment category:				
Master's candidate	147	29,797	.5	166
Doctoral candidate	49	19,798	.2	166
Any other student	5	32.937	--	166
Type of disability:				
Blind/visually impaired	20	85.174	--	167
Deaf/hearing impaired	20	85.174	--	167
Learning disabled	50	85.174	1	167
Orthopedic/mobility impaired	73	85,174	.1	167
All others (multiple disabilities)	57	85.174	.1	167
Race/ethnicity:				
Foreign nationals	26	27.652	.1	165
Black	5	1.779	.2	165
Hispanic	4	1.343	.3	165
Asian	9	5.563	.2	165
American Indian	2	136	1.5	165
White, non-Hispanic	160	44.894	.4	165
Engineering specialty:				
Electrical/computer	82	30.452	2.7	168
Mechanical/aerospace	28	14.939	.2	168
Civil/environmental	28	11,785	.2	168
Chemical/petroleum	9	5.202	.2	168
Industrial/mgmt/manufacturing	18	8.499	.2	168
Other	56	14.730	.4	168

[1] Total students is the number of graduate students enrolled in schools that provided information on students with disabilities. These numbers are further refined to reflect individual schools' ability (or inability) to provide complete data on students reported with disabilities. An enrollee whose gender is unknown is assumed to be male (this applies to total students only). Part-time students are included in the "Any other student" enrollment category.

KEY: -- = larger than zero but less than 0 055 percent

NOTE. The number of schools responding with graduate engineering enrollment totaled 210. The ability to identify students with disabilities broke down as follows:

	Number	Percentage distribution
Thoroughly	118	56.2
Partially	51	24.3
Not at all	41	19.5

SOURCE: American Association for the Advancement of Science (AAAS) Project on Science, Technology and Disability. 1994 *Final Report of the Data Collection Component of the AAAS Access to Engineering Project.*

Appendix table 7-1. Master's and doctoral degrees awarded in all fields and in science and engineering, by sex: 1966–1992

Field and year	Master's			Doctoral		
	Men	Women	Percentage Women	Men	Women	Percentage Women
Total, all fields:						
1966	93,184	47,588	33.8	15,863	2,086	11.6
1967	103,179	54,713	34.7	17,961	2,442	12.0
1968	113,749	63,401	35.8	20,004	2,932	12.8
1969	121,881	72,533	37.3	22,355	3,388	13.2
1970	126,146	83,241	39.8	25,527	3,971	13.5
1971	138,590	92,896	40.1	27,271	4,596	14.4
1972	150,085	102,689	40.6	27,754	5,287	16.0
1973	155,000	109,525	41.4	27,670	6,085	18.0
1974	158,344	119,915	43.1	26,594	6,453	19.5
1975	162,115	131,536	44.8	25,751	7,201	21.9
1976	167,745	145,256	46.4	25,262	7,684	23.3
1977	168,210	150,031	47.1	23,858	7,858	24.8
1978	161,708	151,108	48.3	22,553	8,322	27.0
1979	153,772	148,303	49.1	22,302	8,937	28.6
1980	151,159	147,936	49.5	21,612	9,408	30.3
1981	147,431	149,367	50.3	21,465	9,892	31.5
1982	145,941	150,639	50.8	21,018	10,093	32.4
1983	145,114	145,817	50.1	20,749	10,533	33.7
1984	143,998	141,464	49.6	20,638	10,699	34.1
1985	143,716	143,497	50.0	20,553	10,744	34.3
1986	143,932	145,897	50.3	20,591	11,304	35.4
1987	141,655	149,777	51.4	20,938	11,425	35.3
1988	145,403	154,688	51.5	21,678	11,812	35.3
1989	149,399	161,651	52.0	21,811	12,507	36.4
1990	154,025	170,922	52.6	22,955	13,102	36.3
1991	156,895	181,603	53.6	23,686	13,765	36.8
1992	NA	NA	NA	24,448	14,366	37.0

See explanatory information and SOURCES at end of table.

Appendix table 7-1. Master's and doctoral degrees awarded in all fields and in science and engineering, by sex: 1966–1992

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Field and year	Master's Men	Master's Women	Master's Percentage Women	Doctoral Men	Doctoral Women	Doctoral Percentage Women
Science and engineering:						
1966	35,580	5,469	13.3	10,637	921	8.0
1967	38,682	6,306	14.0	12,006	1,091	8 3
1968	41,551	7,209	14.8	13,317	1,310	9 0
1969	44,182	8,200	15.7	14,774	1,503	9.2
1970	43,973	9,722	18.1	16,400	1,644	9.1
1971	46,116	10,338	18.3	17,373	1,990	10.3
1972	48,721	11,328	18.9	17,182	2,142	11.1
1973	50,233	11,813	19.0	16,842	2,510	13.0
1974	49,528	12,711	20.4	16,032	2,662	14.2
1975	49,410	13,788	21.8	15,806	2,905	15.5
1976	49,992	15,015	23.1	15,304	3,060	16.7
1977	50,899	16,498	24.5	14,707	3,185	17.8
1978	50,034	17,230	25.6	14,129	3,410	19.4
1979	46,614	17,612	27.4	14,050	3,703	20.9
1980	46,004	18,085	28.2	13,753	3,915	22.2
1981	45,505	18,861	29.3	14,000	4,143	22.8
1982	46,557	20,011	30 1	13,883	4,307	23.7
1983	46,718	20,998	31.0	13,856	4,650	25.1
1984	47,033	21,531	31.4	13,902	4,739	25.4
1985	48,232	22,330	31.6	13,984	4,840	25.7
1986	48,611	23,220	32.3	14,225	5,114	26.4
1987	48,759	23,844	32.8	14,531	5,253	26.6
1988	49,820	23,835	32.4	15,226	5,606	26.9
1989	50,845	25,580	33.5	15,581	6,044	27.9
1990	51,230	26,558	34.1	16,447	6,316	27.7
1991	50,441	27,927	35 6	17,065	6,789	28.5
1992	NA	NA	NA	17,476	6,956	28.5

See explanatory information and SOURCES at end of table.

Appendix table 7-1. Master's and doctoral degrees awarded in all fields and in science and engineering, by sex: 1966–1992

Field and year	Master's			Doctoral		
	Men	Women	Percentage Women	Men	Women	Percentage Women
All other fields:						
1966	57,604	42,119	42.2	5,226	1,165	18.2
1967	64,497	48,407	42.9	5,955	1,351	18.5
1968	72,198	56,192	43.8	6,687	1,622	19.5
1969	77,699	64,333	45.3	7,581	1,885	19.9
1970	82,173	73,519	47.2	9,127	2,327	20.3
1971	92,474	82,558	47.2	9,898	2,606	20.8
1972	101,364	91,361	47.4	10,572	3,145	22.9
1973	104,767	97,712	48.3	10,828	3,575	24.8
1974	108,816	107,204	49.6	10,562	3,791	26.4
1975	112,705	117,748	51.1	9,945	4,296	30.2
1976	117,753	130,241	52.5	9,958	4,624	31.7
1977	117,311	133,533	53.2	9,151	4,673	33.8
1978	111,674	133,878	54.5	8,424	4,912	36.8
1979	107,158	130,691	54.9	8,252	5,234	38.8
1980	105,155	129,851	55.3	7,859	5,493	41.1
1981	101,926	130,506	56.1	7,465	5,749	43.5
1982	99,384	130,628	56.8	7,135	5,786	44.8
1983	98,396	124,819	55.9	6,893	5,883	46.0
1984	96,965	119,933	55.3	6,736	5,960	46.9
1985	95,484	121,167	55.9	6,569	5,904	47.3
1986	95,321	122,677	56.3	6,366	6,190	49.3
1987	92,896	125,933	57.5	6,407	6,172	49.1
1988	95,583	130,853	57.8	6,452	6,206	49.0
1989	98,554	136,071	58.0	6,230	6,463	50.9
1990	102,795	144,364	58.4	6,508	6,786	51.0
1991	106,454	153,676	59.1	6,621	6,976	51.3
1992	NA	NA	NA	6,972	7,410	51.5

NOTE: Field totals for doctoral degrees presented in this table differ slightly from those in later tables because the field taxonomy used here was revised to match that for bachelor's and master's degrees.

KEY. NA = not available

SOURCES: U.S. Department of Education/NCES. HEGIS Earned Degrees Surveys. 1981–85. and IPEDS Completion Surveys. 1987–91: tabulations by National Science Foundation/SRS. and National Science Foundation/SRS. Survey of Earned Doctorates

Appendix table 7-2. Master's degrees awarded, by sex and field: 1981–1991

Page 1 of 1

Sex and field	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total all fields	296 798	296.580	290 931	285.462	287 213	289 829	290.532	300.091	311.050	324 947	338 498
Science and engineering fields total	64 366	66 568	67.716	68 564	70.562	71 831	72.603	73 65[illegible]	76.425	77 788	78 368
Science fields total	47 915	49 011	48 830	48.419	49 590	50.735	50.533	50 929	52.682	53 793	54 355
Physical sciences	3 366	3 491	3.285	3.544	3 605	3.649	3.574	3 708	3.876	3.805	3 777
Earth atmos & ocean sciences	1 876	2 012	1.959	1 982	2 160	2.234	2 051	1.920	1 819	1 596	1.499
Mathematical sciences	2 569	2 731	2 839	2 749	2 888	3 171	3 327	3 434	3.430	3 684	3 632
Computer sciences	4.218	4.935	5 321	6 190	7.101	8.070	8.481	9 166	9 399	9.643	9.324
Agricultural sciences	3 092	3 268	3 401	3 268	3 116	2 983	2 776	2 746	2.570	2.634	2 600
Biological sciences	6 015	5 931	5 735	5 437	5 091	5.044	4.999	4.810	4.953	4.893	4 806
Psychology	8 039	7 849	8.439	8 073	8.481	8.363	8 165	7.925	8 652	9 308	9.802
Social sciences	18 740	18 794	17 851	17 176	17 148	17 221	17 160	17.220	17.983	18 230	18.915
Engineering fields, total	16 451	17.557	18 886	20 145	20 972	21.096	22.070	22.726	23.743	23.995	24 013
All other fields	232 432	230 012	223 215	216.898	216 651	217 998	217.929	226.436	234.625	247.159	260 130
Men all fields	147 431	145 941	145 114	143 998	143.716	143.932	141.655	145.403	149 399	154 025	156.895
Science and engineering fields total	45 505	46 557	46 718	47 033	48.232	48.611	48 759	49.820	50 845	51 230	50 441
Science fields total	30 383	30 575	29 587	28 988	29 504	29.915	29 459	29 902	30.184	30.504	29.785
Physical sciences	2.691	2 744	2 600	2.698	2 775	2 736	2 684	2 817	2.836	2 754	2 703
Earth atmos. & ocean sciences	1.470	1 560	1.515	1.517	1.639	1.717	1.531	1.433	1.337	1 218	1 116
Mathematical sciences	1 692	1 821	1 859	1.795	1.877	2 055	2 026	2 057	2 060	2.208	2 146
Computer sciences	3.247	3 625	3.813	4.379	5 064	5.658	5.985	6.702	6.773	6.968	6.563
Agricultural sciences	2 386	2 446	2 465	2.289	2 214	2.053	1 882	1.873	1.719	1 687	1.660
Biological sciences	3 675	3 450	3.234	3.009	2 662	2 627	2 555	2.439	2.491	2.393	2 315
Psychology	3 371	3.228	3.254	2 980	3.064	2.937	2 838	2.599	2.814	3.025	2.994
Social sciences	11 851	11 701	10.847	10 321	10.209	10.132	9.958	9.982	10.154	10 251	10.288
Engineering fields total	15 122	15 982	17 131	18 045	18 728	18.696	19 300	19.918	20.661	20 726	20.656
All other fields	101 926	99 384	98 396	96.965	95 484	95 321	92.896	95.583	98.554	102.795	106 454
Women all fields	149.367	150.639	145.817	141 464	143.497	145 897	148.877	154.688	161 651	170 922	181 603
Science and engineering fields total	18.861	20 011	20 998	21 531	22.330	23 220	23 844	23.835	25.580	26.558	27 927
Science fields total	17 532	18.436	19 243	19 431	20 086	20.820	21.074	21 027	22 498	23 289	24 570
Physical sciences	675	747	685	846	830	913	890	891	1.040	1.051	1 074
Earth atmos. & ocean sciences	406	452	444	465	521	517	520	487	482	378	383
Mathematical sciences	877	910	980	954	1.011	1 116	1 301	1 377	1.370	1 476	1 486
Computer sciences	971	1 310	1 508	1 811	2 037	2 412	2 496	2.464	2.626	2 675	2 761
Agricultural sciences	706	822	936	979	902	930	894	873	851	947	940
Biological sciences	2 340	2 481	2 501	2 428	2 429	2 417	2 444	2 371	2.462	2.500	2 491
Psychology	4 668	4 621	5 185	5 093	5 417	5 426	5 327	5.326	5.838	6 283	6 808
Social sciences	6 889	7 093	7 004	6 855	6 939	7 089	7 202	7 238	7.829	7.979	8.627
Engineering fields total	1 329	1 575	1 755	2 100	2 244	2 400	2.770	2 808	3 082	3 269	3.357
All other fields	130 506	130 628	124 819	119.933	121 167	122 677	125 033	130.853	136 071	144 364	153.676

SOURCE: U.S. Department of Education NCES, IPEDS Completions Survey

Appendix table 7-3. Master's degrees awarded, by field and sex: 1981 and 1991

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Field	1981				1991			
	Total	Men	Women	Percentage women	Total	Men	Women	Percentage women
Total all fields	296.798	147.431	149.367	50 3	338.498	156.895	181.603	53.6
Science and engineering fields. total	64 366	45.505	18.861	29 3	78.368	50.441	27.927	35 6
Science fields	47.915	30.383	17.532	36 6	54 355	29 785	24.570	45.2
Physical sciences	3.366	2.691	675	20 1	3.777	2.703	1.074	28.4
Astronomy	58	49	9	15 5	98	79	19	19 4
Chemistry	1.667	1.194	473	28.4	1.676	993	683	40.8
Physics	1.294	1.179	115	8.9	1 725	1.441	284	16.5
Other physical sciences	347	269	78	22.5	278	190	88	31.7
Earth. atmos & ocean sciences	1.876	1.470	406	21 6	1.499	1.116	383	25.6
Atmospheric sciences	174	154	20	11 5	172	138	34	19.8
Geosciences	1.527	1.175	352	23 1	1.195	887	308	25.8
Oceanography	175	141	34	19 4	132	91	41	31.1
Mathematical sciences	2.569	1.692	877	34.1	3.632	2.146	1 486	40.9
Computer science	4.218	3.247	971	23.0	9.324	6.563	2,761	29.6
Agricultural sciences	3.092	2.386	706	22.8	2.600	1.660	940	36.2
Biological sciences	6.015	3.675	2.340	38.9	4.806	2.315	2.491	51.8
Psychology	8.039	3.371	4.668	58 1	9.802	2.994	6.808	69 5
Social sciences	18.740	11.851	6.889	36.8	18.915	10.288	8.627	45 6
Economics	2.498	1.941	557	22 3	2.411	1.711	700	29 0
Political science	9.952	6.632	3.320	33.4	10.392	5.752	4.640	44.6
Sociology	1.255	598	657	52.4	1.293	514	779	60 2
Other social sciences	5.035	2.680	2.355	46.8	4.819	2.311	2.508	52.0
Engineering fields	16.451	15.122	1.329	8 1	24.013	20 656	3.357	14.0
Aerospace Engineering	408	388	20	4.9	941	855	86	9.1
Chemical Engineering	1.406	1.230	176	12 5	1.025	852	173	16.9
Civil Engineering	3.428	3.112	316	9.2	3.404	2.864	540	15.9
Electrical Engineering	3.902	3.681	221	5 7	7.942	7.008	934	11.8
Mechanical Engineering	2.419	2.292	127	5 3	3.680	3.320	360	9.8
Materials Engineering	666	587	79	11.9	787	607	180	22 9
Industrial Engineering	1.631	1 465	166	10 2	2.039	1.603	436	21 4
Other Engineering	2.591	2.367	224	8 6	4.195	3.547	648	15 4
All other fields	232.432	101.926	130 506	56 1	260.130	106.454	153.676	59.1

SOURCE U S Department of Education NCES IPEDS Completions Survey

Appendix table 7-4. Women as a percentage of all master's degree recipients in science and engineering in top 50 institutions granting master's degrees to women, by institution: 1991

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	Academic institution	Science and engineering			Science			Engineering		
		Total	Women	Percentage women	Total	Women	Percentage women	Total	Women	Percentage women
	All institutions	78 368	27 927	35 6	54,355	24 570	45 2	24,013	3 357	14 0
1	Columbia University main campus	1,110	513	46 2	879	476	54 2	231	37	16 0
2	Johns Hopkins University	1 151	359	31 2	871	325	37 3	280	34	12 1
3	Antioch University main campus	357	278	77 9	357	278	77 9	0	0	..
4	University of Michigan at Ann Arbor	976	264	27 0	435	191	43 9	541	73	13 5
5	New York University	527	261	49 5	527	261	49 5	0	0	..
6	George Washington University	760	254	33 4	410	198	48 3	350	56	16 0
7	Boston University	649	244	37 6	444	212	47 7	205	32	15 6
8	University of Washington	670	241	36 0	417	184	44 1	253	57	22 5
9	University of Wisconsin-Madison	794	239	30 1	526	207	39 4	268	32	11 9
10	Webster University	420	234	55 7	420	234	55 7	0	0	..
	Subtotal first 10 institutions	7 414	2 887	38 9	5,286	2 566	48 5	2 128	321	15 1
11	Harvard University	709	229	32 3	665	220	33 1	44	9	20 5
12	Nova University	315	229	72 7	315	229	72 7	0	0	..
13	Stanford University	960	223	23 2	308	110	35 7	652	113	17 3
14	Univ of Illinois at Urbana-Champaign	817	222	27 2	485	179	36 9	332	43	13 0
15	University of California-Berkeley	697	212	30 4	336	146	43 5	361	66	18 3
16	University of Minnesota at Twin Cities	545	201	36 9	368	173	47 0	177	28	15 8
17	University of Texas at Austin	701	199	28 4	334	155	46 4	367	44	12 0
18	Ohio State University main campus	707	196	27 7	440	164	37 3	267	32	12.0
19	Texas A & M University, main campus	788	189	24 0	345	128	37 1	443	61	13 8
20	University of Maryland at College Park	553	174	31 5	312	141	45 2	241	33	13 7
	Subtotal, first 20 institutions	14 206	4 961	34 9	9 194	4 211	45 8	5 012	750	15 0
21	Pepperdine University	210	172	81 9	210	172	81 9	0	0	..
22	Syracuse University main campus	570	166	29 1	290	124	42 8	280	42	15 0
23	American University	363	165	45 5	363	165	45 5	0	0	..
24	George Mason University	422	165	39 1	323	141	43 7	99	24	24 2
25	University of Pennsylvania	439	163	37 1	343	147	42 9	96	16	16 7
26	University of Arizona	494	161	32 6	352	146	41 5	142	15	10 6
27	Purdue University main campus	657	158	24 0	248	95	38 3	409	63	15 4
28	University of California-Davis	402	158	39 3	284	140	49 3	118	18	15 3
29	Cornell University, all campus	608	156	25 7	338	119	35 2	270	37	13 7
30	Georgetown University	324	152	46 9	324	152	46 9	0	0	..
	Subtotal first 30 institutions	18,695	6 577	35 2	12 269	5 612	45 7	6 426	965	15 0
31	Rutgers the State Univ at New Brunswick	423	151	35 7	283	120	42 4	140	31	22 1
32	National University	301	144	47 8	301	144	47 8	0	0	..
33	University of Pittsburgh main campus	398	144	36 2	282	117	41 5	116	27	23 3
34	Saint Mary's College of Minnesota	170	142	83 5	170	142	83 5	0	0	..
35	University of Florida	506	142	28 1	285	118	41 4	221	24	10 9
36	John F Kennedy University	182	139	76 4	182	139	76 4	0	0	..
37	University of California-Los Angeles	441	139	31 5	302	123	40 7	139	16	11 5
38	Wayne State University	464	139	30 0	229	106	46 3	235	33	14 0
39	University of Chicago	339	137	40 4	339	137	40 4	0	0	..
40	New Jersey Institute of Technology	876	136	15 5	422	85	20 1	454	51	11 2
	Subtotal first 50 institutions	22 795	7 990	35 1	15 064	6 843	45 4	7 731	1 147	14 8
41	Carnegie Mellon University	378	135	35 7	264	118	44 7	114	17	14 9
42	University of Oklahoma Norman Campus	420	133	31 7	325	130	40 0	95	3	3 2
43	Northeastern University	468	130	27 8	166	56	33 7	302	74	24 5
44	Drexel University	329	128	38 9	180	112	62 2	149	16	10 7
45	Santa Clara University	366	127	34 7	89	73	82 0	277	54	19 5
46	University of Colorado at Boulder	487	127	26 1	222	88	39 6	265	39	14 7
47	Yale University	323	126	39 0	294	123	41 8	29	3	10 3
48	Pennsylvania State University main campus	512	125	24 4	251	93	37 1	261	32	12 3
49	University of Massachusetts at Amherst	345	125	36 2	199	98	49 2	146	27	18 5
50	Virginia Polytechnic Inst and State Univ	582	123	21 1	203	65	32 0	379	58	15 3
	Total first 50 institutions	27 005	9 269	34 3	17 257	7 799	45 2	9 748	1 470	15 1

KEY .. cannot be calculated

SOURCE U S Department of Education NCES IPEDS Completions Survey

Appendix table 7-5. Doctorates awarded, by sex and field: 1982–1992

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Sex and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total, all fields	31 111	31 282	31 337	31.297	31 897	32 363	33 490	34 317	36.052	37 503	38 814
Science and engineering fields, total	18 017	18 393	18 514	18 712	19 251	19 706	20 739	21 528	22 672	23 780	24.432
Science fields, total	15 371	15 612	15 601	15 546	15 875	15 994	16 551	16 985	17 778	18 565	18.995
Physical sciences	2 694	2 802	2 845	2 916	3 090	3 212	3 317	3 244	3 492	3.604	3 749
Earth, atmos. & ocean sc.	657	637	614	617	589	628	728	740	769	836	824
Mathematical sciences	720	701	698	688	729	740	749	859	892	1 039	1.058
Computer sciences	220	286	295	310	399	450	515	612	705	800	867
Agricultural sciences	[illegible]	1 015	997	1 111	997	976	1.015	1.088	1 176	1 074	1.063
Biological sciences	3 893	3.741	3 880	3 793	3 807	3 839	4 112	4 115	4.327	4 647	4.794
Psychology	3 159	3 347	3 257	3 117	3.124	3 169	3 064	3.202	3.267	3 244	3 252
Social sciences	3 077	3.083	3 015	2.994	3.140	2 980	3 051	3.125	3.150	3.321	3 388
Engineering fields, total	2 646	2 781	2.913	3 166	3 376	3 712	4 188	4.543	4.894	5 215	5 437
All other fields	13 094	12 889	12 823	12 585	12 646	12 657	12 751	12.789	13 380	13 723	14 382
Men, all fields	21 018	20 749	20 638	20 553	20 593	20 938	21 677	21 809	22 953	23 638	24.448
Science and engineering fields, total	13 747	13.769	13 810	13.900	14.167	14 472	15 162	15.521	16.379	16.959	17.476
Science fields, total	11 225	11.112	11 048	10 932	11 016	11 002	11 260	11 353	11 900	12 211	12 542
Physical sciences	2 337	2.431	2 446	2 452	2.585	2 686	2 760	2 627	2.839	2.931	2 984
Earth, atmos. & ocean sc.	554	540	508	506	489	514	583	590	620	651	632
Mathematical sciences	624	588	583	582	608	615	628	704	734	840	853
Computer sciences	200	250	258	277	351	385	459	504	595	683	747
Agricultural sciences	800	882	864	940	825	805	829	860	929	865	830
Biological sciences	2.752	2.508	2 665	2.555	2.527	2.479	2.607	2 573	2.713	2 874	2.969
Psychology	1 721	1.750	1 626	1.576	1 526	1 474	1 388	1 406	1 360	1 251	1 338
Social sciences	2 237	2 163	2 098	2.044	2 105	2 044	2.006	2.089	2.110	2 116	2.189
Engineering fields, total	2 522	2 657	2 762	2.968	3 151	3.470	3 902	4 168	4 479	4 748	4 934
All other fields	7 271	6 980	6 828	6 653	6 426	6.466	6 515	6.288	6 574	6 679	6.972
Women, all fields	10 093	10 533	10 699	10 744	11 304	11 425	11 813	12 508	13 099	13 865	14.366
Science and engineering fields, total	4 270	4 624	4 704	4 812	5 084	5 234	5 577	6 007	6.293	6 821	6 956
Science fields, total	4 146	4 500	4 553	4 614	4 859	4 992	5.291	5 632	5 878	6 354	6.453
Physical sciences	357	371	399	464	505	526	557	617	653	673	765
Earth, atmos. & ocean sc.	103	97	106	111	[illegible]	114	145	150	149	185	192
Mathematical sciences	96	113	115	106	121	125	121	155	158	199	205
Computer sciences	20	36	37	33	48	65	56	108	110	117	120
Agricultural sciences	151	133	133	171	172	171	186	228	247	209	233
Biological sciences	1 141	1 233	1 215	1 238	1 280	1 360	1.505	1 542	1 614	1 773	1 825
Psychology	1 438	1 597	1 631	1 541	1 598	1 695	1 676	[illegible]	1 907	1 993	1 914
Social sciences	840	920	917	950	1 035	936	1 045	1.036	1 040	1.205	1 199
Engineering fields, total	124	124	151	198	225	242	286	375	415	467	503
All other fields	5 823	5 909	5 995	5 932	6 220	6 191	6 236	6 501	6 806	7 044	7 410

SOURCE: National Science Foundation, SRS, Survey of Earned Doctorates

Appendix table 7-6. Doctorates awarded, by field and sex: 1982 and 1992

Field	1982				1992			
	Total	Men	Women	Percentage women	Total	Men	Women	Percentage women
Total, all fields	31,111	21,018	10,093	32.4	38,814	24,448	14,366	37.0
Science and engineering fields, total	18,017	13,747	4,270	23.7	24,432	17,476	6,956	28.5
Science fields, total	15,371	11,225	4,146	27.0	18,995	12,542	6,453	34.0
Physical sciences	2,694	2,337	357	13.3	3,749	2,984	765	20.4
Earth, atmos., & ocean sciences	657	554	103	15.7	824	632	192	23.3
Mathematical sciences	720	624	96	13.3	1,058	853	205	19.4
Computer sciences	220	200	20	9.1	867	747	120	13.8
Agricultural sciences	951	800	151	15.9	1,063	830	233	21.9
Biological sciences	3,893	2,752	1,141	29.3	4,794	2,969	1,825	38.1
Psychology	3,159	1,721	1,438	45.5	3,252	1,338	1,914	58.9
Social sciences	3,077	2,237	840	27.3	3,388	2,189	1,199	35.4
Engineering fields, total	2,646	2,522	124	4.7	5,437	4,934	503	9.3
Aerospace engineering	86	85	1	1.2	234	226	8	3.4
Chemical engineering	306	289	17	5.6	606	506	100	16.5
Civil engineering	308	296	12	3.9	539	503	36	6.7
Electrical engineering	470	453	17	3.6	1,279	1,178	101	7.9
Industrial engineering	79	73	6	7.6	197	172	25	12.7
Materials science engineering	147	134	13	8.8	365	315	50	13.7
Mechanical engineering	334	322	12	3.6	856	823	33	3.9
Other engineering	916	870	46	5.0	1,361	1,211	150	11.0
All other fields	13,094	7,271	5,823	44.5	14,382	6,972	7,410	51.5

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates

Appendix table 7-7. Women as a percentage of all doctorate recipients in science and engineering in top 50 institutions granting doctorates to women, by institution: 1992

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	Academic institution	Science and engineering Total	Science and engineering Women	Science and engineering Percentage women	Science Total	Science Women	Science Percentage women	Engineering Total	Engineering Women	Engineering Percentage women
	Total all institutions	24 541	6 986	28 5	19 104	6.483	33 9	5.437	503	9.3
1	University of California-Berkeley	589	123	20 9	428	107	25 0	161	16	9 9
2	University of Wisconsin-Madison	470	123	26 2	400	114	28 5	70	9	12 9
3	Cornell University All Campuses	426	121	28 4	325	106	32 6	101	15	14 9
4	Pennsylvania State University main campus	400	117	29 3	275	107	38 9	125	10	8 0
5	University of Minnesota at Twin Cities	423	109	25 8	320	101	31 6	103	8	7 8
6	University of Illinois at Urbana-Champaign	557	102	18 3	377	86	22.8	180	16	8 9
7	University of California-Los Angeles	391	101	25 8	312	97	31 1	79	4	5 1
8	University of Michigan at Ann Arbor	467	101	21 6	261	92	35 2	206	9	4.4
9	Ohio State University, main campus	378	98	25 9	293	97	33 1	85	1	1 2
10	University of Maryland at College Park	323	96	29 7	261	91	34.9	62	5	8 1
	Subtotal first 10 institutions	4 424	1.091	24.7	3.252	998	30 7	1 172	93	7 9
11	Stanford University	440	90	20.5	255	73	28 6	185	17	9.2
12	University of North Carolina at Chapel Hill	195	87	44 6	192	86	44.8	3	1	33 3
13	University of Pennsylvania	268	87	32 5	227	79	34 8	41	8	19 5
14	University of California-Davis	268	85	31 7	231	82	35 5	37	3	8.1
15	Purdue University main campus	396	84	21 2	241	76	31.5	155	8	5 2
16	University of Washington	271	84	31 0	210	74	35 2	61	10	16 4
17	Boston University	151	81	53 6	144	80	55 6	7	1	14.3
18	Massachusetts Institute of Technology	472	79	16 7	245	50	20 4	227	29	12.8
19	Rutgers, the State Univ at New Brunswick	264	79	29 9	211	71	33 6	53	8	15.1
20	University of Florida	279	79	28 3	211	72	34 1	68	7	10 3
	Subtotal first 20 institutions	7 428	1 926	25 9	5.419	1.741	32 1	2.009	185	9 2
21	University of Texas at Austin	379	77	20 3	238	69	29 0	141	8	5 7
22	Texas A & M University main campus	352	75	21 3	249	69	27 7	103	6	5 8
23	Columbia University main campus	253	73	28 9	208	68	32 7	45	5	11 1
24	CUNY Graduate School and University Center	186	73	39 2	175	71	40 6	11	2	18 2
25	Harvard University	293	73	24 9	279	69	24 7	14	4	28 6
26	Northwestern University	258	72	27.9	172	61	35 5	86	11	12 8
27	Michigan State University	309	69	22 3	250	68	27 2	59	1	1 7
28	University of Southern California	269	69	25 7	173	63	36 4	96	6	6 3
29	Indiana University at Bloomington	177	68	38 4	177	68	38 4	0	0	··
30	University of Massachusetts at Amherst	204	68	33 3	151	60	39 7	53	8	15 1
	Subtotal first 30 institutions	10 108	2 643	26 1	7 491	2 407	32 1	2 617	236	9 0
31	University of Georgia	176	66	37 5	175	66	37 7	1	0	0 0
32	New York University	177	65	36 7	175	65	37 1	2	0	0 0
33	University of Colorado at Boulder	210	59	28 1	174	57	32 8	36	2	5 6
34	University of Missouri Columbia	161	58	36 0	145	55	37 9	16	3	18 8
35	SUNY at Buffalo main campus	190	57	30 0	151	54	35 8	39	3	7 7
36	Yale University	207	56	27 1	184	52	28 3	23	4	17 4
37	University of Arizona	247	55	22 3	191	50	26 2	56	5	8 9
38	University of Virginia main campus	154	54	35 1	112	43	38 4	42	11	26 2
39	SUNY at Stony Brook all campuses	176	53	30 1	156	52	33 3	20	1	5 0
40	Virginia Polytechnic Inst and State Univ	228	53	23 2	120	40	33 3	108	13	12 0
	Subtotal first 40 institutions	12 034	3 219	26 7	9 074	2 941	32 4	2 960	278	9 4
41	Johns Hopkins University	199	52	26 1	165	47	28 5	34	5	14 7
42	University of Pittsburgh main campus	174	52	29 9	133	46	34 6	41	6	14 6
43	Iowa State University	218	50	22 9	174	47	27 0	44	3	6 8
44	University of Iowa	177	49	27 7	130	48	36 9	47	1	2 1
45	University of California San Diego	192	48	25 0	157	45	28 7	35	3	8 6
46	University of Chicago	196	48	24 5	196	48	24 5	0	0	··
47	University of Illinois at Chicago	146	48	32 9	116	45	38 8	30	3	10 0
48	University of Kentucky main campus	133	47	35 3	111	47	42 3	22	0	0
49	University of Tennessee at Knoxville	174	47	27 0	127	41	32 3	47	6	12 8
50	Temple University	101	46	45 5	101	46	45 5	0	0	··
	Total first 50 institutions	13 744	3 706	27 0	10 484	3 401	32 4	3 260	305	9 4

KEY ·· cannot be calculated

SOURCE National Science Foundation SRS Survey of Earned Doctorates

Appendix table 7-8. Baccalaureate-origin institutions of 1988–92 female science and engineering (S&E) doctorate recipients, ranked according to total science and engineering doctorates

Page 1 of 1

Academic institution	Total S&E	Total science	Physical Sciences	Math	Computer Sciences	Agric science	Biological Sciences	Psychology	Social sciences	Engineering
Calif U-Berkeley	421	388	42	12	1	13	134	94	92	33
Michigan Univ of	358	328	34	2	1	2	89	141	59	30
Cornell Univ NY	347	324	34	3	2	25	131	89	40	23
Ill U Urbana-Champ	308	272	29	3	4	22	97	76	41	36
Calif. U-Los Angeles	298	288	29	2	4	1	61	141	50	10
Wisconsin. U-Madison	290	272	21	5	3	24	71	94	54	18
Penn State Univ	263	238	19	2	2	21	96	51	47	25
Calif. U-Davis	229	224	26	3	2	23	120	32	18	5
Rutgers Univ NJ	223	205	24	5	2	10	67	71	26	18
Michigan State Univ	203	191	15	0	3	16	65	54	38	12
Pennsylvania U of	202	188	11	3	1	0	50	80	43	14
Minnesota. U-Minneapl	196	183	21	3	1	17	50	45	46	13
Maryland Univ of	194	186	20	4	1	11	62	63	25	8
Ohio State Univ	190	169	15	2	3	16	45	50	38	21
Stanford Univ-CA	172	160	20	0	1	2	42	58	37	12
Brown University RI	166	155	16	0	3	0	46	62	28	11
Texas U-Austin	162	151	12	3	3	4	36	61	32	11
Wellesley College MA	158	152	23	0	0	1	41	51	36	6
Colorado. U-Boulder	156	144	16	3	5	3	39	44	34	12
Harvard Univ/MA	155	149	20	6	7	4	43	30	39	6
Duke University NC	155	146	24	0	4	2	45	55	16	9
Calif. U-San Diego	153	145	15	6	0	1	47	47	29	8
Mass Inst Technology	152	92	32	1	7	0	42	2	8	60
Boston University MA	149	148	8	1	3	0	35	80	21	1
Purdue University IN	146	117	19	0	5	16	36	25	16	29
SUNY at Buffalo	145	138	15	2	0	1	25	66	29	7
SUNY at Binghamton	144	143	9	1	6	0	31	76	20	1
Washington. U of	144	130	10	1	2	6	38	42	31	14
Smith College/MA	139	137	21	1	2	3	42	40	28	2
Florida. Univ of	139	131	10	6	1	11	27	56	20	8
Indiana U-Bloomington	135	133	16	1	4	1	31	44	36	2
Mass U of Amherst	134	125	8	0	0	4	50	38	25	9
Yale University CT	131	127	21	3	2	0	35	34	32	4
Columbia-Barnard/NY	131	128	10	0	2	0	30	54	32	3
Calif. U-Santa Barb	129	126	8	4	2	1	38	42	31	3
PR U-Rio Piedras	128	123	30	3	0	2	23	36	29	5
Delaware Univ of	127	116	23	0	2	7	38	23	23	11
NC U of-Chapel Hill	125	125	22	2	2	4	33	40	22	0
Rochester Univ of NY	122	112	14	1	0	1	34	52	10	10
Oberlin College OH	121	120	14	2	2	0	30	43	29	1
MT Holoke Coll.MA	120	117	26	4	0	1	36	36	14	3
New York University	119	119	9	3	1	0	21	68	17	0
Princeton Univ NJ	119	104	21	6	3	0	36	21	17	15
Northwestern Univ IL	119	108	15	2	3	1	32	35	20	11
Calif U-Irvine	119	118	13	3	3	1	28	48	22	1
Calif U-Santa Cruz	118	116	14	2	0	0	36	31	33	2
Iowa State Univ	117	105	11	1	2	24	31	23	13	12
Suny at Stony Brook	116	112	9	3	1	2	29	52	16	4
Bryn Mawr Coll PA	116	110	22	8	0	2	28	15	35	6
Missouri U-Columbia	115	106	7	1	0	5	28	47	18	9

SOURCE National Science Foundation SRS Survey [illegible]arned Doctorates

Appendix table 7-9. Master's degrees awarded in science and engineering, by field, citizenship status, and race/ethnicity: 1981–1991, selected years

	U S citizens and permanent residents								
Field and year	Total	Total citizens	Black	American Indian	Asian	Hispanic	White	Unknown race/ ethnicity	Nonresident aliens[1]
Science and engineering total 1981	79.869	69 401	3 695	257	2.481	2 052	60.407	509	10 468
Science fields total	63 153	57 248	3.435	226	1.402	1 767	50.260	158	5.905
Physical sciences	5 300	4 514	107	11	153	71	4.115	57	786
Mathematical sciences	2 569	2.105	67	7	97	42	1.890	2	464
Computer sciences	4 218	3 314	70	12	279	60	2 818	75	904
Agricultural sciences	4 017	3 307	73	7	67	77	3 083	0	710
Biological sciences	6.015	5 647	171	15	145	103	5 213	0	368
Psychology	8 039	7 769	424	32	77	217	7 019	0	270
Social sciences	32 995	30.592	2 523	142	584	1 197	26 122	24	2 403
Engineering fields total	16 716	12 153	260	31	1 079	285	10 147	351	4 563
Science and engineering total 1985	80 630	67 498	3 152	313	3 543	2 231	56 101	2.158	13.132
Science fields, total	59 695	52.257	2 822	266	1.992	1 865	43 915	1 377	7.438
Physical sciences	5 802	4.704	89	21	213	127	4.133	121	1.098
Mathematical sciences	2 888	2.203	53	7	164	55	1 873	51	685
Computer sciences	7.101	5 392	180	41	615	94	4.303	159	1.709
Agricultural sciences	3 152	2.546	50	6	58	66	2.345	21	606
Biological sciences	5 091	4.617	151	18	179	139	4.081	49	474
Psychology	8 481	8 185	426	37	129	344	7.220	29	296
Social sciences	27 180	24.610	1 873	136	634	1 060	19 960	947	2 570
Engineering fields	20 935	15 241	330	47	1 551	346	12 186	781	5 694
Science and engineering total 1987	83.515	69 751	3 223	270	3 745	2 291	55.790	4.432	13 764
Science fields total	61 458	53 475	2 820	232	2.095	1.779	42.953	3.596	7 983
Physical sciences	5 638	4 582	79	9	227	122	3.834	311	1 056
Mathematical sciences	3 327	2 491	73	3	183	60	2.012	160	836
Computer sciences	8 481	6 414	207	22	779	123	4.717	566	2 067
Agricultural sciences	2 824	2.257	55	3	47	62	2.044	46	567
Biological sciences	4 999	4 490	167	11	190	126	3 745	251	509
Psychology	8.165	7.945	376	35	113	271	6 698	452	220
Social sciences	28 024	25 296	1 863	149	556	1 015	19 903	1 810	2 728
Engineering fields	22 057	16 276	403	38	1 650	512	12.837	836	5.781
Science and engineering total 1989	87 783	71 834	3 151	302	4 482	2 339	56 864	4 696	15.949
Science fields total	64 048	54 846	2 796	269	2 490	1.871	44 032	3 388	9.202
Physical sciences	5 703	4 465	78	18	278	92	3.766	233	1.238
Mathematical sciences	3 430	2 454	59	6	178	34	2.032	145	976
Computer sciences	9 399	6 957	198	39	894	144	4.786	896	2.442
Agricultural sciences	2 604	1 974	36	6	44	48	1.817	23	630
Biological sciences	4 953	4 317	12[illegible]	17	223	126	3.679	148	636
Psychology	8 652	8 393	395	33	131	360	7 07[illegible]	399	259
Social sciences	29 307	26 286	1 206	150	742	1 067	20 877	1 544	3 021
Engineering fields total	23 735	16.988	355	33	1 992	468	12 832	1 308	6 747
Science and engineering total 1990	89 826	72 749	3 559	258	4 393	2 321	57 606	4.612	17 077
Science fields total	65 841	56 003	3 172	223	2 530	1 875	44 747	3 456	9 838
Physical sciences	5 411	4 047	87	9	234	98	3 401	218	1 364
Mathematical science	3 684	2 649	70	6	184	51	2 169	169	1.035
Computer sciences	9 643	7 080	232	7	941	118	4 851	931	2 563
Agricultural sciences	2 662	2 023	28	8	45	44	1.820	78	639
Biological sciences	4 893	4 164	119	14	225	120	3 501	194	729
Psychology	9 308	8 923	471	37	159	369	7 489	398	385
Social sciences	30 240	27 117	2 174	142	742	1 075	21 516	1 468	3 123
Engineering fields total	23 985	16 746	387	35	1 863	446	12 859	1 156	7 239

See explanatory information and SOURCE at end of table

Appendix table 7-9. Master's degrees awarded in science and engineering, by field, citizenship status, and race/ethnicity: 1981–1991, selected years

Field and year	U S citizens and permanent residents								Nonresident aliens
	Total	Total citizens	Black	American Indian	Asian	Hispanic	White	Unknown race ethnicity	
Science and engineering total 1991	91 126	73 285	3 825	294	4 676	2 575	58 435	3 480	17.841
Science fields total	67 119	56 798	3 427	254	2 668	2 107	45.800	2.542	10 321
Physical sciences	5 282	3 778	73	13	251	96	3 129	216	1 504
Mathematical sciences	3 632	2 573	100	9	189	85	2.068	122	1 059
Computer sciences	9 324	6 505	283	14	1 014	128	4 637	429	2 819
Agricultural sciences	2 625	2 022	51	8	50	49	1 818	46	603
Biological sciences	4 806	4 057	137	13	231	136	3 353	187	749
Psychology	9 802	9 485	454	49	170	391	7 973	448	317
Social sciences	31 648	28 378	2 329	148	763	1 222	22 822	1 094	3 270
Engineering fields	24 007	16 487	398	40	2 008	468	12 635	938	7 520

Nonresident aliens include foreign citizens on temporary visas only No racial ethnic data are collected for this group

Includes earth atmospheric, and ocean sciences

In 1981 engineering technology degrees were included in the engineering total

NOTE Because racial ethnic data were collected by the Department of Education for broad fields of study only the category of science and engineering in this table includes fields not normally included by the National Science Foundation (NSF) There are two fields where this difference has a large impact social sciences (the Department of Education includes history and some other fields excluded by NSF) and engineering (the Department of Education included engineering technologies in this broad category before 1987)

SOURCE U S Department of Education NCES IPEDS Completions Survey

Women. Minorities. and Persons With Disabilities in Science and Engineering. 1994

Appendix table 7-10. Master's degrees in science and engineering awarded to men, by field, citizenship status, and race/ethnicity: 1981–1991, selected years

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Field and year	Total men	U S citizens and permanent residents: Total men	Black	American Indian	Asian	Hispanic	White	Unknown race/ ethnicity	Male nonresident aliens
Science and engineering total, 1981	51,469	42,682	1 712	155	1,813	1 189	37 311	502	8 787
Science fields total	36,115	31,676	1 490	129	839	931	28,134	153	4,439
Physical sciences	4,213	3,572	79	9	115	58	3 255	56	641
Mathematical sciences	1,692	1,348	33	6	64	31	1 212	2	344
Computer sciences	3,247	2,536	52	10	205	45	2 153	71	711
Agricultural sciences	3 071	2,465	53	4	50	60	2,298	0	606
Biological sciences	3 675	3 433	82	9	62	54	3,226	0	242
Psychology	3 371	3 247	164	13	34	91	2 945	0	124
Social sciences	16 846	15 075	1,027	78	309	592	13,045	24	1,771
Engineering fields, total	15 354	11,006	222	26	974	258	9,177	349	4,348
Science and engineering total 1985	50,636	39 933	1,459	184	2,575	1,175	33,023	1,517	10 703
Science fields total	31,944	26,583	1 185	141	1,201	871	22,377	808	5,361
Physical sciences	4,450	3,561	61	19	154	95	3 135	97	889
Mathematical sciences	1 877	1 378	34	4	108	31	1 170	31	499
Computer sciences	5,064	3,795	108	28	414	65	3,052	128	1,269
Agricultural sciences	2,247	1,756	30	4	42	54	1,613	13	491
Biological sciences	2,662	2,376	67	8	86	62	2,126	27	286
Psychology	3 064	2,946	146	16	48	133	2,601	2	118
Social sciences	12 580	10 771	739	62	349	431	8 680	510	1,809
Engineering fields total	18,692	13 350	274	43	1 374	304	10,646	709	5 342
Science and engineering total 1987	51 420	40 424	1 462	141	2,693	1 324	32,214	2 590	10,996
Science fields, total	32 130	26,478	1,147	109	1 238	880	21,251	1 853	5,652
Physical sciences	4,225	3,391	45	7	164	88	2,855	232	834
Mathematical sciences	2,026	1 482	45	1	110	41	1,187	98	544
Computer sciences	5,985	4 410	126	19	522	91	3,229	423	1 575
Agricultural sciences	1,923	1,466	42	1	27	45	1,320	31	457
Biological sciences	2 555	2,287	80	4	85	53	1,932	133	268
Psychology	2,838	2 749	116	12	33	96	2,325	167	89
Social sciences	12,578	10,693	693	65	297	466	8 403	769	1 885
Engineering fields, total	19,290	13 946	315	32	1 455	444	10,963	737	5 344
Science and engineering total 1989	53,531	40 936	1 329	172	3 088	1,240	32,201	2 906	12 595
Science fields total	32,877	26 490	1,067	143	1,389	846	21,327	1 718	6,387
Physical sciences	4,180	3,226	56	12	179	65	2 750	164	954
Mathematical sciences	2 060	1 428	32	5	117	21	1 173	80	632
Computer sciences	6 773	4,925	119	36	565	100	3 430	675	1,848
Agricultural sciences	1 746	1 272	24	6	24	34	1,174	10	474
Biological sciences	2,491	2 134	59	8	105	62	1,830	70	357
Psychology	2 814	2,715	120	12	44	118	2,292	129	99
Social sciences	12,813	10,790	657	64	355	446	8 678	590	2,023
Engineering fields, total	20 654	14,446	262	29	1 699	394	10 874	1 188	6,208
Science and engineering total 1990	54 132	40 935	1 502	128	2 925	1 202	32 259	2 919	13 197
Science fields total	33 415	26 761	1,215	101	1 368	829	21 337	1,911	6 654
Physical sciences	3 981	2 953	61	6	140	63	2 518	165	1 028
Mathematical sciences	2 208	1 559	37	4	106	33	1 275	104	649
Computer sciences	6 968	5 035	140	5	609	93	3,474	714	1 933
Agricultural sciences	1 708	1 258	18	5	24	25	1 138	48	450
Biological sciences	2 393	2 014	51	8	97	61	1 711	86	379
Psychology	3 025	2 889	133	13	42	133	2 431	137	136
Social sciences	13 132	11 053	775	60	350	421	8 790	[illegible]	2 079
Engineering fields total	20 717	14 174	287	27	1 557	373	10 922	[illegible]	6 543

See explanatory information and SOURCE at end of table

Appendix table 7-10. Master's degrees in science and engineering awarded to men, by field, citizenship status, and race/ethnicity: 1981–1991, selected years

Page 2 of 2

Field and year	Total men	U S citizens and permanent residents: Total men	Black	American Indian	Asian	Hispanic	White	Unknown race ethnicity	Male nonresident aliens
Science and engineering total, 1991	53 566	40 052	1 548	141	3.126	1 263	31.847	2 127	13.514
Science fields total	32 916	26 075	1.249	107	1.441	885	21 105	1 288	6.841
Physical sciences	3.825	2.755	43	8	165	73	2.299	167	1 070
Mathematical sciences	2.146	1 463	53	7	108	52	1.169	74	683
Computer sciences	6.563	4.419	150	10	627	84	3.260	288	2 144
Agricultural sciences	1 681	1.257	34	3	27	31	1 134	28	424
Biological sciences	2.315	1.945	58	4	104	54	1 629	96	370
Psychology	2 994	2.890	129	19	47	124	2 420	151	104
Social sciences	13.392	11 346	782	56	363	467	9 194	484	2 046
Engineering fields, total	20.650	13 977	299	34	1.685	378	10.742	839	6 673

' Nonresident aliens include foreign citizens on temporary visas only No racial ethnic data are collected for this group

' Includes earth atmospheric and ocean sciences

' In 1981, engineering technology degrees were included in the engineering total

NOTE Because racial/ethnic data were collected by the Department of Education for broad fields of study only, the category of science and engineering in this table includes fields not normally included by the National Science Foundation (NSF) There are two fields where this difference has a large impact social sciences (the Department of Education includes history and some other fields excluded by NSF) and engineering (the Department of Education included engineering technologies in this broad category before 1987)

SOURCE U S Department of Education NCES IPEDS Completions Survey

Appendix table 7-11. Master's degrees in science and engineering awarded to women, by field, citizenship status, and race/ethnicity: 1981-1991, selected years

Field and year	Total women	U.S. citizens and permanent residents: Total women	Black	American Indian	Asian	Hispanic	White	Unknown race ethnicity	Female nonresident aliens
Science and engineering total 1981	28 400	26 719	1 983	10[illegible]	668	863	23.096	7	1.681
Science fields total	27 038	25 572	1 945	97	563	836	22 126	5	1 466
Physical sciences	1 087	942	28	2	38	13	860	1	145
Mathematical sciences	877	757	34	1	33	11	678	0	120
Computer sciences	971	778	18	2	74	15	665	4	193
Agricultural sciences	946	842	20	3	17	17	785	0	104
Biological sciences	2 340	2 214	89	6	83	49	1 987	0	126
Psychology	4 668	4 522	260	19	43	126	4 074	0	146
Social sciences	16 149	15 517	1 496	64	275	605	13 077	0	632
Engineering fields total	1 362	1,147	38	5	105	27	970	2	215
Science and engineering total 1985	29.994	27 565	1.693	129	968	1 056	23 078	641	2.429
Science fields total	27 751	25.674	1.637	125	791	1 014	21 538	569	2 077
Physical sciences	1 352	1 143	28	2	59	32	998	24	209
Mathematical sciences	1 011	825	19	3	56	24	703	20	186
Computer sciences	2 037	1 597	72	13	201	29	1 251	31	440
Agricultural sciences	905	790	20	2	16	12	732	8	115
Biological sciences	2 429	2 241	84	10	93	77	1 955	22	188
Psychology	5 417	5 239	280	21	81	211	4 619	27	178
Social sciences	14 600	13 839	1 134	74	285	629	11.280	437	761
Engineering fields total	2 243	1 891	56	4	177	42	1 540	72	352
Science and engineering total 1987	32 095	29.327	1 761	129	1 052	967	23 576	1 842	2 768
Science fields total	29.328	26 997	1 673	123	857	899	21.702	1 743	2 331
Physical sciences	1 413	1 191	34	2	63	34	979	79	222
Mathematical sciences	1 301	1.009	28	2	73	19	825	62	292
Computer sciences	2 496	2 004	81	3	257	32	1 488	143	492
Agricultural sciences	901	791	13	2	20	17	724	5	110
Biological sciences	2 444	2 203	87	7	105	73	1 813	116	241
Psychology	5 327	5 196	260	23	80	175	4 373	285	131
Social sciences	15 446	14 603	1 170	84	259	549	11 500	1 041	843
Engineering fields total	2 767	2 330	88	6	195	68	1 874	99	437
Science and engineering total 1989	34 252	30 898	1 822	130	1 394	1 099	24.663	1.790	3 354
Science fields total	31 171	28 356	1 729	126	1 101	1 025	22 705	1 670	2.815
Physical sciences	1 523	1 239	22	6	99	27	1 016	69	284
Mathematical sciences	1 370	1 026	27	1	61	13	859	65	344
Computer sciences	2 626	2 032	79	3	329	44	1.356	221	594
Agricultural sciences	858	702	12	0	20	14	643	13	156
Biological sciences	2 462	2 183	65	9	118	64	1 849	78	279
Psychology	5 838	5 678	275	21	87	242	4.783	270	160
Social sciences	16 494	15 496	1 249	86	387	621	12 199	954	998
Engineering fields total	3 081	2 542	93	4	293	74	1 958	120	539
Science and engineering total 1990	35 694	31 814	2 057	130	1 468	1 119	25 347	1.693	3.880
Science fields total	32.426	29 242	1 957	122	1 162	1 046	23 410	1 545	3 184
Physical sciences	1 430	1 094	26	3	94	35	883	53	336
Mathematical sciences	1 476	1 090	33	2	78	18	894	65	386
Computer sciences	2 675	2 045	92	2	332	25	1 377	217	630
Agricultural sciences	954	765	10	3	21	19	682	30	189
Biological sciences	2 500	2 150	59	6	128	59	1 790	108	350
Psychology	6 283	6 034	338	24	117	236	5 058	261	249
Social sciences	17 108	16 064	1 399	82	392	654	12 726	811	1 044
Engineering fields total	3 268	2 572	100	8	306	73	1 937	148	696

See explanatory information and SOURCE at end of table

Appendix table 7-11. Master's degrees in science and engineering awarded to women, by field, citizenship status, and race/ethnicity: 1981-1991, selected years

Page 2 of 2

Field and year	Total women	U.S. citizens and permanent residents: Total women	Black	American Indian	Asian	Hispanic	White	Unknown race ethnicity	Female nonresident aliens
Science and engineering total 1991	37 560	33 233	2 277	153	1 550	1 312	26 588	1 353	4 327
Science fields total	34.203	30 723	2 178	147	1 227	1 222	24.695	1 254	3 480
Physical sciences	1 457	1.023	30	5	86	23	830	49	434
Mathematical sciences	1 486	1 110	47	2	81	33	899	48	376
Computer sciences	2 761	2 086	133	4	387	44	1 377	141	675
Agricultural sciences	944	765	17	5	23	18	684	18	179
Biological sciences	2.491	2 112	79	9	127	82	1 724	91	379
Psychology	6.808	6 595	325	30	123	267	5 553	297	213
Social sciences	18 256	17 032	1 547	92	400	755	13 628	610	1 224
Engineering fields total	3 357	2.510	99	6	323	90	1.893	99	847

Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

Includes earth, atmospheric, and ocean sciences.

In 1981, engineering technology degrees were included in the engineering total.

NOTE: Because racial/ethnic data were collected by the Department of Education for broad fields of study only, the category of science and engineering in this table includes fields not normally included by the National Science Foundation (NSF). There are two fields where this difference has a large impact: social sciences (the Department of Education includes history and some other fields excluded by NSF) and engineering (the Department of Education included engineering technologies in this broad category before 1987).

SOURCE: U.S. Department of Education, NCES, IPEDS Completions Survey.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

Field, sex, and race/ethnicity	1981	1985	1987	1989	1990	1991
Total, all fields:						
Total	273.184	254,401	246.939	263.166	270,886	285.260
White, non-Hispanic	241,255	223.649	216.807	230.322	236.874	247.524
Asian	6.304	7.805	8.129	10.174	9.994	11.070
Black, non-Hispanic	17.152	13.960	13.173	13.455	14.473	15.857
Hispanic	7.439	7.730	7.781	8.133	8.495	9,684
American Indian/Alaskan Native	1.034	1.257	1.049	1,082	1.050	1.125
Men	129.466	120.055	113.935	118.998	121.066	124,344
White, non-Hispanic	115.572	106.067	100.059	104.042	106.075	107.917
Asian	3.780	4.852	4.978	5.917	5.670	6.220
Black, non-Hispanic	6.161	5.211	4.885	4.964	5.169	5.619
Hispanic	3.452	3.342	3.521	3.597	3.713	4.124
American Indian/Alaskan Native	501	583	492	478	439	464
Women	143.718	134.346	133.004	144.168	149,820	160.916
White, non-Hispanic	125.683	117.582	116.748	126.280	130.799	139.607
Asian	2.524	2.953	3.151	4.257	4.324	4,850
Black, non-Hispanic	10.991	8.749	8.288	8.491	9.304	10,238
Hispanic	3.987	4.388	4.260	4.536	4.782	5.560
American Indian/Alaskan native	533	674	557	604	611	661
Science and engineering:						
Total	68.892	65.936	66.031	68.047	69.097	70,764
White, non-Hispanic	60.407	56.627	56.371	57.666	58.429	59,265
Asian	2.481	3.568	3.791	4.522	4.472	4,736
Black, non-Hispanic	3.695	3.189	3,265	3,206	3.603	3.872
Hispanic	2.052	2.237	2.308	2.349	2.330	2.594
American Indian/Alaskan Native	257	315	296	304	263	297
Men	42.180	38.897	38.383	38.745	38.706	38,630
White, non-Hispanic	37.311	33.446	32.650	32.832	32.866	32.466
Asian	1,813	2.598	2.734	3.124	2.965	3.165
Black, non-Hispanic	1.712	1.487	1.497	1.369	1.534	1.577
Hispanic	1.189	1.180	1.335	1.247	1,209	1,280
American Indian/Alaskan Native	155	186	167	173	132	142
Women	26.712	27.039	27.648	29.302	30.391	32.134
White, non-Hispanic	23.096	23.181	23.721	24.834	25,563	26.799
Asian	668	970	1.057	1,398	1.507	1.571
Black, non-Hispanic	1.983	1.702	1.768	1.837	2.069	2.295
Hispanic	863	1.057	973	1.102	1.121	1,314
American Indian/Alaskan Native	102	129	129	131	131	155

See explanatory information and SOURCE at end of table.

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

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Field, sex, and race/ethnicity	1981	1985	1987	1989	1990	1991
Science:						
Total	57.090	50,880	49.879	51.458	52.547	54,256
White, non-Hispanic	50.260	43.915	42.953	44,032	44,747	45,800
Asian	1.402	1.992	2.095	2,490	2,530	2,668
Black, non-Hispanic	3.435	2,822	2,820	2,796	3.172	3,427
Hispanic	1,767	1,885	1.779	1,871	1.875	2.107
American Indian/Alaskan Native	226	266	232	269	223	254
Men	31.523	25,775	24.625	24,772	24.850	24.787
White, non-Hispanic	28.134	22,377	21,251	21,327	21,337	21.105
Asian	839	1,201	1,238	1,389	1.368	1.441
Black, non-Hispanic	1.490	1,185	1.147	1.067	1,215	1.249
Hispanic	931	871	880	846	829	885
American Indian/Alaskan Native	129	141	109	143	101	107
Women	25.567	25,105	25.254	26.686	27.697	29.469
White, non-Hispanic	22,126	21,538	21.702	22.705	23,410	24.695
Asian	563	791	857	1,101	1.162	1,227
Black, non-Hispanic	1,945	1.637	1,673	1,729	1,957	2,178
Hispanic	836	1.014	899	1,025	1.046	1,222
American Indian/Alaskan Native	97	125	123	126	122	147
Physical sciences[1]:						
Total	4.457	4.583	4,271	4.232	3,829	3,562
White, non-Hispanic	4.115	4,133	3,834	3.766	3,401	3.129
Asian	153	213	227	278	234	251
Black, non-Hispanic	107	89	79	78	87	73
Hispanic	71	127	122	92	98	96
American Indian/Alaskan Native	11	21	9	18	9	13
Men	3.516	3.464	3.159	3,062	2.788	2,588
White, non-Hispanic	3.255	3.135	2.855	2,750	2.518	2.299
Asian	115	154	164	179	140	165
Black, non-Hispanic	79	61	45	56	61	43
Hispanic	58	95	88	65	63	73
American Indian/Alaskan Native	9	19	7	12	6	8
Women	941	1,119	1,112	1,170	1,041	974
White, non-Hispanic	860	998	979	1,016	883	830
Asian	38	59	63	99	94	86
Black, non-Hispanic	28	28	34	22	26	30
Hispanic	13	32	34	27	35	23
American Indian/Alaskan Native	2	2	2	6	3	5

See explanatory information and SOURCE at end of table.

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

Field, sex, and race/ethnicity	1981	1985	1987	1989	1990	1991
Mathematical sciences:						
Total	2,103	2,152	2,331	2,309	2,480	2,451
White, non-Hispanic	1,890	1,873	2,012	2,032	2,169	2,068
Asian	97	164	183	178	184	189
Black, non-Hispanic	67	53	73	59	70	100
Hispanic	42	55	60	34	51	85
American Indian/Alaskan Native	7	7	3	6	6	9
Men	1,346	1,347	1,384	1,348	1,455	1,389
White, non-Hispanic	1,212	1,170	1,187	1,173	1,275	1,169
Asian	64	108	110	117	106	108
Black, non-Hispanic	33	34	45	32	37	53
Hispanic	31	31	41	21	33	52
American Indian/Alaskan Native	6	4	1	5	4	7
Women	757	805	947	961	1,025	1,062
White, non-Hispanic	678	703	825	859	894	899
Asian	33	56	73	61	78	81
Black, non-Hispanic	34	19	28	27	33	47
Hispanic	11	24	19	13	18	33
American Indian/Alaskan Native	1	3	2	1	2	2
Computer sciences:						
Total	3,239	5,233	5,848	6,061	6,149	6,076
White, non-Hispanic	2,818	4,303	4,717	4,786	4,851	4,637
Asian	279	615	779	894	941	1,014
Black, non-Hispanic	70	180	207	198	232	283
Hispanic	60	94	123	144	118	128
American Indian/Alaskan Native	12	41	22	39	7	14
Men	2,465	3,667	3,987	4,250	4,321	4,131
White, non-Hispanic	2,153	3,052	3,229	3,430	3,474	3,260
Asian	205	414	522	565	609	627
Black, non-Hispanic	52	108	126	119	140	150
Hispanic	45	65	91	100	93	84
American Indian/Alaskan Native	10	28	19	36	5	10
Women	774	1,566	1,861	1,811	1,828	1,945
White, non-Hispanic	665	1,251	1,488	1,356	1,377	1,377
Asian	74	201	257	329	332	387
Black, non-Hispanic	18	72	81	79	92	133
Hispanic	15	29	32	44	25	44
American Indian/Alaskan Native	2	13	3	3	2	4

See explanatory information and SOURCE at end of table

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

Field, sex, and race/ethnicity	1981	1985	1987	1989	1990	1991
Agricultural sciences:						
Total	3,307	2,525	2,211	1,951	1,945	1,976
White, non-Hispanic	3,083	2,345	2,044	1,817	1,820	1,818
Asian	67	58	47	44	45	50
Black, non-Hispanic	73	50	55	36	28	51
Hispanic	77	66	62	48	44	49
American Indian/Alaskan Native	7	6	3	6	8	8
Men	2,465	1,743	1,435	1,262	1,210	1,229
White, non-Hispanic	2,298	1,613	1,320	1,174	1,138	1,134
Asian	50	42	27	24	24	27
Black, non-Hispanic	53	30	42	24	18	34
Hispanic	60	54	45	34	25	31
American Indian/Alaskan Native	4	4	1	6	5	3
Women	842	782	776	689	735	747
White, non-Hispanic	785	732	724	643	682	684
Asian	17	16	20	20	21	23
Black, non-Hispanic	20	20	13	12	10	17
Hispanic	17	12	17	14	19	18
American Indian/Alaskan Native	3	2	2	0	3	5
Biological sciences:						
Total	5,647	4,568	4,239	4,169	3,970	3,870
White, non-Hispanic	5,213	4,081	3,745	3,679	3,501	3,353
Asian	145	179	190	223	225	231
Black, non-Hispanic	171	151	167	124	110	137
Hispanic	103	139	126	126	120	136
American Indian/Alaskan Native	15	18	11	17	14	13
Men	3,433	2,349	2,154	2,064	1,928	1,849
White, non-Hispanic	3,226	2,126	1,932	1,830	1,711	1,629
Asian	62	86	85	105	97	104
Black, non-Hispanic	82	67	80	59	51	58
Hispanic	54	62	53	62	61	54
American Indian/Alaskan Native	9	8	4	8	8	4
Women	2,214	2,219	2,085	2,105	2,042	2,021
White, non-Hispanic	1,987	1,955	1,813	1,849	1,790	1,724
Asian	83	93	105	118	128	127
Black, non-Hispanic	89	84	87	65	59	79
Hispanic	49	77	73	64	59	82
American Indian/Alaskan Native	6	10	7	9	6	9

See explanatory information and SOURCE at end of table.

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

Field, sex, and race/ethnicity	1981	1985	1987	1989	1990	1991
Psychology:						
Total	7,769	8,156	7,493	7,994	8,525	9,037
White, non-Hispanic	7,019	7,220	6,698	7,075	7,489	7,973
Asian	77	129	113	131	159	170
Black, non-Hispanic	424	426	376	395	471	454
Hispanic	217	344	271	360	369	391
American Indian/Alaskan Native	32	37	35	33	37	49
Men	3,247	2,944	2,582	2,586	2,752	2,739
White, non-Hispanic	2,945	2,601	2,325	2,292	2,431	2,420
Asian	34	48	33	44	42	47
Black, non-Hispanic	164	146	116	120	133	129
Hispanic	91	133	96	118	133	124
American Indian/Alaskan Native	13	16	12	12	13	19
Women	4,522	5,212	4,911	5,408	5,773	6,298
White, non-Hispanic	4,074	4,619	4,373	4,783	5,058	5,553
Asian	43	81	80	87	117	123
Black, non-Hispanic	260	280	260	275	338	325
Hispanic	126	211	175	242	236	267
American Indian/Alaskan Native	19	21	23	21	24	30
Social sciences:						
Total	30,568	23,663	23,486	24,742	25,649	27,284
White, non-Hispanic	26,122	19,960	19,903	20,877	21,516	22,822
Asian	584	634	556	742	742	763
Black, non-Hispanic	2,523	1,873	1,863	1,906	2,174	2,329
Hispanic	1,197	1,060	1,015	1,067	1,075	1,222
American Indian/Alaskan Native	142	136	149	150	142	148
Men	15,051	10,261	9,924	10,200	10,396	10,862
White, non-Hispanic	13,045	8,680	8,403	8,678	8,790	9,194
Asian	309	349	297	355	350	363
Black, non-Hispanic	1,027	739	693	657	775	782
Hispanic	592	431	466	446	421	467
American Indian/Alaskan Native	78	62	65	64	60	56
Women	15,517	13,402	13,562	14,542	15,253	16,422
White, non-Hispanic	13,077	11,280	11,500	12,199	12,726	13,628
Asian	275	285	259	387	392	400
Black, non-Hispanic	1,496	1,134	1,170	1,249	1,399	1,547
Hispanic	605	629	549	621	654	755
American Indian/Alaskan Native	64	74	84	86	82	92

See explanatory information and SOURCE at end of table.

Appendix table 7-12. Master's degrees awarded to U.S. citizens and permanent residents, by field, sex, and race/ethnicity: 1981–1991, selected years

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Field. sex. and race/ethnicity	1981	1985	1987	1989	1990	1991
Engineering[3]:						
Total	11.802	15.056	16.152	16.589	16.550	16 508
White. non-Hispanic	10.147	12.712	13.418	13.634	13.682	13 465
Asian	1.079	1.576	1.696	2.032	1.942	2.068
Black. non-Hispanic	260	367	445	410	431	445
Hispanic	285	352	529	478	455	487
American Indian/Alaskan Native	31	49	64	35	40	43
Men	10.657	13.122	13.758	13.973	13.856	13 843
White. non-Hispanic	9.177	11 069	11.399	11.505	11.529	11 361
Asian	974	1.397	1.496	1.735	1.597	1 724
Black. non-Hispanic	222	302	350	302	319	328
Hispanic	258	309	455	401	380	395
American Indian/Alaskan Native	26	45	58	30	31	35
Women	1.145	1.934	2.394	2.616	2.694	2.665
White. non-Hispanic	970	1.643	2.019	2.129	2.153	2 104
Asian	105	179	200	297	345	344
Black. non-Hispanic	38	65	95	108	112	117
Hispanic	27	43	74	77	75	92
American Indian/Alaskan Native	5	4	6	5	9	8
All other fields:						
Total	204.292	188.465	180.908	195.119	201.789	214.496
White. non-Hispanic	180.848	167.022	160.436	172.656	178.445	188.259
Asian	3.823	4.237	4.338	5.652	5.522	6.334
Black. non-Hispanic	13.457	10.771	9.908	10.249	10.870	11.985
Hispanic	5.387	5.493	5.473	5.784	6.165	7.090
American Indian/Alaskan Native	777	942	753	778	787	828
Men	87.286	81.158	75.552	80.253	82.360	85.714
White. non-Hispanic	78.261	72.621	67.409	71.210	73.209	75 451
Asian	1.967	2.254	2.244	2.793	2.705	3 055
Black. non-Hispanic	4.449	3.724	3.388	3.595	3.635	4 042
Hispanic	2.263	2.162	2.186	2.350	2.504	2.844
American Indian/Alaskan Native	346	397	325	305	307	322
Women	117.006	107.307	105.356	114.866	119.429	128 782
White. non-Hispanic	102.587	94.401	93.027	101.446	105.236	112.808
Asian	1.856	1.983	2.094	2.859	2.817	3 279
Black. non-Hispanic	9.008	7.047	6.520	6.654	7.235	7.943
Hispanic	3.124	3.331	3.287	3.434	3 661	4 246
American Indian/Alaskan Native	431	545	428	473	480	506

[1] Includes earth. atmospheric. and ocean sciences

[2] Data for the social sciences included "Afro-American black culture studies" and "American Indian studies" in 1981

[3] Includes engineering technology in all years.

NOTE. Because racial/ethnic data were collected by the Department of Education for broad fields of study only. the category of science and engineering in this table includes fields not normally included by the National Science Foundation (NSF) There are two fields where this difference has a large impact social sciences (the Department of Education includes history and some other fields excluded by NSF) and engineering (the Department of Education included engineering technologies in this broad category before 1987)

SOURCE U S Department of Education NCES IPEDS Completions Survey

Appendix table 7-13. Master's degrees in science and engineering awarded to minorities, by State/territory and race/ethnicity: 1981 and 1991

State territory and rank		Total minority recipients		Black non-Hispanic		American Indian		Asian		Hispanic	
		1981	1991	1981	1991	1981	1991	1981	1991	1981	1991
United States total		8,485	11 370	3,695	3 825	257	294	2 481	4 676	2,052	2 575
Alabama	21	143	147	113	102	3	2	12	33	15	10
Alaska	48	2	10	1	0	0	1	1	9	0	0
American Samoa	55	0	0	0	0	0	0	0	0	0	0
Arizona	28	89	102	12	15	7	13	27	31	43	43
Arkansas	38	48	27	33	18	6	1	6	6	3	2
California	1	1 318	1 820	329	339	53	52	585	1 041	351	388
Colorado	26	71	111	21	28	8	10	19	45	23	28
Connecticut	27	66	109	43	35	1	1	9	54	13	19
Delaware	44	4	22	0	15	1	0	2	7	1	0
District of Columbia	13	320	297	197	169	3	2	87	82	33	44
Florida	8	274	386	133	116	7	3	34	91	100	176
Georgia	14	214	279	177	182	0	1	23	68	14	28
Guam	54	7	1	0	0	0	0	7	1	0	0
Hawaii	20	150	159	2	6	0	1	145	149	3	3
Idaho	50	5	5	1	1	1	1	3	3	0	0
Illinois	4	615	659	280	195	7	9	235	359	93	96
Indiana	23	73	130	37	45	1	5	18	57	17	23
Iowa	35	42	42	23	18	1	0	9	16	9	8
Kansas	32	38	52	18	12	3	7	6	17	11	16
Kentucky	31	74	83	55	41	6	5	7	27	6	10
Louisiana	17	78	185	55	131	2	2	2	35	19	17
Maine	52	2	2	0	0	0	1	1	1	1	0
Maryland	12	140	313	105	173	4	3	21	105	10	32
Massachusetts	6	272	426	91	103	4	11	106	201	71	111
Michigan	11	327	366	205	183	9	6	77	125	36	52
Minnesota	36	30	42	11	10	2	5	13	14	4	13
Mississippi	25	64	119	50	72	0	0	12	45	2	2
Missouri	15	172	224	112	126	7	2	32	59	21	37
Montana	49	5	6	1	0	4	3	0	1	0	2
Nebraska	45	45	19	16	5	1	0	24	11	4	3
Nevada	40	5	26	3	4	0	4	2	13	0	5
New Hampshire	39	9	27	5	12	0	0	2	10	2	5
New Jersey	7	281	402	115	86	4	2	112	251	50	63
New Mexico	29	122	90	4	4	7	5	37	11	74	70
New York	2	1 198	1 576	531	545	27	22	300	633	340	376
North Carolina	18	111	177	83	107	0	5	19	46	9	19
North Dakota	47	4	15	0	1	2	2	2	11	0	1
Ohio	10	220	368	124	149	17	11	53	141	26	67
Oklahoma	22	57	137	22	62	9	28	16	25	10	22
Oregon	33	47	52	9	2	10	9	21	34	7	7
Pennsylvania	5	344	516	210	227	10	9	89	230	35	50
Puerto Rico	9	360	377	0	0	0	0	0	0	360	377
Rhode Island	41	17	25	10	9	1	0	4	11	2	5
South Carolina	34	39	50	22	36	0	1	13	8	4	5
South Dakota	37	2	35	2	1	0	4	0	29	0	1
Tennessee	19	146	167	107	85	2	1	33	59	4	12
Texas	3	516	674	154	160	12	13	157	259	193	242
Utah	43	10	24	2	1	2	7	4	12	2	4
Vermont	46	24	19	20	3	0	4	2	5	2	7
Virgin Islands	51	1	5	1	5	0	0	0	0	0	0
Virginia	16	115	217	90	127	1	6	14	68	4	16
Washington	24	83	130	24	21	7	8	40	70	12	31
West Virginia	42	7	25	2	7	0	1	5	8	0	9
Wisconsin	30	79	86	28	30	5	5	33	34	13	17
Wyoming	53	0	2	0	1	0	0	0	0	0	1

* Ranked on the [illegible] minority science and engineering master's degree recipients in 1991

NOTE Because racial/ethnic data were collected by the Department of Education for broad fields of study only the category of science and engineering in this table includes fields not normally included by the National Science Foundation (NSF) There are two fields where this difference has a large impact social sciences (the Department of Education includes history and some other fields excluded by NSF) and engineering (the Department of Education included engineering technologies in this broad category before 1987)

SOURCE U S Department of Education/NCES IPEDS Completions Survey

Appendix table 7-14. Top 50 institutions awarding master's degrees in science and engineering (S&E) to blacks: 1991

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	Academic institution	Total S&E	Science	Engineering
	Total, all institutions	3,825	3,427	398
1	Howard University (H)	108	97	11
2	Webster University	77	77	0
3	Columbia University, main campus	74	68	6
4	Clark Atlanta University (H)	65	65	0
5	University of Michigan at Ann Arbor	63	54	9
6	Lincoln University (H)	61	61	0
7	Golden Gate University	52	52	0
8	University of Oklahoma, Norman Campus	50	49	1
9	Wayne State University	48	42	6
10	Johns Hopkins University	46	42	4
	Subtotal, first 10 institutions	644	607	37
11	Fordham University	46	46	0
12	CUNY Hunter College	43	43	0
13	University of Maryland, Baltimore Professional Schs	42	42	0
14	Temple University	39	39	0
15	University of Illinois at Chicago	36	33	3
16	University of Chicago	35	35	0
17	New School For Social Research	35	35	0
18	Bowie State University (H)	35	35	0
19	Ohio State University, main campus	34	31	3
20	Georgia Institute of Technology, main campus	34	8	26
	Subtotal, first 20 institutions	1,023	954	69
21	University of California-Berkeley	33	23	10
22	Spertus College Judaica	33	33	0
23	North Carolina Agricultural and Technical St Univ (H)	33	14	19
24	Texas Southern University (H)	32	32	0
25	Long Island University, Brooklyn Campus	31	31	0
26	Case Western Reserve University	31	27	4
27	Southern University at New Orleans (H)	30	30	0
28	Norfolk State University (H)	30	30	0
29	CUNY City College	30	26	4
30	University of Pittsburgh, main campus	29	28	1
	Subtotal, first 30 institutions	1,335	1,228	107
31	Rutgers, the State University at New Brunswick	29	27	2
32	California State University-Dominguez Hills	29	29	0
33	Grambling State University (H)	28	28	0
34	University of South Carolina at Columbia	27	27	0
35	New York University	27	27	0
36	Harvard University	27	27	0
37	Georgia State University	27	27	0
38	Virginia Commonwealth University	26	26	0
39	Southern University and A & M Col at Baton Rouge (H)	26	26	0
40	Alabama State University (H)	25	25	0
	Subtotal, first 40 institutions	1,606	1,497	109
41	University of Tennessee at Knoxville	25	21	4
42	SUNY at Stony Brook, all campuses	25	25	0
43	National University	25	25	0
44	Jackson State University (H)	25	25	0
45	Syracuse University, main campus	24	17	7
46	Stanford University	24	8	16
47	CUNY John Jay College of Criminal Justice	24	24	0
48	North Carolina Central University (H)	23	23	0
49	California State University-Long Beach	22	20	2
50	University of Pennsylvania	21	14	7
	Total, first 50 institutions	1,844	1,699	145

KEY H = Historically Black College or University

SOURCE U S Department of Education/NCES IPEDS Completions Survey

Appendix table 7-15. Top 50 institutions awarding master's degrees in science and engineering (S&E) to Hispanics: 1991

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	Academic institution	Total, S&E	Science	Engineering
	Total, all institutions	2 575	2 107	468
1	University of Puerto Rico, Rio Piedras Campus	201	201	0
2	University of Puerto Rico, Mayaguez	68	45	23
3	Center For Adv Stud On Puerto Rico and Caribbean (A)	55	55	0
4	Columbia University, main campus	54	45	9
5	Fordham University	45	45	0
6	Florida International University	40	34	6
7	New York University	39	39	0
8	CUNY Hunter College	38	38	0
9	Harvard University	38	38	0
10	University of Texas at Austin	38	31	7
	Subtotal, first 10 institutions	616	571	45
11	Stanford University	36	16	20
12	Inter American Univ of Puerto Rico, Metro Campus	34	34	0
13	University of New Mexico, all campuses	33	18	15
14	University of California-Berkeley	30	16	14
15	Texas A & M University, main campus	29	10	19
16	Arizona State University	28	20	8
17	University of Miami	28	23	5
18	Our Lady of the Lake University of San Antonio (A)	27	27	0
19	University of California-Los Angeles	26	25	1
20	University of Michigan at Ann Arbor	26	18	8
	Subtotal, first 20 institutions	913	778	135
21	University of Illinois at Chicago	25	19	6
22	University of Texas at El Paso (A)	25	15	10
23	New Mexico State University, all campuses (A)	24	13	11
24	Nova University	24	24	0
25	Webster University	23	23	0
26	George Washington University	22	14	8
27	National University	22	22	0
28	University of Washington	22	18	4
29	California State University-Long Beach	21	17	4
30	Case Western Reserve University	21	3	18
	Subtotal, first 30 institutions	1,142	946	196
31	Rutgers, the State University at New Brunswick	19	18	1
32	Barry University (A)	18	18	0
33	San Francisco State University	18	18	0
34	Springfield College	18	18	0
35	Georgia Institute of Technology, main campus	17	4	13
36	Ohio State University, main campus	17	12	5
37	University of Florida	17	13	4
38	California State University-Fresno	16	16	0
39	Adelphi University	15	15	0
40	University of Texas at Arlington	15	13	2
	Subtotal, first 40 institutions	1 312	1,091	221
41	American University	14	14	0
42	California State University-Sacramento	14	13	1
43	CUNY City College	14	13	1
44	Johns Hopkins University	14	5	9
45	Polytechnic University	14	4	10
46	SUNY at Stony Brook, all campuses	14	13	1
47	University of Arizona	14	12	2
48	University of Chicago	14	14	0
49	University of Illinois at Urbana-Champaign	14	7	7
50	California State University-Northridge	13	7	6
	Total, first 50 institutions	1,451	1,193	258

KEY A = member of the Hispanic Association of Colleges and Universities

SOURCE U S Department of Education/NCES IPEDS Completions Survey

Appendix table 7-16. Top 50 institutions awarding master's degrees in science and engineering (S&E) to Asians: 1991

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	Academic institution	Total, S&E	Science	Engineering
	Total, all institutions	4,676	2,668	2,008
1	University of Hawaii at Manoa	145	108	37
2	Columbia University, main campus	118	85	33
3	Stanford University	110	22	88
4	New Jersey Institute of Technology	93	43	50
5	University of California-Berkeley	90	34	56
6	Golden Gate University	81	81	0
7	Santa Clara University	80	1	73
8	University of California-Los Angeles	79	51	28
9	De Paul University	77	77	0
10	University of Houston-University Park	76	39	37
	Subtotal, first 10 institutions	949	541	408
11	Polytechnic University	70	18	52
12	California State University-Long Beach	58	29	29
13	Johns Hopkins University	58	32	26
14	Illinois Institute of Technology	57	30	27
15	University of Illinois at Urbana-Champaign	57	33	24
16	Case Western Reserve University	53	7	46
17	San Jose State University	52	16	36
18	Northrop University	51	21	30
19	CUNY City College	50	24	26
20	Massachusetts Institute of Technology	48	1	47
	Subtotal, first 20 institutions	1,503	752	751
21	Monmouth College	47	19	28
22	New York University	47	47	0
23	University of Washington	47	20	27
24	Georgia Institute of Technology, main campus	45	4	41
25	University of Michigan at Ann Arbor	42	16	26
26	Boston University	41	25	16
27	California State University-Fullerton	41	21	20
28	Temple University	41	38	3
29	Florida Institute of Technology	40	16	24
30	Texas A & M University, main campus	40	8	32
	Subtotal, first 30 institutions	1,934	966	968
31	Cornell University, all campuses	38	11	27
32	Stevens Institute of Technology	37	22	15
33	University of Chicago	35	35	0
34	University of Illinois at Chicago	35	10	25
35	Syracuse University, main campus	33	8	25
36	Carnegie Mellon University	32	10	22
37	Purdue University, main campus	32	6	26
38	University of California-San Diego	31	20	11
39	University of California-Santa Barbara	31	16	15
40	California State University-Los Angeles	30	9	21
	Subtotal, first 40 institutions	2,268	1,113	1,155
41	Memphis State University	30	14	16
42	University of California-Davis	30	17	13
43	George Mason University	29	19	10
44	Harvard University	29	26	3
45	Rutgers, the State University at New Brunswick	29	15	14
46	South Dakota School of Mines & Technology	29	12	17
47	National University	28	28	0
48	University of Pennsylvania	27	19	8
49	University of Texas at Arlington	27	3	24
50	University of Texas at Austin	27	13	14
	Total, first 50 institutions	2,553	1,279	1,274

SOURCE: U.S. Department of Education/NCES, IPEDS Completions Survey

Appendix table 7-17. Top 50 institutions awarding master's degrees in science and engineering(S&E) to American Indians/Alaskan Natives: 1991

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	Academic institution	Total. S&E	Science	Engineering
	Total. all institutions	294	254	40
1	Arizona State University	8	6	2
2	Southeastern Oklahoma State University	8	8	0
3	Stanford University	8	4	4
4	Portland State University	7	7	0
5	University of California-Berkeley	7	6	1
6	Oklahoma State University. all campuses	5	5	0
7	University of California-Los Angeles	5	5	0
8	University of Colorado at Boulder	5	1	4
9	University of Louisville	5	4	1
10	University of Oklahoma. Norman Campus	5	4	1
	Subtotal. first 10 institutions	63	50	13
11	Carnegie Mellon University	4	2	2
12	Cleveland State University	4	4	0
13	Purdue University. main campus	4	1	3
14	San Diego State University	4	4	0
15	University of Arizona	4	3	1
16	University of Houston-University Park	4	4	0
17	University of Oklahoma Health Science Center	4	4	0
18	Utah State University	4	4	0
19	Colorado State University	3	2	1
20	Columbia University. main campus	3	3	0
	Subtotal. first 20 institutions	101	81	20
21	Montana State University	3	3	0
22	Pace University-White Plains	3	3	0
23	Pepperdine University	3	3	0
24	SUNY at Buffalo. main campus	3	2	1
25	University of Kansas. main campus	3	3	0
26	University of Minnesota at Twin Cities	3	3	0
27	University of Nevada-Reno	3	3	0
28	University of North Carolina at Chapel Hill	3	3	0
29	University of South Dakota	3	3	0
30	University of Utah	3	3	0
	Subtotal. first 30 institutions	131	110	21
31	University of Washington	3	3	0
32	California State University-Long Beach	2	2	0
33	Case Western Reserve University	2	2	0
34	Central State University	2	2	0
35	Central Washington University	2	2	0
36	Cornell University. all campuses	2	1	1
37	Florida State University	2	2	0
38	George Mason University	2	1	1
39	Goddard College	2	2	0
40	Harvard University	2	2	0
	Subtotal. first 40 institutions	152	129	23
41	New Mexico Highlands University	2	2	0
42	New Mexico State University. all campuses	2	2	0
43	North Dakota State University. all campuses	2	1	1
44	Northeastern State University	2	2	0
45	Northern Illinois University	2	2	0
46	Norwich University. main campus	2	2	0
47	Oregon State University	2	1	1
48	SUNY at Stony Brook. all campuses	2	2	0
49	Texas A & M University-Kingsville	2	0	2
50	Tufts University	2	2	0
	Total. first 50 institutions	172	145	27

SOURCE U S Department of Education/NCES IPEDS Completions Survey

Appendix table 7-18. Master's degrees in science and engineering (S&E) awarded to blacks, by State/territory and field: 1991

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State territory	Total all fields	Total S&E	Sciences: Total	Physical	Mathematical	Computer	Agricultural	Biological	Psychology	Social	Total engineering	Total all other fields
United States total	15 857	3 825	3,427	73	100	283	51	137	454	2 329	398	12 032
Alabama	501	102	88	4	4	6	6	5	23	40	14	399
Alaska	5	0	0	0	0	0	0	0	0	0	0	5
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	257	15	12	1	0	0	0	0	0	11	3	242
Arkansas	119	18	17	1	2	0	0	1	1	12	1	101
California	1 213	339	288	5	8	21	1	10	68	175	51	874
Colorado	79	28	24	1	1	11	0	0	1	10	4	51
Connecticut	149	35	32	0	0	3	0	1	3	25	3	114
Delaware	66	15	14	1	0	0	0	0	0	13	1	51
District of Columbia	559	169	145	5	1	32	0	9	9	89	24	390
Florida	697	116	105	2	2	12	7	2	16	64	11	581
Georgia	669	182	154	5	9	15	1	2	6	116	28	487
Guam	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	13	6	6	0	0	2	1	0	1	2	0	7
Idaho	2	1	0	0	0	0	0	0	0	0	1	1
Illinois	1.098	195	184	3	2	13	0	4	14	148	11	903
Indiana	245	45	39	2	1	1	0	1	6	28	6	200
Iowa	62	18	17	1	0	0	0	1	2	13	1	44
Kansas	64	12	12	0	0	1	0	0	0	11	0	52
Kentucky	104	41	41	1	0	0	0	1	8	31	0	63
Louisiana	480	131	129	1	5	9	0	2	16	96	2	349
Maine	0	0	0	0	0	0	0	0	0	0	0	0
Maryland	535	173	164	4	3	35	1	2	36	83	9	362
Massachusetts	459	103	94	0	1	1	0	2	6	84	9	356
Michigan	1.005	183	158	3	2	3	0	8	16	126	25	822
Minnesota	49	10	9	0	1	2	0	0	0	6	1	39
Mississippi	363	72	70	0	2	7	10	9	11	31	2	291
Missouri	525	126	125	1	0	3	0	1	78	42	1	399
Montana	1	0	0	0	0	0	0	0	0	0	0	1
Nebraska	17	5	5	1	2	0	0	0	0	2	0	12
Nevada	13	4	4	0	0	0	0	0	0	4	0	9
New Hampshire	31	12	12	0	0	1	0	0	0	11	0	19
New Jersey	253	86	75	1	1	16	1	5	7	44	11	167
New Mexico	28	4	4	0	0	0	0	0	0	4	0	24
New York	1 864	545	495	5	20	39	0	15	33	383	50	1 319
North Carolina	529	107	82	4	5	1	4	14	8	46	25	422
North Dakota	3	1	1	0	0	1	0	0	0	0	0	2
Ohio	568	149	125	3	3	10	1	8	15	85	24	419
Oklahoma	180	62	60	0	1	1	0	0	5	53	2	118
Oregon	17	2	2	0	0	0	0	0	1	1	0	15
Pennsylvania	605	227	203	1	5	10	2	1	9	175	24	378
Puerto Rico	0	0	0	0	0	0	0	0	0	0	0	0
Rhode Island	27	9	8	0	0	0	1	0	0	7	1	18
South Carolina	305	36	33	0	3	0	0	5	1	24	3	269
South Dakota	9	1	1	0	0	0	0	0	0	1	0	8
Tennessee	360	85	76	5	5	2	9	11	9	35	9	275
Texas	936	160	141	4	5	7	5	12	21	87	19	776
Trust Territory	0	0	0	0	0	0	0	0	0	0	0	0
Utah	6	1	1	0	0	1	0	0	0	0	0	5
Vermont	14	3	3	0	0	0	0	0	1	2	0	11
Virgin Islands	31	5	5	0	0	0	0	0	0	5	0	26
Virginia	556	127	109	8	4	15	1	3	19	59	18	429
Washington	62	21	19	0	0	2	0	0	2	15	2	41
West Virginia	27	7	7	0	0	0	0	1	1	5	0	20
Wisconsin	92	30	28	0	2	0	0	1	1	24	2	62
Wyoming	1	1	1	0	0	0	0	0	0	1	0	0
Unidentified State	4	0	0	0	0	0	0	0	0	0	0	4

SOURCE: U.S. Department of Education NCES IPEDS Completions Survey

Appendix table 7-19. Master's degrees in science and engineering (S&E) awarded to Hispanics, by State/territory and field: 1991

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State territory	Total all fields	Total S&E	Sciences: Total	Sciences: Physical	Sciences: Mathematical	Sciences: Computer	Sciences: Agricultural	Sciences: Biological	Sciences: Psychology	Sciences: Social	Total, engineering	Total, all other fields
United States total	9,684	2 575	2 107	96	85	128	49	136	391	1 222	468	7,109
Alabama	42	10	9	1	0	1	0	0	2	5	1	32
Alaska	3	0	0	0	0	0	0	0	0	0	0	3
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	444	43	33	2	2	1	1	4	3	20	10	401
Arkansas	7	2	1	0	0	1	0	0	0	0	1	5
California	1 570	388	323	15	14	16	8	14	93	163	65	1,182
Colorado	133	28	20	1	2	2	0	2	5	8	8	105
Connecticut	76	19	14	0	0	0	1	0	2	11	5	57
Delaware	5	0	0	0	0	0	0	0	0	0	0	5
District of Columbia	118	44	36	2	0	5	0	1	2	26	8	74
Florida	737	176	142	8	3	22	7	2	37	63	34	561
Georgia	65	28	15	2	1	[illegible]	0	0	5	4	13	37
Guam	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	14	3	3	1	0	0	0	0	1	1	0	11
Idaho	12	0	0	0	0	0	0	0	0	0	0	12
Illinois	373	96	80	0	1	9	0	5	17	48	16	277
Indiana	67	23	14	2	1	0	0	0	2	9	9	44
Iowa	33	8	8	0	0	0	0	3	1	4	0	25
Kansas	49	16	10	1	0	0	0	0	1	8	6	33
Kentucky	26	10	10	1	0	1	0	0	0	8	0	16
Louisiana	56	17	15	3	0	1	0	2	1	8	2	39
Maine	0	0	0	0	0	0	0	0	0	0	0	0
Maryland	71	32	17	1	0	3	0	0	3	10	15	39
Massachusetts	395	111	93	6	4	4	0	1	8	70	18	284
Michigan	180	52	40	2	1	2	0	3	4	28	12	128
Minnesota	35	13	11	0	0	0	1	2	3	5	2	22
Mississippi	8	2	2	0	0	2	0	0	0	0	0	6
Missouri	135	37	31	0	0	0	1	2	22	6	6	98
Montana	3	2	1	1	0	0	0	0	0	0	1	1
Nebraska	10	3	3	0	0	0	0	0	0	3	0	7
Nevada	15	5	4	0	0	0	1	0	0	3	1	10
New Hampshire	36	5	4	0	0	0	0	0	1	3	1	31
New Jersey	179	63	42	1	2	8	1	9	2	19	21	116
New Mexico	275	70	44	3	2	2	3	3	3	28	26	205
New York	1,307	376	335	9	12	26	2	13	34	239	41	931
North Carolina	46	19	14	0	1	0	1	1	2	9	5	27
North Dakota	5	1	1	0	0	0	0	0	0	1	0	4
Ohio	147	67	35	5	1	2	0	2	13	12	32	80
Oklahoma	43	22	19	2	0	1	1	1	5	9	3	21
Oregon	24	7	7	0	0	0	0	2	1	4	0	17
Pennsylvania	146	50	42	2	1	2	2	1	3	31	8	96
Puerto Rico	1 223	377	354	16	17	0	11	39	77	194	23	846
Rhode Island	12	5	5	0	2	0	0	0	0	3	0	7
South Carolina	27	5	4	1	0	0	0	0	1	2	1	22
South Dakota	3	1	0	0	0	0	0	0	0	0	1	2
Tennessee	32	12	6	0	0	0	0	0	3	3	6	20
Texas	1 239	242	188	5	7	12	3	21	28	112	54	997
Utah	19	4	3	0	0	0	0	0	0	3	1	15
Vermont	11	7	7	0	0	0	0	0	2	5	0	4
Virgin Islands	1	0	0	0	0	0	0	0	0	0	0	1
Virginia	54	16	11	1	0	2	0	0	2	6	5	38
Washington	77	31	27	1	0	0	3	2	1	20	4	46
West Virginia	21	9	4	0	9	0	0	0	0	0	0	12
Wisconsin	72	17	14	1	2	0	2	1	1	7	3	55
Wyoming	2	1	1	0	0	0	0	0	0	1	0	1
Unknown State	1	0	0	0	0	0	0	0	0	0	0	1

SOURCE U.S. Department of Education NCES IPEDS Completions Survey

Appendix table 7-20. Master's degrees in science and engineering (S&E) awarded to Asians, by State/territory and field: 1991

State/territory	Total all fields	Total S&E	Sciences: Total	Physical	Mathematical	Computer	Agricultural	Biological	Psychology	Social	Total engineering	Total all other fields
United States total	11 070	4 676	2 668	251	189	1 014	50	231	170	763	2 008	6 394
Alabama	55	33	17	3	1	6	1	2	2	2	16	22
Alaska	10	9	5	1	0	1	1	0	0	2	4	1
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	193	31	15	3	1	8	0	1	0	2	16	162
Arkansas	15	6	4	1	0	1	0	1	1	0	2	9
California	2 760	1 041	543	49	35	170	6	33	49	201	498	1 719
Colorado	87	45	29	2	4	11	3	2	2	5	16	42
Connecticut	151	54	39	2	4	10	0	6	2	15	15	97
Delaware	12	7	6	0	0	2	0	0	1	3	1	5
District of Columbia	234	82	62	3	0	18	0	13	3	25	20	152
Florida	224	91	40	4	2	24	1	0	4	5	51	133
Georgia	115	68	27	7	2	8	0	2	1	7	41	47
Guam	10	1	1	0	0	0	0	0	0	1	0	9
Hawaii	534	149	112	10	1	11	11	21	8	50	37	385
Idaho	8	3	3	0	0	0	1	0	0	2	0	5
Illinois	743	359	266	23	18	127	1	33	9	55	93	384
Indiana	132	57	29	4	2	8	0	5	3	7	28	75
Iowa	35	16	9	1	4	1	1	0	0	2	7	19
Kansas	45	17	8	1	0	0	0	0	1	6	9	28
Kentucky	54	27	14	2	2	3	2	1	2	2	13	27
Louisiana	73	35	19	1	3	9	0	1	2	3	16	38
Maine	2	1	1	0	1	0	0	0	0	0	0	1
Maryland	196	105	64	2	2	39	0	3	6	12	41	91
Massachusetts	455	201	103	6	4	34	2	7	7	43	98	254
Michigan	300	125	72	8	1	30	2	6	6	19	53	175
Minnesota	59	14	11	0	0	4	0	1	1	5	3	45
Mississippi	94	45	25	6	0	11	5	0	2	1	20	49
Missouri	202	59	29	4	5	8	0	2	5	5	30	143
Montana	1	1	1	0	0	0	1	0	0	0	0	0
Nebraska	28	11	10	0	2	2	0	1	0	5	1	17
Nevada	19	13	6	3	1	0	0	0	1	1	7	6
New Hampshire	41	10	9	2	0	7	0	0	0	0	1	31
New Jersey	360	251	132	8	1	88	2	15	2	16	119	109
New Mexico	22	11	4	0	0	1	0	0	0	3	7	11
New York	1 461	633	407	14	18	196	1	29	20	129	226	828
North Carolina	90	46	27	9	4	1	3	6	0	4	19	44
North Dakota	16	11	1	0	0	0	0	1	0	0	10	5
Ohio	299	141	60	10	9	17	2	2	7	13	81	158
Oklahoma	60	25	14	2	1	3	0	0	2	6	11	35
Oregon	91	34	20	3	0	4	0	0	3	10	14	57
Pennsylvania	481	230	128	13	22	52	0	7	6	28	102	251
Puerto Rico	0	0	0	0	0	0	0	0	0	0	0	0
Rhode Island	50	11	8	1	1	4	0	1	0	1	3	39
South Carolina	31	8	5	0	1	2	0	0	0	2	3	23
South Dakota	34	29	12	6	0	6	0	0	0	0	17	5
Tennessee	141	69	32	6	14	1	2	4	0	5	37	72
Texas	601	259	114	17	13	52	1	13	1	17	145	342
Utah	24	12	7	0	1	2	0	0	1	3	5	12
Vermont	15	5	5	0	1	0	0	0	0	4	0	10
Virgin Islands	1	0	0	0	0	0	0	0	0	0	0	1
Virginia	123	68	41	7	5	14	0	2	5	8	27	55
Washington	171	70	40	1	2	6	0	8	4	19	30	101
West Virginia	13	8	5	0	0	5	0	0	0	0	3	5
Wisconsin	[illegible]	14	[illegible]	5	1	2	1	2	1	[illegible]	12	[illegible]
Wyoming	0	0	0	[illegible]	0	0	0	0	0	0	0	0
Unknown State	6	5	5	0	0	5	0	0	0		0	1

SOURCE: Department of Education, IPEDS Completions Survey

Appendix table 7-21. Master's degrees in science and engineering (S&E) awarded to American Indians/Alaskan Natives, by State/territory and field: 1991

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State territory	Total all fields	Total S&E	Sciences: Total	Physical	Mathematical	Computer	Agricultural	Biological	Psychology	Social	Total engineering	Total, all other fields
United States total	1 125	294	254	13	9	14	8	13	49	148	40	831
Alabama	6	2	2	0	0	1	0	0	0	1	0	4
Alaska	6	1	1	0	0	0	0	0	0	1	0	5
American Samoa	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	75	13	10	0	0	0	0	0	0	10	3	62
Arkansas	7	1	1	0	0	0	0	0	0	1	0	6
California	195	52	43	3	1	3	1	2	9	24	9	143
Colorado	26	10	5	0	0	0	1	1	1	2	5	16
Connecticut	5	1	1	0	0	0	0	0	0	1	0	4
Delaware	1	0	0	0	0	0	0	0	0	0	0	1
District of Columbia	11	2	2	0	0	0	0	0	1	1	0	9
Florida	17	3	3	0	0	1	0	0	0	2	0	14
Georgia	6	1	1	0	0	0	0	0	0	1	0	5
Guam	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	9	1	1	0	0	0	0	0	0	1	0	8
Idaho	1	1	1	0	0	0	0	0	0	1	0	0
Illinois	36	9	9	1	0	1	0	1	0	6	0	27
Indiana	16	5	2	0	1	0	0	0	1	0	3	11
Iowa	6	0	0	0	0	0	0	0	0	0	0	6
Kansas	19	7	7	1	0	0	1	0	3	2	0	12
Kentucky	9	5	4	0	0	0	0	0	1	3	1	4
Louisiana	10	2	2	0	0	0	0	0	1	1	0	8
Maine	1	1	1	0	0	0	0	0	0	1	0	0
Maryland	8	3	3	0	0	1	0	0	0	2	0	5
Massachusetts	30	11	8	1	0	0	0	0	1	6	3	19
Michigan	38	6	5	0	1	0	0	0	0	4	1	32
Minnesota	15	5	5	0	0	1	0	1	1	2	0	10
Mississippi	2	0	0	0	0	0	0	0	0	0	0	2
Missouri	17	2	2	1	0	0	0	0	0	1	0	15
Montana	10	3	3	0	0	0	0	0	0	3	0	7
Nebraska	1	0	0	0	0	0	0	0	0	0	0	1
Nevada	6	4	4	0	0	0	0	0	1	3	0	2
New Hampshire	4	0	0	0	0	0	0	0	0	0	0	4
New Jersey	11	2	2	0	0	1	0	1	0	0	0	9
New Mexico	50	5	5	1	0	0	1	0	0	3	0	45
New York	85	22	18	0	1	1	0	2	2	12	4	63
North Carolina	21	5	5	0	0	1	0	1	1	2	0	16
North Dakota	5	2	1	0	0	0	0	1	0	0	1	3
Ohio	40	11	11	2	0	2	0	1	1	5	0	29
Oklahoma	121	28	27	1	0	0	1	1	12	12	1	93
Oregon	[illegible]	[illegible]	8	1	1	0	1	0	0	5	1	11
Pennsylvania	25	9	6	0	0	0	0	0	2	4	3	16
Puerto Rico	0	0	0	0	0	0	0	0	0	0	0	0
Rhode Island	5	0	0	0	0	0	0	0	0	0	0	5
South Carolina	6	1	1	1	0	0	0	0	0	0	0	5
South Dakota	13	4	3	0	0	0	0	0	0	3	1	9
Tennessee	4	1	1	0	0	0	0	0	0	1	0	3
Texas	45	13	11	0	2	0	1	0	1	7	2	32
Utah	8	7	7	0	0	1	0	0	3	3	0	1
Vermont	5	4	4	0	0	0	0	0	3	1	0	1
Virgin Islands	0	0	0	0	0	0	0	0	0	0	0	0
Virginia	13	6	4	0	2	0	0	0	0	2	2	7
Washington	32	8	8	0	0	0	1	0	3	4	0	24
West Virginia	3	1	1	0	0	0	0	1	0	0	0	2
Wisconsin	19	5	5	0	0	0	0	0	1	4	0	14
Wyoming	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1

SOURCE: U.S. Department of Education, NCES, IPEDS Completions Survey

Appendix table 7-22. Doctorates awarded to U.S. citizens and permanent residents, by race/ethnicity: 1982–1992

Field and year	Total, U.S citizens & permanent residents	White, non-Hispanic	Black, non-Hispanic	American Indian/ Alaskan Native	Asian/ Pacific Islander	Hispanic	Other and unknown
Total, all fields:							
1982	25.619	22,143	1,143	77	1.004	614	638
1983	25 634	22.245	1.005	82	1,043	608	651
1984	25,251	21.864	1.055	74	1.019	607	632
1985	24.694	21.297	1.043	96	1.069	634	555
1986	24.515	21.225	949	99	1.058	678	506
1987	24.561	21.116	907	115	1.167	709	547
1988	24.912	21,457	966	94	1,235	696	464
1989	25.026	21.568	962	94	1.261	695	446
1990	26.592	22,869	1,047	96	1.305	834	441
1991	27.398	23.152	1.156	132	1.527	867	564
1992	27.717	23.425	1.092	148	1.731	882	439
Science and engineering.							
1982	14.259	12.422	351	38	767	273	408
1983	14.395	12.557	331	28	779	284	416
1984	14.191	12.328	365	32	776	299	391
1985	13.964	12.072	372	41	808	294	377
1986	13.928	12.074	325	52	811	343	323
1987	13.958	11.963	315	52	923	355	350
1988	14,412	12,381	349	42	916	397	327
1989	14.500	12.421	360	53	980	380	306
1990	15.262	13.084	370	41	1.004	459	304
1991	15.789	13.211	450	56	1,176	487	409
1992	15.706	13.146	390	69	1.321	494	286
All other fields:							
1982	11.360	9.721	792	39	237	341	230
1983	11.239	9.688	674	54	264	324	235
1984	11.060	9.536	690	42	243	308	241
1985	10.730	9.225	671	55	261	340	178
1986	10.587	9.151	624	47	247	335	183
1987	10.603	9.153	592	63	244	354	197
1988	10.500	9.076	617	52	319	299	137
1989	10.526	9.147	602	41	281	315	140
1990	11.330	9.785	677	55	301	375	137
1991	11.609	9.941	706	76	351	380	155
1992	12.011	10.279	702	79	410	388	153

See explanatory information and SOURCE at end of table

Appendix table 7-22. Doctorates awarded to U.S. citizens and permanent residents, by race/ethnicity: 1982–1992

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Field and year	Total, U.S. citizens	White, non-Hispanic	Black, non-Hispanic	American Indian/ Alaskan Native	Asian/ Pacific Islander	Hispanic	Other and unkonwn
Total, all fields:							
1982	24,391	21,680	1,047	77	452	535	600
1983	24,359	21,700	922	81	492	539	625
1984	24,027	21,350	953	74	512	536	602
1985	23,370	20,763	912	96	516	561	522
1986	23,082	20,629	823	99	530	571	430
1987	22,983	20,462	768	115	542	618	478
1988	23,289	20,783	814	94	614	597	387
1989	23,400	20,892	821	94	626	583	384
1990	24,894	22,162	898	96	641	717	380
1991	25,543	22,392	1,001	130	787	730	503
1992	25,759	22,718	951	148	828	755	359
Science and engineering:							
1982	13,404	12,125	300	38	329	230	382
1983	13,494	12,195	290	27	345	239	398
1984	13,353	12,003	305	32	385	258	370
1985	13,034	11,728	292	41	373	248	352
1986	12,939	11,676	261	52	399	277	274
1987	12,872	11,525	241	52	445	306	303
1988	13,283	11,931	263	42	454	330	263
1989	13,377	11,970	291	53	488	311	264
1990	14,068	12,609	288	41	485	382	263
1991	14,509	12,730	355	56	596	405	367
1992	14,343	12,681	306	69	636	416	235
All other fields:							
1982	10,987	9,555	747	39	123	305	218
1983	10,865	9,505	632	54	147	300	227
1984	10,674	9,347	648	42	127	278	232
1985	10,336	9,035	620	55	143	313	170
1986	10,143	8,953	562	47	131	294	156
1987	10,111	8,937	527	63	97	312	175
1988	10,006	8,852	551	52	160	267	124
1989	10,023	8,922	530	41	138	272	120
1990	10,826	9,553	610	55	156	335	117
1991	11,034	9,662	646	74	191	325	136
1992	11,416	10,037	645	79	192	339	124

See explanatory information and SOURCE at end of table.

Appendix table 7-22. Doctorates awarded to U.S. citizens and permanent residents, by race/ethnicity: 1982–1992

Page 3 of 3

Field and year	Total, permanant residents	White, non-Hispanic	Black, non-Hispanic	American Indian/ Alaskan Native	Asian/ Pacific Islander	Hispanic	Other and unknown
Total, all fields:							
1982	1,228	463	96	0	552	79	38
1983	1,275	545	83	1	551	69	26
1984	1,224	514	102	0	507	71	30
1985	1,324	534	131	0	553	73	33
1986	1,433	596	126	0	528	107	76
1987	1,578	654	139	0	625	91	69
1988	1,623	674	152	0	621	99	77
1989	1,626	676	141	0	635	112	62
1990	1,698	707	149	0	664	117	61
1991	1,855	760	155	2	740	137	61
1992	1,958	707	141	0	903	127	80
Science and engineering:							
1982	855	297	51	0	438	43	26
1983	901	362	41	1	434	45	18
1984	838	325	60	0	391	41	21
1985	930	344	80	0	435	46	25
1986	989	398	64	0	412	66	49
1987	1,086	438	74	0	478	49	47
1988	1,129	450	86	0	462	67	64
1989	1,123	451	69	0	492	69	42
1990	1,194	475	82	0	519	77	41
1991	1,280	481	95	0	580	82	42
1992	1,363	465	84	0	685	78	51
All other fields:							
1982	373	166	45	0	114	36	12
1983	374	183	42	0	117	24	8
1984	386	189	42	0	116	30	9
1985	394	190	51	0	118	27	8
1986	444	198	62	0	116	41	27
1987	492	216	65	0	147	42	22
1988	494	224	66	0	159	32	13
1989	503	225	72	0	143	43	20
1990	504	232	67	0	145	40	20
1991	575	279	60	2	160	55	19
1992	595	242	57	0	218	49	29

NOTE. Data presented in this and subsequent tables (7-23 through 7-29) differ slightly from previously published totals because field classifications were modified slightly for consistency with other tables in this report.

SOURCE. National Science Foundation/SRS. Survey of Earned Doctorates.

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

Race ethnicity sex and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
U S citizens total											
Total all fields	24 391	24.359	24 027	23.370	23 082	22 983	23 289	23 400	24 894	25 543	25.759
Science and engineering total	13 404	13 494	13 353	13 034	12 939	12 872	13 283	13.377	14.068	14 509	14.343
Science fields	12 235	12 331	12.114	11 755	11 556	11.314	11 502	11 513	12 111	12 423	12 241
Physical sciences	1 991	2 074	2.074	2 050	2.032	2 095	2.118	1.984	2 168	2.119	2 146
Earth, atm & oc sci	528	473	471	435	404	410	493	518	516	592	503
Mathematical sciences	458	411	407	376	366	345	342	393	375	463	452
Computer sciences	143	180	178	[illegible]	202	243	284	338	348	388	418
Agricultural sciences	647	649	625	[illegible]	579	584	539	606	630	564	509
Biological sciences	3 317	3 210	3 285	3 148	3 124	2.981	3.131	3.117	3 190	3 311	3 298
Psychology	2 876	3.044	2 935	2 805	2 766	2.747	2 667	2.683	2.910	2 951	2.857
Social sciences	2 275	2.290	2.139	2 069	2 083	1.909	1 928	1.874	1.974	2 035	2.058
Engineering fields	1 169	1 163	1 239	1 279	1.383	1.558	1.781	1 864	1 957	2.086	2.102
Chemical engineering	144	174	182	240	241	294	358	382	[illegible]	348	316
Civil engineering	145	154	158	130	139	162	188	188	180	173	164
Electrical engineering	262	259	287	270	327	320	398	440	491	554	594
Industrial engineering	38	27	30	29	33	44	40	51	56	50	55
Materials engineering	108	117	122	144	119	176	172	173	190	211	201
Mechanical engineering	198	145	163	193	209	241	256	259	299	297	351
Other engineering	274	287	297	273	315	321	369	371	399	453	421
All other fields total	10 987	10 865	10 674	10 336	10 143	10.111	10.006	10.023	10 826	[illegible]	11 416
Men all fields	15 562	15 120	14 730	14 223	13 637	13 575	13.725	13.396	14 159	14 366	14 391
Science and engineering, total	9 733	9 524	9.359	9.080	8 826	8.758	8 976	8.786	9 226	9.340	9.285
Science fields	8.638	8 444	8.208	7.920	7.585	7.349	7.373	7 171	7.517	7 533	7.464
Physical sciences	1.727	1 787	1 771	1.726	1.695	1 733	1 749	1 582	1 746	1 707	1.700
Earth, atm . & oc. sci	436	394	375	348	331	328	384	404	398	444	367
Mathematical sciences	386	335	333	306	297	280	283	300	293	370	355
Computer sciences	126	153	153	165	165	193	245	266	268	305	349
Agricultural sciences	530	549	531	563	463	468	420	450	[illegible]	436	375
Biological sciences	2.321	2 139	2 242	2 116	2 049	1 904	1 960	1 927	1.958	2.021	1 978
Psychology	1 556	1 576	1.440	1 396	1 330	1 259	1.190	1.146	1 190	1,105	1 160
Social sciences	1 556	1,511	1 363	1 300	1.255	1 184	1.142	1.096	[illegible]	1 145	1.180
Engineering fields	1.095	1 080	1 151	1 160	1 241	1 409	1 603	1 615	1 709	1.807	1 821
Chemical engineering	134	160	166	211	205	250	312	322	288	297	249
Civil engineering	135	144	145	121	129	153	175	151	151	152	144
Electrical engineering	251	249	279	250	[illegible]	306	370	411	446	510	540
Industrial engineering	33	23	20	[illegible]	[illegible]	36	27	41	40	39	40
Materials engineering	100	99	110	125	[illegible]	144	155	138	160	164	161
Mechanical engineering	187	139	152	178	[illegible]	231	240	240	276	263	328
Other engineering	255	266	279	250	276	289	324	312	348	382	359
All other fields total	5 829	5 596	5 371	5 143	4 811	4 817	4 749	4 610	4 933	5 026	5 106
Women all fields	8 829	9 239	9 297	9 147	9 445	9 408	9 564	10 004	10 735	[illegible]	11 368
Science and engineering total	3 671	3 970	3 994	[illegible]	4 113	4 114	4 307	4.591	4 842	5 169	5 058
Science fields	3 597	3 887	3 906	3 835	3 971	3 965	4 129	4 342	4 594	4 890	4.777
Physical sciences	264	287	303	324	337	362	369	402	422	412	446
Earth, atm & oc sci	92	79	96	87	73	82	109	114	118	148	136
Mathematical sciences	[illegible]	76	74	70	69	65	59	93	82	93	97
Computer sciences	17	27	25	24	37	50	39	72	80	83	69
Agricultural sciences	117	100	94	120	116	116	119	156	147	128	134
Biological sciences	996	1 071	[illegible]	1 037	1 075	1 077	1 171	1 190	1 232	1.290	1 320
Psychology	1 320	1 468	1 495	1 409	1 436	1 488	1 477	1 537	1 720	1 846	1 697
Social sciences	719	779	776	769	828	725	786	778	793	890	878
Engineering fields	[illegible]	83	88	119	142	149	178	249	248	279	281
Chemical engineering	10	14	16	29	36	44	46	60	54	51	67
Civil engineering	10	10	13	9	10	9	13	37	29	21	20
Electrical engineering	11	10	8	20	21	14	28	29	45	44	54
Industrial engineering	[illegible]	4	10	4	1	8	13	10	16	11	15
Materials engineering	8	18	12	19	15	12	17	35	30	47	40
Mechanical engineering	11	6	11	15	13	10	16	19	23	34	23
Other engineering	19	21	18	23	39	32	45	59	51	71	62
All other fields total	5 158	5 269	5 303	5 193	5 332	5 294	5 257	5 413	5 893	6 008	6 310

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

Page [illegible]

Race/ethnicity, sex, and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
White, non-Hispanic											
Total, all fields	21 680	21 700	21 350	20 763	20 629	20 462	20 783	20 892	22 162	22 392	[illegible]
Science and engineering total	12 125	12 195	12 003	11 728	11 676	11.525	11 931	11.970	12 609	12 730	12 681
Science fields	11 110	11 179	10 941	10.631	10.447	10 194	10 401	10 387	10 919	11 024	[illegible]
Physical sciences	1 827	1 888	1 857	1 856	1 833	1 902	1 899	1 777	1 938	1 896	1 906
Earth, atm., & oc. sci.	498	434	446	409	382	381	462	484	488	542	466
Mathematical sciences	419	374	366	337	326	295	308	351	346	[illegible]	405
Computer sciences	134	161	155	170	176	215	253	296	325	330	[illegible]
Agricultural sciences	611	600	593	646	543	541	493	560	582	[illegible]	[illegible]
Biological sciences	3.021	2 960	2.997	2 869	2 640	2 696	2 878	2 832	2 909	2 964	[illegible]
Psychology	2 607	2 740	[illegible]	2.552	2.509	2 476	2 404	2 422	2 591	2 614	2 558
Social sciences	1.993	2.022	1 875	1 792	1 838	1.688	1 704	1 665	1 740	1 746	[illegible]
Engineering fields	1.015	1 016	1.062	1 097	1.229	1 331	1 530	1 583	1 690	[illegible]	1 744
Chemical engineering	118	149	156	190	216	252	309	328	299	[illegible]	266
Civil engineering	132	131	145	115	124	140	162	163	162	143	142
Electrical engineering	219	232	242	231	293	256	324	360	413	430	[illegible]
Industrial engineering	34	25	25	28	30	39	30	41	49	42	44
Materials engineering	99	103	100	127	109	151	151	147	168	179	[illegible]
Mechanical engineering	177	128	135	160	181	203	225	218	261	243	[illegible]
Other engineering	236	248	259	237	276	290	329	326	338	369	352
All other fields, total	9 555	9 505	9.347	9 035	8.953	8.937	8.852	8 922	9 553	9 662	[illegible]
Men, all fields	13 990	13 610	13.171	12.810	12.308	12.168	12 343	11 988	12 684	12 661	12 741
Science and engineering total	8 843	8 652	8 425	8.215	7.996	7.861	8 055	7.849	8 251	8 190	[illegible]
Science fields	7 897	7.709	7.428	7.215	6.892	6 662	6 680	6 478	6 777	6 705	6 682
Physical sciences	1.598	1 635	1.591	1 573	1.539	1.580	1 570	1.412	1 570	1 524	1 525
Earth, atm., & oc. sci.	415	365	356	326	312	301	363	377	379	407	338
Mathematical sciences	355	303	297	272	266	238	253	268	272	324	[illegible]
Computer sciences	117	139	132	149	139	[illegible]	215	235	248	[illegible]	[illegible]
Agricultural sciences	501	512	503	534	435	437	387	415	441	406	[illegible]
Biological sciences	2.131	1.987	2 056	1 943	1 880	1 726	1 798	1 745	1 776	1 823	1 784
Psychology	1 424	1 434	1 302	1 284	1 215	1 159	1 078	1 049	1 055	979	[illegible]
Social sciences	1 356	1 334	1 191	1 134	1 106	1 049	1 016	977	1 036	982	[illegible]
Engineering fields	946	943	997	1 000	1 104	1 199	1 375	1 371	1 474	1 455	[illegible]
Chemical engineering	108	138	144	179	187	212	268	280	254	262	[illegible]
Civil engineering	122	121	137	106	116	132	151	131	135	128	[illegible]
Electrical engineering	209	223	238	216	274	244	304	337	374	[illegible]	418
Industrial engineering	29	21	17	24	22	32	19	33	36	32	[illegible]
Materials engineering	92	88	91	114	95	124	136	118	139	141	144
Mechanical engineering	166	124	125	146	169	193	210	201	242	216	[illegible]
Other engineering	220	228	245	215	241	262	287	271	294	309	[illegible]
All other fields, total	5 147	4 958	4 746	4 595	4 312	4 307	4 288	4 139	4 433	[illegible]	[illegible]
Women, all fields	[illegible]	[illegible]	8 179	7 953	8 321	8.294	8 440	8 904	9 478	[illegible]	[illegible]
Science and engineering total	3 282	3 543	3 578	3 513	3.680	3.664	3 876	4 121	4 358	[illegible]	[illegible]
Science fields	3 213	3 470	3 513	3 416	3 555	3 532	3 721	3 909	4 142	[illegible]	[illegible]
Physical sciences	229	253	266	283	294	322	329	365	368	[illegible]	[illegible]
Earth, atm., & oc. sci.	83	69	90	83	70	80	99	107	109	[illegible]	[illegible]
Mathematical sciences	64	71	69	65	60	57	55	83	74	[illegible]	[illegible]
Computer sciences	17	22	23	21	37	43	38	61	[illegible]	[illegible]	[illegible]
Agricultural sciences	110	88	90	112	108	104	106	145	141	[illegible]	[illegible]
Biological sciences	890	973	941	926	960	970	1 080	1 087	[illegible]	[illegible]	[illegible]
Psychology	1 183	1 306	1 350	1 268	1 294	1 317	1 326	1 373	[illegible]	[illegible]	[illegible]
Social sciences	637	688	684	658	[illegible]	630	688	688	[illegible]	[illegible]	[illegible]
Engineering fields	69	73	65	97	125	132	155	212	216	[illegible]	[illegible]
Chemical engineering	10	11	12	20	29	40	41	48	45	[illegible]	[illegible]
Civil engineering	10	10	8	[illegible]	8	8	11	32	[illegible]	[illegible]	[illegible]
Electrical engineering	10	9	4	15	19	12	20	23	39	[illegible]	[illegible]
Industrial engineering	[illegible]	4	[illegible]	4	8	7	11	8	[illegible]	[illegible]	[illegible]
Materials engineering	[illegible]	[illegible]	[illegible]	[illegible]	14	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mechanical engineering	11	4	10	14	12	10	15	17	[illegible]	[illegible]	[illegible]
Other engineering	16	20	14	22	35	28	42	55	44	[illegible]	[illegible]
All other fields, total	4 408	4 547	4 601	4 440	4 641	4 630	4 564	4 783	[illegible]	[illegible]	[illegible]

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

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Race ethnicity sex and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Black non Hispanic											
Total all fields	1 047	922	953	912	823	768	814	821	898	1 001	951
Science and engineering total	300	290	305	292	261	241	263	291	288	355	306
Science fields	291	271	293	273	247	229	244	267	260	312	275
Physical sciences	21	19	26	23	20	16	28	25	19	24	21
Earth, atm., & oc sci	2	1	2	2	0	1	2	3	3	2	5
Mathematical sciences	6	3	3	3	5	10	2	6	4	9	4
Computer sciences	1	3	2	2	0	2	1	1	1	5	4
Agricultural sciences	5	12	10	5	7	7	8	6	9	6	4
Biological sciences	43	37	45	44	40	45	36	45	36	47	46
Psychology	112	110	115	101	102	88	99	96	111	125	97
Social sciences	101	86	88	93	73	60	68	85	77	94	94
Engineering fields	9	19	12	19	14	12	19	24	28	43	31
Chemical engineering	0	2	2	4	1	4	4	2	5	4	7
Civil engineering	0	4	0	2	2	1	0	2	0	8	0
Electrical engineering	1	2	2	6	2	0	7	8	7	16	12
Industrial engineering	0	1	1	1	0	0	3	2	0	1	2
Materials engineering	1	4	0	1	1	2	1	0	0	1	2
Mechanical engineering	3	4	2	1	3	2	0	5	5	3	3
Other engineering	4	2	5	4	5	3	4	5	11	10	5
All other fields, total	747	632	648	620	562	527	551	530	610	646	645
Men all fields	483	413	427	379	323	317	315	327	351	415	386
Science and engineering total	169	153	161	161	125	121	145	147	152	183	155
Science fields	160	135	150	145	115	110	130	126	129	148	130
Physical sciences	16	17	26	18	16	13	21	18	13	20	16
Earth, atm & oc sci	2	1	1	2	0	0	2	2	1	1	4
Mathematical sciences	4	2	2	3	2	8	2	4	3	5	4
Computer sciences	1	1	1	2	0	1	1	0	1	1	3
Agricultural sciences	4	11	8	4	4	4	4	5	8	5	4
Biological sciences	20	16	20	24	21	23	18	22	16	22	24
Psychology	49	35	41	39	36	30	45	35	42	42	23
Social sciences	64	52	51	53	36	31	37	40	45	52	52
Engineering fields	9	18	11	16	10	11	15	21	23	35	25
Chemical engineering	0	2	2	2	0	4	3	1	3	3	6
Civil engineering	0	4	0	2	1	1	0	2	0	6	0
Electrical engineering	1	2	2	6	2	0	5	8	6	14	10
Industrial engineering	0	1	1	1	0	0	3	0	0	1	1
Materials engineering	1	4	0	0	1	1	0	0	0	1	0
Mechanical engineering	3	3	2	1	2	2	0	5	5	2	3
Other engineering	4	2	4	4	4	3	4	5	9	8	5
All other fields total	314	260	266	218	198	196	170	180	199	232	231
Women all fields	564	509	526	533	500	451	499	494	547	586	565
Science and engineering total	131	137	144	131	136	120	118	144	136	172	151
Science fields	131	136	143	128	132	119	114	141	131	164	145
Physical sciences	5	2	2	5	4	3	7	7	6	4	5
Earth, atm & oc sci	0	0	1	0	0	1	0	1	2	1	1
Mathematical sciences	2	1	1	0	3	2	0	2	1	4	0
Computer sciences	0	2	1	0	0	1	0	1	0	4	1
Agricultural sciences	1	1	2	1	3	3	4	1	1	1	0
Biological sciences	23	21	25	20	19	22	18	23	20	25	22
Psychology	63	75	74	62	66	58	54	61	69	83	74
Social sciences	37	34	37	40	37	29	31	45	32	42	42
Engineering fields	0	1	1	3	4	1	4	3	5	8	6
Chemical engineering	0	0	0	2	1	0	1	1	2	1	1
Civil engineering	0	0	0	0	1	0	0	0	0	2	0
Electrical engineering	0	0	0	0	0	0	2	0	1	2	2
Industrial engineering	0	0	0	0	0	0	0	2	0	0	1
Materials engineering	0	0	0	1	0	1	1	0	0	0	2
Mechanical engineering	0	1	0	0	1	0	0	0	0	1	0
Other engineering	0	0	1	0	1	0	0	0	2	2	0
All other fields total	433	372	382	402	364	331	381	350	411	414	414

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

Race ethnicity sex, and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
American Indian/Alaskan Native											
Total, all fields	77	81	74	96	99	115	94	94	96	130	148
Science and engineering total	38	27	32	41	52	52	42	53	41	56	69
Science fields	35	27	29	40	46	45	38	46	37	50	58
Physical sciences	3	6	4	3	5	7	6	10	3	10	12
Earth, atm., & oc sci	0	2	0	1	2	0	2	6	1	3	1
Mathematical sciences	1	0	3	0	1	0	2	0	1	0	2
Computer sciences	1	1	0	0	0	3	1	2	0	1	2
Agricultural sciences	3	1	1	4	0	2	6	2	4	4	0
Biological sciences	7	4	10	13	17	11	6	7	4	10	13
Psychology	16	9	6	10	9	16	7	11	18	13	15
Social sciences	4	4	5	9	12	6	8	8	6	9	13
Engineering fields	3	0	3	1	6	7	4	7	4	6	11
Chemical engineering	0	0	2	0	0	1	2	1	0	1	1
Civil engineering	0	0	1	0	0	1	1	1	2	1	1
Electrical engineering	0	0	0	1	2	3	0	0	0	2	4
Industrial engineering	0	0	0	0	0	0	0	0	0	0	1
Materials engineering	0	0	0	0	0	0	0	4	2	1	0
Mechanical engineering	0	0	0	0	2	1	1	0	0	1	1
Other engineering	3	0	0	0	2	1	0	1	0	0	3
All other fields, total	39	54	42	55	47	63	52	41	55	74	79
Men all fields	44	50	54	40	58	62	52	49	52	74	81
Science and engineering, total	27	22	27	21	33	31	28	33	24	37	42
Science fields	24	22	24	20	28	24	24	28	20	33	34
Physical sciences	3	6	4	3	3	5	5	10	3	8	10
Earth atm . & oc sci	0	2	0	1	1	0	1	4	0	2	1
Mathematical sciences	1	0	3	0	0	0	2	0	1	0	1
Computer sciences	1	1	0	0	0	2	1	1	0	1	2
Agricultural sciences	2	1	1	4	0	2	4	1	4	4	0
Biological sciences	4	3	7	4	11	7	4	4	3	6	8
Psychology	10	7	5	5	4	4	3	3	6	5	6
Social sciences	3	2	4	3	9	4	4	5	3	7	6
Engineering fields	3	0	3	1	5	7	4	5	4	4	8
Chemical engineering	0	0	2	0	0	1	2	1	0	0	1
Civil engineering	0	0	1	0	0	1	1	0	2	1	0
Electrical engineering	0	0	0	1	2	3	0	0	0	1	3
Industrial engineering	0	0	0	0	0	0	0	0	0	0	1
Materials engineering	0	0	0	0	0	0	0	3	2	1	0
Mechanical engineering	0	0	0	0	2	1	1	0	0	1	1
Other engineering	3	0	0	0	1	1	0	1	0	0	2
All other fields, total	17	28	27	19	25	31	24	16	28	37	39
Women all fields	33	31	20	56	41	53	42	45	44	56	67
Science and engineering total	11	5	5	20	19	21	14	20	17	19	27
Science fields	11	5	5	20	18	21	14	18	17	17	24
Physical sciences	0	0	0	0	2	2	1	0	0	2	2
Earth, atm . & oc sci	0	0	0	0	1	0	1	2	1	1	0
Mathematical sciences	0	0	0	0	1	0	0	0	0	0	1
Computer sciences	0	0	0	0	0	1	0	1	0	0	0
Agricultural sciences	1	0	0	0	0	0	2	1	0	0	0
Biological sciences	3	1	3	9	6	4	2	3	1	4	5
Psychology	6	2	1	5	5	12	4	8	12	8	9
Social sciences	1	2	1	6	3	2	4	3	3	2	7
Engineering fields	0	0	0	0	1	0	0	2	0	2	3
Chemical engineering	0	0	0	0	0	0	0	0	0	1	0
Civil engineering	0	0	0	0	0	0	0	1	0	0	1
Electrical engineering	0	0	0	0	0	0	0	0	0	1	1
Industrial engineering	0	0	0	0	0	0	0	0	0	0	0
Materials engineering	0	0	0	0	0	0	0	1	0	0	0
Mechanical engineering	0	0	0	0	0	0	0	0	0	0	0
Other engineering	0	0	0	0	1	0	0	0	0	0	1
All other fields total	22	26	15	36	22	32	28	25	27	37	40

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

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Race ethnicity, sex, and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Asian											
Total, all fields	452	492	512	516	530	542	614	626	611	787	828
Science and engineering, total	329	345	385	373	399	445	454	488	485	596	636
Science fields	257	279	290	283	319	310	313	315	328	409	423
Physical sciences	56	66	77	76	75	67	67	75	86	85	106
Earth, atm., & oc sci	12	8	8	8	6	9	8	11	4	7	14
Mathematical sciences	11	13	9	14	14	18	17	13	11	23	20
Computer sciences	2	6	12	2	12	10	20	18	10	32	37
Agricultural sciences	8	15	7	8	12	17	9	7	11	9	13
Biological sciences	96	101	103	106	124	106	101	120	116	160	129
Psychology	25	35	32	34	32	38	37	38	44	46	43
Social sciences	47	35	42	35	44	45	54	33	46	47	61
Engineering fields	72	66	95	90	80	135	141	173	157	187	213
Chemical engineering	13	12	12	22	17	24	32	40	26	27	25
Civil engineering	9	11	8	5	8	14	8	14	8	11	12
Electrical engineering	21	13	25	15	19	41	45	48	51	67	95
Industrial engineering	2	0	3	0	3	2	4	8	3	3	3
Materials engineering	2	7	12	11	5	15	11	18	11	21	15
Mechanical engineering	9	9	18	21	10	25	22	25	27	26	35
Other engineering	16	14	17	16	18	14	19	20	?	32	28
All other fields, total	123	147	127	143	131	97	160	138	156	191	192
Men, all fields	281	312	338	329	347	369	414	441	427	482	523
Science and engineering, total	225	235	269	260	283	322	337	366	358	407	444
Science fields	156	172	190	184	209	198	205	216	221	247	264
Physical sciences	37	50	57	53	55	52	52	62	67	65	71
Earth, atm. & oc sci	7	4	6	7	5	8	6	9	3	4	11
Mathematical sciences	9	12	8	12	12	14	13	12	8	18	17
Computer sciences	2	3	11	2	12	6	19	14	9	25	34
Agricultural sciences	6	9	6	7	10	14	5	4	9	6	8
Biological sciences	55	58	61	67	72	61	64	73	77	92	68
Psychology	6	19	16	18	15	14	13	20	19	13	16
Social sciences	34	17	25	18	28	29	33	22	29	24	39
Engineering fields	69	63	79	76	74	124	132	150	137	160	180
Chemical engineering	13	12	9	17	15	21	29	31	19	20	18
Civil engineering	9	11	5	5	8	13	8	12	7	10	11
Electrical engineering	20	13	21	12	18	39	42	43	47	64	83
Industrial engineering	2	0	1	0	3	2	3	8	2	3	3
Materials engineering	2	5	10	7	4	12	10	14	10	14	11
Mechanical engineering	9	8	17	20	10	25	22	24	25	23	33
Other engineering	14	14	16	15	16	12	18	18	27	26	21
All other fields, total	56	77	69	69	64	47	77	75	69	75	79
Women, all fields	171	180	174	187	183	173	200	185	214	305	305
Science and engineering, total	104	110	116	113	116	123	117	122	127	183	192
Science fields	101	107	100	99	110	112	108	99	107	162	159
Physical sciences	19	16	20	23	20	15	15	13	19	20	35
Earth, atm., & oc sci	5	4	2	1	1	1	2	2	1	3	3
Mathematical sciences	2	1	1	2	2	4	4	1	3	5	3
Computer sciences	0	3	1	0	0	4	1	4	1	7	3
Agricultural sciences	2	6	1	1	2	3	4	3	2	3	5
Biological sciences	41	43	42	39	52	45	37	47	39	68	61
Psychology	19	16	16	16	17	24	24	18	25	33	27
Social sciences	13	18	17	17	16	16	21	11	17	23	22
Engineering fields	3	3	16	14	6	11	9	23	20	27	33
Chemical engineering	0	0	3	[illegible]	2	3	3	9	7	7	7
Civil engineering	0	0	3	[illegible]	0	[illegible]	0	2	1	1	1
Electrical engineering	1	0	4	[illegible]	1	2	3	5	4	3	12
Industrial engineering	0	0	2	0	0	0	1	0	1	0	0
Materials engineering	0	2	2	4	1	3	1	4	1	7	4
Mechanical engineering	0	1	1	1	0	0	0	1	2	3	2
Other engineering	2	0	1	1	2	2	1	2	4	6	7
All other fields, total	67	70	58	74	67	50	83	63	87	116	113

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

Race ethnicity sex, and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Hispanic											
Total, all fields	535	539	536	561	571	618	597	583	717	730	755
Science and engineering total	230	239	258	248	277	306	330	311	382	405	416
Science fields	207	221	236	232	252	282	287	277	343	357	358
Physical sciences	21	24	38	26	36	48	57	52	63	54	58
Earth atm & oc sci	6	9	1	4	4	3	8	6	11	12	13
Mathematical sciences	6	4	11	7	9	9	3	8	7	6	10
Computer sciences	1	0	3	5	4	4	2	4	4	11	7
Agricultural sciences	6	2	4	10	7	12	13	12	14	7	10
Biological sciences	44	39	39	49	52	52	61	59	72	79	89
Psychology	69	84	81	64	81	92	89	87	97	112	108
Social sciences	54	59	59	67	59	62	54	49	75	76	63
Engineering fields	23	18	22	16	25	24	43	34	39	48	58
Chemical engineering	5	4	2	2	4	7	3	5	7	10	10
Civil engineering	1	5	3	6	3	1	10	5	6	5	6
Electrical engineering	6	3	6	1	7	4	10	10	9	11	14
Industrial engineering	2	0	1	0	0	1	2	0	4	3	4
Materials engineering	2	1	1	0	1	2	4	1	2	5	3
Mechanical engineering	1	0	4	3	3	4	5	3	3	8	10
Other engineering	6	5	5	4	7	5	9	10	8	6	11
All other fields, total	305	300	278	313	294	312	267	272	335	325	339
Men, all fields	344	288	314	300	302	332	323	309	378	370	402
Science and engineering total	163	141	175	149	177	180	202	180	232	238	255
Science fields	141	126	157	133	155	159	165	152	199	200	208
Physical sciences	15	11	30	20	28	33	44	37	41	44	43
Earth atm., & oc sci	4	9	1	4	3	3	4	4	7	11	9
Mathematical sciences	5	2	10	5	6	7	3	4	4	3	7
Computer sciences	1	0	3	3	4	4	2	1	3	10	6
Agricultural sciences	5	2	4	7	4	8	12	9	11	6	7
Biological sciences	28	20	26	28	29	33	39	44	44	44	55
Psychology	42	41	41	25	43	31	37	27	45	47	45
Social sciences	41	41	42	41	38	40	24	26	44	35	36
Engineering fields	22	15	18	16	22	21	37	28	33	38	47
Chemical engineering	5	3	1	2	2	6	3	3	7	6	8
Civil engineering	1	5	1	6	3	1	9	5	5	3	5
Electrical engineering	6	3	6	1	6	4	8	9	8	11	12
Industrial engineering	2	0	1	0	0	1	1	0	2	2	3
Materials engineering	2	0	0	0	1	2	4	1	2	4	2
Mechanical engineering	1	0	4	3	3	4	4	2	2	6	8
Other engineering	5	4	5	4	7	3	8	8	7	6	9
All other fields, total	181	147	139	151	125	152	121	129	146	132	147
Women all fields	191	251	222	261	269	286	274	274	339	360	353
Science and engineering total	67	98	83	99	100	126	128	131	150	167	161
Science fields	66	95	79	99	97	123	122	125	144	157	150
Physical sciences	6	13	8	6	8	15	13	15	22	10	15
Earth atm., & oc sci	2	0	0	0	1	0	4	2	4	1	4
Mathematical sciences	1	2	1	2	3	2	0	4	3	3	3
Computer sciences	0	0	0	2	0	0	0	3	1	1	1
Agricultural sciences	1	0	0	3	3	4	1	3	3	1	3
Biological sciences	16	19	13	21	23	19	[illegible]	15	28	35	34
Psychology	27	43	40	39	38	61	52	60	52	65	63
Social sciences	13	18	17	26	21	22	30	23	31	41	27
Engineering fields	1	3	4	0	3	3	6	6	6	10	11
Chemical engineering	0	1	1	0	2	1	0	2	0	4	2
Civil engineering	0	0	2	0	0	0	1	0	1	2	1
Electrical engineering	0	0	0	0	1	[illegible]	2	1	1	0	2
Industrial engineering	0	0	0	0	0	0	1	0	2	1	1
Materials engineering	0	1	1	0	0	0	0	0	0	1	1
Mechanical engineering	0	0	0	0	0	0	1	1	1	2	2
Other engineering	1	1	0	0	0	2	1	2	1	0	2
All other fields total	124	153	139	162	169	160	146	143	189	193	192

See explanatory information and SOURCE at end of table

Appendix table 7-23. Doctorates in science and engineering awarded to U.S. citizens, by race/ethnicity, sex, and field: 1982–1992

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Race ethnicity sex, and field	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Unknown race ethnicity											
Total all fields	600	625	602	522	430	478	387	384	380	503	359
Science and engineering total	382	398	370	352	274	303	263	264	263	367	235
Science fields	335	354	325	296	245	254	219	221	224	271	190
Physical sciences	63	71	70	66	63	55	61	45	59	50	43
Earth, atm , & oc sci	10	19	14	11	10	16	11	8	9	26	4
Mathematical sciences	15	17	15	15	11	13	10	15	6	22	11
Computer sciences	4	9	6	10	10	9	7	17	8	9	8
Agricultural sciences	14	19	10	10	10	5	10	19	10	11	9
Biological sciences	106	69	91	67	51	71	49	54	53	51	47
Psychology	47	66	49	44	33	37	31	29	49	41	36
Social sciences	76	84	70	73	57	48	40	34	30	61	32
Engineering fields	47	44	45	56	29	49	44	43	39	96	45
Chemical engineering	8	7	8	13	3	6	8	6	5	6	7
Civil engineering	3	3	1	2	2	5	7	3	2	5	3
Electrical engineering	15	9	12	16	4	16	12	14	11	28	14
Industrial engineering	0	1	0	0	0	2	1	0	0	1	1
Materials engineering	4	2	9	5	3	6	5	3	7	4	4
Mechanical engineering	8	4	4	8	10	6	3	8	3	16	4
Other engineering	9	18	11	12	7	8	8	9	11	36	12
All other fields total	218	227	232	170	156	175	124	120	117	136	124
Men all fields	420	447	426	365	299	327	278	282	267	364	258
Science and engineering total	306	321	302	274	212	243	209	211	209	285	188
Science fields	260	280	259	223	186	196	169	171	171	200	146
Physical sciences	58	68	63	59	54	50	57	43	52	46	35
Earth atm , & oc sci	8	13	11	8	10	16	8	8	8	19	4
Mathematical sciences	12	16	13	14	11	13	10	12	5	20	9
Computer sciences	4	9	6	9	10	8	7	15	7	8	8
Agricultural sciences	12	14	9	7	10	3	8	16	10	9	9
Biological sciences	83	55	72	50	36	54	37	39	42	34	39
Psychology	25	40	35	25	17	21	14	12	23	19	18
Social sciences	58	65	50	51	38	31	28	26	24	45	24
Engineering fields	46	41	43	51	26	47	40	40	36	85	42
Chemical engineering	8	5	8	11	1	6	7	6	5	6	5
Civil engineering	3	3	1	2	1	5	6	1	2	4	3
Electrical engineering	15	8	12	14	4	16	11	14	11	23	14
Industrial engineering	0	1	0	0	0	1	1	0	0	1	1
Materials engineering	3	2	9	4	3	5	5	2	7	3	4
Mechanical engineering	8	4	4	8	10	6	3	8	2	15	4
Other engineering	9	18	9	12	7	8	7	9	11	33	11
All other fields total	114	126	124	91	87	84	69	71	58	79	70
Women all fields	180	178	176	157	131	151	109	102	113	139	101
Science and engineering total	76	77	68	78	62	60	54	53	54	82	47
Science fields	75	74	66	73	59	58	50	50	53	71	44
Physical sciences	5	3	7	7	9	5	4	2	7	4	8
Earth atm & oc sci	2	6	3	3	0	0	3	0	1	7	0
Mathematical sciences	3	1	2	1	0	0	0	3	1	2	2
Computer sciences	0	0	0	1	0	1	0	2	1	1	0
Agricultural sciences	2	5	1	3	0	2	2	3	0	2	0
Biological sciences	23	14	19	17	15	17	12	15	11	17	8
Psychology	22	26	14	19	16	16	17	17	26	22	18
Social sciences	18	19	20	22	19	17	12	8	6	16	8
Engineering fields	1	3	2	5	3	2	4	3	1	11	3
Chemical engineering	0	2	0	2	2	0	1	0	0	0	2
Civil engineering	0	0	0	0	1	0	1	2	0	1	0
Electrical engineering	0	1	[illegible]	[illegible]	0	0	1	0	0	5	0
Industrial engineering	0	0	0	0	0	1	0	0	[illegible]	0	0
Materials engineering	1	0	0	1	0	1	0	1	0	1	0
Mechanical engineering	0	0	0	0	0	0	0	0	1	1	0
Other engineering	0	0	2	0	0	0	1	0	0	3	1
All other fields total	104	101	108	79	69	91	55	49	59	57	54

NOTE Data differ slightly from previously published totals because field classifications were modified for consistency

SOURCE National Science Foundation SRS Survey of Earned Doctorates

Appendix table 7-24. Top 50 institutions awarding doctorates in science and engineering to minorities with U.S. citizenship, by race/ethnicity: 1992

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	Academic institution	Total, U.S citizens	White	Minorities					
				Total	Black	American Indian	Asian	Hispanic	Other or unknown
	Total, all institutions	14,343	12,681	1,427	306	69	636	416	235
1	University of California-Berkeley	390	328	53	7	1	34	11	9
2	University of California-Los Angeles	221	179	41	6	0	24	11	1
3	Stanford University	277	231	39	1	1	31	6	7
4	University of Illinois at Urbana-Champaign	272	231	37	2	3	28	4	4
5	Massachusetts Institute of Technology	199	156	32	3	0	23	6	11
6	University of Michigan at Ann Arbor	250	215	32	9	0	13	10	3
7	Texas A & M University, main campus	187	158	27	5	3	5	14	2
8	University of Southern California	129	100	27	2	0	22	3	2
9	Cornell University, all campuses	248	221	24	2	0	17	5	3
10	Harvard University	191	160	23	6	0	10	7	8
	Subtotal, first 10 institutions	2,364	1,979	335	43	8	207	77	50
11	Ohio State University, main campus	202	177	21	6	0	12	3	4
12	University of Wisconsin-Madison	300	277	20	3	2	7	8	3
13	University of California-Davis	161	136	19	0	2	8	9	4
14	University of Florida	157	138	19	8	3	0	8	0
15	University of Maryland at College Park	177	156	19	9	0	6	4	2
16	Howard University	23	4	18	17	0	1	0	1
17	Purdue University, main campus	199	179	18	6	0	7	5	2
18	University of California-San Diego	112	91	18	1	1	11	5	3
19	University of Washington	183	163	18	2	0	10	6	2
20	Columbia University, main campus	141	122	15	1	1	9	4	4
	Subtotal, first 20 institutions	4,019	3,424	520	96	17	278	129	75
21	North Carolina State University at Raleigh	131	116	15	6	2	4	3	0
22	University of Arizona	133	116	15	0	3	5	7	2
23	University of Chicago	137	119	15	0	0	8	7	3
24	University of Hawaii at Manoa	67	51	15	0	0	12	3	1
25	University of California-Irvine	98	82	14	0	0	9	5	2
26	University of California-Santa Barbara	99	81	14	1	1	8	4	4
27	Boston University	97	83	13	1	1	7	4	1
28	Pennsylvania State Univ. main campus	226	213	13	1	1	7	4	0
29	University of Texas at Austin	216	200	13	3	1	3	6	3
30	Georgia Inst of Technology main campus	93	81	12	3	0	6	3	0
	Subtotal, first 30 institutions	5,316	4,566	659	111	26	347	175	91
31	Northwestern University	142	128	12	3	1	7	1	2
32	Rutgers, the State Univ at New Brunswick	144	132	12	2	0	6	4	0
33	University of Colorado at Boulder	162	145	12	2	0	5	5	5
34	University of Illinois at Chicago	68	55	12	2	1	7	2	1
35	University of Massachusetts at Amherst	133	121	12	2	0	2	8	0
36	University of Pennsylvania	162	144	12	2	1	6	3	6
37	University of Virginia, main campus	128	114	12	6	1	4	1	2
38	Arizona State University	69	58	11	1	2	6	2	0
39	California Sch of Prof Psych Los Angeles	56	44	11	2	0	1	8	1
40	Clark Atlanta University	10	0	10	9	0	1	0	0
	Subtotal, first 40 institutions	6,390	5,507	775	142	32	392	209	108
41	CUNY Graduate School and University Center	100	89	10	3	1	2	4	1
42	Indiana University at Bloomington	122	110	10	3	0	5	2	2
43	University of Minnesota at Twin Cities	230	216	10	2	0	4	4	4
44	University of North Carolina Chapel Hill	141	130	10	2	1	4	3	1
45	Yeshiva University	40	30	10	1	0	4	5	0
46	California Institute of Technology	84	73	9	0	0	7	2	2
47	Florida State University	70	60	9	5	0	0	4	1
48	Johns Hopkins University	129	117	9	1	0	5	3	3
49	New York University	100	90	9	0	0	6	3	1
50	University of Cincinnati, all campuses	74	63	9	4	0	3	2	2
	Total, first 50 institutions	7480	6485	870	163	34	432	241	125

NOTES Institutions are ranked by total doctorates awarded to minorities.
Data differ slightly from previously published totals because field classifications were modified for consistency

SOURCE National Science Foundation/SRS Survey of Earned Doctorates

Appendix table 7-25. Doctorates in science and engineering awarded to minorities with U.S. citizenship, by geographic division, State, and race/ethnicity: 1982 and 1992

Geographic division and State	Minorities 1982	Minorities 1992	Black 1982	Black 1992	American Indian 1982	American Indian 1992	Asian 1982	Asian 1992	Hispanic 1982	Hispanic 1992
Total, all U.S. institutions	897	1 427	300	306	38	69	329	636	230	416
New England	73	119	25	18	2	3	28	59	18	39
Connecticut	14	13	3	4	0	0	6	7	5	2
Maine	1	0	0	0	0	0	0	0	1	0
Massachusetts	49	91	20	12	2	2	17	47	10	30
New Hampshire	1	3	0	0	0	0	1	0	0	3
Rhode Island	7	9	2	1	0	1	3	4	2	3
Vermont	1	3	0	1	0	0	1	1	0	1
Middle Atlantic	167	218	53	40	6	7	68	107	40	64
New Jersey	17	28	4	3	0	0	13	16	0	9
New York	122	141	41	24	3	3	46	71	32	43
Pennsylvania	28	49	8	13	3	4	9	20	8	12
East North Central	139	245	56	55	6	10	48	123	29	57
Illinois	41	93	16	11	2	5	18	59	5	18
Indiana	13	29	6	9	1	0	4	12	2	8
Michigan	42	51	14	19	2	1	15	18	11	13
Ohio	27	44	17	12	0	0	8	22	2	10
Wisconsin	16	28	3	4	1	4	3	12	9	8
West North Central	45	50	18	17	2	5	18	18	7	10
Iowa	6	5	1	1	0	0	4	2	1	2
Kansas	10	8	5	2	0	2	4	2	1	2
Minnesota	8	15	3	7	0	0	4	4	1	4
Missouri	14	19	7	6	0	2	4	10	3	1
Nebraska	6	1	1	1	2	0	2	0	1	0
North Dakota	1	0	1	0	0	0	0	0	0	0
South Dakota	0	2	0	0	0	1	0	0	0	1
South Atlantic	146	223	81	91	3	10	34	56	28	64
Delaware	3	7	3	4	0	0	0	2	0	1
District of Columbia	40	33	22	22	0	1	14	6	4	4
Florida	30	47	13	15	2	3	3	2	12	27
Georgia	26	38	18	17	0	0	3	12	5	9
Maryland	25	33	16	12	0	0	6	14	3	7
North Carolina	12	29	6	8	1	4	4	10	1	7
South Carolina	3	8	1	2	0	0	2	3	0	3
Virginia	5	25	2	10	0	2	1	9	2	4
West Virginia	2	3	0	1	0	0	1	0	1	2
East South Central	25	53	12	23	2	5	8	15	3	10
Alabama	6	11	3	2	0	2	3	4	0	3
Kentucky	1	4	1	3	0	0	0	1	0	0
Mississippi	3	11	1	3	1	1	1	4	0	3
Tennessee	15	27	7	15	1	2	4	6	3	4
West South Central	75	101	17	24	8	8	18	30	32	39
Arkansas	3	2	1	2	1	0	0	0	1	0
Louisiana	7	10	2	4	1	1	1	2	3	3
Oklahoma	13	11	3	1	3	2	5	6	2	2
Texas	52	78	11	17	3	5	12	22	26	34
Mountain	37	70	7	6	3	9	13	28	14	27
Arizona	6	27	1	1	0	5	3	11	2	10
Colorado	17	23	6	3	1	1	6	9	4	10
Idaho	1	1	0	0	1	0	0	1	0	0
Montana	2	0	0	0	0	0	[illegible]	0	0	0
Nevada	1	1	0	0	0	0	0	1	0	0
New Mexico	3	9	0	1	0	2	0	1	3	5
Utah	7	6	0	1	1	1	2	3	4	1
Wyoming	0	3	0	0	0	0	0	2	0	1
Pacific	188	339	31	32	6	12	94	198	57	97
Alaska	0	0	0	0	0	0	0	0	0	0
California	164	291	27	29	4	9	80	169	53	84
Hawaii	7	15	0	0	0	0	6	12	1	3
Oregon	4	10	1	0	0	2	3	5	0	3
Washington	13	23	3	3	2	1	5	12	3	7
Outlying areas	2	9	0	0	0	0	0	0	2	9
Puerto Rico	2	9	0	0	0	0	0	0	2	9

NOTES Excludes permanent residents (i.e., foreign citizens on permanent visas who have been admitted for permanent residency).
A table listing institutions within each State is available from the National Science Foundation.
Data differ slightly from previously published totals because field classifications were modified for consistency.

SOURCE National Science Foundation/SRS, Survey of Earned Doctorates

Appendix table 7-26. Doctorates in science and engineering (S&E) awarded to blacks with U.S. citizenship, by State/territory: 1992

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	State/territory	Total, all fields	Total, S&E	Science	Engineering	All other fields
	United States, total	951	306	275	31	645
1	California	68	29	26	3	39
2	New York	78	24	22	2	54
3	District of Columbia	50	22	21	1	28
4	Michigan	50	19	18	1	31
5	Georgia	44	17	15	2	27
6	Texas	48	17	15	2	31
7	Florida	71	15	13	2	56
8	Tennessee	42	15	13	2	27
9	Pennsylvania	49	13	13	0	36
10	Maryland	43	12	12	0	31
11	Massachusetts	37	12	9	3	25
12	Ohio	51	12	12	0	39
13	Illinois	45	11	8	3	34
14	Virginia	30	10	8	2	20
15	Indiana	17	9	6	3	8
16	North Carolina	24	8	7	1	16
17	Minnesota	22	7	7	0	15
18	Missouri	9	6	6	0	3
19	Connecticut	9	4	4	0	5
20	Delaware	5	4	2	2	1
21	Louisiana	10	4	4	0	6
22	Wisconsin	9	4	4	0	5
23	Colorado	6	3	3	0	3
24	Kentucky	9	3	3	0	6
25	Mississippi	23	3	3	0	20
26	New Jersey	13	3	2	1	10
27	Washington	8	3	3	0	5
28	Alabama	10	2	2	0	8
29	Arkansas	2	2	1	1	0
30	Kansas	8	2	2	0	6
31	South Carolina	22	2	2	0	20
32	Arizona	4	1	1	0	3
33	Iowa	16	1	1	0	15
34	Nebraska	2	1	1	0	1
35	New Mexico	1	1	1	0	0
36	Oklahoma	6	1	1	0	5
37	Rhode Island	3	1	1	0	2
38	Utah	1	1	1	0	0
39	Vermont	1	1	1	0	0
40	West Virginia	3	1	1	0	2
41	Alaska	0	0	0	0	0
42	American Samoa	0	0	0	0	0
43	Guam	0	0	0	0	0
44	Hawaii	0	0	0	0	0
45	Idaho	0	0	0	0	0
46	Maine	0	0	0	0	0
47	Montana	0	0	0	0	0
48	Nevada	0	0	0	0	0
49	New Hampshire	0	0	0	0	0
50	North Dakota	0	0	0	0	0
51	Oregon	0	0	0	0	0
52	Puerto Rico	0	0	0	0	0
53	South Dakota	2	0	0	0	2
54	Virgin Islands	0	0	0	0	0
55	Wyoming	0	0	0	0	0

NOTES Excludes permanent residents (i.e., foreign citizens on permanent visas who have been admitted for permanent residency). Data differ slightly from previously published totals because field classifications were modified for consistency.

SOURCE National Science Foundation/SRS Survey of Earned Doctorates

Appendix table 7-27. Doctorates in science and engineering (S&E) awarded to Hispanics with U.S. citizenship, by State/territory: 1992

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	State/territory	Total, all fields	Total, S&E	Science	Engineering	All other fields
	United States, total	755	416	356	58	339
1	California	139	84	73	11	55
2	New York	74	43	38	5	31
3	Texas	59	34	27	7	25
4	Massachusetts	56	30	27	3	26
5	Florida	61	27	22	5	34
6	Illinois	33	18	18	0	15
7	Michigan	22	13	10	3	9
8	Pennsylvania	25	12	9	3	13
9	Arizona	25	10	8	2	15
10	Colorado	18	10	10	0	8
11	Ohio	18	10	9	1	8
12	Georgia	10	9	9	0	1
13	New Jersey	14	9	8	1	5
14	Puerto Rico	26	9	9	0	17
15	Indiana	14	8	4	4	6
16	Wisconsin	14	8	7	1	6
17	Maryland	12	7	7	0	5
18	North Carolina	9	7	6	1	2
19	Washington	9	7	5	2	2
20	New Mexico	18	5	4	1	13
21	District of Columbia	9	4	3	1	5
22	Minnesota	10	4	4	0	6
23	Tennessee	4	4	3	1	0
24	Virginia	6	4	2	2	2
25	Alabama	4	3	3	0	1
26	Hawaii	3	3	2	1	0
27	Louisiana	3	3	3	0	0
28	Mississippi	4	3	2	1	1
29	New Hampshire	3	3	3	0	0
30	Oregon	6	3	3	0	3
31	Rhode Island	6	3	3	0	3
32	South Carolina	6	3	2	1	3
33	Connecticut	9	2	2	0	7
34	Iowa	5	2	2	0	3
35	Kansas	4	2	2	0	2
36	Oklahoma	4	2	2	0	2
37	West Virginia	2	2	2	0	0
38	Delaware	1	1	0	1	0
39	Missouri	2	1	1	0	1
40	South Dakota	1	1	1	0	0
41	Utah	2	1	1	0	1
42	Vermont	1	1	1	0	0
43	Wyoming	1	1	1	0	0
44	Alaska	0	0	0	0	0
45	American Samoa	0	0	0	0	0
46	Arkansas	0	0	0	0	0
47	Guam	0	0	0	0	0
48	Idaho	0	0	0	0	0
49	Kentucky	1	0	0	0	1
50	Maine	0	0	0	0	0
51	Montana	0	0	0	0	0
52	Nebraska	1	0	0	0	1
53	Nevada	1	0	0	0	1
54	North Dakota	0	0	0	0	0
55	Virgin Islands	0	0	0	0	0

NOTES Excludes permanent residents (i.e., foreign citizens on permanent visas who have been admitted for permanent residency). Data differ slightly from previously published totals because field classifications were modified for consistency.

SOURCE National Science Foundation SRS Survey of Earned Doctorates

Appendix table 7-28. Doctorates in science and engineering (S&E) awarded to Asians with U.S. citizenship, by State/territory: 1992

	State/territory	Total, all fields	Total, S&E	Science	Engineering	All other fields
	United States, total	828	636	423	213	192
1	California	208	169	106	63	39
2	New York	88	71	54	17	17
3	Illinois	76	59	42	17	17
4	Massachusetts	58	47	29	18	11
5	Ohio	29	22	15	7	7
6	Texas	30	22	12	10	8
7	Pennsylvania	28	20	12	8	8
8	Michigan	23	18	8	10	5
9	New Jersey	23	16	12	4	7
10	Maryland	22	14	10	4	8
11	Georgia	16	12	7	5	4
12	Hawaii	18	12	10	2	6
13	Indiana	15	12	8	4	3
14	Washington	16	12	9	3	4
15	Wisconsin	13	12	7	5	1
16	Arizona	16	11	7	4	5
17	Missouri	11	10	7	3	1
18	North Carolina	13	10	7	3	3
19	Colorado	10	9	7	2	1
20	Virginia	13	9	4	5	4
21	Connecticut	8	7	5	2	1
22	District of Columbia	7	6	4	2	1
23	Oklahoma	6	6	4	2	0
24	Tennessee	8	6	5	1	2
25	Oregon	7	5	5	0	2
26	Alabama	7	4	3	1	3
27	Minnesota	6	4	2	2	2
28	Mississippi	6	4	3	1	2
29	Rhode Island	5	4	4	0	1
30	South Carolina	4	3	1	2	1
31	Utah	5	3	3	0	2
32	Delaware	2	2	0	2	0
33	Florida	11	2	0	2	9
34	Iowa	3	2	1	1	1
35	Kansas	2	2	1	1	0
36	Louisiana	4	2	2	0	2
37	Wyoming	2	2	2	0	0
38	Idaho	1	1	1	0	0
39	Kentucky	2	1	1	0	1
40	Nevada	2	1	1	0	1
41	New Mexico	2	1	1	0	1
42	Vermont	1	1	1	0	0
43	Alaska	0	0	0	0	0
44	American Samoa	0	0	0	0	0
45	Arkansas	0	0	0	0	0
46	Guam	0	0	0	0	0
47	Maine	0	0	0	0	0
48	Montana	0	0	0	0	0
49	Nebraska	1	0	0	0	1
50	New Hampshire	0	0	0	0	0
51	North Dakota	0	0	0	0	0
52	Puerto Rico	0	0	0	0	0
53	South Dakota	0	0	0	0	0
54	Virgin Islands	0	0	0	0	0
55	West Virginia	0	0	0	0	0

NOTES Excludes permanent residents (i.e., foreign citizens on permanent visas who have been admitted for permanent residency). Data differ slightly from previously published totals because field classifications were modified for consistency.

SOURCE National Science Foundation/SRS Survey of Earned Doctorates

Appendix table 7-29. Doctorates in science and engineering (S&E) awarded to American Indians/Alaskan Natives with U.S. citizenship, by State/territory: 1992

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	State/territory	Total all fields	Total, S&E	Science	Engineering	All other fields
	United States, total	148	69	58	11	79
1	California	16	9	8	1	7
2	Arizona	9	5	4	1	4
3	Illinois	10	5	3	2	5
4	Texas	8	5	3	2	3
5	North Carolina	6	4	3	1	2
6	Pennsylvania	7	4	4	0	3
7	Wisconsin	6	4	3	1	2
8	Florida	6	3	3	0	3
9	New York	5	3	2	1	2
10	Alabama	2	2	2	0	0
11	Kansas	2	2	2	0	0
12	Massachusetts	2	2	2	0	0
13	Missouri	4	2	2	0	2
14	New Mexico	3	2	2	0	1
15	Oklahoma	8	2	2	0	6
16	Oregon	3	2	2	0	1
17	Tennessee	4	2	2	0	2
18	Virginia	2	2	2	0	0
19	Colorado	4	1	1	0	3
20	District of Columbia	1	1	1	0	0
21	Louisiana	2	1	0	1	1
22	Michigan	3	1	1	0	2
23	Mississippi	2	1	1	0	1
24	Rhode Island	1	1	0	1	0
25	South Dakota	4	1	1	0	3
26	Utah	3	1	1	0	2
27	Washington	4	1	1	0	3
28	Alaska	0	0	0	0	0
29	American Samoa	0	0	0	0	0
30	Arkansas	4	0	0	0	4
31	Connecticut	0	0	0	0	0
32	Delaware	0	0	0	0	0
33	Georgia	0	0	0	0	0
34	Guam	0	0	0	0	0
35	Hawaii	0	0	0	0	0
36	Idaho	0	0	0	0	0
37	Indiana	5	0	0	0	5
38	Iowa	1	0	0	0	1
39	Kentucky	0	0	0	0	0
40	Maine	0	0	0	0	0
41	Maryland	1	0	0	0	1
42	Minnesota	1	0	0	0	1
43	Montana	2	0	0	0	2
44	Nebraska	0	0	0	0	0
45	Nevada	0	0	0	0	0
46	New Hampshire	0	0	0	0	0
47	New Jersey	0	0	0	0	0
48	North Dakota	0	0	0	0	0
49	Ohio	6	0	0	0	6
50	Puerto Rico	0	0	0	0	0
51	South Carolina	1	0	0	0	1
52	Vermont	0	0	0	0	0
53	Virgin Islands	0	0	0	0	0
54	West Virginia	0	0	0	0	0
55	Wyoming	0	0	0	0	0

NOTE Data differ slightly from previously published totals because field classifications were modified for consistency

SOURCE National Science Foundation SRS Survey of Earned Doctorates

Appendix table 7-30. Recipients of science and engineering doctorates reporting a disability: 1988 and 1992

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Doctoral recipients	1988	1992
Total, scientists and engineers	20,739	24,432
Number reporting disability	231	280
Percentage reporting disability	1.1	1.1
Scientists	16.551	18,995
Number reporting disability	201	240
Percentage reporting disability	1.2	1.3
Engineers	4.188	5,437
Number reporting disability	30	40
Percentage reporting disability	0.7	0.7

NOTE: Some recipients may have responded to the survey using forms for a different year.
Because of revisions to the survey, respondents may have answered slightly different questions.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Women. Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 7-31. Recipients of science and engineering doctorates reporting a disability, by type of disability: 1988 and 1992

Page 1 of 1

Doctoral recipients	Total	Visual	Orthopedic	Auditory	Vocal[1]	Other[1]
1988:						
Total, scientists and engineers	231	62	76	35	4	54
Percentage distribution	100.0	26.8	32.9	15.2	1.7	23.4
Scientists	201	50	66	33	4	48
Percentage distribution	100.0	24.9	32.8	16.4	2.0	23.9
Engineers	30	12	10	2	0	6
Percentage distribution	100.0	40.0	33.3	6.7	0.0	20.0
1992:						
Total, scientists and engineers	280	72	53	41	6	108
Percentage distribution	100.0	25.7	18.9	14.6	2.1	38.6
Scientists	240	59	43	38	4	96
Percentage distribution	100.0	24.6	17.9	15.8	1.7	40.0
Engineers	40	13	10	3	2	12
Percentage distribution	100.0	32.5	25.0	7.5	5.0	30.0

[1] Because of the restrictive definition of the disability question, it is possible that some responding recipients who did not meet the strict definition checked "other." The vocal category was eliminated from the questionnaire, thus affecting this response. In most cases, "other" was selected in lieu of "vocal," leaving vocal underrepresented.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Appendix table 7-32. Percentage distribution of recipients of science and engineering doctorates, by major field and disability status: 1992

Page 1 of 1

Major field	Total recipients	Recipients with disabilities
Total, science and engineering	100.0	100.0
Total, science	77.7	85.7
Physical sciences[1]	18.7	18.9
Mathematics	5.7	2.3
Computer/information sciences	3.5	3.2
Agricultural/biological sciences	24.0	25.0
Social sciences	13.9	17.1
Psychology	13.3	18.5
Total, engineering	22.2	14.3

[1] Includes earth, atmospheric, and ocean sciences

NOTE: Because of rounding, details may not add to totals.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 7-33. Recipients of science and engineering doctorates, by race/ethnicity and disability status: 1992

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Doctoral Recipients	Total	Black	Asian	American Indian	White	Hispanic	Race/ ethnicity Unknown
Total, scientists and engineers	23,634	574	6,760	70	14,755	856	619
Percentage	100.0	2.4	28.6	0.3	62.4	3.6	2.6
Total, scientists & engineers with disabilities	280	7	50	0	208	9	6
Percentage	100.0	2.5	17.9	0.0	74.3	3.2	2.1

NOTES: Includes recipients of all citizenship groups
Because of rounding, percentages may not add to 100.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Appendix table 7-34. Years between bachelor's and doctoral degrees for scientists and engineers, by disability status and sex: 1992

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Years between degrees	Total recipients			Recipients with disabilities		
	Total	Women	Men	Total	Women	Men
Total, scientists and engineers	17,353	4,986	12,367	231	68	163
0 to 5 years	1,687	448	1,239	20	3	17
6 to 10 years	8,859	2,377	6,482	96	20	76
11 to 15 years	3,498	968	2,530	63	26	37
16 to 20 years	1,404	516	888	23	6	17
21 or more years	872	415	457	24	12	12
Unknown	1,033	262	771	5	1	4
Percentage distribution						
Total, scientists and engineers	100.0	100.0	100.0	100.0	100.0	100.0
0 to 5 years	9.7	9.0	10.0	8.7	4.4	10.4
6 to 10 years	51.1	47.7	52.4	41.6	29.4	46.6
11 to 15 years	20.2	19.4	20.5	27.3	38.2	22.7
16 to 20 years	8.1	10.3	7.2	10.0	8.8	10.4
21 or more years	5.0	8.3	3.7	10.4	17.6	7.4
Unknown	6.0	5.3	6.2	2.2	1.5	2.5

NOTE: Includes doctoral recipients with U.S. citizenship only

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 7-35. Science and engineering postdoctoral appointees in doctorate-granting institutions, by sex and field: fall 1985–1992

Sex and field	1985	1986	1987	1988	1989	1990	1991	1992
Both sexes								
Total science and engineering	16 872	17 847	18.770	19.688	20 878	21.813	22 915	24.024
Science total	15 519	16.449	17.327	18.004	18 970	19 873	20.660	21.680
Physical sciences	4 495	4.808	4.941	5.178	5.348	5.557	5.678	5.772
Astronomy	138	133	125	147	[illegible]	184	210	206
Chemistry	2.995	3.149	3.234	3.420	3.456	3.629	3 647	3.573
Physics	1 320	1.494	1.548	1.578	1.677	1.716	1.798	1.954
Physical sciences n e c	42	32	34	33	29	28	23	39
Earth, atmospheric, & ocean sciences	375	417	420	499	459	607	645	709
Atmospheric sciences	48	43	58	71	58	57	59	64
Geosciences	226	247	239	279	274	359	391	418
Oceanography	79	98	81	116	107	170	161	186
Earth atmospheric & ocean sciences n e c	22	29	42	33	20	21	34	41
Mathematical sciences	226	201	228	280	223	247	206	201
Computer sciences	68	72	99	91	78	71	127	149
Agricultural sciences	373	409	441	454	512	529	575	634
Biological sciences	9.136	9.701	10.364	10.686	11.449	11.963	12.550	13.287
Anatomy	310	342	332	377	460	462	509	501
Biochemistry	1.858	1.985	2.113	2.078	2.216	2.174	2.123	2.161
Biology	1 123	1.083	1.173	1.223	1.277	1.358	1.398	1.477
Biometry/epidemiology	59	93	74	70	100	97	100	125
Biophysics	101	133	116	124	138	118	156	176
Botany	355	373	408	443	445	440	475	488
Cell biology	723	812	899	884	966	1.272	1.282	1.325
Ecology	37	37	39	33	52	57	49	60
Entomology/parasitology	139	143	162	176	219	212	236	223
Genetics	377	428	493	504	535	614	625	680
Microbiology, immunology, & virology	1.168	1.255	1.310	1.405	1.539	1.492	1.768	1.846
Nutrition	202	185	177	141	130	134	175	203
Pathology	619	709	765	819	899	1 037	1.094	1.192
Pharmacology	855	882	902	991	1.033	1.104	1.153	1.291
Physiology	833	904	1.019	1.034	1.067	1.043	1.060	1.137
Zoology	199	206	198	188	199	165	163	166
Biosciences, n e c	178	131	184	196	174	184	184	236
Psychology	498	520	458	497	535	463	504	521
Social sciences	348	321	376	319	366	436	375	407
Agricultural economics	31	35	31	20	28	57	39	49
Anthropology (cultural & social)	57	52	54	56	74	64	50	62
Economics (except agricultural)	19	22	36	9	33	37	40	22
Geography	9	10	15	22	22	19	15	22
Linguistics	26	21	42	36	30	38	14	26
Political science	44	66	54	49	41	66	78	96
Sociology	92	84	93	73	75	94	90	70
Sociology/anthropology	2	1	3	1	0	2	1	3
Social sciences other	68	30	48	53	63	59	48	57
Engineering, total	1 353	1.398	1 443	1.684	1.908	1.940	2.255	2.344
Aerospace engineering	51	48	43	48	38	67	77	92
Agricultural engineering	15	17	29	31	38	31	33	37
Biomedical engineering	47	52	44	47	67	74	66	71
Chemical engineering	273	295	310	423	466	551	578	554
Civil engineering	122	140	175	203	182	168	185	187
Electrical engineering	182	174	176	186	193	241	333	307
Engineering science	90	67	41	38	74	76	117	71
Industrial eng./management sci	18	25	26	32	32	6	27	38
Mechanical engineering	207	239	216	216	302	219	329	355
Metallurgical/materials eng	245	250	283	325	323	365	394	458
Nuclear engineering	31	31	20	17	36	30	29	34
Engineering, other	72	60	80	118	157	[illegible]	87	140

See explanatory information and SOURCE at end of table

Appendix table 7-35. Science and engineering postdoctoral appointees in doctorate-granting institutions, by sex and field: fall 1985–1992

Sex and field	1985	1986	1987	1988	1989	1990	1991	1992
Men								
Total, science and engineering	12.932	13 504	14.107	14.780	15.567	16.173	16.938	17.566
Science total	11.680	12.237	12.813	13.267	13.834	14.439	14.920	15.467
Physical sciences	3 900	4 176	4.276	4.465	4.599	4.763	4 843	4.934
Astronomy	133	122	109	128	160	159	176	181
Chemistry	2.514	2.630	2.712	2.857	2.874	3.026	3.007	2 927
Physics	1.221	1 398	1.424	1 452	1.540	1.554	1.641	1.792
Physical sciences, n e c	32	26	31	28	25	24	19	34
Earth, atmospheric, & ocean sciences	318	355	357	414	389	513	533	555
Atmospheric sciences	39	38	53	66	56	51	49	51
Geosciences	195	214	208	231	231	298	333	338
Oceanography	68	81	65	92	86	145	127	135
Earth, atmospheric & ocean sciences, n e c	16	22	31	25	16	19	24	31
Mathematical sciences	197	175	196	243	195	217	177	175
Computer sciences	58	62	86	80	64	62	106	115
Agricultural sciences	301	317	342	348	380	391	440	473
Biological sciences	6 399	6.650	7.039	7.233	7.645	7.969	8.324	8.679
Anatomy	217	210	213	232	294	299	332	318
Biochemistry	1.325	1.384	1.426	1 446	1.517	1.492	1.409	1.455
Biology	792	758	805	833	841	917	939	972
Biometry/epidemiology	32	49	41	43	61	62	67	73
Biophysics	77	104	88	90	106	72	112	127
Botany	264	276	279	299	313	303	323	333
Cell biology	464	527	594	582	614	809	808	845
Ecology	32	27	33	25	44	41	33	36
Entomology/parasitology	112	114	123	142	170	157	186	158
Genetics	254	272	314	326	348	378	396	413
Microbiology immunology & virology	784	840	861	909	1.007	987	1.144	1.175
Nutrition	138	128	124	97	84	85	119	138
Pathology	424	475	521	551	588	694	731	773
Pharmacology	604	623	623	673	683	747	775	849
Physiology	621	647	732	723	733	706	718	752
Zoology	127	126	130	130	129	106	103	103
Biosciences, n e c	132	90	132	132	113	114	129	159
Psychology	273	296	266	281	326	242	267	274
Social sciences	234	206	251	203	236	282	230	262
Agricultural economics	29	31	29	17	21	47	29	39
Anthropology (cultural & social)	29	34	34	37	45	37	27	37
Economics (except agricultural)	15	18	31	9	30	33	37	17
Geography	7	8	9	10	13	13	11	14
Linguistics	12	10	24	21	18	23	9	16
Political science	39	48	41	34	27	45	45	59
Sociology	50	35	47	40	41	55	49	41
Sociology/anthropology	2	1	2	0	0	2	0	3
Social sciences other	51	21	34	35	41	27	23	36
Engineering total	1.252	1.267	1.294	1 513	1.733	1 734	2 018	2.099
Aerospace engineering	50	46	39	45	35	63	73	88
Agricultural engineering	14	14	25	27	30	24	32	35
Biomedical engineering	39	43	37	43	63	69	55	59
Chemical engineering	246	257	274	370	420	470	486	486
Civil engineering	119	133	163	184	153	154	163	166
Electrical engineering	171	161	160	170	180	227	315	277
Engineering science	84	60	38	35	68	71	104	63
Industrial eng /management sci	15	21	25	28	26	5	25	35
Mechanical engineering	193	218	205	198	288	203	307	333
Metallurgical/materials eng	222	227	238	289	287	322	353	405
Nuclear engineering	29	27	17	12	32	26	26	33
Engineering, other	70	60	73	112	151	100	79	119

See explanatory information and SOURCE at end of table

Appendix table 7-35. Science and engineering postdoctoral appointees in doctorate-granting institutions, by sex and field: fall 1985–1992

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Sex and field	1985	1986	1987	1988	1969	1990	1991	1992
Women								
Total science and engineering	3 940	4 343	4 663	4 906	5 311	5 640	5 977	6 458
Science total	3 839	4 212	4.514	4.737	5.136	5.434	5 740	6 213
Physical sciences	595	632	665	713	749	794	835	838
Astronomy	5	11	16	19	26	25	34	25
Chemistry	481	519	522	563	582	603	640	646
Physics	99	96	124	126	137	162	157	162
Physical sciences n e c	10	6	3	5	4	4	4	5
Earth. atmospheric & ocean sciences	57	62	63	85	70	94	112	154
Atmospheric sciences	9	5	5	5	2	6	10	13
Geosciences	31	33	31	48	43	61	58	80
Oceanography	11	17	16	24	21	25	34	51
Earth. atmospheric & ocean sciences n e c	6	7	11	8	4	2	10	10
Mathematical sciences	29	26	32	37	28	30	29	26
Computer sciences	10	10	13	11	14	9	21	34
Agricultural sciences	72	92	99	106	132	138	135	161
Biological sciences	2.737	3.051	3 325	3.453	3.804	3 994	4 226	4.608
Anatomy	93	132	119	145	166	163	177	183
Biochemistry	533	601	687	632	699	682	714	706
Biology	331	325	368	390	436	441	459	505
Biometry/epidemiology	27	44	33	27	39	35	33	52
Biophysics	24	29	28	34	32	46	44	49
Botany	91	97	129	144	132	137	152	155
Cell biology	259	285	305	302	352	463	474	480
Ecology	5	10	6	8	8	16	16	24
Entomology/parasitology	27	29	39	34	49	55	50	65
Genetics	123	156	179	178	187	236	229	267
Microbiology immunology & virology	384	415	449	496	532	505	624	671
Nutrition	64	57	53	44	46	49	56	65
Pathology	195	234	244	268	311	343	363	419
Pharmacology	251	259	279	318	350	357	378	442
Physiology	212	257	287	311	334	337	342	385
Zoology	72	80	68	58	70	59	60	63
Biosciences n e c	46	41	52	64	61	70	55	77
Psychology	225	224	192	216	209	221	237	247
Social sciences	114	115	125	116	130	154	145	145
Agricultural economics	2	4	2	3	7	10	10	10
Anthropology (cultural & social)	28	18	20	19	29	27	23	25
Economics (except agricultural)	4	4	5	0	3	4	3	5
Geography	2	2	6	12	9	6	4	8
Linguistics	14	11	18	15	12	15	5	10
Political science	5	18	13	15	14	21	33	37
Sociology	42	49	46	33	34	39	41	29
Sociology anthropology	0	0	1	1	0	0	1	0
Social sciences other	17	9	14	18	22	32	25	21
Engineering total	101	131	149	171	175	206	237	245
Aerospace engineering	1	2	4	3	3	4	4	4
Agricultural engineering	1	3	4	4	8	7	1	2
Biomedical engineering	8	9	7	4	4	5	11	12
Chemical engineering	27	38	36	53	46	81	92	68
Civil engineering	3	7	12	19	29	14	22	21
Electrical engineering	11	13	16	16	13	14	18	30
Engineering science	6	7	3	3	6	5	13	8
Industrial eng. management sci	3	4	1	4	6	1	2	3
Mechanical engineering	14	21	11	18	14	16	22	22
Metallurgical/materials eng	23	23	45	36	36	43	41	53
Nuclear engineering	2	4	3	5	4	4	3	1
Engineering other	2	0	7	6	6	12	8	21

KEY n e c = not elsewhere classified

SOURCE National Science Foundation SRS Survey of Graduate Students and Postdoctorates in Science and Engineering

Appendix table 8-1. Individuals in the U.S. civilian labor force, by occupation, sex, disability status, race/ethnicity, and nativity: 1980 and 1990

Characteristic	1980	1990	Percentage change 1980 to 1990	Percentage of total: 1980	Percentage of total: 1990
Total	104.449.800	123.473.500	18.2	100 0	100.0
Men	59.926.500	66.986.200	11 8	57.4	54.3
Women	44.523.300	56.487.200	26.9	42.6	45 7
People with disabilities	12.300.000	12.800.000	4 1	11.8	10 4
People without disabilities	92.149.800	110.673.500	20.1	88.2	89.6
Whites, non-Hispanic, total	85.677.200	96.243.100	12.3	82.0	77 9
Asians, total	1,696,400	3.495.800	106.1	1.6	2 8
Hispanics, total	5.992.700	10,021.700	67.2	5 7	8.1
Blacks, non-Hispanic, total	10.437.200	12.835.600	23.0	10.0	10 4
American Indians, total	546.500	783.400	43 3	.5	.6
Total, science and engineering					
Total	2.271.200	3.306.800	45 6	100 0	100.0
Men	1.968.400	2.567.200	30.4	86.7	77.6
Women	302,800	739.600	144 3	13.3	22.4
People with disabilities	74,100	88.900	20 0	3 3	2.7
People without disabilities	2,197,100	3.217.900	46 5	96.7	97.3
All races, total	2.271.200	3.306.800	45 6	100 0	100.0
Native born	2.059.600	2.933.700	42.4	90.7	88 7
Foreign born	211.600	373.200	76.4	9.3	11 3
Whites, non-Hispanic, total	2,043.600	2.838.100	38.9	90.0	85.8
Native born	1.931.600	2.685.500	39 0	85.0	81 2
Foreign born	112.100	152.700	52 4	4.9	5.2
Asians, total	96,100	206.600	115 0	4.2	6 2
Native born	21,800	39.900	83.0	1 0	1.2
Foreign born	74,300	166.800	124.5	3.3	5.0
Hispanics, total	49.900	103.500	107.4	2.2	3 1
Native born	31,900	67.300	111 0	1 4	2 0
Foreign born	18.000	36.300	101.7	8	1.1
Blacks, non-Hispanic, total	73.000	146.900	101.2	3 2	4 4
Native born	67.200	130.200	93.8	3.0	3 9
Foreign born	5.800	16.700	187.9	3	5
American Indians, total	5.700	9.700	70 2	3	.3

See explanatory information and SOURCES at end of table

Appendix table 8-1. Individuals in the U.S. civilian labor force, by occupation, sex, disability status, race/ethnicity, and nativity: 1980 and 1990

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Characteristic	1980	1990	Percentage change 1980 to 1990	Percentage of total: 1980	Percentage of total: 1990
Engineering					
Total	1.374.400	1.714.900	24.8	100 0	100.0
Men	1.312.300	1.558.100	18.7	95 5	90.9
Women	62.100	156.900	152.7	4.5	9.1
People with disabilities	45.500	44.100	-3 1	3 3	2 6
People without disabilities	1.328.900	1.670.900	25.7	96.7	97.4
All races, total	1.374.400	1.714.900	24 8	100.0	100.0
Native born	1.238.200	1.503.500	21.4	90.1	87 7
Foreign born	136.100	211.400	55 3	9.9	12 3
Whites, non-Hispanic, total	1.243.600	1.474.900	18.6	90.5	86.0
Native born	1.172.000	1.389.800	18.6	85.3	81.0
Foreign born	71.600	85.100	18.9	5.2	5.0
Asians, total	62.900	119.900	90 6	4.6	7.0
Native born	13.800	22.200	60 9	1 0	1.3
Foreign born	49.200	97.700	98.6	3.6	5 7
Hispanics, total	29.800	54.600	83.2	2 2	3.2
Native born	18.300	34.000	85.8	1 3	2.0
Foreign born	11.500	20.700	80.0	8	1.2
Blacks, non-Hispanic, total	33.400	60.000	79.6	2.4	3.5
Native born	30.600	52.300	70.9	2 2	3.0
Foreign born	2.900	7.600	162.1	.2	.4
American Indians, total	3.000	4.700	56.7	.2	.3
Math/computer science					
Total	334.000	779.900	133.5	100 0	100.0
Men	246.000	503 300	104 6	73.7	64 5
Women	88.000	276.600	214 3	26 3	35.5
People with disabilities	11.200	21.900	95 5	3 4	2.8
People without disabilities	322.900	758.000	134.7	96 7	97.2
All races, total	334.000	779.900	133 5	100 0	100.0
Native born	310.500	700.100	125.5	93 0	89 8
Foreign born	23.600	79.800	238.1	7 1	10 2
Whites, non-Hispanic, total	295.500	654.700	121 6	88 5	83.9
Native born	284.100	626.000	120.3	85 1	80.3
Foreign born	11.400	28.700	151 8	3 4	3.7
Asians, total	11.800	49.500	319.5	3.5	6 3
Native born	3.400	10.100	197 1	1 0	1 3
Foreign born	8.400	39.400	369 0	2 5	5.1
Hispanics, total	7 700	23 800	209 1	2 3	3 1
Native born	5.200	17.000	226 9	1 6	2 2
Foreign born	2.500	6.800	172 0	7	.9
Blacks, non-Hispanic, total	17.800	49.000	175 3	5 3	6 3
Native born	16.700	44.400	165 9	5 0	5 7
Foreign born	1.100	4.700	327 3	3	6
American Indians, total	900	2.300	155 6	.3	3

See explanatory information and SOURCES at end of table

Appendix table 8-1. Individuals in the U.S. civilian labor force, by occupation, sex, disability status, race/ethnicity, and nativity: 1980 and 1990

Characteristic	1980	1990	Percentage change 1980 to 1990	Percentage of total: 1980	Percentage of total: 1990
Natural science:					
Total	344,000	424,400	23.4	100.0	100.0
Men	274,700	311,900	13.5	79.9	73.5
Women	69,300	112,500	62 3	20 1	26.5
People with disabilities	10,800	11,100	2.8	3.1	2.6
People without disabilities	333,200	413,200	24.0	96.9	97 4
All races, total	344,000	424,400	23.4	100.0	100.0
Native born	308,300	369,400	19.8	89.6	87.0
Foreign born	35,700	54,900	53.8	10.4	12.9
Whites, non-Hispanic, total	306,500	364,300	18.9	89 1	85.8
Native born	288,200	340,500	18.1	83.8	80 2
Foreign born	18,300	23,800	30 1	5.3	5.6
Asians, total	17,000	28,500	67 6	4.9	6.7
Native born	3,400	4,700	38 2	1 0	1.1
Foreign born	13,600	23,900	75.7	4.0	5.6
Hispanics, total	7,300	12,300	68 5	2.1	2 9
Native born	4,800	7,400	54.2	1.4	1.7
Foreign born	2,400	4,900	104.2	7	1.2
Blacks, non-Hispanic, total	11,600	17,400	50 0	3 4	4.1
Native born	10,500	15,100	43.8	3.1	3 6
Foreign born	1,100	2,300	109 1	.3	.5
American Indians, total	1,100	1,600	45.5	3	.4
Social science:					
Total	218,800	387,500	77 1	100.0	100 0
Men	135,400	193,900	43.2	61 9	50.0
Women	83,300	193,600	132 4	38.1	50.0
People with disabilities	6,700	11,700	74 6	3.1	3.0
People without disabilities	212,100	375,800	77.2	96.9	97 0
All races, total	218,600	387,500	77 1	100 0	100 0
Native born	202,600	360,600	78 0	92 6	93.1
Foreign born	16,100	27,000	67.7	7 4	7 0
Whites, non-Hispanic, total	198,000	344,300	73 9	90 5	88 9
Native born	187,300	329,100	75.7	85 6	84.9
Foreign born	10,700	15,200	42 1	4.9	3 9
Asians, total	4,400	8,700	97.7	2.0	2 2
Native born	1,300	2,900	123.1	6	.7
Foreign born	3,000	5,800	93 3	1 4	1.5
Hispanics, total	5,200	12,800	146 2	2 4	3 3
Native born	3,600	8 900	147 2	1 6	2.3
Foreign born	1,600	3,900	143.8	7	1.0
Blacks, non-Hispanic, total	10,200	20,500	101 0	4 7	5 3
Native born	9,400	18,400	95.7	4.3	4 7
Foreign born	700	2,100	200 0	3	.5
American Indians, total	800	1,200	50.0	4	3

NOTE Because of rounding and exclusion of "other races," details may not add to totals and percentages may not add to 100

SOURCES U S. Department of Commerce, Bureau of the Census 1980 & 1990 Census of Population, supplementary report Detailed Occupation for the Civilian Labor Force: Special tabulations from the Public Use Microdata Files, U.S Census

Appendix table 8-2. Doctoral scientists and engineers in the U.S. labor force, by race/ethnicity, disability status, sex, and citizenship status: 1991

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Race/ethnicity, disability status, and sex	Total	U.S. native	Foreign-born			
			Total	Naturalized citizen	Permanent resident	Temporary resident
Total, all races	443,600	366,800	74,800	45,600	24,000	5,200
Men	359,600	293,900	63,900	39,000	20,500	4,400
Women	84,000	72,900	10,900	6,600	3,500	800
With disabilities:						
Total	21,300	19,000	2,300	1,700	500	100
Men	17,200	15,200	1,900	1,500	400	100
Women	4,100	3,800	400	200	100	--
Without disabilities:						
Total	416,700	343,400	71,400	43,300	23,200	4,900
Men	337,800	275,100	61,100	37,000	19,900	4,100
Women	78,900	68,400	10,300	6,300	3,300	800
Whites, non-Hispanic, total	377,900	349,100	28,000	18,100	8,500	1,400
Men	305,400	281,300	23,400	15,300	6,900	1,200
Women	72,500	67,800	4,500	2,800	1,500	200
With disabilities:						
Total	19,200	18,100	1,000	800	200	--
Men	15,500	14,700	900	700	100	--
Women	3,600	3,500	200	100	100	--
Without disabilities:						
Total	354,600	327,200	26,700	17,200	8,200	1,400
Men	286,500	263,500	22,400	14,500	6,700	1,200
Women	68,100	63,700	4,300	2,700	1,400	200
Blacks, non-Hispanic, total	9,400	6,800	2,500	900	1,400	300
Men	6,500	4,200	2,200	700	1,300	300
Women	3 000	2,700	300	100	100	--
With disabilities:						
Total	400	400	--	--	--	--
Men	200	200	--	--	--	--
Women	200	200	--	--	--	--
Without disabilities						
Total	8,900	6,400	2,500	800	1,400	200
Men	6,100	3,900	2,200	700	1,300	200
Women	2,800	2,500	300	100	100	--
Hispanics, total	8,300	4,700	3,400	1,900	1,300	200
Men	6,400	3,600	2,800	1,500	1,100	200
Women	1,900	1,200	700	400	200	--
With disabilities:						
Total	400	200	100	100	100	--
Men	300	200	100	100	--	--
Women	100	100	--	--	--	--
Without disabilities:						
Total	7,800	4,400	3,200	1,800	1,200	200
Men	6,100	3,300	2,600	1,400	1,000	200
Women	1,700	1,100	600	400	200	--

See explanatory information and SOURCE at end of table

Appendix table 8-2. Doctoral scientists and engineers in the U.S. labor force, by race/ethnicity, disability status, sex, and citizenship status: 1991

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Race/ethnicity, disability status, and sex	Total	U.S. native	Foreign-born			
			Total	Naturalized citizen	Permanent resident	Temporary resident
Asians, total	45,200	3,800	40,300	24,500	12,700	3,200
Men	38,900	2,900	35,000	21,200	11,100	2,700
Women	6,300	900	5,300	3,300	1,500	500
With disabilities:						
Total	1,200	100	1,100	800	300	100
Men	1,100	100	1,000	700	300	--
Women	200	--	200	100	--	--
Without disabilities:						
Total	43.300	3,700	38.600	23,300	12,300	3.000
Men	37,300	2,800	33.600	20,300	10,800	2,500
Women	6.000	900	5.000	3,000	1,500	500
American Indians, total	800	700	--	--	--	--
Men	600	600	--	--	--	--
Women	200	200	--	--	--	--
With disabilities:						
Total	100	100	--	--	--	--
Men	--	--	--	--	--	--
Women	--	--	--	--	--	--
Without disabilities:						
Total	700	700	--	--	--	--
Men	500	500	--	-	--	--
Women	200	200	--	--	--	--

NOTES: Because of rounding, "other races," and "no reports," details may not add to totals. "No reports" on race/ethnicity are excluded.

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS, 1991 Survey of Doctorate Recipients

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-3. Doctoral scientists and engineers in the U.S. labor force, by field of doctorate and sex: 1991

Page 1 of 1

Field	Total	Men	Women
Total, science and engineering	443,600	359,600	84,000
Science, total	373,100	291,500	81,600
Physical sciences	82,500	75,000	7,500
Chemistry	50,100	44,200	6,000
Physics/astronomy	32,400	30,800	1,500
Mathematical sciences	20,100	18,000	2,100
Mathematics	16,600	15,000	1,600
Statistics/probability	3,500	3,000	500
Computer/information sciences	5,500	4,800	600
Environmental sciences	13,400	12,100	1,300
Earth sciences	9,900	8,900	1,000
Oceanography	1,900	1,700	200
Atmospheric sciences	1,600	1,500	100
Life sciences	115,700	87,700	28,000
Biological sciences	79,500	60,100	19,400
Agricultural sciences	16,900	15,100	1,700
Medical sciences	19,300	12,400	6,900
Psychology	66,500	41,100	25,400
Social sciences	69,500	52,700	16,700
Economics	19,300	17,100	2,200
Sociology/anthropology	18,600	11,900	6,700
Other social sciences	31,500	23,700	7,800
Engineering, total	70,500	68,100	2,400
Aeronautical/astronautical	3,100	3,100	100
Chemical	10,700	10,300	400
Civil	7,500	7,300	300
Electrical/electronic	17,300	16,900	400
Materials science	6,300	5,900	400
Mechanical	8,800	8,600	200
Nuclear	1,900	1,900	100
Systems design	1,600	1,400	200
Other engineering	13,300	12,800	400

NOTE: Because of rounding, details may not add to totals.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-4. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by field of doctorate and sex: 1991

Page 1 of 1

Field and sex	Labor force participation rate	Unemployment rate	Under-employment rate
Total, science and engineering:			
Total	91	1	2
Men	91	1	1
Women	92	2	3
Science, total:			
Total	91	2	2
Men	91	1	1
Women	92	2	3
Physical sciences:			
Total	89	2	1
Men	89	2	1
Women	89	4	2
Mathematical sciences:			
Total	94	--	1
Men	94	--	1
Women	93	2	1
Computer sciences:			
Total	100	1	--
Men	100	1	--
Women	97	2	*
Environmental sciences:			
Total	91	1	2
Men	91	1	2
Women	89	3	5
Life sciences:			
Total	90	2	2
Men	90	1	1
Women	91	3	3
Psychology:			
Total	92	1	2
Men	92	1	1
Women	93	1	3
Social sciences:			
Total	91	1	4
Men	90	1	3
Women	93	2	5
Engineering:			
Total	94	1	1
Men	94	1	1
Women	93	2	2

[1] Underemployment rate is the percentage of individuals in the workforce who work full time but prefer part-time employment and/or who have non-science and engineering positions but prefer science and engineering employment.

KEY. -- = less than 0.5 percent
* = suppressed due to sample size less than 100

SOURCE National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-5. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by years of professional work experience and sex: 1991

Page 1 of 1

Years of experience and sex	Labor force participation rate	Unemployment rate	Under-employment rate
Total:			
Total	91	1	2
Men	91	1	1
Women	92	2	3
Less than 5 years:			
Total	97	2	3
Men	99	2	2
Women	93	3	5
5 to 14 years:			
Total	99	2	2
Men	100	2	1
Women	97	2	3
15 to 24 years:			
Total	100	1	1
Men	100	1	1
Women	99	1	2
25 or more years:			
Total	100	1	1
Men	100	1	1
Women	99	1	--

[1] Underemployment rate is the percentage of individuals in the workforce who work full time but prefer part-time employment and/or who have non-science and engineering positions but prefer science and engineering employment.

KEY: -- = less than 0.5 percent

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-6. Median annual salaries of employed doctoral scientists and engineers, by field of doctorate and sex: 1991

Page 1 of 1

Field	Total	Men	Women
Total, science and engineering	$61,000	$63,000	$50,000
Science, total	59,000	61,000	50,000
Physical sciences	65,000	66,000	55,000
Chemistry	63,000	64,000	55,000
Physics/astronomy	67,000	68,000	58,000
Mathematical sciences	61,000	61,000	53,000
Mathematics	60,000	61,000	51,000
Statistics/probability	62,000	63,000	61,000
Computer/information sciences	68,000	69,000	63,000
Environmental sciences	60,000	61,000	51,000
Earth sciences	60,000	61,000	52,000
Oceanography	60,000	61,000	*
Atmospheric sciences	58,000	59,000	*
Life sciences	56,000	58,000	49,000
Biological sciences	56,000	58,000	48,000
Agricultural sciences	52,000	53,000	42,000
Medical sciences	60,000	66,000	51,000
Psychology	56,000	59,000	50,000
Social sciences	56,000	59,000	50,000
Economics	64,000	65,000	57,000
Sociology/anthropology	51,000	51,000	47,000
Other social sciences	55,000	57,000	49,000
Engineering, total	70,000	70,000	60,000
Aeronautical/astronautical	73,000	73,000	*
Chemical	72,000	73,000	58,000
Civil	65,000	65,000	59,000
Electrical/electronic	74,000	75,000	61,000
Materials science	65,000	66,000	57,000
Mechanical	69,000	70,000	*
Nuclear	70,000	70,000	*
Systems design	71,000	72,000	*
Other engineering	68,000	68,000	61,000

NOTE: Median salaries were computed only for full-time employed civilians.

KEY: * = suppressed due to sample size less than 20

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-7. Median annual salaries of employed doctoral scientists and engineers, by years of professional work experience and sex: 1991

Page 1 of 1

Years of experience	Total	Men	Women
Total	$60.700	$62,800	$50,400
Less than 5 years	46,000	48,000	42,000
5 to 14 years	55,800	57,900	50.500
15 to 24 years	68.400	70,000	58,700
25 or more years	75,700	76,200	66,500

NOTE Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-8. Employed doctoral scientists and engineers, by field of doctorate, sex, and employment sector: 1991

Page 1 of 1

Field and sex	Total employed	Employment sector: Business/ Industry	University/ 4-yr college	Other educ inst	Gov't	Other
Total, science and engineering:						
Total	437,200	157,300	195,300	10,900	40,100	31,300
Men	355,000	133,300	156,900	7,100	33,600	22,400
Women	82,200	23,900	38,400	3,800	6,500	9,000
Science, total						
Total	367,400	117,700	172,500	10,700	35,500	29,000
Men	287,700	94,900	135,100	6,900	29,300	20,100
Women	79,800	22,800	37,500	3,800	6,300	8,900
Physical sciences:						
Total	80,900	42,100	27,700	1,700	5,800	3,200
Men	73,700	38,200	25,500	1,400	5,400	2,800
Women	7,200	3,800	2,200	300	500	400
Mathematical sciences:						
Total	20,000	4,100	13,800	400	1,100	500
Men	18,000	3,600	12,600	300	1,000	400
Women	2,000	500	1,200	100	100	100
Computer sciences:						
Total	5,400	2,600	2,500	--	100	100
Men	4,700	2,400	2,100	--	100	100
Women	600	300	300	--	--	--
Environmental sciences:						
Total	13,300	3,700	5,400	100	3,500	500
Men	12,000	3,400	4,700	100	3,200	500
Women	1,300	300	600	100	200	--
Life sciences:						
Total	113,700	29,600	59,900	2,900	12,400	8,400
Men	86,500	23,900	44,200	2,000	10,100	5,900
Women	27,300	5,800	15,700	900	2,300	2,500
Psychology:						
Total	65,700	24,100	21,400	3,500	4,800	11,400
Men	40,700	14,600	13,700	1,700	3,300	7,100
Women	25,000	9,500	7,700	1,700	1,600	4,300
Social sciences:						
Total	68,500	11,400	41,900	2,200	7,800	4,800
Men	52,100	8,800	32,100	1,400	6,200	3,300
Women	16,400	2,600	9,800	800	1,600	1,600
Engineering:						
Total	69,800	39,600	22,800	200	4,500	2,400
Men	67,400	38,400	21,800	200	4,400	2,300
Women	2,400	1,200	900	--	200	100

NOTE: Because of rounding and "no reports," details may not add to totals.

KEY: -- = fewer than 50 reporting

SOURCE. National Science Foundation/SRS 1991 Survey of Doctorate Recipients.

Appendix table 8-9. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, academic rank, and sex: 1991

Page 1 of 1

Years of experience and academic rank	Total	Men	Women
Total:			
Total, all academic ranks	195,300	156,900	38,400
Full professor	71,800	65,500	6,200
Associate professor	46,500	36,700	9,700
Assistant professor	36,300	25,700	10,600
Other faculty	11,800	7,500	4,300
Does not apply	10,500	7,200	3,300
Less than 8 years:			
Total, all academic ranks	55,000	37,500	17,500
Full professor	900	600	300
Associate professor	7,700	5,400	2,200
Assistant professor	25,800	18,300	7,500
Other faculty	4,700	2,300	2,400
Does not apply	5,500	3,500	1,900
8 or more years:			
Total, all academic ranks	137,100	117,100	20,000
Full professor	70,000	64,200	5,800
Associate professor	38,300	30,900	7,400
Assistant professor	10,000	7,100	2,900
Other faculty	6,800	5,100	1,700
Does not apply	4,900	3,600	1,300

NOTE: Because of rounding and "no reports," details may not add to totals.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-10. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, tenure status, and sex: 1991

Page 1 of 1

Years of experience and tenure status	Total	Men	Women
Total:			
Total, all tenure statuses	195,300	156,900	38,400
Tenured	106,700	93,100	13,600
Not tenured, in track	34,800	25,600	9,200
Not tenured, not in track	15,500	9,700	5,800
Tenure not applicable	19,400	14,000	5,400
Less than 8 years:			
Total, all tenure statuses	55,000	37,500	17,500
Tenured	6,000	4,200	1,800
Not tenured, in track	23,600	17,100	6,400
Not tenured, not in track	6,900	3,700	3,200
Tenure not applicable	7,900	5,000	2,900
8 or more years:			
Total, all tenure statuses	137,100	117,100	20,000
Tenured	99,300	87,800	11,500
Not tenured, in track	10,800	8,200	2,600
Not tenured, not in track	8,200	5,800	2,400
Tenure not applicable	11,300	8,900	2,400

NOTE: Because of rounding and "no reports," details may not add to totals.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-11. Doctoral scientists and engineers in the U.S. labor force, by field of doctorate, race/ethnicity, and citizenship status: 1991

Page 1 of 2

Field and race/ethnicity	Total	U.S. native	Foreign-born			
			Total	Naturalized citizen	Permanent resident	Temporary resident
Total, science and engineering:						
Total	443,600	366,800	74,800	45,600	24,000	5,200
White, non-Hispanic	377,900	349,100	28,000	18,100	8,500	1,400
Black, non-Hispanic	9,400	6,800	2,500	900	1,400	300
Hispanic	8,300	4,700	3,400	1,900	1,300	200
Asian	45,200	3,800	40,300	24,500	12,700	3,200
American Indian	800	700	--	--	--	--
Science, total:						
Total	373,100	321,700	50,000	30,300	16,000	3,700
White, non-Hispanic	326,900	305,900	20,400	13,200	6,200	1,000
Black, non-Hispanic	8,600	6,500	2,100	700	1,100	300
Hispanic	6,900	4,200	2,700	1,600	900	200
Asian	28,300	3,200	24,400	14,600	7,600	2,300
American Indian	600	600	--	--	--	--
Physical sciences:						
Total	82,500	67,200	15,000	9,400	4,200	1,400
White, non-Hispanic	69,400	64,300	5,100	3,600	1,200	300
Black, non-Hispanic	1,000	700	300	100	200	100
Hispanic	1,500	900	600	300	300	100
Asian	9,900	800	8,900	5,400	2,600	900
American Indian	100	100	--	--	--	--
Mathematical sciences:						
Total	20,100	16,000	4,000	2,200	1,400	300
White, non-Hispanic	16,900	15,300	1,500	800	600	100
Black, non-Hispanic	200	200	100	--	100	--
Hispanic	500	200	300	100	100	--
Asian	2,200	100	2,000	1,200	700	200
American Indian	--	--	--	--	--	--
Computer sciences:						
Total	5,500	3,800	1,500	600	800	100
White, non-Hispanic	4,200	3,700	500	300	200	--
Black, non-Hispanic	--	--	--	--	--	--
Hispanic	100	--	100	--	100	--
Asian	1,100	100	900	300	500	100
American Indian	--	--	--	--	--	--

See explanatory information and SOURCE at end of table.

Appendix table 8-11. Doctoral scientists and engineers in the U.S. labor force, by field of doctorate, race/ethnicity, and citizenship status: 1991

Page 2 of 2

Field and race/ethnicity	Total	U.S. native	Foreign-born			
			Total	Naturalized citizen	Permanent resident	Temporary resident
Environmental sciences:						
Total	13,400	11,700	1,600	1,000	400	200
White, non-Hispanic	12,400	11,500	900	600	200	100
Black, non-Hispanic	--	--	--	--	--	--
Hispanic	200	100	100	100	--	--
Asian	700	100	600	400	100	100
American Indian	--	--	--	--	--	--
Life sciences:						
Total	115,700	100,600	14,800	9,500	4,000	1,300
White, non-Hispanic	101,500	96,000	5,400	3,600	1,600	300
Black, non-Hispanic	2,200	1,600	600	200	300	100
Hispanic	1,900	1,100	700	500	200	100
Asian	9,400	1,300	7,900	5,200	2,000	800
American Indian	200	200	--	--	--	--
Psychology:						
Total	66,500	62,700	3,700	2,600	1,000	100
White, non-Hispanic	61,800	59,000	2,700	1,900	800	100
Black, non-Hispanic	2,100	2,000	100	--	--	--
Hispanic	1,300	1,000	300	300	--	--
Asian	1,100	500	600	400	200	--
American Indian	100	100	--	--	--	--
Social sciences:						
Total	69,500	59,700	9,400	5,000	4,100	400
White, non-Hispanic	60,600	56,200	4,200	2,400	1,600	200
Black, non-Hispanic	2,900	1,900	1,000	400	600	100
Hispanic	1,600	900	600	300	300	--
Asian	4,000	400	3,500	1,800	1,600	100
American Indian	200	200	--	--	--	--
Engineering, total:						
Total	70,500	45,100	24,800	15,300	8,000	1,400
White, non-Hispanic	51,000	43,200	7,600	4,900	2,300	400
Black, non-Hispanic	900	400	500	200	300	--
Hispanic	1,300	500	700	300	300	100
Asian	16,900	600	15,900	9,900	5,100	900
American Indian	100	100	--	--	--	--

NOTE: Because of rounding, "other races," and "no reports," details may not add to totals.

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS 1991 Survey of Doctorate Recipients.

Appendix table 8-12. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

Field, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
Total, science and engineering:			
Total[2]	91	1	2
U.S. native	91	1	2
Not U.S. native	94	2	2
Whites, non-Hispanic, total	91	1	2
U.S. native	91	1	2
Not U.S. native	91	2	2
Blacks, non-Hispanic, total	95	2	2
U.S. native	95	2	2
Not U.S. native	95	2	2
Hispanics, total	95	1	2
U.S. native	95	2	2
Not U.S. native	96	1	3
Asians, total	96	2	1
U.S. native	92	1	1
Not U.S. native	96	2	2
American Indians, total	95	2	1
U.S. native	95	2	1
Not U.S. native	*	*	*
Science, total:			
Total[2]	91	2	2
U.S. native	90	1	2
Not U.S. native	93	2	2
Whites, non-Hispanic, total	90	2	2
U.S. native	90	1	2
Not U.S. native	90	2	3
Blacks, non-Hispanic, total	95	2	2
U.S. native	95	2	2
Not U.S. native	95	3	2
Hispanics, total	95	1	2
U.S. native	95	2	2
Not U.S. native	95	1	2
Asians, total	95	2	2
U.S. native	91	1	1
Not U.S. native	95	2	2
American Indians, total	94	2	1
U.S. native	94	2	1
Not U.S. native	*	*	*
Physical sciences:			
Total[2]	89	2	1
U.S. native	88	2	1
Not U.S. native	94	3	1
Whites, non-Hispanic, total	88	2	1
U.S. native	88	2	1
Not U.S. native	90	2	2
Blacks, non-Hispanic, total	99	7	--
U.S. native	99	5	1
Not U.S. native	*	*	*
Hispanics, total	96	6	1
U.S. native	97	7	1
Not U.S. native	*	*	*
Asians, total	96	3	1
U.S. native	91	1	1
Not U.S. native	96	4	1
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

See explanatory information and SOURCE at end of table

Appendix table 8-12. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

Field, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
Mathematical sciences:			
Total[2]	94	--	1
U.S. native	93	--	1
Not U.S. native	96	--	1
Whites, non-Hispanic, total	93	--	1
U.S. native	93	--	1
Not U.S. native	95	--	2
Blacks, non-Hispanic, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Hispanics, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Asians, total	97	--	--
U.S. native	*	*	*
Not U.S. native	97	--	--
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Computer/information sciences:			
Total[2]	100	1	--
U.S. native	100	2	--
Not U.S. native	99	--	1
Whites, non-Hispanic, total	100	2	--
U.S. native	100	2	--
Not U.S. native	*	*	*
Blacks, non-Hispanic, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Hispanics, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Asians, total	99	--	2
U.S. native	*	*	*
Not U.S. native	*	*	*
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Environmental sciences:			
Total[2]	91	1	2
U.S. native	90	1	2
Not U.S. native	94	3	3
Whites, non-Hispanic, total	91	1	2
U.S. native	90	1	2
Not U.S. native	*	*	*
Blacks, non-Hispanic, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Hispanics, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Asians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

See explanatory information and SOURCE at end of table.

Appendix table 8-12. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

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Field, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
Life sciences:			
Total[2]	90	2	2
U.S. native	90	2	2
Not U.S. native	92	2	2
Whites, non-Hispanic, total	90	2	2
U.S. native	90	2	2
Not U.S. native	88	2	2
Blacks, non-Hispanic, total	94	1	2
U.S. native	93	--	2
Not U.S. native	*	*	*
Hispanics, total	94	--	2
U.S. native	93	--	3
Not U.S. native	*	*	*
Asians, total	94	2	2
U.S. native	90	2	--
Not U.S. native	95	2	2
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Psychology:			
Total[2]	92	1	2
U.S. native	92	1	2
Not U.S. native	92	2	3
Whites, non-Hispanic, total	92	1	2
U.S. native	92	1	2
Not U.S. native	90	1	3
Blacks, non-Hispanic, total	95	3	3
U.S. native	95	3	3
Not U.S. native	*	*	*
Hispanics, total	94	--	1
U.S. native	92	--	2
Not U.S. native	*	*	*
Asians, total	93	2	4
U.S. native	*	*	*
Not U.S. native	*	*	*
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Social sciences:			
Total[2]	91	1	4
U.S. native	91	1	3
Not U.S. native	91	1	5
Whites, non-Hispanic, total	91	2	3
U.S. native	91	2	3
Not U.S. native	88	2	5
Blacks, non-Hispanic, total	94	1	3
U.S. native	94	1	2
Not U.S. native	*	*	*
Hispanics, total	97	--	3
U.S. native	98	--	2
Not U.S. native	*	*	*
Asians, total	93	1	6
U.S. native	*	*	*
Not U.S. native	94	1	6
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

See explanatory information and SOURCE at end of table.

Appendix table 8-12. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

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Field, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
Engineering:			
Total[2]	94	1	1
U.S native	93	1	1
Not U.S. native	97	1	1
Whites, non-Hispanic, total	93	1	1
U.S. native	92	1	1
Not U.S. native	95	2	1
Blacks, non-Hispanic, total	97	--	1
U.S. native	*	*	*
Not U.S. native	*	*	*
Hispanics, total	95	2	4
U.S. native	*	*	*
Not U.S. native	*	*	*
Asians, total	98	1	1
U.S. native	*	*	*
Not U.S. native	97	1	1
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

[1] Underemployment rate is the percentage of individuals in the workforce who work full time but prefer part-time employment and/or who have non-science and engineering positions but prefer science and engineering employment.
[2] Totals include other races and "no reports" on race/ethnicity and nativity.

KEY: -- = less than 0.5 percent
* = suppressed due to sample size less than 100

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women. Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-13. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by years of professional work experience, race/ethnicity, and nativity: 1991

Years of experience, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
Total:			
Total[2]	91	1	2
U.S. native	91	1	2
Not U.S. native	94	2	2
Whites, non-Hispanic, total	91	1	2
U.S. native	91	1	2
Not U.S. native	91	2	2
Blacks, non-Hispanic, total	95	2	2
U.S. native	95	2	2
Not U.S. native	95	2	2
Hispanics, total	95	1	2
U.S. native	95	2	2
Not U.S. native	96	1	3
Asians, total	96	2	1
U.S. native	92	1	1
Not U.S. native	96	2	2
American Indians, total	95	2	1
U.S. native	95	2	1
Not U.S. native	*	*	*
Less than 5 years:			
Total[2]	97	2	3
U.S. native	97	2	3
Not U.S. native	98	2	4
Whites, non-Hispanic, total	97	2	3
U.S. native	97	2	3
Not U.S. native	99	3	6
Blacks, non-Hispanic, total	99	2	2
U.S. native	99	3	3
Not U.S. native	*	*	*
Hispanics, total	96	2	2
U.S. native	98	3	2
Not U.S. native	*	*	*
Asians, total	98	2	3
U.S. native	99	3	5
Not U.S. native	98	2	3
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
5 to 14 years:			
Total[2]	99	2	2
U.S. native	99	2	2
Not U.S. native	99	2	1
Whites, non-Hispanic, total	99	2	2
U.S. native	99	2	2
Not U.S. native	99	2	1
Blacks, non-Hispanic, total	100	2	2
U.S. native	100	2	2
Not U.S. native	*	*	*
Hispanics, total	100	2	3
U.S. native	100	3	2
Not U.S. native	100	1	4
Asians, total	99	2	1
U.S. native	99	1	--
Not U.S. native	99	2	1
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

See explanatory information and SOURCE at end of table.

Appendix table 8-13. Labor force participation, unemployment, and underemployment[1] rates for doctoral scientists and engineers, by years of professional work experience, race/ethnicity, and nativity: 1991

Page 2 of 2

Years of experience, race/ethnicity, and nativity	Labor force participation rate	Unemployment rate	Under-employment rate
15 to 24 years:			
Total[2]	100	1	1
U.S. native	100	1	1
Not U.S. native	99	2	1
Whites, non-Hispanic, total	100	1	1
U.S. native	100	1	1
Not U.S. native	100	2	1
Blacks, non-Hispanic, total	99	--	2
U.S. native	100	--	1
Not U.S. native	*	*	*
Hispanics, total	100	1	--
U.S. native	100	--	1
Not U.S. native	*	*	*
Asians, total	100	2	1
U.S. native	100	--	--
Not U.S. native	99	2	1
American Indians, total	*	*	*
U.S native	*	*	*
Not U.S. native	*	*	*
25 or more years:			
Total[2]	100	1	1
U.S. native	100	1	1
Not U.S. native	100	1	1
Whites, non-Hispanic, total	100	1	1
U.S. native	100	1	1
Not U.S. native	100	1	1
Blacks, non-Hispanic, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Hispanics, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*
Asians, total	99	--	1
U.S. native	*	*	*
Not U.S. native	100	--	1
American Indians, total	*	*	*
U.S. native	*	*	*
Not U.S. native	*	*	*

[1] Underemployment rate is the percentage of individuals in the workforce who work full time but prefer part-time employment and/or who have non-science and engineering positions but prefer science and engineering employment

[2] Totals include other races and "no reports" on race/ethnicity and nativity.

KEY: -- = less than 0.5 percent
* = suppressed due to sample size less than 100

SOURCE National Science Foundation/SRS. 1991 Survey of Doctorate Recipients

Appendix table 8-14. Median annual salaries of employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

Page 1 of 2

Field and race/ethnicity	Total[1]	U.S. native	Not U.S. native
Total, science and engineering:			
Total[2]	$61,000	$61,000	$61,000
White, non-Hispanic	61,000	61,000	63,000
Black, non-Hispanic	53,000	55,000	48,000
Hispanic	55,000	55,000	56,000
Asian	60,000	60,000	60,000
American Indian	56,000	56,000	*
Science, total:			
Total[2]	59,000	59,000	57,000
White, non-Hispanic	60,000	60,000	61,000
Black, non-Hispanic	52,000	55,000	46,000
Hispanic	53,000	53,000	53,000
Asian	56,000	58,000	56,000
American Indian	55,000	55,000	*
Physical sciences:			
Total[2]	65,000	66,000	61,000
White, non-Hispanic	66,000	66,000	65,000
Black, non-Hispanic	57,000	62,000	*
Hispanic	61,000	61,000	51,000
Asian	59,000	63,000	60,000
American Indian	*	*	*
Mathematical sciences:			
Total[2]	61,000	62,000	56,000
White, non-Hispanic	62,000	62,000	58,000
Black, non-Hispanic	59,000	61,000	*
Hispanic	53,000	64,000	*
Asian	54,000	*	55,000
American Indian	*	*	*
Computer sciences:			
Total[2]	68,000	70,000	67,000
White, non-Hispanic	70,000	69,000	74,000
Black, non-Hispanic	*	*	*
Hispanic	*	*	*
Asian	64,000	*	64,000
American Indian	*	*	*
Environmental sciences:			
Total[2]	60,000	61,000	57,000
White, non-Hispanic	60,000	61,000	60,000
Black, non-Hispanic	*	*	*
Hispanic	66,000	*	*
Asian	54,000	*	52,000
American Indian	*	*	*
Life sciences:			
Total[2]	56,000	56,000	55,000
White, non-Hispanic	56,000	56,000	62,000
Black, non-Hispanic	50,000	52,000	42,000
Hispanic	52,000	52,000	52,000
Asian	52,000	53,000	52,000
American Indian	49,000	49,000	*

See explanatory information and SOURCE at end of table.

Appendix table 8-14. Median annual salaries of employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, and nativity: 1991

Page 2 of 2

Field and race/ethnicity	Total[1]	U.S. native	Not U.S. native
Psychology:			
Total[2]	$56,000	$56,000	$53,000
White, non-Hispanic	56,000	56,000	59,000
Black, non-Hispanic	52,000	53,000	*
Hispanic	52,000	54,000	*
Asian	50,000	57,000	44,000
American Indian	*	*	*
Social sciences:			
Total[2]	56,000	57,000	53,000
White, non-Hispanic	57,000	57,000	55,000
Black, non-Hispanic	51,000	56,000	44,000
Hispanic	48,000	47,000	50,000
Asian	54,000	56,000	54,000
American Indian	49,000	49,000	*
Engineering:			
Total[2]	70,000	73,000	66,000
White, non-Hispanic	72,000	73,000	70,000
Black, non-Hispanic	61,000	72,000	60,000
Hispanic	61,000	62,000	60,000
Asian	65,000	73,000	65,000
American Indian	*	*	*

[1] Totals include "no reports" on nativity.
[2] Totals include other races and "no reports" on race/ethnicity.

KEY: * = suppressed due to sample size less than 20

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-15. Median annual salaries of employed doctoral scientists and engineers, by years of professional work experience, race/ethnicity, and nativity: 1991

Page 1 of 1

Years of experience and race/ethnicity	Total[1]	U.S. native	Not U.S. native
Total:			
Total[2]	$61,000	$61,000	$61,000
White, non-Hispanic	61,000	61,000	63,000
Black, non-Hispanic	53,000	55,000	48,000
Hispanic	55,000	55,000	56,000
Asian	60,000	60,000	60,000
American Indian	56,000	56,000	*
Less than 5 years:			
Total[2]	46,000	46,000	48,000
White, non-Hispanic	46,000	46,000	49,000
Black, non-Hispanic	43,000	45,000	40,000
Hispanic	43,000	39,000	46,000
Asian	49,000	49,000	49,000
American Indian	47,000	47,000	*
5 to 14 years:			
Total[2]	56,000	55,000	60,000
White, non-Hispanic	56,000	55,000	61,000
Black, non-Hispanic	53,000	54,000	50,000
Hispanic	52,000	52,000	53,000
Asian	59,000	59,000	59,000
American Indian	58,000	58,000	*
15 to 24 years:			
Total[2]	68,000	68,000	70,000
White, non-Hispanic	68,000	68,000	71,000
Black, non-Hispanic	61,000	61,000	57,000
Hispanic	71,000	67,000	75,000
Asian	70,000	65,000	70,000
American Indian	60,000	*	*
25 or more years:			
Total[2]	76,000	75,000	80,000
White, non-Hispanic	76,000	75,000	81,000
Black, non-Hispanic	69,000	68,000	*
Hispanic	75,000	69,000	*
Asian	79,000	85,000	77,000
American Indian	*	*	*

[1] Totals include "no reports" on nativity.
[2] Totals include other races and "no reports" on race/ethnicity.

KEY. * = suppressed due to sample size less than 20

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Women, Minorities, and Persons With Disabilities in Science and Engineering: 1994

Appendix table 8-16. Employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, nativity, and employment sector: 1991

Field, race/ethnicity, and nativity	Total employed	Industry/ business	University/ 4-year college	Other educ. institution	Govern- ment	Other
Total, all fields:						
Total	437,200	157,300	195,300	10,900	40,100	31,300
U.S. native	361,700	125,200	163,200	9,600	35,600	26,100
Not U.S. native	73,400	31,600	31,000	1,300	4,500	4,900
Whites, non-Hispanic, total	372,600	130,100	168,800	9,600	35,200	26,800
U.S. native	344,400	120,300	154,700	9,000	33,600	24,700
Not U.S. native	27,500	9,500	13,700	600	1,500	1,900
Blacks, non-Hispanic, total	9,300	2,000	4,800	400	1,100	900
U.S. native	6,700	1,400	3,500	300	900	700
Not U.S. native	2,500	700	1,300	100	200	200
Hispanics, total	8,200	2,200	4,100	300	700	800
U.S. native	4,600	1,200	2,300	200	500	400
Not U.S. native	3,400	1,000	1,700	100	300	400
Asians, total	44,400	22,000	16,300	600	2,700	2,800
U.S. native	3,800	1,500	1,600	100	300	200
Not U.S. native	39,600	20,200	14,100	500	2,400	2,400
American Indians, total	700	200	400	--	200	--
U.S. native	700	200	400	--	200	--
Not U.S. native	--	--	--	--	--	--
Science, total:						
Total	367,400	117,700	172,500	10,700	35,500	29,000
U.S. native	317,100	100,800	148,100	9,500	32,100	24,700
Not U.S. native	49,000	16,600	23,700	1,200	3,400	3,900
Whites, non-Hispanic, total	322,100	103,000	150,900	9,500	31,600	25,200
U.S. native	301,600	96,900	140,300	8,900	30,300	23,400
Not U.S. native	20,000	6,100	10,300	600	1,300	1,600
Blacks, non-Hispanic, total	8,400	1,600	4,500	400	1,100	800
U.S. native	6,400	1,200	3,300	300	900	600
Not U.S. native	2,000	400	1,200	100	200	200
Hispanics, total	6,900	1,600	3,600	300	700	800
U.S. native	4,100	1,000	2,100	200	400	400
Not U.S. native	2,700	500	1,500	100	200	400
Asians, total	27,800	10,800	12,400	500	1,900	2,100
U.S. native	3,200	1,100	1,500	100	300	200
Not U.S. native	23,900	9,600	10,500	400	1,700	1,700
American Indians, total	600	200	400	--	100	--
U.S. native	600	200	400	--	100	--
Not U.S. native	--	--	--	--	--	--
Physical sciences:						
Total	80,900	42,100	27,700	1,700	5,800	3,200
U.S. native	66,000	34,100	22,700	1,300	5,200	2,400
Not U.S. native	14,500	7,900	4,800	400	700	800
Whites, non-Hispanic, total	68,300	35,400	23,700	1,300	5,000	2,500
U.S. native	63,200	32,900	21,600	1,100	4,900	2,300
Not U.S. native	5,000	2,500	2,000	100	100	300
Blacks, non-Hispanic, total	900	400	300	100	100	--
U.S. native	700	300	200	--	100	--
Not U.S. native	300	100	100	--	--	--
Hispanics, total	1,400	400	700	100	200	100
U.S. native	800	200	400	100	--	--
Not U.S. native	600	200	300	--	100	--
Asians, total	9,600	5,600	2,800	200	500	600
U S native	800	400	300	--	--	--
Not U S native	8,600	5,100	2,400	200	400	500
American Indians, total	100	--	--	--	--	--
U.S. native	100	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--

See explanatory information and SOURCE at end of table

Appendix table 8-16. Employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, nativity, and employment sector: 1991

Page 2 of 4

Field, race/ethnicity, and nativity	Total employed	Industry/ business	University/ 4-year college	Other educ. institution	Govern- ment	Other
Mathematical sciences:						
Total	20,000	4,100	13,800	400	1,100	500
U.S. native	16,000	3,200	11,000	300	900	500
Not U.S. native	4,000	900	2,700	100	100	100
Whites, non-Hispanic, total	16,900	3,300	11,700	300	1,000	400
U.S. native	15,300	3,100	10,500	300	900	400
Not U.S. native	1,500	300	1,200	--	100	--
Blacks, non-Hispanic, total	200	100	100	--	--	--
U.S. native	200	--	100	--	--	--
Not U.S. native	100	--	--	--	--	--
Hispanics, total	500	--	300	--	--	--
U.S. native	200	--	100	--	--	--
Not U.S. native	300	--	200	--	--	--
Asians, total	2,200	600	1,400	100	100	--
U.S. native	100	--	100	--	--	--
Not U.S. native	2,000	600	1,200	100	100	--
American Indians, total	--	--	--	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--
Computer sciences:						
Total	5,400	2,600	2,500	--	100	100
U.S. native	3,800	2,000	1,600	--	100	100
Not U.S. native	1,500	600	800	--	--	--
Whites, non-Hispanic, total	4,100	2,100	1,800	--	100	100
U.S. native	3,600	1,900	1,500	--	100	100
Not U.S. native	500	200	300	--	--	--
Blacks, non-Hispanic, total	--	--	--	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--
Hispanics, total	100	--	100	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	100	--	--	--	--	--
Asians, total	1,100	500	500	--	--	--
U.S. native	100	100	--	--	--	--
Not U.S. native	900	400	500	--	--	--
American Indians, total	--	--	--	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--
Environmental sciences:						
Total	13,300	3,700	5,400	100	3,500	500
U.S. native	11,700	3,200	4,700	100	3,200	400
Not U.S. native	1,500	500	700	--	300	100
Whites, non-Hispanic, total	12,300	3,400	5,000	100	3,300	500
U.S. native	11,400	3,100	4,500	100	3,100	400
Not U.S. native	900	300	500	--	200	--
Blacks, non-Hispanic, total	--	--	--	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--
Hispanics, total	100	--	100	--	--	--
U.S. native	100	--	100	--	--	--
Not U.S. native	100	--	--	--	--	--
Asians, total	700	300	200	--	100	--
U.S. native	100	--	--	--	--	--
Not U.S. native	600	200	200	--	100	--
American Indians, total	--	--	--	--	--	--
U.S. native	--	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--

See explanatory information and SOURCE at end of table.

Appendix table 8-16. Employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, nativity, and employment sector: 1991

Field, race/ethnicity, and nativity	Total employed	Industry/ business	University/ 4-year college	Other educ. institution	Govern- ment	Other
Life sciences:						
Total	113,700	29,600	59,900	2,900	12,400	8,400
U.S. native	98,900	25,400	52,200	2,700	11,200	6,900
Not U.S. native	14,500	4,200	7,500	100	1,200	1,400
Whites, non-Hispanic, total	99,700	25,900	52,500	2,700	10,900	7,100
U.S. native	94,400	24,300	49,800	2,600	10,500	6,600
Not U.S. native	5,300	1,500	2,700	--	400	500
Blacks, non-Hispanic, total	2,200	300	1,400	--	400	100
U.S. native	1,600	300	900	--	300	100
Not U.S. native	600	--	400	--	100	--
Hispanics, total	1,900	400	1,000	--	200	200
U.S. native	1,100	200	600	--	100	100
Not U.S. native	700	200	400	--	100	100
Asians, total	9,200	2,800	4,700	100	800	900
U.S. native	1,300	300	700	--	100	100
Not U.S. native	7,800	2,400	3,900	100	700	800
American Indians, total	200	100	100	--	--	--
U.S. native	200	100	100	--	--	--
Not U.S. native	--	--	--	--	--	--
Psychology:						
Total	65,700	24,100	21,400	3,500	4,800	11,400
U.S. native	61,900	23,000	20,100	3,200	4,500	10,700
Not U.S. native	3,700	1,100	1,300	300	300	700
Whites, non-Hispanic, total	61,100	22,800	19,800	3,200	4,400	10,400
U.S. native	58,300	22,000	18,800	2,900	4,200	10,000
Not U.S. native	2,700	900	900	200	200	400
Blacks, non-Hispanic, total	2,000	400	800	200	200	400
U.S. native	2,000	400	800	100	200	400
Not U.S. native	100	--	--	--	--	--
Hispanics, total	1,300	400	400	100	100	400
U.S. native	1,000	400	200	--	100	200
Not U.S. native	300	100	100	--	--	100
Asians, total	1,000	200	400	100	100	300
U.S. native	500	100	100	--	--	100
Not U.S. native	500	100	200	--	100	200
American Indians, total	100	--	--	--	--	--
U.S. native	100	--	--	--	--	--
Not U.S. native	--	--	--	--	--	--
Social sciences:						
Total	68,500	11,400	41,900	2,200	7,800	4,800
U.S. native	58,800	10,000	35,800	1,900	7,100	3,800
Not U.S. native	9,300	1,400	5,900	300	700	900
Whites, non-Hispanic, total	59,600	10,100	36,400	1,900	6,900	4,100
U.S. native	55,400	9,600	33,500	1,700	6,600	3,500
Not U.S. native	4,100	500	2,700	100	300	400
Blacks, non-Hispanic, total	2,900	300	1,800	100	400	300
U.S. native	1,900	200	1,200	100	300	100
Not U.S. native	1,000	200	600	--	100	100
Hispanics, total	1,600	200	1,100	--	100	100
U.S. native	900	100	600	--	100	--
Not U.S. native	600	100	400	--	--	100
Asians, total	3,900	800	2,400	100	400	300
U.S native	400	100	200	--	--	--
Not U S. native	3,500	700	2,100	100	300	200
American Indians, total	200	--	100	--	--	--
U.S. native	200	--	100	--	--	--
Not U.S. native	--	--	--	--	--	--

See explanatory information and SOURCE at end of table.

Appendix table 8-16. Employed doctoral scientists and engineers, by field of doctorate, race/ethnicity, nativity, and employment sector: 1991

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Field, race/ethnicity, and nativity	Total employed	Industry/ business	University/ 4-year college	Other educ. institution	Govern-ment	Other
Engineering:						
Total	69,800	39,600	22,800	200	4,500	2,400
U.S. native	44,600	24,400	15,100	100	3,500	1,400
Not U.S. native	24,500	15,000	7,300	--	1,100	1,000
Whites, non-Hispanic, total	50,500	27,100	17,800	100	3,600	1,600
U.S. native	42,800	23,500	14,400	100	3,300	1,300
Not U.S. native	7,500	3,500	3,400	--	300	300
Blacks, non-Hispanic, total	900	400	300	--	100	--
U.S. native	400	200	100	--	--	--
Not U.S. native	500	300	100	--	--	--
Hispanics, total	1,300	700	500	--	100	--
U.S. native	500	200	300	--	100	--
Not U.S. native	700	500	200	--	--	--
Asians, total	16,600	11,200	3,900	--	800	700
U.S. native	600	500	100	--	--	--
Not U.S. native	15,700	10,600	3,600	--	700	700
American Indians, total	100	--	--	--	100	--
U.S. native	100	--	--	--	100	--
Not U.S. native	--	--	--	--	--	--

NOTE: Because of rounding, other races, and "no reports," details may not add to totals.

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-17. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, academic rank, race/ethnicity, and nativity: 1991

Page 1 of 3

Years of experience, academic rank, and race/ethnicity	Total	U.S. native	Not U.S. native
Total:			
Total	195,300	163,200	31,000
White, non-Hispanic	168,800	154,700	13,700
Black, non-Hispanic	4,800	3,500	1,300
Hispanic	4,100	2,300	1,700
Asian	16,300	1,600	14,100
American Indian	400	400	--
Professor:			
Total	71,800	62,200	9,500
White, non-Hispanic	64,600	59,500	5,000
Black, non-Hispanic	1,200	1,000	200
Hispanic	1,100	800	300
Asian	4,400	400	3,900
American Indian	100	100	--
Associate professor:			
Total	46,500	39,700	6,700
White, non-Hispanic	40,600	37,700	2,800
Black, non-Hispanic	1,400	1,100	300
Hispanic	900	500	400
Asian	3,300	200	3,100
American Indian	100	100	--
Assistant professor:			
Total	36,300	28,600	7,300
White, non-Hispanic	29,400	26,500	2,700
Black, non-Hispanic	1,400	900	500
Hispanic	1,200	600	500
Asian	4,000	400	3,500
American Indian	100	100	--
Other faculty:			
Total	11,800	10,300	1,500
White, non-Hispanic	10,700	9,800	900
Black, non-Hispanic	200	200	--
Hispanic	200	100	100
Asian	700	100	500
American Indian	--	--	--
Academic rank does not apply:			
Total	10,500	8,300	2,100
White, non-Hispanic	8,600	7,800	700
Black, non-Hispanic	300	100	200
Hispanic	300	100	100
Asian	1,300	200	1,000
American Indian	--	--	--

See explanatory information and SOURCE at end of table.

Appendix table 8-17. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, academic rank, race/ethnicity, and nativity: 1991

Page 2 of 3

Years of experience, academic rank, and race/ethnicity	Total	U.S. native	Not U.S. native
Less than 8 years:			
Total:			
Total	55,000	41,600	12,600
White non-Hispanic	43,300	38,700	4,400
Black, non-Hispanic	1,800	1,100	700
Hispanic	1,900	900	900
Asian	7,700	700	6,500
American Indian	200	200	--
Professor:			
Total	900	700	100
White non-Hispanic	700	700	--
Black, non-Hispanic	--	--	--
Hispanic	--	--	--
Asian	100	--	100
American Indian	--	--	--
Associate professor:			
Total	7,700	6,000	1,600
White, non-Hispanic	6,200	5,600	600
Black, non-Hispanic	300	200	--
Hispanic	300	100	100
Asian	900	100	800
American Indian	--	--	--
Assistant professor:			
Total	25,800	19,700	5,800
White, non-Hispanic	20,400	18,200	2,000
Black, non-Hispanic	1,100	600	400
Hispanic	900	500	400
Asian	3,300	300	2,900
American Indian	100	100	--
Other faculty:			
Total	4,700	3,800	800
White, non-Hispanic	4,000	3,600	300
Black, non-Hispanic	100	100	--
Hispanic	100	100	--
Asian	400	100	400
American Indian	--	--	--
Academic rank does not apply:			
Total	5,500	3,900	1,400
White, non-Hispanic	4,100	3,600	400
Black, non-Hispanic	200	100	100
Hispanic	200	100	100
Asian	1,000	100	800
American Indian	--	--	--

See explanatory information and SOURCE at end of table

Appendix table 8-17. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, academic rank, race/ethnicity, and nativity: 1991

Page 3 of 3

Years of experience, academic rank, and race/ethnicity	Total	U.S. native	Not U.S. native
8 or more years:			
Total:			
Total	137,100	119,000	17,800
White, non-Hispanic	122,900	113,700	9,100
Black, non-Hispanic	2,900	2,400	600
Hispanic	2,200	1,400	700
Asian	8,300	900	7,300
American Indian	200	200	--
Professor:			
Total	70,000	60,700	9,200
White, non-Hispanic	63,100	58,100	4,900
Black, non-Hispanic	1,100	1,000	200
Hispanic	1,100	800	300
Asian	4,200	400	3,800
American Indian	100	100	--
Associate professor:			
Total	38,300	33,200	5,000
White, non-Hispanic	33,900	31,700	2,200
Black, non-Hispanic	1,200	900	300
Hispanic	600	400	300
Asian	2,400	200	2,200
American Indian	100	100	--
Assistant professor:			
Total	10,000	8,600	1,400
White, non-Hispanic	8,600	8,000	600
Black, non-Hispanic	300	300	100
Hispanic	300	100	100
Asian	700	100	600
American Indian	--	--	--
Other faculty:			
Total	6,800	6,100	700
White, non-Hispanic	6,400	5,900	500
Black, non-Hispanic	100	100	--
Hispanic	100	100	--
Asian	200	100	200
American Indian	--	--	--
Academic rank does not apply:			
Total	4,900	4,300	600
White, non-Hispanic	4,400	4,100	300
Black, non-Hispanic	100	100	100
Hispanic	100	--	--
Asian	300	--	200
American Indian	--	--	--

NOTE: Because of rounding, other races, and "no reports," details may not add to totals.

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients

Appendix table 8-18. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, tenure status, race/ethnicity, and nativity: 1991

Page 1 of 3

Years of experience, tenure status, and race/ethnicity	Total	U.S. native	Not U.S. native
Total:			
Total	195,300	163,200	31,000
White, non-Hispanic	168,800	154,700	13,700
Black, non-Hispanic	4,800	3,500	1,300
Hispanic	4,100	2,300	1,700
Asian	16,300	1,600	14,100
American Indian	400	400	--
Tenured:			
Total	106,700	92,400	14,100
White, non-Hispanic	95,500	88,300	7,100
Black, non-Hispanic	2,200	1,800	400
Hispanic	1,700	1,100	600
Asian	6,600	600	5,900
American Indian	200	200	--
Not tenured, in track:			
Total	34,800	27,400	7,100
White, non-Hispanic	28,100	25,400	2,600
Black, non-Hispanic	1,600	900	600
Hispanic	1,100	600	500
Asian	3,800	300	3,400
American Indian	100	100	--
Not tenured, not in track:			
Total	15,500	12,900	2,400
White, non-Hispanic	13,600	12,300	1,200
Black, non-Hispanic	300	200	100
Hispanic	300	200	100
Asian	1,300	200	1,100
American Indian	--	--	--
Tenure not applicable:			
Total	19,400	15,900	3,300
White, non-Hispanic	16,400	15,100	1,200
Black, non-Hispanic	500	300	200
Hispanic	500	300	300
Asian	1,900	200	1,600
American Indian	100	100	--

See explanatory information and SOURCE at end of table.

Appendix table 8-18. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, tenure status, race/ethnicity, and nativity: 1991

Years of experience, tenure status, and race/ethnicity	Total	U.S. native	Not U.S. native
Less than 8 years:			
Total:			
Total	55,000	41,600	12,600
White, non-Hispanic	43,300	38,700	4,400
Black, non-Hispanic	1,800	1,100	700
Hispanic	1,900	900	900
Asian	7,700	700	6.500
American Indian	200	200	--
Tenured:			
Total	6,000	4,800	1,100
White, non-Hispanic	5,000	4,500	500
Black, non-Hispanic	100	100	--
Hispanic	200	100	100
Asian	600	--	500
American Indian	--	--	--
Not tenured, in track:			
Total	23,600	17,900	5,400
White, non-Hispanic	18,500	16,600	1,800
Black, non-Hispanic	1,100	600	500
Hispanic	800	400	400
Asian	3,000	200	2,700
American Indian	100	100	--
Not tenured, not in track:			
Total	6,900	5,400	1,400
White, non-Hispanic	5.700	5,100	600
Black, non-Hispanic	200	100	--
Hispanic	200	100	100
Asian	900	100	800
American Indian	--	--	--
Tenure not applicable:			
Total	7,900	5,900	1,800
White, non-Hispanic	6,100	5,500	600
Black, non-Hispanic	200	100	100
Hispanic	300	100	200
Asian	1,100	100	900
American Indian	--	--	--

See explanatory information and SOURCE at end of table.

Appendix table 8-18. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, tenure status, race/ethnicity, and nativity: 1991

Page 3 of 3

Years of experience, tenure status, and race/ethnicity	Total	U.S. native	Not U.S. native
8 or more years:			
Total:			
Total	137,100	119,000	17,800
White, non-Hispanic	122,900	113,700	9,100
Black, non-Hispanic	2,900	2,400	600
Hispanic	2,200	1,400	700
Asian	8,300	900	7,300
American Indian	200	200	--
Tenured:			
Total	99,300	86,500	12,700
White, non-Hispanic	89,300	82,700	6,500
Black, non-Hispanic	2,100	1,700	400
Hispanic	1,500	1,000	500
Asian	5,900	600	5,300
American Indian	200	200	--
Not tenured, in track:			
Total	10,800	9,100	1,700
White, non-Hispanic	9,300	8,600	700
Black, non-Hispanic	400	300	100
Hispanic	300	100	100
Asian	800	100	700
American Indian	--	--	--
Not tenured, not in track:			
Total	8,200	7,200	1,000
White, non-Hispanic	7,500	7,000	600
Black, non-Hispanic	100	100	--
Hispanic	200	100	--
Asian	400	--	300
American Indian	--	--	--
Tenure not applicable:			
Total	11,300	9,800	1,500
White, non-Hispanic	10,100	9,400	600
Black, non-Hispanic	200	200	100
Hispanic	200	100	100
Asian	700	100	700
American Indian	--	--	--

NOTE: Because of rounding, other races, and "no reports," details may not add to totals

KEY: -- = fewer than 50 estimated

SOURCE National Science Foundation/SRS 1991 Survey of Doctorate Recipients.

Appendix table 8-19. Doctoral scientists and engineers in the U.S. labor force, by field of doctorate and disability status: 1991

Page 1 of 1

Field	Total	Persons with disabilities	Persons without disabilities
Total, science and engineering	443,600	21,300	416,700
Science, total	373,100	18,300	350,200
Physical sciences	82,500	3,300	78,300
Chemistry	50,100	2,000	47,600
Physics/astronomy	32,400	1,300	30,700
Mathematical sciences	20,100	800	18,800
Mathematics	16,600	800	15,300
Statistics/probability	3,500	100	3,500
Computer/information sciences	5,500	100	5,100
Environmental sciences	13,400	700	12,600
Earth sciences	9,900	500	9,200
Oceanography	1,900	100	1,900
Atmospheric sciences	1,600	100	1,500
Life sciences	115,700	5,300	109,200
Biological sciences	79,500	3,600	75,100
Agricultural sciences	16,900	800	15,900
Medical sciences	19,300	900	18,300
Psychology	66,500	3,700	62,000
Social sciences	69,500	4,300	64,200
Economics	19,300	1,400	17,400
Sociology/anthropology	18,600	1,200	17,200
Other social sciences	31,500	1,700	29,600
Engineering, total	70,500	3,000	66,500
Aeronautical/astronautical	3,100	200	2,900
Chemical	10,700	600	9,900
Civil	7,500	300	7,200
Electrical/electronic	17,300	600	16,300
Materials science	6,300	200	6,000
Mechanical	8,800	400	8,200
Nuclear	1,900	--	1,900
Systems design	1,600	100	1,500
Other engineering	13,300	500	12,700

NOTE: Because of rounding and "no reports," details may not add to totals

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

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Appendix table 8-20. Median annual salaries of employed doctoral scientists and engineers, by field of doctorate and disability status: 1991

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Field	Total	Persons with disabilities	Persons without disabilities
Total	$61,000	$62,000	$61,000
Science	59,000	60,000	59,000
Physical sciences	65,000	65,000	65,000
Mathematical sciences	61,000	64,000	60,000
Computer sciences	68,000	*	68,000
Environmental sciences	60,000	71,000	60,000
Life sciences	56,000	58,000	55,000
Psychology	56,000	56,000	55,000
Social sciences	56,000	56,000	56,000
Engineering	70,000	75,000	70,000

NOTE: Median salaries were computed only for full-time employed civilians.

KEY: * = suppressed due to sample size less than 20

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-21. Median annual salaries of employed doctoral scientists and engineers, by years of professional work experience and disability status: 1991

Years of experience	Total	Persons with disabilities	Persons without disabilities
Total	$61,000	$62,000	$61,000
Less than 5 years	46,000	42,000	46,000
5 to 14 years	56,000	53,000	56,000
15 to 24 years	68,000	67,000	69,000
25 or more years	76,000	71,000	76,000

NOTE: Median salaries were computed only for full-time employed civilians.

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients.

Appendix table 8-22. Employed doctoral scientists and engineers, by employment sector and disability status: 1991

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Employment sector	Total	Persons with disabilities	Persons without disabilities
Total employed	437,200	21,100	410,600
Business/industry	157,300	6,900	148,200
University/4-year college	195,300	10,200	182,800
Other educational institution	10,900	800	9,900
Government	40,100	1,400	38,100
Other	31,300	1,500	29,500

NOTE: Because of rounding and "no reports," details may not add to totals.

SOURCE: National Science Foundation/SRS. 1991 Survey Doctorate Recipients.

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Appendix table 8-23. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, academic rank, and disability status: 1991

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Years of experience and academic rank	Total	Persons with disabilities	Persons without disabilities
Total:			
Total, all academic ranks	195,300	10,200	182,800
Professor	71,800	4,800	66,000
Associate professor	46,500	2,500	43,500
Assistant professor	36,300	1,200	34,800
Other faculty	11,800	800	10,900
Does not apply	10,500	500	10,000
Less than 8 years:			
Total, all academic ranks	55,000	1,600	53,300
Professor	900	--	800
Associate professor	7,700	300	7,400
Assistant professor	25,800	700	25,100
Other faculty	4,700	300	4,400
Does not apply	5,500	100	5,300
8 or more years:			
Total, all academic ranks	137,100	8,600	127,600
Professor	70,000	4,700	64,700
Associate professor	38,300	2,200	35,800
Assistant professor	10,000	500	9,400
Other faculty	6,800	500	6,300
Does not apply	4,900	300	4,600

NOTE: Because of rounding and "no reports," details may not add to totals.

KEY: -- = fewer than 50 estimated

SOURCE: National Science Foundation/SRS. 1991 Survey of Doctorate Recipients

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Appendix table 8-24. Doctoral scientists and engineers employed in universities and 4-year colleges, by years of professional work experience, tenure status, and disability status: 1991

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Years of experience and tenure status	Total	Persons with disabilities	Persons without disabilities
Total:			
Total, all tenure statuses	195,300	10,200	182,800
Tenured	106,700	6,800	98,700
Not tenured, in track	34,800	1,200	33,400
Not tenured, not in track	15,500	800	14,500
Tenure not applicable	19,400	900	18,400
Less than 8 years:			
Total, all tenure statuses	55,000	1,600	53,300
Tenured	6,000	200	5,700
Not tenured, in track	23,600	600	22,900
Not tenured, not in track	6,900	200	6,700
Tenure not applicable	7,900	300	7,600
8 or more years:			
Total, all tenure statuses	137,100	8,600	127,600
Tenured	99,300	6,500	92,100
Not tenured, in track	10,800	500	10,300
Not tenured, not in track	8,200	600	7,600
Tenure not applicable	11,300	600	10,700

NOTE: Because of rounding and "no reports," details may not add to totals.

SOURCE: National Science Foundation/SRS, 1991 Survey of Doctorate Recipients.

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