# Women, Minorities, and Persons with Disabilities

*in Science and Engineering: 1998*

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# FOREWORD

Scientists and engineers play a vital role in the U.S. educational system, in industrial competition, and in the generation of new knowledge. A challenge for our country is to attract the best talent from all sources to science and engineering to stimulate creativity, innovation, and change; contribute to the advancement of science and engineering; and foster a scientifically literate population. Different perspectives, talents, and experiences produce better ideas and ultimately better goods and services to meet the needs of increasingly diverse markets for products and services in the United States and abroad. Our Nation needs the most from its human resources. Indeed, we need the talents of all our citizens if science, mathematics, and engineering are to remain a hallmark of America's excellence. So vital is this to the National Science Foundation (NSF) that one of the strategic goals of NSF as outlined in the Government Performance and Results Act Strategic Plan FY 1997–2003 is to "strive for a diverse, globally oriented workforce of scientists and engineers." To ensure this outcome is achieved, a second strategic goal of NSF is to obtain improved achievement in mathematics and science skills needed by all Americans.

Some groups—women, minorities, and persons with disabilities—traditionally have not been fully represented in science and engineering. Although progress has been made in the achievement and participation of some of these groups, this progress has not been consistent, and full representation has not yet been achieved. This report, the ninth in a series of biennial reports to the Congress, the administration, and others who direct public policy, presents data on participation of underrepresented groups in science and engineering. It also documents factors important to success in science and engineering in precollege, undergraduate, and graduate education, and employment. The data and analyses presented here can be used to track progress, inform development of policies to increase participation in science and engineering, and evaluate the effectiveness of such policies.

Rita R. Colwell
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# ABBREVIATIONS

| | |
|---|---|
| ACT | American College Testing |
| ADA | Americans with Disabilities Act of 1990 |
| AP | Advanced Placement |
| BIA | Bureau of Indian Affairs |
| GRE | Graduate Record Examination |
| HBCU | Historically Black College or University |
| HEGIS | Higher Education General Information 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 |
| PSAT | Preliminary SAT |
| R&D | research and development |
| S&E | science and engineering |
| SAT | Scholastic Assessment 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 |
| SESTAT | Scientist and Engineer Statistics Data System |

# HIGHLIGHTS

## Women

- Female students are similar to males in completion of high school mathematics courses, according to the 1994 National Education Longitudinal Study Transcripts. More than half of both male and female high school graduates in 1992 had taken algebra I, algebra II, and geometry, but far fewer had taken trigonometry and calculus in high school. Nevertheless, the same percentages of male and female students had taken these advanced courses: about 17 percent of both male and female graduates had taken trigonometry, 9 percent of both had taken calculus, and 7 percent of both had taken advanced placement calculus. The proportion of both male and female high school graduates who took each of these mathematics courses increased from 1982 to 1994.
- Male and female high school graduates were also similar in science course taking in 1994. Female students were slightly more likely than males to have taken biology and chemistry, and males were slightly more likely than females to have taken physics: most students, more than 90 percent, had taken biology, slightly more than half had taken chemistry, and about one-fourth had taken physics. A larger proportion of both male and female high school students in 1994 took biology, chemistry, and physics than did 1982 graduates.
- Results of the 1996 National Assessment of Educational Progress (NAEP) mathematics assessment[1] showed that the gender gap in mathematics achievement has, for the most part, disappeared. Previous NAEP mathematics assessments showed that males scored higher than females in grade 12, but in 1996, average mathematics scores for males and females in 8th and 12th grade were not significantly different.[2] Among 4th graders, the average mathematics score for male students was slightly higher than that of female students.
- Among 12th graders, female students scored slightly lower than male students on the 1996 NAEP science assessment (152 for males and 148 for females). The difference in males' and females' science scores at grades 4 and 8 are not statistically significant.
- An examination of Scholastic Assessment Test (SAT) mathematics test scores for only the students who reported taking the highest level of mathematics (calculus) and science (physics) showed that women scored lower on average than men. Among those who took calculus, women averaged 594 and men 631 on the SAT mathematics; this difference—of 37 points—is similar to that for men and women test takers in general (35-point difference). Among those who took physics, women averaged 542 and men 577—a 35-point gap.
- From the SAT and ACT student data, it is clear that a larger number of women than men who choose to take college entrance tests are from lower income families. Although the proportions of test takers from the higher family income groups were about evenly split between males and females, among the lowest income groups, women accounted for more than 60 percent of the test takers. Given that parental income is related to average scores, then the higher proportion of women test takers who are from lower income families would reduce the averages for women test takers in general.
- The number of science and engineering doctorate degrees awarded to women increased 69 percent over the 10-year period, from

[1] The National Assessment of Educational Progress (NAEP), funded by the National Center for Education Statistics in the U.S. Department of Education, is designed to determine the achievement levels of precollege students in a number of areas, including mathematics and science, and to measure changes in achievement over time. Both mathematics and science assessments are administered periodically to students in the 4th, 8th, and 12th grades. National results are reported by NAEP for each grade level and within various subgroups (e.g., males and females, racial/ethnic groups).

[2] Here, as elsewhere in the report, tests of significance are calculated at the 0.5 level.

4,891 in 1985 to 8,273 in 1995. The *proportion* of total science and engineering doctoral degrees that were awarded to women increased from 26 percent of total science and engineering degrees in 1985 to 31 percent in 1995.

- Women received a minority of science and engineering doctorates in all fields except psychology. The proportion of women receiving the doctorate in psychology rose from 51 percent in 1985 to 64 percent in 1995. Women received 38 percent of all social science doctoral degrees awarded in 1995, but their participation within the various social science disciplines varied. For example, women received 24 percent of the economics degrees, but they received 58 percent of all the anthropology doctoral degrees and 53 percent of the sociology degrees.
- Women constitute 51 percent of the U.S. population, 46 percent of the U.S. labor force,[3] and 22 percent of scientists and engineers in the labor force. The lesser representation in science and engineering compared to the labor force as a whole can be explained in part by their more recent entry into science and engineering as well as a slightly greater tendency of women trained in science and engineering to be employed outside of science and engineering.[4]
- Among those in the labor force, unemployment rates of men and women scientists and engineers are similar: 2.0 percent of women and 2.2 percent of men were unemployed in 1995.
- Among all scientists and engineers in academic employment, women are more likely than men to be employed in elementary or secondary schools (11 percent versus 4 percent) and in 2-year colleges (12 percent versus 9 percent).
- In 4-year colleges and universities, women scientists and engineers hold fewer high-ranked positions than men. Women are less likely than men to be full professors, and are more likely than men to be assistant professors or instructors. Among ranked science and engineering faculty, 49 percent of men and 24 percent of women are full professors. Part of this difference in rank can be explained by age differences, but differences in rank remain even after controlling for age. Among those ages 45 to 54, 40 percent of women and 61 percent of men are full professors.[5]
- Women are also less likely than men to be tenured. Thirty-five percent of full-time employed women science and engineering faculty are tenured, compared to 59 percent of men. Some, but not all, of the differences in tenure may be attributable to differences in age. Among full-time employed science and engineering faculty ages 45 to 54, 57 percent of women and 76 percent of men are tenured.[5]
- Although roughly the same proportion of men and women had no publications (17 percent of women and 18 percent of men), women faculty had, on average, fewer publications in refereed journals since 1990 than men. Among doctoral scientists and engineers who were employed full time in colleges or universities and who received their doctorates in 1990 or earlier, 45 percent of women and 34 percent of men had 1 to 5 publications, and 38 percent of women and 48 percent of men had more than 5 publications since 1990.
- Differences in research support do not appear to be a factor in differences in publications. Women faculty are as likely as men to be supported on Federal contracts or grants—44 percent of women and 45 percent of men faculty were supported by Federal contracts or grants.
- Women are less likely than men to engage in managerial activity—22 percent of men and 18 percent of women cite management or administration as their primary work activity. Among those of similar ages, even less difference in managerial status is evident. Among scientists and engineers between the ages of 35 and 44, 19 percent of women and 21 percent of men are managers or administrators. Differences in field are also related to differences in primary work activities. For example, men are more likely than women to be engineers and physical scientists and are thus more likely to be engaged in research and development.

[3] The labor force referred to here consists of civilians who are 20 years old or older who are either employed or actively seeking employment.

[4] The science and engineering field in which women earn their degrees influences participation in the science and engineering labor force. A large proportion of women earn degrees in the social sciences, which are defined by NSF as science and engineering, and are then employed in social services occupations, e.g., social worker, clinical psychologist, which are defined by NSF as non–science-and-engineering occupations.

[5] Differences in field, time since degree and number of publications are likely to explain an additional portion of the differences.

- Although men and women scientists and engineers of similar ages are about equally likely to be managers, men are more likely than women to be high-level managers. Women who are supervisors have, on average, fewer subordinates (direct plus indirect) than men. Women supervisors have, on average, 8 direct and indirect subordinates; men have 12. This disparity in number of subordinates holds true among age groups as well.
- Full-time employed women scientists and engineers generally earn less than men, but differences in salary by gender are due primarily to differences in age and field. Women scientists and engineers are younger, on average, than men and are less likely than men to be in computer science or engineering, fields that command higher salaries. The overall median salary for women ($42,000) is much lower than that for men ($52,000), but within fields and within younger age categories the salaries of men and women differ much less. For example, among computer and mathematical scientists with bachelor's degrees between the ages of 20 and 29, the median salary for women was $35,000 and for men it was $38,000 in 1995. With increasing age, however, the gap in salaries of men and women widens.

## Minorities[6]

- Although substantial differences in course taking by racial/ethnic groups remain, the percentages of black, Hispanic, and American Indian students taking many basic and advanced mathematics courses doubled between 1982 and 1994. For example, in 1982, 22 percent of black high school graduates had taken algebra II. By 1994, 44 percent had taken this course.
- Racial/ethnic groups differ greatly in mathematics course taking. Black and Hispanic high school graduates in 1994 were far more likely than white and Asian students to have taken remedial mathematics courses. Thirty-one percent of black, 24 percent of Hispanic, and 35 percent of American Indian high school graduates, compared with about 15 percent of whites and Asians had taken remedial mathematics in high school.
- Significant differences in mathematics and science achievement by race/ethnicity remain. Average mathematics scores increased for all racial/ethnic groups since 1990, but differences between white students and black and Hispanic students have not significantly decreased. For example, among 12th graders in 1990, the average difference between white students' mathematics scores and those of black students was 33 points. In 1996, it was 31 points.[7] The average difference between white students' mathematics scores and those of Hispanic students was 25 points in 1990; in 1996, it was 24 points.
- College enrollment and degree attainment by minorities have been increasing. Although minority enrollment in undergraduate programs dropped in the early 1980s, it has been steadily increasing since 1984, both in numbers and as a percentage of total undergraduate enrollment. In 1984, underrepresented minorities were 14.6 percent of all undergraduate students; by 1994, they were 20.6 percent. Minority women account for more of the increase in enrollment than do minority men. More than half (59 percent) of minority undergraduate students are women, whereas less than half (44 percent) of white, non-Hispanic undergraduate students are women.
- Of the 325,135 U.S. citizen and permanent resident students enrolled in graduate science and engineering programs in 1995 (both full-time and part-time), 14 percent were minorities. Blacks (6 percent), American Indians (0.5 percent), and Hispanics (4 percent) continued to be underrepresented relative to their proportion in the population.
- Field choices of minority women in science and engineering are more similar to those of white women than they are to those of minority men. Higher proportions of women than men within each racial/ethnic group are in computer or mathematical sciences, life sciences, and social sciences and lower proportions are in engineering. Asian women differ from women in other racial/ethnic

[6] 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. 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.

[7] The National Assessment of Educational Progress measures mathematics achievement on a scale ranging from 0 to 500.

groups in that a relatively small proportion are in social sciences.

- With the exception of Asians, minorities are a small proportion of scientists and engineers in the United States. Asians were 10 percent of scientists and engineers in the United States in 1995, although they were 3 percent of the U.S. population. Blacks, Hispanics, and American Indians as a group were 6 percent of the total science and engineeringlabor force in 1995 and 23 percent of the U.S. population.[8] Blacks were 3 percent, Hispanics were 3 percent, and American Indians were less than 1 percent of scientists and engineers.
- In 1995, the unemployment rate of white scientists and engineers was significantly lower than that of other racial/ethnic groups. The unemployment rate for whites was 2.0 percent, compared with 2.8 percent for Hispanics, 2.4 percent for blacks, and 3.4 percent for Asians. The differences in unemployment rates were evident within specific fields of science and engineering, as well as for science and engineering as a whole.
- Racial and ethnic groups differ in employment sector, partly because of differences in field. Among employed scientists and engineers in 1995, 51 percent of black, 57 percent of Hispanic, 64 percent of Asian, and 62 percent of white scientists and engineers were employed in for-profit business or industry. Blacks and American Indians are concentrated in the social sciences, which are less likely to offer employment in business or industry, and are underrepresented in engineering, which is more likely to offer employment in business or industry. Asians, on the other hand, are overrepresented in engineering, and thus are more likely to be employed by private for-profit employers.
- Black, Hispanic, and Asian faculty are less likely than white faculty to be full professors or to be tenured. Some, but not all, of the differences in rank and tenure are related to age differences. Black, Hispanic, and Asian scientists and engineers are younger on average than white and American Indian scientists and engineers. When age differences are accounted for, differences in rank and tenure are reduced. For example, among ranked faculty between the ages of 45 and 54, 50 percent of Hispanic faculty, 55 percent of Asian faculty, and 59 percent of white faculty were full professors. Among black faculty in that age group, however, 25 percent were full professors.
- Black science and engineering faculty had, on average, fewer publications since 1990 than did science and engineering faculty in other racial/ethnic groups. Among scientists and engineers who received their doctorates in 1990 or earlier and who work in 4-year colleges or universities, 29 percent of black faculty had no publications since 1990 compared with 14 percent of Hispanic, 12 percent of white, and 8 percent of Asian faculty.
- Black and American Indian faculty are also less likely than other groups to have Federal grants or contracts. Thirty-five percent of black and 25 percent of American Indian doctoral scientists and engineers employed in colleges or universities are supported by Federal contracts or grants compared to 45 percent of all doctoral scientists and engineers employed full time in colleges or universities.
- Asians are less likely than other groups to be in management or administration (14 percent of Asians compared with roughly 22 percent of Hispanic, white, and black scientists and engineers). Age differences do not explain this difference in managerial activity. Among 35 to 44 year olds, Asians remain less likely to be in management—13 percent of Asians and between 20 and 23 percent of other groups are in management or administration.
- Salaries for scientists and engineers differ little among racial/ethnic groups. Among all scientists and engineers, the median salaries by racial/ethnic group are $50,500 for whites, $50,000 for Asians, $45,000 for blacks, $47,000 for Hispanics, and $48,000 for American Indians. Within fields and age categories, median salaries of scientists and engineers by race/ethnicity are not dramatically different and do not follow a consistent pattern.
- Black and Asian women scientists and engineers are more likely than women from other racial/ethnic groups to be in the labor force and to be employed full time in a field related

[8] The science and engineering field in which blacks, Hispanics, and American Indians earn their degrees influences their participation in the science and engineering labor force. Blacks, Hispanics, and American Indians are disproportionately likely to earn bachelor's degrees in the social sciences, which are defined by NSF as science degrees, and then employed in social service occupations, e.g., social worker, clinical psychologist, which are defined by NSF as non–science-and-engineering occupations. See appendix A for the definitions of science and engineering occupations.

to their degree. Seventy-one percent of black and 72 percent of Asian women scientists and engineers compared with 61 percent of white, 68 percent of Hispanic, and 65 percent of American Indian women scientists and engineers were employed full time in their field.

- Median annual salaries of minority women are more similar to those of both white women and minority men after controlling for field and age. Among engineers in the 20- to 29-year-old age group, for example, the median salary of Hispanic women was $40,000, for black women $42,000, for Asian women $37,700, and for white women $38,800. Median salaries for men engineers in the same age group ranged from $38,000 to $40,000.

## Persons With Disabilities

- Students with disabilities take fewer science and mathematics courses and have lower grades and lower achievement scores than students without disabilities. Students with disabilities are also more likely to drop out of high school than students without disabilities.
- About 5 percent of students taking the SAT, or more than 40,000, checked one of the categories indicating a disability; the ACT also had 5 percent of students (almost 20,000) who indicated a disability category in 1996.
- Among SAT test takers, almost 20,000 students took the test under nonstandard conditions. These test takers had average scores (463 verbal and 452 mathematics) that were below that of the average of all test takers who indicated on the student questionnaire that they had a permanent disability (472 verbal and 468 mathematics).
- Although the number of persons with reported disabilities who received science and engineering doctorates in 1995 was very small, the total has been increasing rapidly: the 355 recipients in 1995 were a 78 percent increase from the 200 science and engineering doctorates in 1989. Persons reporting disabilities constituted 1.3 percent of all doctorate recipients in 1995, up from 0.9 percent of the total in 1989.
- The labor force participation rates of scientists and engineers with and without disabilities are quite different. Almost one-third of scientists and engineers with disabilities are out of the labor force, compared with 11 percent of those without disabilities. Although age accounts for some of the tendency for persons with disabilities to be out of the labor force (because of retirements), chronic illness or permanent disability is also a factor. The primary reason for not working for both persons with and without disabilities was retirement (76 percent versus 60 percent), but 21 percent of persons with disabilities and 2 percent of those without disabilities cited chronic illness or permanent disability.
- Faculty who have disabilities are more likely than those without disabilities to be full professors and to be tenured. The differences in rank and tenure are related to differences in age. Because incidence of disability increases with age, scientists and engineers with disabilities tend to be older and to have greater years of professional work experience than those without disabilities.
- Science and engineering faculty with disabilities are less likely to have publications than those without disabilities. Twenty-two percent of those with disabilities and 17 percent of those without disabilities had no publications since 1990. Faculty with disabilities had fewer publications than those without disabilities—43 percent of those with disabilities and 46 percent of those without disabilities had 6 or more publications since 1990. Faculty with disabilities (38 percent) were also less likely than those without disabilities (45 percent) to have been supported on Federal grants or contracts.
- The type of work done by scientists and engineers with disabilities is similar to the type of work done by those without disabilities. The primary work activity of 37 percent of scientists and engineers with disabilities is research and development, compared with 38 percent of those without disabilities. Twenty-five percent of scientists and engineers with disabilities and 21 percent of those without disabilities are in management or administration. Among those with supervisory responsibilities, persons with and without disabilities have about the same number of subordinates (12 and 11, respectively).
- Median salaries of scientists and engineers with disabilities do not differ substantially from median salaries for those without disabilities. Among all scientists and engineers, the median salary for those with disabilities is $51,000; for those without disabilities it is $50,000. Salaries differ little within fields and age groups as well.

# CHAPTER 1

# INTRODUCTION

This report is the ninth in a series of Congressionally mandated biennial reports on the status of women and minorities in science and engineering. The primary purpose of this report is to serve as an information source on the participation of women, minorities, and persons with disabilities in science and engineering. It offers no endorsement or recommendations on policies or programs. The report documents both short- and long-term trends in the participation of women, minorities, and persons with disabilities in science and engineering education and employment.

Current data and historical trends from a number of National Science Foundation (NSF) surveys are reported, and also, where appropriate, findings from externally conducted research are cited. The report follows the chronological sequence of the educational system, then analyzes workforce participation.

## Major Findings

Several major findings arise from an examination of data in this report.

- First, family income and education are related to the educational preparation and achievement of women and minority precollege students. For example, parental income is related to average scores on achievement tests. The higher proportion, in recent years, of women SAT test takers from lower income families could influence the average scores of women which tend to be lower on average than men's. Similarly, the higher proportion of minority achievement test takers from lower income families is related to lower average scores on these tests.
- Second, the number (and proportion) of women and minorities enrolling in and earning degrees in science and engineering is continuing to increase, whereas the number of white men doing so is decreasing.
- Third, access and accommodation continue to be crucial to participation of persons with disabilities in science and engineering. Although employed scientists and engineers with disabilities differ little from those without disabilities in field of employment, employment sector, primary work activity, and salary, persons with disabilities are underrepresented among those with degrees in science and engineering. Also, among those with degrees in science and engineering, they are underrepresented among persons employed in science and engineering.

## Representation in Science and Engineering

Substantial gains have been made in the participation of women, minorities, and persons with disabilities in science and engineering in the last two decades. The gender gap in high school mathematics course taking has disappeared for the most part, and women are earning close to half of the bachelor's degrees in science and engineering. The employment experiences of women, minorities, and persons with disabilities in science and engineering are also improving. Unemployment rates no longer differ by sex, although differences remain among racial/ethnic groups and between those with and without disabilities. Salaries, controlling for field and length of experience, are similar across sex, race/ethnicity, and disability categories and the proportions of scientists and engineers in management within certain age categories are similar across sex, racial/ethnic, and disability categories. Despite similarities, widely different levels of participation exist within fields, degree levels, and sectors of employment.

### Women

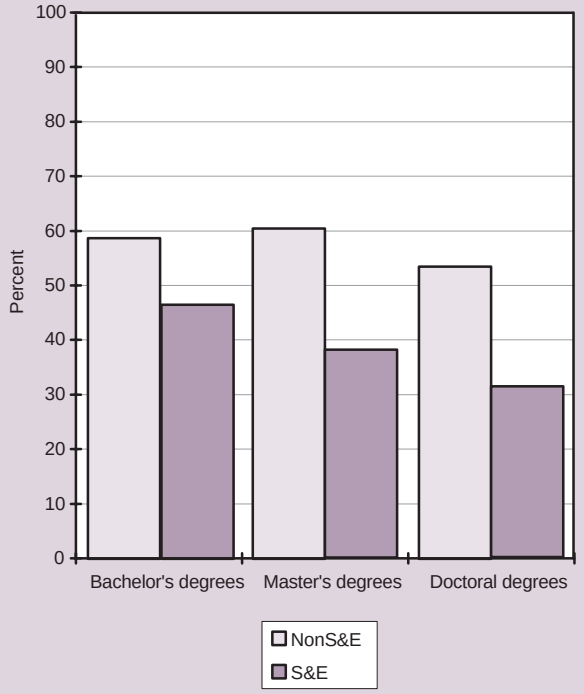
Women are approaching half of science and engineering bachelor's degree recipients. The proportion

of bachelor's degrees in science and engineering awarded to women held fairly constant in the early to mid-1980s at 38 to 39 percent but has been steadily increasing since then, reaching 46 percent in 1995. (See appendix table 3-3.) Women have been more than half of bachelor's degree recipients in non–science-and-engineering fields since at least 1966 and were 59 percent of bachelor's degree recipients in non–science-and-engineering fields in 1995. Within science and engineering, some fields have a higher proportion of women than others. In 1995, women earned 73 percent of bachelor's degrees in psychology, 50 percent of bachelor's degrees in biological/agricultural sciences, and 50 percent of bachelor's degrees in social sciences. They earned about one-third of the bachelor's degrees in physical sciences; earth, atmospheric and ocean sciences; and in mathematical/computer sciences. They earned 17 percent of the bachelor's degrees in engineering.

Women earn a smaller proportion of master's and doctoral degrees in science and engineering than they do of bachelor's degrees. In 1995, women were 38 percent of master's degree recipients and 31 percent of doctorate recipients in science and engineering. (See appendix table 4-27.) By contrast, in non–science-and-engineering fields, women earn about the same proportion of advanced degrees as they do of bachelor's degrees. In 1995, women earned 59 percent of bachelor's degrees, 60 percent of master's degrees, and 53 percent of doctoral degrees in non–science-and-engineering fields. (See figure 1-1 and appendix table 4-28.)

Women constitute 46 percent of the U.S. labor force, and 22 percent of scientists and engineers in the labor force. (See appendix table 1-2 and text table 1-1.) The lesser representation in science and engineering compared to the labor force as a whole can be explained in part by their more recent entry into science and engineering and by the higher proportion of women than men with science and engineering degrees who are employed outside of science and engineering. The highest degree earned and the science and engineering field in which women earn their degrees influence participation in the science and engineering labor force. For example, a large proportion of women who earned bachelor's degrees in the social sciences, which are defined by NSF as science and engineering degrees, are then employed in social services occupations (for example, social worker, clinical psychologist).[1]

Figure 1-1.
**Percentage of degrees in science and engineering and in non–science-and-engineering fields to women, by level of degree: 1995**




See appendix tables 4-27 and 4-28.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

## Minorities[2]

Blacks, Hispanics, and American Indians are less likely than whites to participate in higher education whether in science and engineering or in non–science-and-engineering fields. Although blacks, Hispanics, and American Indians as a group are 23 percent of the U.S. population, they are 21 percent of college enrollment, 14 percent of non–science-and-engineering bachelor's degree recipients and 13 percent of science and engineering bachelor's degree recipients. (See text table 1-1 and appendix tables 1-1, 3-1, and 3-7.)

College enrollment and degree attainment by blacks, Hispanics and American Indians has been increasing. Minority enrollment has been steadily increasing since

[1] Social services occupations are defined in NSF surveys as non–science-and-engineering occupations.

[2] 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. 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 1-1.
**Selected indicators of participation in science and engineering, by sex, race/ethnicity, and disability status; 1995**

Dash indicates not available.

| Sex and race/ethnicity | Resident population of U.S. [1] | BA/BS degrees in nonS&E [2] | BA/BS degrees in S&E [2] | S&E graduate school enrollment [3] | PhD degrees in S&E [4] | U.S. labor force [5] | S&E labor force [6] |
|---|---|---|---|---|---|---|---|
| All races | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Men | 48.9 | 40.4 | 53.5 | 58.6 | 63.7 | 54.1 | 77.6 |
| Women | 51.1 | 59.6 | 46.5 | 41.4 | 36.3 | 45.9 | 22.4 |
| White, not Hispanic | 73.5 | 79.5 | 76.6 | 75.9 | 73.2 | 84.6 | 83.8 |
| Men | 35.9 | 32.6 | 42.0 | 45.1 | 45.7 | 46.3 | 65.6 |
| Women | 37.6 | 46.9 | 34.6 | 30.8 | 27.5 | 38.3 | 18.2 |
| Asian | 3.4 | 4.0 | 7.6 | 8.0 | 19.3 | — | 9.7 |
| Men | 1.6 | 1.6 | 4.2 | 5.1 | 13.5 | — | 7.5 |
| Women | 1.7 | 2.4 | 3.4 | 2.9 | 5.8 | — | 2.2 |
| Black, not Hispanic | 12.0 | 7.7 | 7.1 | 5.6 | 2.9 | 11.2 | 3.4 |
| Men | 5.7 | 2.6 | 2.9 | 2.5 | 1.5 | 5.4 | 2.1 |
| Women | 6.3 | 5.0 | 4.3 | 3.1 | 1.4 | 5.8 | 1.3 |
| Hispanic | 10.4 | 5.9 | 5.8 | 4.3 | 3.0 | 9.2 | 2.8 |
| Men | 5.3 | 2.2 | 2.9 | 2.3 | 1.8 | 5.5 | 2.2 |
| Women | 5.1 | 3.7 | 2.9 | 2.1 | 1.2 | 3.6 | 0.7 |
| American Indian | 0.7 | 0.6 | 0.6 | 0.5 | 0.4 | — | 0.2 |
| Men | 0.4 | 0.2 | 0.3 | 0.2 | 0.2 | — | 0.2 |
| Women | 0.4 | 0.4 | 0.3 | 0.2 | 0.1 | — | 0.1 |
| Persons with disabilities | 20.6 | — | — | — | 1.3 | 13.9 | 4.9 |
| Men | 9.7 | — | — | — | 0.9 | 7.6 | 3.9 |
| Women | 10.9 | — | — | — | 0.4 | 6.4 | 1.0 |
| Persons without disabilities | 79.4 | — | — | — | 98.7 | 86.1 | 95.1 |
| Men | 39.2 | — | — | — | 67.9 | 46.5 | 73.7 |
| Women | 40.2 | — | — | — | 30.7 | 39.6 | 21.4 |

[1] Sources: U.S. Bureau of the Census, Population Division, Release PPL-57. *United States Population Estimates, by Age, Sex, Race, and Hispanic Origin, 1990 to 1996*. Data by disability status are from the Census' 1994 Survey of Income and Program Participation.

[2] Figures are for U.S. citizens and permanent residents only. Total includes persons with unknown race/ethnicity. Source: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Survey, 1995.

[3] Figures are for U.S. citizens and permanent residents only. Source: National Science Foundation, Survey of Graduate Students and Postdoctorates in Science and Engineering, 1995.

[4] Figures by race and sex are for U.S. citizens and permanent residents only. Source: National Science Foundation, Survey of Earned Doctorates, 1995.

[5] Source: U.S. Department of Commerce, Bureau of the Census, 1995, Current Population Reports. Details will not add to totals because data for "other races" group are not presented and Hispanics include both white and black population groups. Data by disability status are for persons age 15 to 64, are from the Census' 1994 Survey of Income and Program Participation and refer to employed persons rather than persons in the labor force.

[6] Source: National Science Foundation, SESTAT data system, 1995. Data by disability status refer to employment rather than participation in the labor force.

NOTE: Because of rounding, details may not add to totals.

1990, both in numbers and as a percentage of total enrollment. In 1990, underrepresented minorities were 17 percent of all undergraduate students; by 1994, they were 21 percent. (See appendix table 3-7.) Minority women are a larger percentage of undergraduate students than are minority men. Underrepresented minority women constituted 12 percent of total undergraduate enrollment in 1994 whereas underrepresented minority men constituted 8 percent.

Both the number and proportion of degrees in science and engineering earned by minorities increased since 1990. By 1995, blacks earned 7 percent of science and engineering bachelor's degrees to U.S. citizens and permanent residents, up from 5 percent in 1985; Hispanics earned 6 percent, up from 4 percent; and American Indians earned 0.6 percent, up from 0.4 percent.[3] (See appendix table 3-1.) A higher proportion of bachelor's degrees in science and engineering to blacks, Hispanics, and American Indians were earned in social science (38 percent) and in psychology (21 percent) than was the case for other groups: 34 percent of those earned by whites and 24 percent of those earned by Asians were in social science and 19 percent of those earned by whites and 11 percent of those earned by Asians were in psychology.

Underrepresented minorities as a whole are 6 percent of the science and engineering labor force. Asians are 10 percent of the science and engineering labor force. (See text table 1-1.)

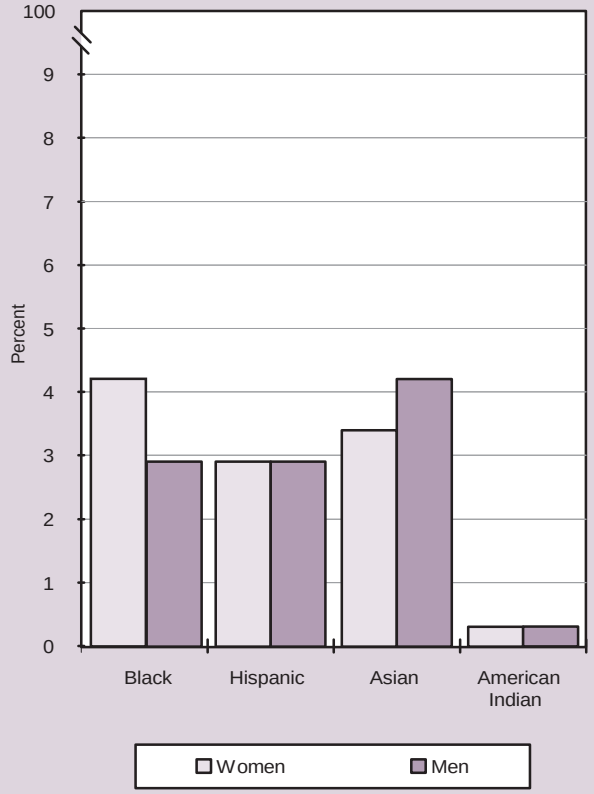
## Minority Women

Minority women are as well represented among science and engineering bachelor's degree recipients as minority men, for the most part. Black women are more likely than black men to earn bachelor's degrees, whether in science and engineering or in other fields. Black women were 4.3 percent of science and engineering and 5.0 percent of non–science-and-engineering bachelor's degree recipients in 1995; black men were 2.9 percent and 2.6 percent, respectively. (See figure 1-2.) The same proportion of bachelor's degrees in science and engineering were earned by Hispanic women and Hispanic men (2.9 percent) in 1995. Likewise, the same proportion of American Indian women and American Indian men (0.3 percent) earned bachelor's degrees in science and engineering in 1995. Asian women were a slightly smaller proportion (3.4 percent) of bachelor's degree recipients in science and engineering than were Asian men (4.2 percent).

As is the case for minority men, black, Hispanic, and American Indian women are less represented among bachelor's degree recipients, whether science and engineering, or non–science-and-engineering, than they are among the population as a whole. As a group, they were 12 percent of the population, 9 percent of non–science-and-engineering bachelor's degree recipients, and 7 percent of science and engineering bachelor's degree recipients in 1995. Asian women, however, were 2.4 percent of non–science-and-engineering and 3.4 percent of science and engineering bachelor's degree recipients and were 1.7 percent of the population. (See text table 1-1.)

Black, Hispanic, and American Indian women are less represented among science and engineering doctoral degree recipients than are minority men. As a group, they earned 2.8 percent of science and engineering doctorate degrees to U.S. citizens and permanent residents in 1995. (See appendix table 4-40.) Black, Hispanic, and American Indian men are 3.5 percent of science and engineering doctorate recipients. Asian women are a higher proportion of science and engineering doctorate recipients than they are of bachelor's degree recipients, but are less likely than Asian men to earn doctoral degrees in science and engineering.

Figure 1-2.
**Percentage of bachelor's degrees in science and engineering and in non–science-and-engineering fields to men and women, by race/ethnicity: 1995**




See appendix tables 3-17, 3-18, and 3-19.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

[3] U.S. citizens and permanent residents only.

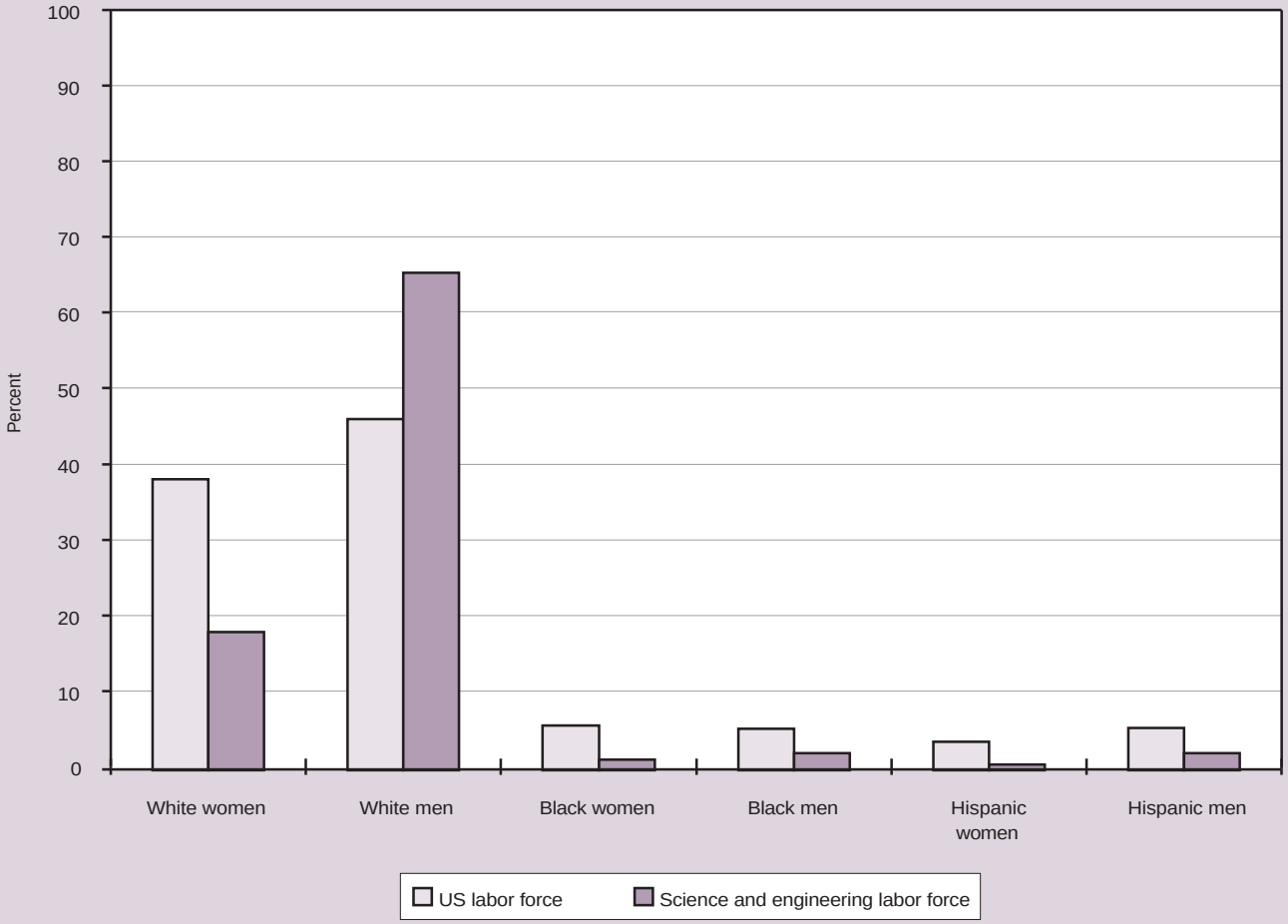
Minority women (including Asians) are 19 percent of all women in the science and engineering labor force and 4 percent of all scientists and engineers in the labor force. (See text table 1-1 and appendix table 5-22.) Within every racial/ethnic group, women are a smaller proportion of the science and engineering labor force than are men. (See figure 1-3.) Field of degree results in differences in employment statistics, as will be discussed in chapter 5.

Field choices of minority women are more similar to those of white women than to those of minority men. Smaller proportions of black and Hispanic women than of black and Hispanic men are in engineering, and higher proportions are in the broad fields of computer/mathematical sciences and social sciences. Asian women are more likely than other women to be engineers and less likely than other women to be social scientists. (See appendix table 5-22.)

## Persons With Disabilities

Data on participation of persons with disabilities are less available than data on other groups. These data 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. Second, data about disabilities are frequently not included in comprehensive institutional records (for example, in registrars' records in institutions of higher education). Concerns about confidentiality often inhibit collection or dissemination by institutions of data on disabilities. 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

Figure 1-3.
**Percentage of the U.S. civilian labor force and the science and engineering labor force, by sex and race/ethnicity: 1995**




See appendix tables 1-2 and 5-22.

*Women, Minorities, and Persons With Disabilitiies in Science and Engineering: 1998*

data, therefore, reflect individual decisions to self-identify, not objective measures.

Although NSF collects data on persons with disabilities in most of its surveys and uses common definitions among its surveys, these surveys cover people who earn doctoral degrees in science and engineering or who are employed in science and engineering. NSF does not collect data on precollege education or undergraduate education. The National Center for Education Statistics of the Department of Education does collect data on those levels of education, but in most instances does not include measures of disability status. For example, colleges and universities do not maintain data on students with disabilities. Therefore, enrollment and degree data collected from colleges and universities are not reported by disability status.

Estimates of the proportion of the population with disabilities vary greatly. About 20 percent of the population have some form of disability, with about 10 percent of the population having a severe disability.[4] (See appendix 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.[5]

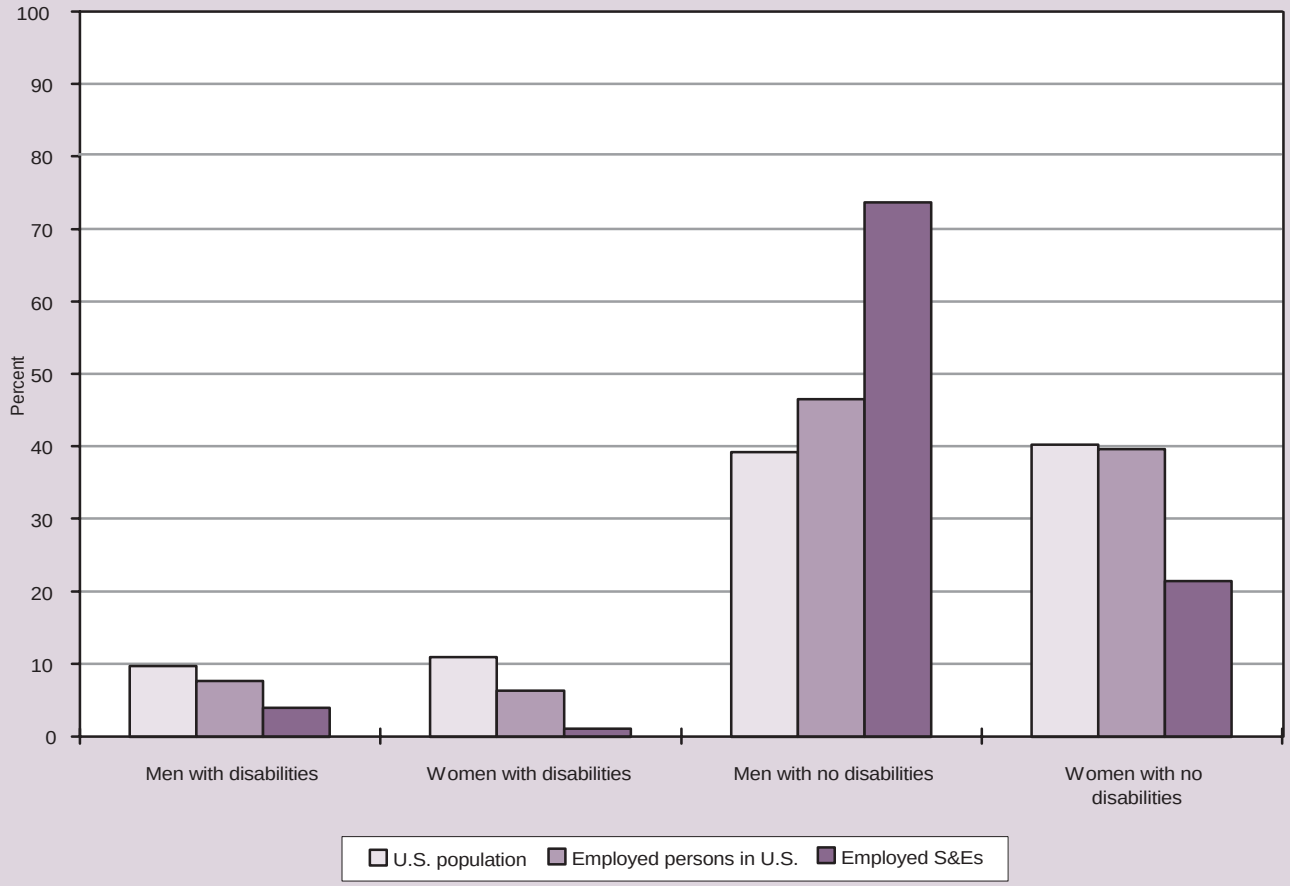
Persons with disabilities are underrepresented in the workforce and in the science and engineering workforce. Persons with disabilities were 13.9 percent of employed persons in 1994 and 4.9 percent of employed scientists and engineers in 1995.[6] (See text table

[4] Estimates of the proportion of the population with disabilities vary due to differing definitions of "disability." See the technical notes in appendix A for a discussion of the limitations of estimates of the size of this group.

[5] For a discussion of the data problems in describing the population with disabilities, see McNeil (1993).

[6] The incidence of disability increases with age. More than half of doctoral scientists and engineers who indicate they have a disability became disabled at age 30 or later. See appendix table 5-29.

Figure 1-4.
**Percentage of the U.S. population, employed persons in United States, and employed scientists and engineers, by sex and disability status: 1995**




See appendix table 1-3 and text table 1-1.

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1-1 and appendix table 1-4.) Women with disabilities are less likely than men with disabilities to be employed and to be employed in science and engineering. (See figure 1-4 and appendix table 1-5.)

## Data Sources

Data for this report come from a number of sources. (See appendix A, "Technical Notes.") The primary sources of information are surveys conducted by NSF's Division of Science Resources Studies. Other sources include surveys conducted by the Department of Education's National Center for Education Statistics (NCES).

Data on bachelor's and master's degrees come from the Integrated Postsecondary Education Data System's (IPEDS) Completions Survey, which is part of an integrated system of surveys conducted by the National Center for Education Statistics. This survey provides data on the number and types of degrees awarded by U.S. postsecondary institutions and data on the characteristics of degree recipients.

Graduate enrollment data come from NSF's Survey of Graduate Students and Postdoctorates in Science and Engineering. This survey provides data on the number and characteristics of graduate science and engineering students enrolled in U.S. institutions, differences in enrollment patterns, and differences in financial support patterns.

The Survey of Earned Doctorates is the source of data on doctoral degrees. This survey, which is conducted for the National Science Foundation, the National Institutes of Health, the National Endowment for the Humanities, the U.S. Department of Education, and the U.S. Department of Agriculture, annually provides data on the number and characteristics of individuals receiving research doctorate degrees[7] from U.S. institutions.

Employment data come primarily from three surveys that form an integrated system of NSF surveys called the Scientist and Engineer Statistics Data System (SESTAT) to produce national estimates of the entire science and engineering workforce. The Survey of Doctorate Recipients provides demographic and employment information on individuals with doctoral degrees in science and engineering. This survey is a longitudinal survey of a sample of individuals under the age of 76 who received a research doctorate in science or engineering from a U.S. institution and who were living in the United States. The National Survey of Recent College Graduates provides employment and demographic data on individuals who recently obtained bachelor's or master's degrees in science or engineering fields. The National Survey of College Graduates provides data on the number and characteristics of individuals with training and/or employment in science and engineering in the United States.

The "Technical Notes" found in appendix A present information on the underlying concepts, data collection techniques, reporting procedures, and statistical reliability of the primary data sources used in this report.

## Statistical Reliability of Comparisons

The "Technical Notes" found in appendix A present information on the primary data sources used in this report. Many of the data sources used in this report are sample surveys. Information presented from sample surveys has differing degrees of reliability. Survey summaries may differ from the actual values for the population under study due to a number of sources contributing error to the estimates. This report states differences in comparisons of groups or in trends in the data over time only if they are greater than the differences that would be likely to result due to chance. (In statistical terms, for this report the impact of sampling error is accounted for by testing at the 95 percent confidence level any individual comparisons presented.) Where possible, analysts have also considered the impact of nonsampling errors such as incomplete coverage and nonresponse.

## Organization of Report

Chapter 2 focuses on precollege mathematics and science education, including factors influencing science and mathematics achievement, course taking, test scores, and attitudes toward science and engineering.

Chapter 3 examines undergraduate education as preparation both for careers and for graduate education. This chapter presents data on trends in enrollments and degrees in 2- and 4-year colleges and universities and college course taking patterns.

Chapter 4 addresses graduate enrollment, degrees, and financial support. It presents data on trends in enrollments and degrees, primary source of support in graduate school, and time to completion of PhD.

Chapter 5 examines employment patterns including unemployment, full- and part-time employment, and employment by field and sector. It also focuses separately on academic and nonacademic employment.

## References and Data Sources

McNeil, John M. 1993. *Americans With Disabilities, 1991–92: Data from the Survey of Income and Program Participation.* Bureau of the Census,

[7] Research doctorates are doctorates which require original research. These include most PhD, and some Ed.D. and D.Sc. degrees. Nonresearch doctorates and first-professional degrees such as the J.D., M.D., D.D.S., or Psy.D. are not included in the Survey of Earned Doctorates.

Current Population Reports, P70-33. Washington, DC: U.S. Department of Commerce.

National Science Foundation. 1997. *Science and Engineering Degrees: 1966–1995* (NSF 97-335). Arlington, VA: National Science Foundation.

National Science Foundation. 1997. *Science and Engineering Degrees, by Race Ethnicity: 1988–1995* (NSF 97-334). Arlington, VA: National Science Foundation.

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# CHAPTER 2

# PRECOLLEGE EDUCATION

## Overview

Precollege participation in science and mathematics influences participation of women, minorities, and persons with disabilities in science and engineering. Current and historical differences in science and mathematics course taking and scores on achievement tests influence current and future participation by these groups in postsecondary science and engineering education and employment.

This chapter examines (1) factors influencing achievement, (2) precollege science and mathematics course taking, (3) mathematics and science achievement test scores, (4) high school completion rates, and (5) college entrance examinations.

## Influences on Mathematics and Science Achievement

Although gains have been made by women and minorities in mathematics and science achievement—as measured by elementary and secondary assessment test scores and by college entrance examinations—differences remain. These differences in achievement can then become a basis for unequal participation in further mathematics and science education, employment, and technological and science literacy. This section addresses factors that influence mathematics and science achievement—factors that account for both gains in achievement in some areas and persistent differences among groups in other areas. It should be noted that these factors influence the achievement of *all* students, regardless of sex, race/ethnicity, or disability status.

### Mathematics and Science Course Taking

A primary factor contributing to mathematics and science achievement is mathematics and science course taking. Both the number and type of courses taken are positively related to achievement (Oakes, 1990; Peng, Wright, and Hill, 1995). One of the factors contributing to the increase in science and mathematics achievement test scores (as measured by the National Assessment of Educational Progress discussed on page 15) over time could be the increase in science and mathematics course taking (NSB, 1996). Differences in course taking by gender, race/ethnicity, and disability status, thus may contribute to differences among these groups in science and mathematics achievement.

### Family Income and Education

Differences in mathematics and science achievement are also related to differences in family income and parents' education. Socioeconomic status (parental occupation, education, and income) accounts for a substantial amount of the differences in mathematics achievement (Ekstrom, Goertz, and Rock, 1988; Madigan, 1997). Students at grades 4, 8, and 12 whose parents had less than high school education scored lower in science and mathematics than students whose parents had higher levels of education. Similarly, those students eligible for the free or reduced price lunch program (an indicator of parental income) scored lower than those not eligible (Campbell et al., 1996). Poverty may explain some of the differences in females' and males' Scholastic Assessment Test (SAT) scores: a higher proportion of women than men SAT and American College Testing (ACT) test takers are from low-income families. Poverty may also explain some of the racial/ethnic differences in achievement test scores: blacks and Hispanics are more likely than whites and Asians to live in poverty. In 1995, poverty rates were 8.5 percent for non-Hispanic whites, 29.3 percent for blacks, 30.3 percent for Hispanics, and 14.6 percent for Asians (Baugher and Lamison-White, 1996). Further, children in poverty are more likely to have disabilities. Poverty is associated with health problems and learning disabilities: a higher proportion of children from low-income families than from higher income families are in special education because of developmental delays, learning disabilities, and emotional disturbances (U.S. Department of Education, 1997).

### School Characteristics

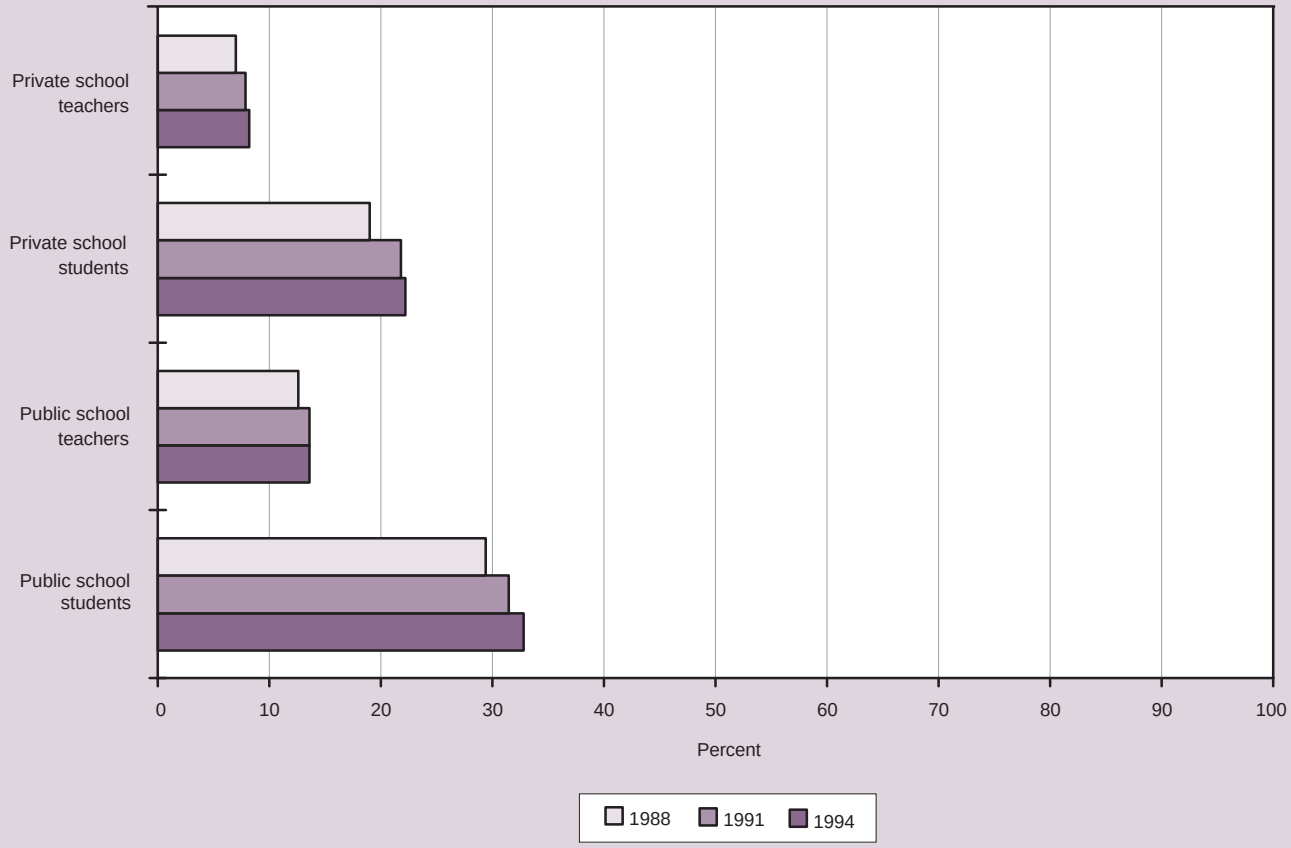
School characteristics contributing to unequal participation in science and mathematics education include

tracking, judgments about ability, number and quality of science and mathematics courses offered, access to qualified teachers, access to resources, curricula emphases (Oakes, 1990; Weiss, 1994; Madigan, 1997), and access to teachers and services that reduce language and cultural barriers (Laosa, 1997; Miller, 1997; Ponessa, 1997).

Lack of role models may also influence achievement. The proportion of minority (black, Hispanic, and Asian) students in elementary and secondary schools has increased in recent years from 28 percent in 1987–1988 to 32 percent in 1993–1994. (See appendix table 2-1.) In the 1993–1994 school year, black students constituted 16 percent; Hispanic students, 12 percent; and Asian students, 3 percent of all public and private elementary and secondary school students. The proportion of elementary and secondary teachers who are members of minority racial/ethnic groups was 12 percent in 1987–1988 and 13 percent in 1993–1994—still well below the proportion of minority students. (See figure 2-1 and appendix table 2-2.)

Classroom placement and accommodations are factors that influence the achievement of students with disabilities in addition to factors mentioned previously. Elementary and secondary students with disabilities have special needs that may hinder their ability to participate fully in science and mathematics instruction if accommodations are not made. Students with disabilities 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. Secondary students who spend more time in regular education and vocational classes have greater access to the general educational curriculum, higher expectations for performance, and more positive school outcomes (U.S. Department of Education, 1996 and 1997). During the past few years, the fraction of students served in regular classrooms has increased and the

Figure 2-1.
**Percentage of students and teachers who are minority, by type of school: 1988, 1991, and 1994**




NOTE: "Minority" includes Asians, Hispanics, blacks, and American Indians.

See appendix tables 2-1 and 2-2.

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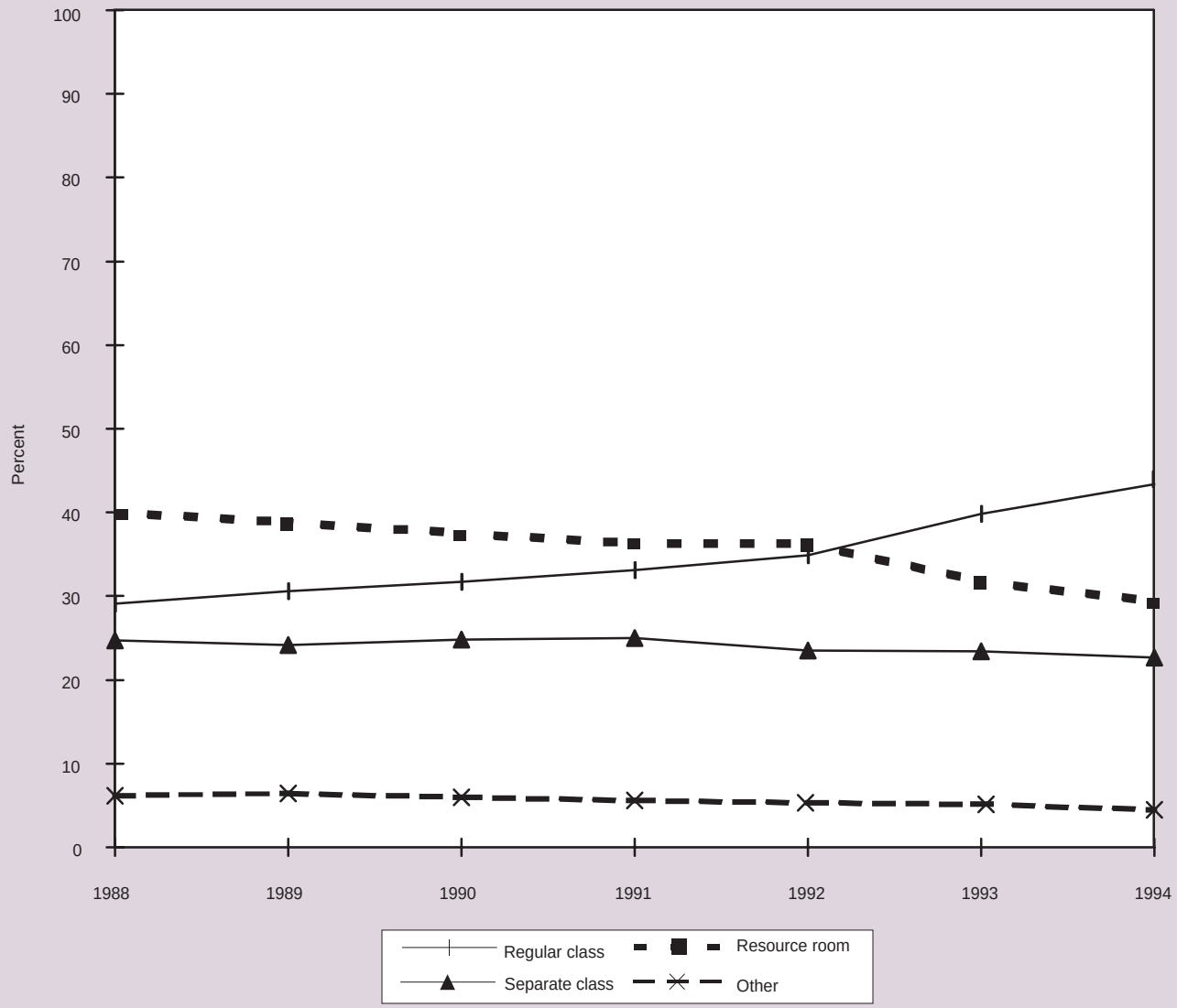
percentage served in resource rooms has decreased. (See figure 2-2.) In the 1993–1994 school year, 43 percent of all students receiving special education services were in regular classrooms (up from 29 percent in 1987–1988), 30 percent were in resource rooms, 23 percent in separate classes, 3 percent in separate schools, and less than 1 percent each in residential facilities or in homebound/hospital placements. (See appendix table 2-3.)

Placement patterns for students vary considerably depending on the type of disability. Students with speech and language impairments are most likely to attend regular classes: 88 percent are in regular classes. Students with learning disabilities, orthopedic impairments, serious emotional disturbance, and traumatic brain injury are more widely distributed in their placements within several settings—regular classes, resource rooms, and separate classes—within regular schools. (See appendix table 2-4.)

Technology in the classroom can also influence instruction of students with disabilities. Advances in technology (for example, closed captioning, personal computers, and Internet services) can allow students with disabilities to communicate and participate in

Figure 2-2.

**Percentage of students ages 6 to 21 with disabilities by type of educational environment: 1988–1994**




See appendix table 2-3.

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## Differences in Student Access to Technology

Students differ in their access to computer technology and in their use of computers, according to the report *Computers and Classrooms* (Coley, Cradler, and Engel, 1997). In general, students attending high-poverty and high-minority schools had less access to computer technology. These schools had fewer computers and multimedia computers per student than other schools and were less likely to have cable TV, access to the Internet, CD-ROM technology, and local area networks. Also, schools with high percentages of minorities were less likely to have satellite dishes. There were two exceptions to the general finding: high-poverty schools were more likely to have satellite dishes and the schools with low percentages of minority students were least likely to have videodisc players.[1]

The Educational Testing Service (ETS) study reported several differences among students in their computer-related coursework or experience (based on a 1996 College Board report on SAT program test takers). Females were slightly more likely than males to have experience in word processing and to use a computer in their English courses. Females were less likely than males to have experience in computer literacy, using computers to solve mathematics problems, and taking courses in computer programming. Blacks and Hispanics were less likely than whites to have experience in word processing, computer literacy, using computers in their English courses, and using computers to solve mathematics problems. Asians were more likely to have taken courses in computer programming.

[1] The data for access to the Internet are for fall 1996 and are reported in the NCES survey report: *Advanced Telecommunications in U.S. Public Elementary and Secondary Schools, Fall 1996*, U.S. Department of Education, National Center for Education Statistics, February 1997 (Heaviside, Riggins, and Farris, 1997). The rest are 1995–1996 data reported in *Technology in Public Schools, 15th Edition. Installed Base Technology in U.S. Public Schools, Covering 1981–1996*, 1997, Quality Education Data, Denver, CO (Quality Education Data, 1997).

classroom activities more on par with students who do not have disabilities. Efforts to increase accessibility to persons with disabilities often increases accessibility to others. For example, closed captioning, which was implemented for people who are deaf, is now being used by people learning English as a second language (National Research Council, 1997). Not all of these advances, however, will be accessible by all people in all situations.

## Science and Mathematics Course Taking and Achievement

The number of courses taken in mathematics and science is an important indicator of preparation for undergraduate majors in science and engineering as well as of general scientific literacy and is, as we have seen, an important influence on mathematics and science achievement.

### Women

#### *Mathematics Course Taking*

Female and male students are similar in completion of high school mathematics courses. More than half of both male and female high school graduates in 1994 had taken algebra II and geometry, but far fewer had taken trigonometry and calculus in high school. Nevertheless, the same percentages of male and female students had taken these advanced courses: 17 percent of male and 18 percent of female students had taken trigonometry, 9 percent of both had taken calculus, and 7 percent of both had taken advanced placement calculus. (See appendix table 2-5.)

#### *Science Course Taking*

Male and female high school students differed only slightly in science course taking in 1994. Female students were slightly more likely than males to have taken biology and chemistry, and males were slightly more likely than females to have taken physics: 92 percent of males and 95 percent of females had taken biology, 53 percent of males and 59 percent of females had taken chemistry, and 27 percent of males and 22 percent of females had taken physics. (See appendix table 2-5.) The increases in physics course taking from 1982 to 1994 were greater for females than for males. During that period, the proportion of male high school graduates who had taken physics increased 8 percentage points (from 19 percent to 27 percent) and the proportion of females who had taken physics increased 12 percentage points (from 10 percent to 22 percent).

#### *Mathematics and Science Achievement*

The National Assessment of Educational Progress (NAEP), funded by the National Center for Education Statistics in the U.S. Department of Education, is

## Diversity Among Asian American High School Students

Although Asian Americans are often treated as a single group for statistical analysis, a recent report (Kim, 1997) found many differences in educational and family background among Asian American high school seniors depending on whether they were Chinese, Filipinos, Koreans, Japanese, Southeast Asians, or South Asians.[2] Differences were also found between native-born and foreign-born Asian Americans. Data for the report were drawn from the Second Follow-up Survey of the 1988 National Education Longitudinal Study (NELS:88).[3]

The author of the report, Heather Kim, argues that even though stereotypes of Asian Americans may be largely favorable, they still can be harmful. For example, because there is a widespread belief that Asian Americans are strong academically, there may not be sufficient effort to provide help for those groups of Asian Americans that are less highly educated. She states, "The myth of them all being educational high achievers has kept many from needed student services and support."

In some respects, the six groups of Asian Americans were fairly similar to one another. Nearly all believed that getting a good education was important in their lives. Three-fourths or more of the parents expected their child to earn a college degree or higher.

Parents of South Asian students had the highest occupational status and educational expectations for their children of any of the groups. The South Asian students themselves tended to have the highest educational aspirations, to be more involved in extracurricular activities, and to perform the best on the National Assessment of Educational Progress (NAEP) standardized tests in reading and (to a lesser degree) mathematics. By contrast, the parents of Southeast Asians were the least likely to have a college education and had the lowest occupational status on average. The Southeast Asian students tended to have the lowest educational aspirations, to be least likely to participate in extracurricular activities, and to receive the lowest scores on the NAEP standardized tests.

Native-born seniors tended to have greater educational advantages than foreign-born seniors. Their parents generally had achieved higher educational levels and higher status occupations. Native-born seniors on average spent more time on extracurricular activities than foreign-born seniors but less time on homework. Native-born seniors did better on the NAEP standardized test on reading, but about the same as their foreign-born peers on mathematics.

The ethnicity of Asian Americans and their likelihood of being native born are interrelated. Chinese immigration started earliest (about 1840), followed by the Japanese (between 1890 and 1920), and Korean (about 1903). Thus, among these groups one can expect to find substantial groups of native-born students. By contrast, Southeast Asians are more likely than other groups to be foreign born.

Aside from her use of the NELS data, Kim also cites other statistics concerning the disadvantages facing some Asian ethnic groups. These include high school dropout rates around 50 percent for schools with high concentrations of Southeast Asians and high dropout rates for Filipinos (46 percent) and Samoans (60 percent) in 1992. The median family income in 1990 for all Asian Americans was $41,241 but only $14,327 for Hmongs, $18,126 for Cambodians, and $23,101 for Laotians.

The NELS data are subject to relatively high standard errors because of the small sample sizes for these groups (for example, the total number of Asian Americans was 961, with only 70 Japanese and 97 South Asians in the sample) and clustering can be expected to increase the size of the standard errors further. (For example, many of the Japanese students may attend just a small number of the sampled schools.) Thus, the data are illuminating, but should not be considered definitive estimates. The groups of native-born and foreign-born Asian Americans were roughly equal in size, so the sample size is less of an issue for that portion of the analysis (though clustering remains an issue).

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[2] Southeast Asians include Vietnamese, Laotian, Cambodian/Kampuchean, and Thai. South Asians include Asian Indian, Pakistani, Bangladeshi, and Sri Lankan.

[3] The Second Follow-Up Survey of the 1988 National Education Longitudinal Study of 1988 (NELS:88) was conducted in 1992 by the National Opinion Research Center (NORC) at the University of Chicago for the National Center for Education Statistics, U.S. Department of Education.

designed to determine the achievement levels of precollege students in a number of areas, including mathematics and science and to measure changes in achievement over time. Both mathematics and science assessments are administered periodically to students in the 4th, 8th, and 12th grades. National results are reported by NAEP for each grade level and within various subgroups (for example, males and females, racial/ethnic groups).

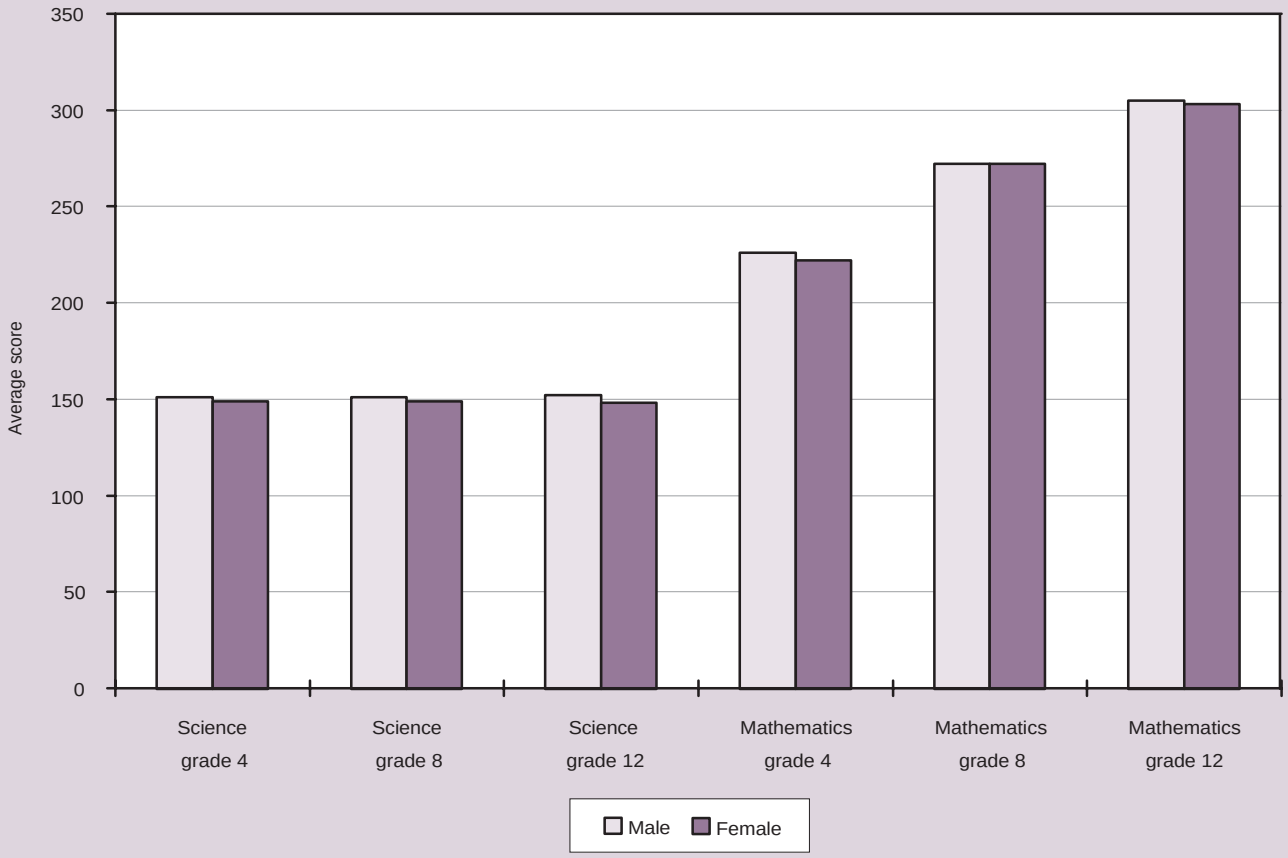
## Mathematics

The 1996 NAEP mathematics assessment measured mathematics performance in five content areas: number sense, properties, and operations; measurement; geometry and spatial sense; data analysis, statistics, and probability; and algebra and functions as well as mathematical abilities (conceptual understanding, procedural knowledge, and problem solving) and mathematical power (reasoning, connections, and communication). Achievement was measured on a scale ranging from 0 to 500.

Results of the 1996 mathematics assessment showed that the gender gap in mathematics achievement is narrowing. (See appendix table 2-6.) Previous NAEP mathematics assessments showed that males scored higher than females in grade 12, but in 1996, average mathematics scores for males and females in 8th and 12th grade were not significantly different. (See figure 2-3.) In 4th grade, the average mathematics assessment score for males (226) was higher than that for females (222). (See appendix table 2-7.) Although the difference is small, it is statistically significant.

Differences remain, however, in the percentages performing at the *proficient* and *advanced* levels of

Figure 2-3.
**Average NAEP mathematics and sciences scores at grades 4, 8, and 12, by sex: 1996**




NOTE: Science scale scores, which range from 0 to 300, were developed independently for each grade assessed. Mathematics scale scores ranged from 0 to 500 across all three grades.

See appendix table 2-6.

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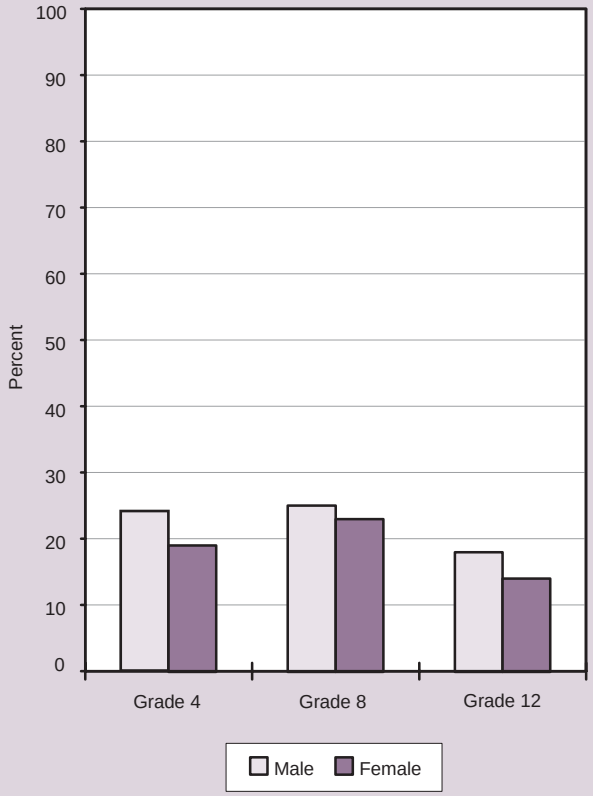
Figure 2-4.
**Percentage of students scoring at or above proficient level on NAEP mathematics assessment in grades 4, 8, and 12, by sex: 1996**




See appendix table 2-8.

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## NAEP Achievement Levels

*Basic* level—denotes partial mastery of the knowledge and skills that are fundamental for proficient work at a given grade.

*Proficient* level—represents solid academic performance. Students reaching this level demonstrate competency with a range of challenging subject matter.

*Advanced* level—signifies superior performance at a given grade.

These performance levels are cumulative—students performing at the advanced or proficient levels also perform at the immediately preceding levels.

achievement. NAEP developed three achievement levels—basic, proficient, and advanced—to measure level of knowledge and skills. (See sidebar, this page.) Among 8th graders, the differences in the percentages of male and female students at each achievement level were not statistically significant. (See appendix table 2-8.) Among 4th and 12th grade students, however, higher percentages of males than females scored at the *advanced* level and at or above the *proficient* level. (See figure 2-4.)

### Science

The 1996 NAEP science assessment measured achievement on knowledge of facts, concepts, and analytical reasoning skills; abilities to explain, integrate, apply, reason about, plan, design, evaluate, and communicate scientific information; and abilities to use materials to make observations, perform investigations, evaluate experimental results, and apply problem-solving skills. Science achievement was measured on a scale ranging from 0 to 300.

Among 12th graders, female students scored lower than male students on the 1996 science assessment. (See figure 2-3.) Although the average science scores (152 for males and 148 for females) did not differ greatly, the difference is statistically significant. The differences in males' and females' science scores at grades 4 and 8 are not statistically significant.

## The International Gender Gap in Mathematics and Science Achievement

The United States is one of many nations worldwide in which the gender gap in mathematics and science achievement has virtually disappeared (Peak, 1997). No statistically significant difference was found between the mathematics scores of 8th grade boys and girls in 33 nations, including the United States, that participated in the Third International Mathematics and Science Study (TIMSS).[4] Further, no statistically significant difference was found between the science scores of 8th grade boys and girls in 11 nations, including the United States, that participated in TIMSS. The 11 nations with no statistically significant gender differences in 8th grade mathematics and science scores were Australia, Columbia, Cyprus, Flemish Belgium, Ireland, Romania, the Russian Federation, Singapore, South Africa, and the United States.

[4] TIMSS was a study of science and mathematics knowledge in 41 nations during the 1995 school year.

## Gender Differences in Attitudes Toward Science and Mathematics

Attitudes toward science and mathematics both reflect and reinforce achievement in these subjects. Those who do well tend to like science and mathematics, and those who like these subjects tend to have higher levels of achievement in them. It is not that surprising then that females' and males' attitudes toward science and mathematics are similar given that their achievement levels are becoming more similar. Results from the 1995 TIMSS study show that for the most part, female and male students in 4th grade and in 8th grade were similar in their attitudes toward science and mathematics.

Among 4th graders in the United States and in many countries, little difference was found in males' and females' self-perceptions of doing well in mathematics (Mullis et al., 1997). Among 8th graders, females and males were about equally likely to like mathematics (Beaton et al., 1996b). In several countries, however, (Austria, France, Germany, Hong Kong, Japan, Norway, and Switzerland) males were more likely to like mathematics than were females. In Ireland, a greater percentage of females than males liked mathematics.

Similarly, among 4th and 8th graders, males and females in most countries that participated in the study (including the United States) did not differ significantly in self-perceptions of doing well in science or in liking science. In Austria, Japan, and Korea, however, a greater percentage of male than female 4th graders liked science, and in Iceland and Ireland a greater percentage of females than males liked science (Martin et al., 1997). Some differences were apparent by subject area, however. Eighth grade males and females differed little in liking of biological science or earth science, but male students in most countries were more likely to like physical science than were females (Beaton et al., 1996a).

## Minorities

### *Mathematics Course Taking*

Although substantial differences in course taking by racial/ethnic groups remain, the percentages of black, Hispanic, and American Indian students taking many basic and advanced mathematics courses have doubled between 1982 and 1994. For example, in 1982, 22 percent of black high school graduates had taken algebra II. By 1994, 44 percent had taken this course. (See figure 2-5.) Similarly, 29 percent of black high school graduates in 1982 had taken geometry, 6 percent had taken trigonometry, and 1 percent had taken calculus. By 1992, these percentages had increased to 58 percent, 14 percent, and 4 percent, respectively. (See appendix table 2-9.)

Despite the gains, racial/ethnic groups differ greatly in mathematics course taking. Black and Hispanic high school graduates in 1994 were more likely than white and Asian students to have taken remedial mathematics courses: 31 percent of black, 24 percent of Hispanic, and 35 percent of American Indian high school graduates, compared with about 15 percent of whites and Asians had taken remedial mathematics in high school. Black and Hispanic high school graduates in 1994 were less likely than white and Asian students to have taken advanced mathematics courses. Although more than 60 percent of both white and Asian students had taken algebra II, 44 percent of blacks, 51 percent of Hispanics, and 39 percent of American Indians had taken this course. Asians were the most likely of any racial/ethnic group to have taken advanced mathematics courses. Almost one-third of Asians had taken precalculus and 23 percent had taken calculus. By contrast, 18 percent of white, 10 percent of black, 14 percent of Hispanic, and 9 percent of American Indians had taken precalculus and less than 10 percent of any of these groups had taken calculus. (See appendix table 2-9.)

### *Science Course Taking*

As is the case with mathematics course taking, blacks, Hispanics, and American Indians are taking more science classes than they took in the past. The percentage of blacks and Hispanics taking chemistry and physics doubled between 1982 and 1994. In 1982, 22 percent of black, 16 percent of Hispanic, and 26 percent of American Indian high school graduates had taken chemistry. By 1994, this had increased to 44 percent, 46 percent, and 41 percent respectively. In 1982, approximately 7 percent each of blacks, Hispanics, and American Indians had taken physics; by 1994, 15 percent of blacks, 16 percent of Hispanics, and 10 percent of American Indians had taken physics. (See appendix table 2-9.)

Despite these gains, the percentage of black, Hispanic, and American Indian students taking chemistry and physics is below the percentage of white and Asian students taking these courses. Fifty-eight percent of white and 69 percent of Asian high school graduates

in 1992 had taken chemistry, and 26 percent of white and 42 percent of Asian students had taken physics.

## Mathematics and Science Achievement

### Mathematics

Average mathematics scores have increased for all racial/ethnic groups since 1990, but differences between the scores of white students and black and Hispanic students have not significantly narrowed. For example, among 12th graders in 1990, the average difference between white students' mathematics scores and those of black students was 33 points. In 1996, it was 31 points. (See appendix table 2-7.) The average difference between 12th grade white students' mathematics scores and those of Hispanic students was 25 points in 1990; in 1996, it was 24 points. Differences are as great among 4th graders. In 1996, the average gap in mathematics scores between white and black 4th graders was 32 points, and the average gap between white and Hispanic 4th graders was 26 points.

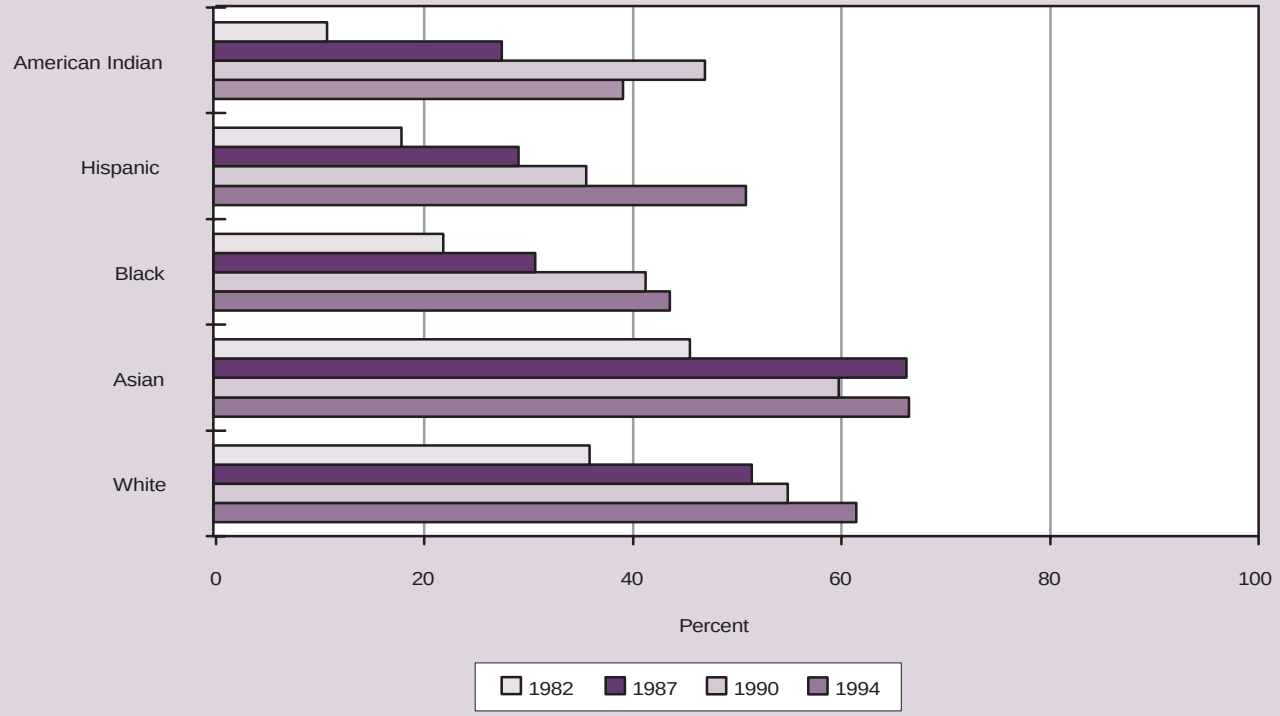
Differences by race/ethnicity also existed in the percentages performing at *proficient* levels in mathematics. Among 4th, 8th, and 12th grade students, more than 20 percent of white students and less than 10 percent of black, Hispanic, and American Indian students scored at or above the *proficient* level. (See appendix table 2-8.) Half, or more than half, of black and Hispanic students at all three grade levels scored below the *basic* proficiency level in mathematics compared with about one-fourth of white students. (See figure 2-6.)

### Science

As with mathematics scores, differences in science scores persist across racial/ethnic groups. Scores for white, Asian, and American Indian students are substantially higher than those for black and Hispanic students in grades 4, 8, and 12.[5] (See figure 2-7.) Among 12th graders in 1996, average science scores were 159 for whites, 149 for Asians, 145 for American Indians, 130 for Hispanics, and 124 for blacks.

[5] An accurate determination of the standard error associated with the average scale score for 12th grade American Indian students was not possible; therefore differences between this group and other groups at grade 12 should be interpreted with caution.

Figure 2-5.
**Percentage of high school graduates taking algebra II in high school, by race/ethnicity: 1982, 1987, 1990, and 1994**




See appendix table 2-9.

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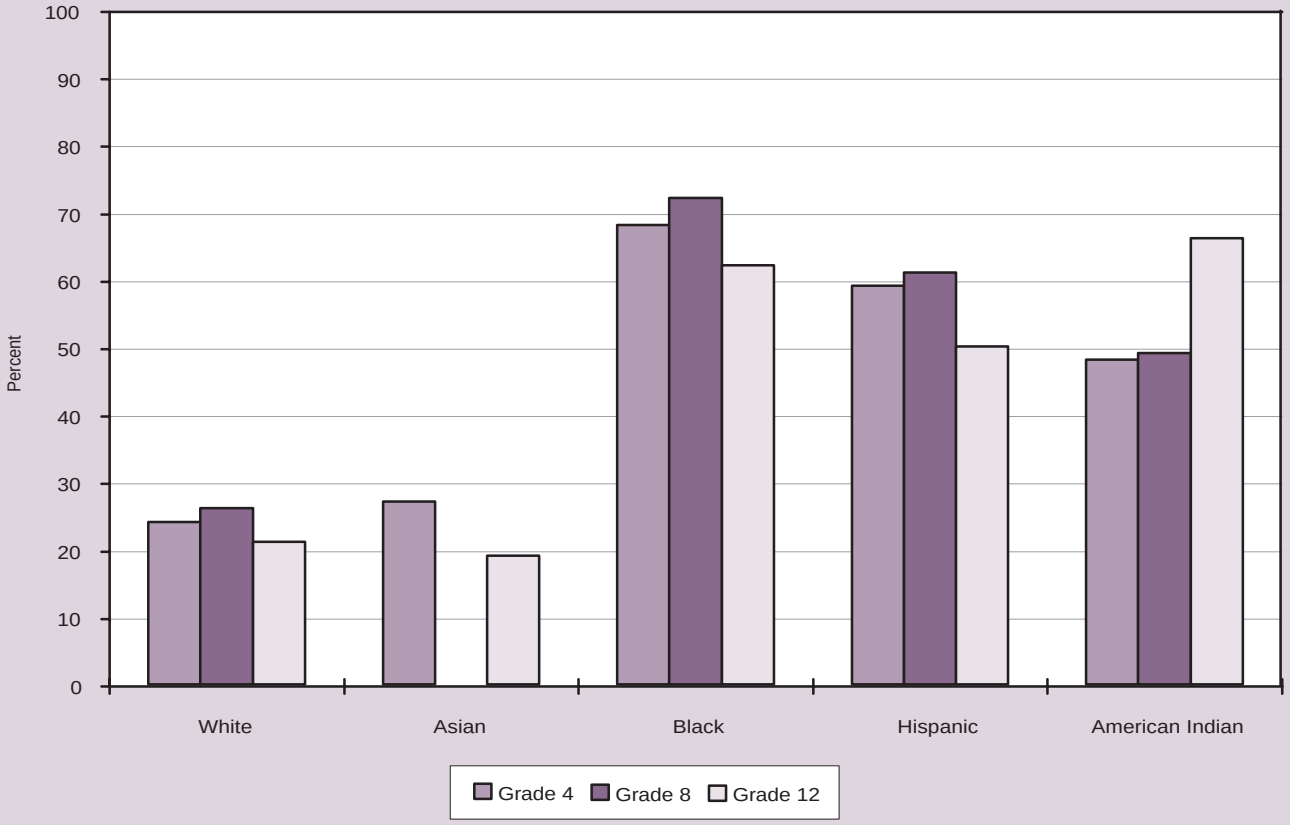
Figure 2-6.
**Percentage of students in grades 4, 8, and 12 scoring below the basic proficiency level in mathematics, by race/ethnicity: 1996**




NOTE: Results for 8th grade Asian students not available.

See appendix table 2-8.

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## Students With Disabilities

### *Variations in Estimates of the Number of Students With Disabilities*

Determining the number of students with disabilities is challenging given variations in age ranges of the population, in definitions, in data collection procedures, and in the individual reporting the disability (for example, student, parent, teacher, school official) (Rossi, Herting, and Wolman, 1997). For differences in prevalence and classification from various sources, see text table 2-1.

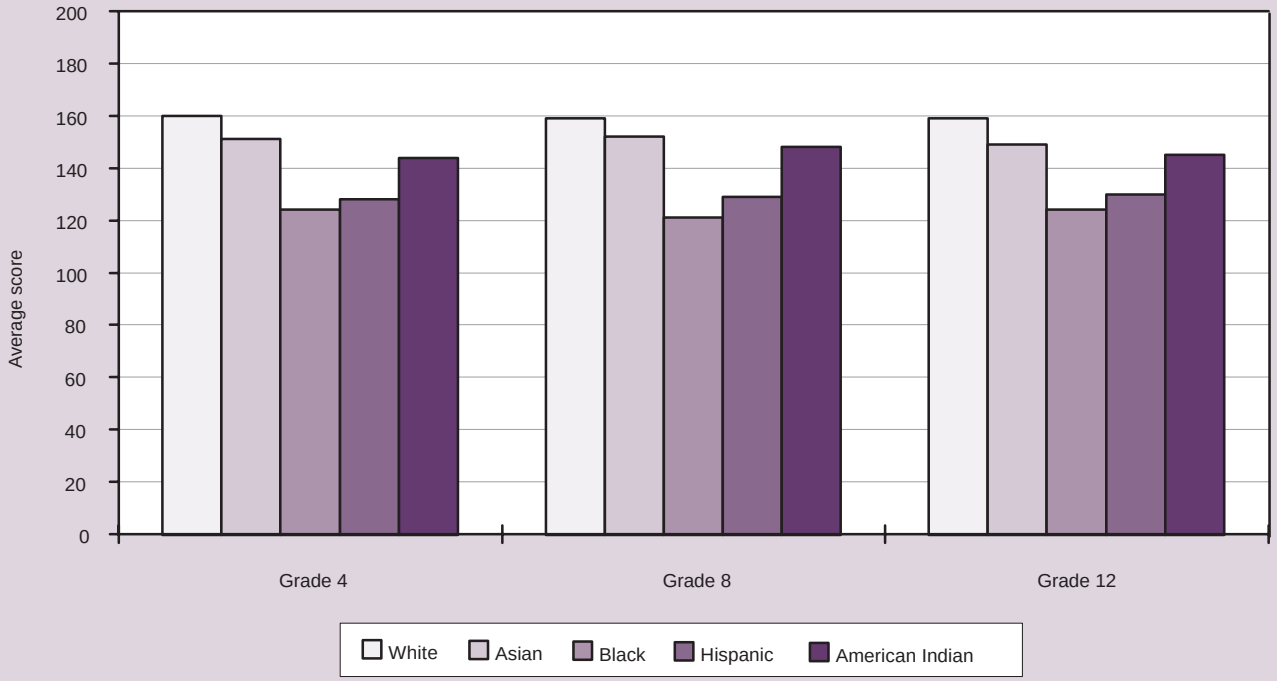
According to the Department of Education's Office of Special Education and Rehabilitative Services, the percentage of children enrolled in school and between the ages of 6 and 17 who were served in Federally supported special education programs was 10 percent in 1994–1995.[6] [7] [8] Eight percent of all children ages 6 through 21 were served in these programs. Fifty-one percent of the children age 6 through 21 with disabilities had specific learning disabilities, and another 21 percent had speech or language impairments. (See appendix table 2-10.) About 12 percent were mentally retarded, 9 percent had a serious emotional disturbance, 2 percent had "other" health impairments, and 1 percent each had

[6] It should be noted that not all children with impairments require special education.

[7] The data collected by the Office of Special Education and Rehabilitative Services are the only data collected specifically to provide counts of students eligible to receive services.

[8] The Individuals with Disabilities Education Act (IDEA), Part B, requires that "all children and youth with disabilities have access to a free appropriate public education that is determined on an individual basis and designed to meet their unique needs" (Barbett and Korb, 1997).

Figure 2-7.
**Average NAEP science scores at grades 4, 8, and 12, by race/ethnicity: 1996**




NOTE: Science scale scores, which range from 0 to 300, were developed independently for each grade assessed.

See appendix table 2-6.

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mobility or hearing impairments. Visual impairments, autism, deaf-blindness, and traumatic brain injury each accounted for less than 1 percent of the students with disabilities.

Students participating in Federal programs for children with disabilities have been increasing both in number and as a fraction of total public school enrollment. Between 1977 and 1995, the number of students who participated in Federal programs for children with disabilities increased 47 percent, from 3.7 million to 5.4 million students. Part of this growth is due to an increase in the number of students identified with specific learning disabilities. Students with specific learning disabilities increased from approximately 800,000 students or 2 percent of total public K–12 enrollment in 1977 to 2.5 million students or 6 percent of total public K–12 enrollment in 1995. The number of students with other types of disabilities (with the exception of students with serious emotional disturbance) went down during that time period (U.S. Department of Education, 1997).

Students with disabilities made up 11 percent of students in grade 4, 9 percent of students in grade 8, and 5 percent of students in grade 12 in 1996 (Reese et al., 1997). These students take fewer science and mathematics courses, have lower grades, and have lower achievement scores than students without disabilities.

## Mathematics and Science Course Taking

Twelfth-grade students with disabilities[9] earned fewer credits in mathematics in 1992 than did those without disabilities. (See appendix table 2-11.) Differences are not great by type of disability. Students with disabilities also earned fewer science credits than those without disabilities. (See appendix table 2-11.)

## Mathematics and Science Achievement

Students with disabilities have lower average high school grades in mathematics and in science than those without disabilities. (See appendix table 2-11.)

[9] Students were identified by their parents as being disabled. The source of these data is the National Center for Education Statistics, National Education Longitudinal Study, 1988.

Text table 2-1.
**Data sets on disability prevalence among children in the United States**[1]

| 1988 NELS (8th grade)[2] | | | HS & B (10th grade)[3] | | | 1988 NAEP (age 13)[4] | | 1992 CPS (age 5–17) | | 1988 NHIS/CH Under age 18)[5] | | 1994 OSEP (age 6–21)[6] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Classification (Parent report) | % with condition | % received services | Classification (student report) | % 1980 | % 1982 | Classification | % | Classification | % | Classification | % | Classification | % |
| Mental retardation | 0.1 [3.1][7] | 0.0 | | | | Mentally retarded | 1.0 [20.4] | Mental retardation | 0.7 | Delay in growth or development | 4.0 | Mental retardation | 0.9 |
| Specific learning problem | 6.1 | 7.6 | Specific learning disability | 2.6 | 1.7 | Learning disabled | 2.1 [43.5] | Learning disability | 4.3 | Learning disability | 6.5 | Specific learning disability | 4.1 |
| Emotional problem | 2.8 | 2.6 | | | | Emotionally disturbed | 0.3 [6.1] | Serious emotional disturbance | 0.9 | Emotional or behavioral problem (age 3-17) | 6.1 | Serious emotional disturbance | 0.7 |
| Speech problem | 1.6 | 6.9 | Speech disability | 1.6 | 1.1 | Speech impaired | 0.1 [1.3] | Speech impairment | 2.5 | Speech impairment | 2.6 | Speech or language impairment | 1.7 |
| Hearing problem | 2.2 | 1.9 | Hard of hearing | 2.2 | 1.8 | Hard of hearing | 0.0 [0.5] | Other hearing impairment | 1.2 | Deafness and hearing loss | 1.5 | Hearing impairment | 0.1 |
| Deafness | 0.4 | 0.3 | Deafness | 0.4 | 0.5 | Deaf | 0.0 [0.2] | Deafness | 0.4 | | | | |
| Visual handicap (not correctable with glasses) | 1.6 | 1.1 | Visual handicap[8] | 1.6 | 1.5 | Visual handicap/ blind | 0.0 [0.2] | Other visual impairment | 1.8 | Blindness and vision impairment | 1.3 | Visual impairment | <0.1 |
| | | | | | | Deaf/blind | 0.0 [0.1] | Blindness | 0.3 | | | Deaf-blindness | 0.0 |
| Orthopedic problem | 0.9 | 1.1 | Orthopedic problem | 1.3 | 0.9 | Orthopedically impaired | 0.0 [0.7] | Orthopedic impairment | 1.0 | Musculoskeletal impairments | 1.5 | Orthopedic impairment | 0.1 |
| Other physical disability | 1.1 [0.4][7] | 0.8 | Other health impairment | 2.0 | 2.6 | Multidisabled | 0.2 [3.2] | Other health impairment | 1.9 | | | Multiple impairment | 0.2 |
| Any other health problem | 3.7 | 2.3 | | | | Other | 0.3 [5.5] | | | | | Other health impaired[9] | 0.1 |
| Total | 15.9[10] | 19.5[10] | | 11.7 | 10.1 | | 4.0 | | 15.0 | | 23.5 | | 8.0 |

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NOTES:

[1] Data sets include National Educational Longitudinal Study (NELS), 1988; High School and Beyond (HS&B), 1980 and 1982 sophomore cohort; National Assessment of Educational Progress (NAEP), 1988, 13-year-olds; Current Population Survey (CPS), 1992 October Supplement on School Enrollment; National Health Interview Survey on Child Health (NHIS/CH), 1988; Office of Special Education Programs (OSEP) State-reported data. Data and notes for NAEP, CPS, and NHIS/CH were abstracted from Westat, Inc. (1994).

[2] NELS:88 data are derived from the base-year parent survey as follows: Weighted percentages in first column (% with condition) are derived from variable BYP47; weighted percentages in the second column (% received services) are derived from variable BYP48. The unbracketed percentages in these columns include only those students who were included in the 1988 base-year parent survey. They do not include students who were judged ineligible to participate in the base-year survey (i.e., the base-year ineligible, or BYI, students described in the last section of this appendix). These students are shown in the bracketed percentages, as explained in note 7 below.

[3] HS & B data abstracted from Owings, J. and Stocking, C. (1985).

[4] Bracketed figure is the disability prevalence among the approximately 5 percent of students excluded from NAEP because of physical disability, mental disability, or language problem. Approximately 79 percent of excluded 13-year-olds had a disability; the remainder had only a language problem. The first, unbracketed, percentage figure is the number of excluded students with a disability as a percent of total students. (In 1988, NAEP collected no data on the specific disability categories of included students.)

[5] The first three items: Delay in growth or development, Learning disability, and Emotional or behavioral problem (age 3–17) include children who have ever had the condition (lifetime prevalence). Concerning the third, when two additional questions are included: Has the child ever been treated for any emotional, mental, or behavioral problem or ever had anyone suggest that the child needed such treatment, the rate increases to 13.4 percent. The remaining items come from the Child Health questionnaire for chronic conditions, and the rates are conditions per 100 persons rather than percent of persons. A person may have more than one condition per category, especially Musculoskeletal impairments, which consists of many subgroups; so the condition rate may exceed the number of separate individuals involved.

[6] Data from table AA25 in the Sixteenth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act (OSEP 1994). Data are based on counts of students, ages 6–21, served in special education programs under IDEA, Part B, and chapter 2 of ESEA (SOP/State Operated Programs), as a percentage of U.S. Census Bureau estimates of resident populations, by state, for July 1992. This excludes children and disabilities unrelated to special education needs as defined by the federal disability categories.

[7] The bracketed percentages for the categories Mental retardation and Other physical disability reflect the percent of students, in terms of the total population, who were judged to be ineligible to participate in the base-year NELS: 88 survey on the basis of mental or physical disability (i.e., BYI sample).

[8] In the 1982 survey, “not correctable with glasses” was added to the definition.

[9] Other health impairments include Autism and Traumatic brain injury (categories added under IDEA in 1990).

[10] Each NELS:88 “total” is the total weighted percentage of students whose parents indicated they have one or more disability-related problems (first column) or have ever received services for one or more disability-related problems (second column). These percentages are smaller than the sums of the individual column percentages because parents attributed more than one disability-related problem to some students (i.e., adding the column percentages would have produced duplicated counts).

SOURCE: Rossi, Herting, and Wolman (1997, table A.3).

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## Federal Definitions of Special Education Disability Categories

**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 do mathematical calculations; this includes perceptual handicaps, brain injury, minimal brain dysfunction, 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, and 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 sighted 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: U.S. Department of Education, Office of Special Education Programs. 1991. *Youth With Disabilities: How Are They Doing? The First Comprehensive Report from the National Longitudinal Transition Study of Special Educational Students*. Menlo Park, CA: SRI International, pp. 2–3.

Twelfth grade students with disabilities scored lower than those without disabilities on standardized cognitive tests of mathematics proficiency[10] and had less gain in scores from 1988 to 1992 than students without disabilities. Students with disabilities were more likely than those without disabilities to score in the lowest proficiency levels on these tests. (See appendix table 2-12.) Students with multiple disabilities and students with learning disabilities scored at the lowest performance levels. Students identified as having health problems had 1992 proficiency scores similar to students without disabilities and had gains in proficiency from 1988 to 1992 similar to those without disabilities.

## High School Completion

Racial/ethnic and disability status differences in high school completion rates contribute to differences in college enrollment. (Women are as likely to graduate from high school as men—among people age 25 or older, 82 percent of both men and women graduated from high school.) Among all people age 25 or

[10] These tests were administered to all NELS:88 student participants in 1992. The most severely disabled students were excluded from this survey.

## Increasing the Inclusion of Students With Disabilities in Science and Mathematics Assessments

Students with disabilities were often excluded from the National Assessment of Educational Progress (NAEP) in the past because State and local policies often excluded them from testing, school staff may have believed they were unable to participate fully, and no accommodations were available that met the needs of their legally required Individualized Education Plans. Half or more than half of students with disabilities were excluded from NAEP assessments before 1995.

The 1996 NAEP science and mathematics assessment explored the effects of various mechanisms to increase the participation of students with disabilities in the national assessments. Exclusion or inclusion rules were changed to be clearer, rules were more inclusive and more likely to be applied consistently, and accommodations were provided, including "provision of large-print booklets and large-face calculators, provision of Braille booklets and talking calculators, and accommodations in administration procedures (e.g., unlimited testing time, individual or small-group administrations, allowing a facilitator to read directions, allowing students to give answers orally, allowing students to give answers using a special mechanical apparatus)" (Olson and Goldstein, 1996, p. 5).

Before these modifications can be implemented as official policy, several statistical and measurement issues need to be addressed. One of the issues to be addressed is the effect of accommodations or adaptations on measurement of trends in achievement. Inclusion of additional students and improved testing of students with disabilities who have in the past been assessed under standard conditions complicates the interpretation of trend results. Another issue is the comparability of results of students included and assessed with accommodations to those from other students. The special sample design developed for the 1996 NAEP assessment will allow these issues to be examined.

older in 1995, 86 percent of non-Hispanic whites, 74 percent of non-Hispanic blacks, and 53 percent of Hispanics were high school graduates. (See appendix table 2-13.)

Gains in high school completion by blacks in recent years have narrowed the educational gap. In 1975, 87 percent of whites and 71 percent of blacks in the 25 to 29 age group had completed high school. By 1995, 92 percent of whites and 87 percent of blacks in that age range had completed high school.

Hispanics (of any race) have the lowest high school completion rates and have experienced the least gains over time. In 1995, 57 percent of those in the 25 to 29 age group were high school graduates, a modest increase from 53 percent in 1975. The low high school completion rates are partly explained by the large number of foreign-born Hispanics who entered the United States without a high school education. The lower high school completion rates for blacks and Hispanics may also be related to family income. Youths between the ages of 16 and 24 who lived in families with low income levels were eight times more likely to drop out than those from families with higher incomes (McMillan and Kaufman, 1997).

Students with disabilities have an annual dropout rate of 5 percent. Students with disabilities who drop out of school are less likely than those without disabilities to eventually receive high school diplomas or certificates. Drop out and graduation rates vary by type of disability, with those with visual and hearing impairments most likely to have graduated with a diploma. Those with serious emotional disturbances are most likely to have dropped out. (See appendix table 2-14.)

### Transition to Higher Education

The United States has one of the highest rates in the world of secondary students who go into higher education and earn college degrees (National Science Board, 1998). The transition from secondary school to college is an important step, not only to the person making it, but also to a nation committed to the education of its citizens in a technological world. This section analyzes data primarily on high school seniors who graduated in 1996, many of whom will earn a college degree in the year 2000.

Usually, many people are involved in the student's decision to attend a college—students and their parents, along with guidance counselors and teachers. For students from low-income families, however, guidance counselors, teachers, friends, and youth leaders are almost as important as parents in helping to make decisions about post-high-school plans (Gallup International Institute, 1996.) These individuals help students to assess their strengths and weaknesses and to clarify their goals; the earlier in high school they are discussed, the more successful students are in attaining their goals

(Rodriguez, 1993). Taking assessment tests during high school also helps students ascertain their strengths and weaknesses and choose suitable colleges.

Several organizations are also involved in assessing student aptitude or achievement. In 1900, the College Board was founded as a national membership association of schools and colleges. The College Board currently administers the Advanced Placement, the Preliminary SAT (PSAT), and the SAT tests through the Educational Testing Service. In 1961, American College Testing (ACT) was founded to measure students' educational development through the ACT Assessment. None of these tests individually provides data that can be considered nationally representative of all college bound seniors, because students in different states tend to take either the SAT or the ACT (see sidebar on State-by-State breakout of SAT or ACT on page 29), but they do provide information on the transition from high school to college.

Almost three-fourths of high school seniors take either the SAT or the ACT in preparation for applying to college.[11] Results of these exams are important to students for planning purposes and to colleges for admissions purposes. It is important to note, however, that many students who go to 2-year colleges do not take either test, and that approximately 10 percent of 4-year colleges indicate that SAT and ACT scores are optional for admission (calculation by NSF/SRS based on data from National Center for Fair & Open Testing 1997 and from National Center for Education Statistics 1997 IPEDS surveys, unpublished tabulations).

It is important to note that although test scores can help evaluate a student's academic preparedness in terms of strengths and weaknesses, "directors of admission say that high school grades are still the most important factor in the selection of a freshman class" (College Board, 1997b, p. 4). The percentage of college admissions directors who indicated that school achievement was very important was 87 percent, compared with 46 percent who indicated that test scores were very important; however, highly selective colleges may base admissions on formulas in which standardized test scores account for as much as two-thirds of the calculation (Hernandez, 1997). Although they do not measure many characteristics necessary for success in college, such as motivation, creativity, and persistence, admissions tests are designed to provide a consistent measure across the variety of curricula and opportunities offered in U.S. high schools.

## Women

Women accounted for the majority of test-takers of the Advanced Placement (see page 28) tests (55 percent), the SAT (53 percent), and the ACT (55 percent) in 1996. The number of women taking these tests has increased considerably in the 1990s, and women are also increasing their performance on the tests. In fact, they provide most of the increases seen in total test scores for the ACT and over half in the SAT since 1991,

[11] National Center for Education Statistics, NELS:88, Data Analysis System, unpublished tabulation.

## The ACT

The ACT Assessment Test is a 2-hour 40-minute, multiple-choice examination administered five times a year by the American College Testing Program in Iowa. According to ACT, the test is designed to measure critical reasoning and higher order thinking skills in four curriculum areas—English, mathematics, reading, and science. The composite score is an average of the scores on each of the components on a scale from 1 to 36, with a mean of 18 for the sample of students who take the test nationally. Scores must be different by more than 0.2 points to be significant at the 95 percent level of confidence.

ACT states that these tests reflect students' skills and achievement levels as products of their high school experience and serve as measures of preparation for academic work in college. ACT results are used by postsecondary institutions for admissions, academic advising, course placement, and scholarships. A Federal court has faulted colleges in Mississippi, however, for basing student aid awards on cut-off scores from the ACT because it restricts black students' access to predominantly white colleges (Healy, 1997).

Most students take the test in their junior year of high school. (There is a P-ACT+ test offered that helps students to become familiar with the test format before taking the ACT.) The students who take the ACT are self-selected and do not represent the entire population of college-bound students. Further, the percentage of students who take the ACT, as opposed to the SAT, varies considerably by State. (See sidebar on page 29.) Many factors—such as motivation to learn, parental support, the quality of teaching, socioeconomic status—contribute to individual and group achievement scores (American College Testing, 1996).

## The SAT

The SAT is a 3-hour, primarily multiple-choice test that measures verbal and mathematical reasoning abilities. According to the SAT Program, it is related to successful freshman performance in college and is intended to supplement the high school record and other information about the student in assessing readiness for college-level work. Over the years, the average SAT scores have drifted downward from 500 on both sections to 424 on the verbal and 478 on the mathematics sections. The main reason average SAT scores have drifted is the dramatic expansion in the number of test takers from 10,000 in its beginning to over 1 million now. Beginning in April 1995, the SAT scores were "recentered" to 500 as the midpoint of the 200–800 scale for both the verbal and mathematics portions. All tables in this report use the recentered scores that have been calculated by the College Board for earlier years. The College Board has studied the complex area of how well the SAT predicts freshman grades. (College Board, 1996d).

Text table 2-2.
**Average test scores for college-bound seniors, by sex: 1991 and 1996**

| Sex | SAT | | | | ACT | |
|---|---|---|---|---|---|---|
| | Verbal | | Mathematics | | Composite | |
| | 1991 | 1996 | 1991 | 1996 | 1991 | 1996 |
| Women..... | 495 | 503 | 482 | 492 | 20.4 | 20.8 |
| Men..... | 503 | 507 | 520 | 527 | 20.9 | 21.0 |

NOTE: Scores for the 1991 SAT have been converted to the recentered scale.

SOURCES: College Board and American College Testing tabulations, 1996.

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although men have increased their scores also. (See text table 2-2.)

The ACT score changes show greater progress for women, as the overall gap in composite scores between men and women narrowed from 0.5 points in 1991 to 0.2 points in 1996, not a significant difference. The SAT scores indicate that women have made greater progress than men from 1991 to 1996 in both verbal and mathematics mean scores. In this period, the mean scores changed in the following ways:

- verbal increased 8 points for women and 4 points for men;
- mathematics increased 10 points for women and 7 points for men.

Even with this progress for women, women's scores on average are lower than men's in 1996 on the SAT. Two ways in which men and women taking the college placement tests differ are in their socioeconomic characteristics and type of coursework taken in high school.

### Socioeconomic Differences

From the SAT and ACT student data, it is clear that a larger number of women than men from lower income families choose to take college entrance tests. Although the proportions of test takers from the higher family income groups were about evenly split between males and females, among the lowest income groups, women accounted for over 60 percent of the test takers. (See appendix table 2-15.) Given that parental income is related to average scores (College Board, unpublished tabulations), then this fact would mean that the higher proportion of women test takers who are from low-income families would likely reduce the overall averages for women test takers.

### Course-Taking Differences

Do course-taking differences account for test score differences among groups? This was believed earlier, as a 1987 National Academy of Sciences report stated that "The general consensus is that these gender differences in college admission mathematics test scores can be largely accounted for by differences in the amount of mathematics, physical science, and computer programming courses that high school and college-bound women take compared to their male peers" (LeBold, 1987, p. 67). More recent studies have shown that although this is a small part of the explanation, there is "the need for more comprehensive research on gender, race, and SES [socio-economic status] differences in science achievement growth" (Madigan, 1997, p. 12).

Differences between quantitative course taking by female and male high school students have lessened in the 1990s, as shown in earlier sections of this report. Similar proportions of women and men took honors mathematics and science classes (29 percent) according to SAT data for 1996 college bound seniors. (See appendix table 2-16.) In terms of level of classes taken, the percentages of women and men taking

higher level mathematics were nearly the same. Only small gaps remained between the percentages of men and women who had taken trigonometry (2 percent), precalculus (3 percent), and calculus (4 percent). In science classes, similar percentages of both men and women had taken biology and chemistry; however, a larger gap existed in the percentage who had taken physics (9 percentage points higher among men than women) (College Board, 1996, SAT unpublished tabulations).

The reduction in differences in mathematics course taking leads to the question, Are the average mathematics scores of men and women who took the same level mathematics class more similar? At the lower mathematics level classes (geometry and trigonometry), differences in the mean SAT scores of men and women persist but are smaller than differences at the higher level classes, such as calculus, according to both SAT and ACT data.

An examination of SAT mathematics test scores for only the students who reported taking the highest level of mathematics (calculus) and science (physics) showed that women scored lower on average than men. Among those who took calculus, women averaged 594 and men 631 on the SAT mathematics test; this difference—37 points—is similar to that for men and women test takers in general (35 points difference). Among those who took physics, women averaged 542 and men 577—a 35-point gap (College Board, 1996, SAT unpublished tabulations).

ACT data also show that women who took calculus and physics reported higher grade point averages than men in their high school mathematics and science classes. In the ACT mathematics and science test sections, however, the average scores of women were also lower than those of men. (See text table 2-3.)

Educators and researchers in both the academic community and within the testing organizations have been concerned about the underlying reasons for this disparity. In 1997, ETS released a study (Cole, 1997) that had three interesting results that pertain to this issue.

- In nationally representative samples of 12th graders, "the spread of scores of males tends to be larger than the spread for females. This means that there are more males among the very highest scorers and also more males among the very lowest scorers. Below the 10th percentile and above the 90th percentile, there are about 4 females for every 5 males. We see this low-end result perhaps in the presence of more males in some special education classes…. The high-end result is especially important for self-selected groups, such as those taking high-stakes tests. These groups [students taking the SAT] come from the high end of the distribution and, all other things being equal, we can expect more males than females among such groups and higher average scores for males than for females among such groups" (pp. 16–18).
- Tests measure particular skills on a single day, whereas grades measure a much wider array of skills. "In fact, we view grades as likely measuring a constellation of desirable characteristics that we call 'studenting skills'—skills that are especially valuable in school or in work. These skills may include characteristics such as persistence, follow-through, doing required work, participating, and performing in different contexts…. Years of results in predicting college grades have, for example, shown that grades are most often the single best predictor…. Also, tests have consistently been shown to add to the prediction of college performance beyond that accomplished by grades alone." (See sidebar on SAT, page 25.)

  For example, were the SAT used alone, it would slightly underpredict the overall grade-point average of first-year female college students…. One subject, calculus, has yielded larger differences than…most other subjects examined. Earlier results had indicated…underprediction of college calcu-

Text table 2-3.
**ACT mathematics and science reasoning scores and GPA for women and men who had taken calculus and physics in high school: 1996**

| High school class | Women | Men |
|---|---|---|
| Calculus: | | |
| Mathematics GPA…… | 3.02 | 2.94 |
| | 30,555 | 26,922 |
| Mean score…… | 24.10 | 25.40 |
| Physics:[1] | | |
| Science GPA…… | 3.15 | 3.04 |
| | 139,084 | 133,105 |
| Mean score…… | 22.00 | 23.50 |

[1] Students who had taken general science, biology, chemistry, and physics.

SOURCE: American College Testing, 1996 Profile Report, unpublished tabulations.

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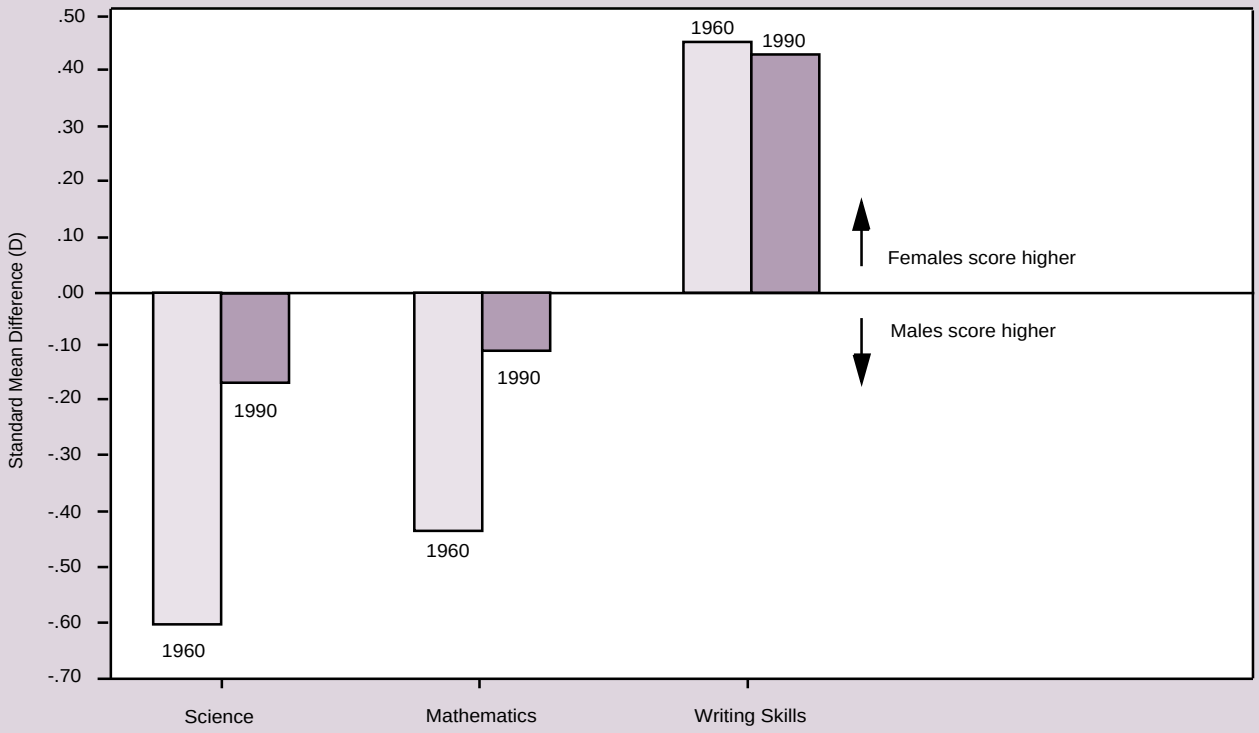
Figure 2-8.
**Gender difference in three subjects, 1960–1990**




SOURCES: Project TALENT and ETS Gender Study

NOTE: Cited in *The ETS Gender Study* by Nancy Cole (May 1997).

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lus grades when the SAT was used alone[12]…. We found that…adding high school grades corrected the underprediction. In fact, using grades alone would have resulted in underprediction of calculus grades for males in those cases" (pp. 19–20). However, both grade point averages and test scores are the key factors in institutional selection, so there may be problems of severe selection bias associated with these findings.

- "We found that the differences cut both ways and that 12th grade girls have substantially closed the familiar mathematics and science gap over the past 30 years, but there continues to be a fairly large gap in writing skills that boys have not closed." (See figure 2-8.)

There is a gap between men and women in writing, but is it relevant for scientists and engineers? As National Education Goals for the year 2000, Goal 3, Objective 2 recommends that "the proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially" (National Education Goals Panel, 1997). "Good communication skills, both verbal and written, rank high among the top priorities of those in business and industry" (Barabas, 1990). Employers of engineering graduates rated speaking/writing as one of the most important areas of competence, and yet these same areas were identified as the most deficient in these graduates (Kimel and Monsees, 1979).

## College Credit From Advanced Placement

Half of the high schools in the United States offer Advanced Placement (AP) college-level classes, and the number of students taking AP tests for college credit is increasing each year, reaching over 500,000 students in 1996. Of these, 200,000 qualified for college credit by earning a certain score on AP exams taken in high school (College Board, 1996c).

[12] Bridgeman, B., and C. Wendler. 1991. Gender differences in predictors of college mathematics performance and in college mathematics course grades. *Journal of Educational Psychology*, 83, 275–284.

Wainer, H., and L.S. Steinberg. 1992. Sex differences in performance on the mathematics section of the Scholastic Aptitude Test: A bidirectional validity study. *Harvard Educational Review*, 62, 323–336.

Of the subjects offered for AP exams, 12 are science or mathematics subjects. Women constituted over half of the test takers in psychology and biology. These subjects were followed by calculus AB[13] (47 percent female) and chemistry (42 percent female). The science subject in which women were least likely to take an AP exam was computer science, where women accounted for only 20 percent of the computer science A and 12 percent of the computer science AB[14] test takers. (See appendix table 2-17.)

## Underrepresented Minorities

### *Introduction*

Students who decide to go to college usually take a college admissions test if they are planning to apply to a 4-year college or university, but may not take the test if they are planning only to apply to a 2-year college. Two-year colleges play a somewhat larger role in the higher education of minority students than they do of white students. (See text table 2-4.)

College admission test data for "1996 college bound students," then, may not be representative of all students who went on to college, especially for Hispanic and American Indian students.

For those who decide to take a college admission test, registration includes a student questionnaire. Both the ACT and the SAT student questionnaires ask for race/ethnicity.

[13] The College Board's Advanced Placement Program offers two levels of advanced placement examinations in calculus—calculus AB and calculus BC. Calculus BC covers more advanced topics than calculus AB.

[14] The College Board's Advanced Placement Program offers two levels of advanced placement examinations in computer science—computer science A and computer science AB. Computer science AB covers more advanced topics than computer science A.

Text table 2-4.
**Percentage of undergraduates enrolled in 2-year colleges, by race/ethnicity: 1995**

| Race/ethnicity | Percentage |
|---|---|
| White | 43 |
| Asian/Pacific Islander | 46 |
| Black | 47 |
| Hispanic | 60 |
| American Indian/Alaskan Native | 54 |

SOURCE: Barbett and Korb (1996, p. 15).

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Text table 2-5.
**Percentage of college admissions test takers in each racial/ethnic group taking the SAT or ACT: 1996**

| Racial/ethnic group | Percentage taking SAT | Percentage taking ACT |
|---|---|---|
| White | 51 | 49 |
| Asian/Pacific Islander | 76 | 24 |
| Black | 55 | 45 |
| Hispanic[1] | 64 | 36 |
| American Indian/ Alaskan Native | 44 | 56 |

[1] Does not include students in Puerto Rico.

SOURCE: College Board and American College Testing, unpublished tabulations, 1996.

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- On the form for the SAT, students are asked "How do you describe yourself?" and one of the categories offered is an "other" category. Eleven percent of 1996 SAT test takers chose "other" or did not respond to this question.
- On the form for the ACT, students are asked "Which best describes your racial/ethnic background?" and "other," "multiracial," and "prefer not to respond" categories are offered. Eleven percent of 1996 ACT test takers chose one of these three categories.

Therefore, the data provided on ACT and SAT by race/ethnicity groups cover 89 percent of both ACT and SAT test takers.

There are some differences in the proportions of each racial/ethnic group who take the SAT versus the ACT. (See text table 2-5.) Some of these differences reflect the distinct differences found by State (see sidebar on page 29). For example, American Indian/Alaskan Natives are much more likely to take the ACT and Asian/Pacific Islanders are much more likely to take the SAT.

Note that the data presented in this section do not include students in Puerto Rico. The ACT is not given in Puerto Rico and although an SAT-equivalent test is given in Puerto Rico, those test scores are not included in the SAT data for Hispanics. Since Puerto Ricans ages 16 to 19 years living in Puerto Rico account for 14 percent of the Hispanic population in the United States (Puerto Ricans living on the continent account for another 10 percent of the Hispanic population) (U.S. Department of Commerce, 1993a, b), a significant part of the Hispanic population overall is not included in

## Percentage of High School Graduates[1] Taking the SAT or ACT by State: 1996

| States | Percentage taking SAT | Percentage taking ACT | States | Percentage taking SAT | Percentage taking ACT |
|---|---|---|---|---|---|
| National | 41 | 35 | Missouri | 9 | 63 |
| Alabama | 8 | 57 | Montana | 21 | 54 |
| Alaska | 47 | 35 | Nebraska | 9 | 72 |
| Arizona | 28 | 27 | Nevada | 31 | 39 |
| Arkansas | 6 | 64 | New Hampshire | 70 | 3 |
| California | 45 | 11 | New Jersey | 69 | 2 |
| Colorado | 30 | 60 | New Mexico | 12 | 59 |
| Connecticut | 79 | 2 | New York | 73 | 16 |
| Delaware | 66 | 4 | North Carolina | 59 | 11 |
| District of Columbia | 50 | 5 | North Dakota | 5 | 77 |
| Florida | 48 | 34 | Ohio | 24 | 58 |
| Georgia | 63 | 16 | Oklahoma | 8 | 63 |
| Hawaii | 54 | 15 | Oregon | 50 | 11 |
| Idaho | 15 | 59 | Pennsylvania | 71 | 6 |
| Illinois | 14 | 67 | Rhode Island | 69 | 1 |
| Indiana | 57 | 19 | South Carolina | 57 | 13 |
| Iowa | 5 | 64 | South Dakota | 5 | 65 |
| Kansas | 9 | 70 | Tennessee | 14 | 77 |
| Kentucky | 12 | 62 | Texas | 48 | 30 |
| Louisiana | 9 | 73 | Utah | 4 | 66 |
| Maine | 68 | 2 | Vermont | 70 | 3 |
| Maryland | 64 | 9 | Virginia | 68 | 5 |
| Massachusetts | 80 | 5 | Washington | 47 | 15 |
| Michigan | 11 | 64 | West Virginia | 17 | 54 |
| Minnesota | 9 | 59 | Wisconsin | 8 | 63 |
| Mississippi | 4 | 68 | Wyoming | 11 | 64 |

[1] Based on number of high school graduates in 1996 as projected by the Western Interstate Commission for Higher Education and number of students in the class of 1996 who took the SAT or ACT.

NOTES: Puerto Rico is not included. A very low percentage of students may have taken both tests.

SOURCE: College Board (1996c) and American College Testing (1996).

this section. The number of high school graduates in Puerto Rico is increasing (in 1996, a total of 36,600 students graduated from both public and private high schools in Puerto Rico), and many of these graduates consider going to college and taking the SAT. The SAT-equivalent test administered in Puerto Rico by the College Board is given in Spanish; for academic year 1995–1996, 32,490 persons took the test, of whom 58 percent were women. Only about one-fourth of persons who took the test had a parent who had a college degree (College Board, 1995), so most of these students were the first generation in their families to go to college.

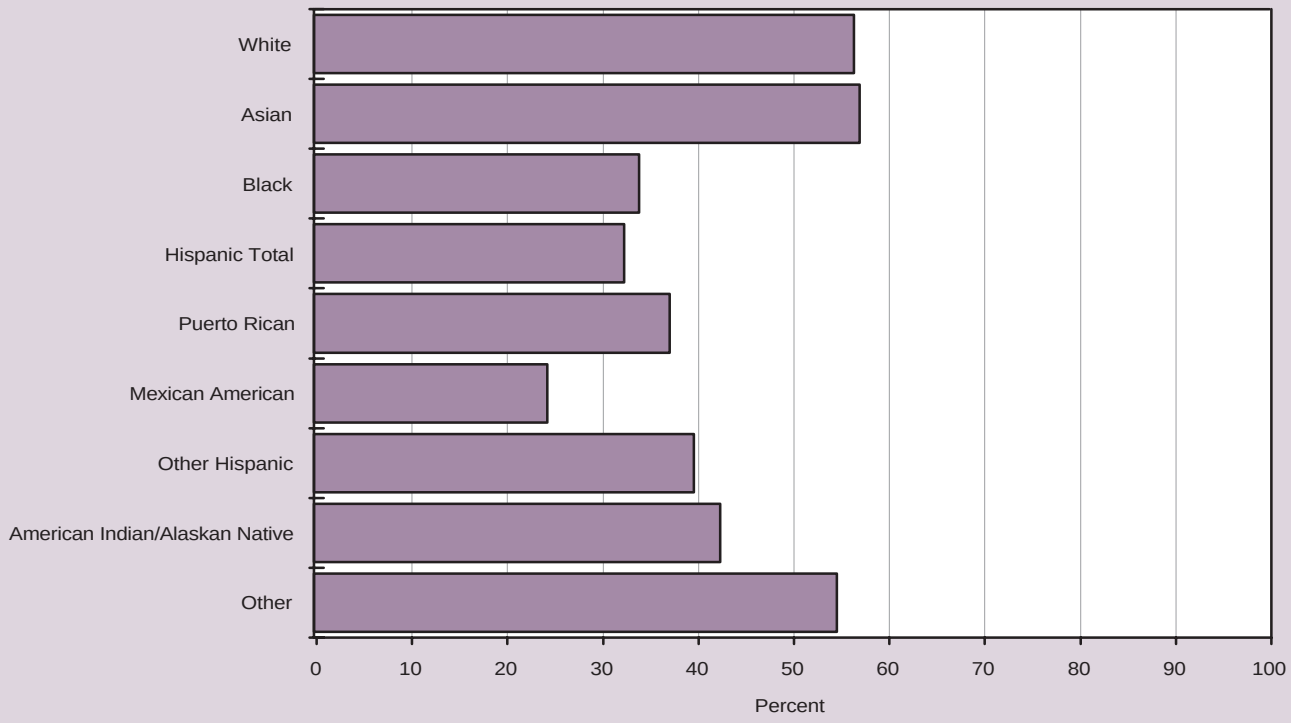
## Increased Participation in College Admissions Test Taking

One of the major pieces of information derived from data on the ACT and SAT is that the number of high school seniors from underrepresented minority groups taking college admissions tests has increased significantly in the 1990s. Although the number of white students taking the SAT declined slightly (–1 percent) between 1991 and 1996, the number of minority students taking the test has increased 13 percent (the largest percentage increases were among Mexican American and Latin American students). (See appendix table 2-18.) During this same period, the number of ACT test takers increased 11 percent for whites and 29 percent for minority students. (See appendix table 2-19.)

The College Board data indicate that a higher proportion of underrepresented minorities make the decision to take a college admission test late in high school. Students who have plans for college early in high school often begin by taking a commercial "diagnostic SAT" in 10th grade, the PSAT in 11th grade, sometimes an SAT preparation class, and then the SAT in 11th grade and/or 12th grade. Parents play a major role in educating their children to this schedule and process, particularly if the parents have gone to college themselves. But college experience of parents varies greatly by racial/ethnic group, with blacks, Hispanics, and American Indians having the lowest percentages of parents with college degrees. (See figure 2-9.) Among these underrepresented groups, the majority of high school seniors taking the SAT are trying to be the first generation of their family to go to college. (See appendix table 2-20.)

Although guidance counselors and teachers in the schools may help some "first-generation" students

Figure 2-9.
**Percent of SAT takers who have a parent with a college degree, by race/ethnicity: 1996**




SOURCE: College Board, unpublished tabulations, 1996.

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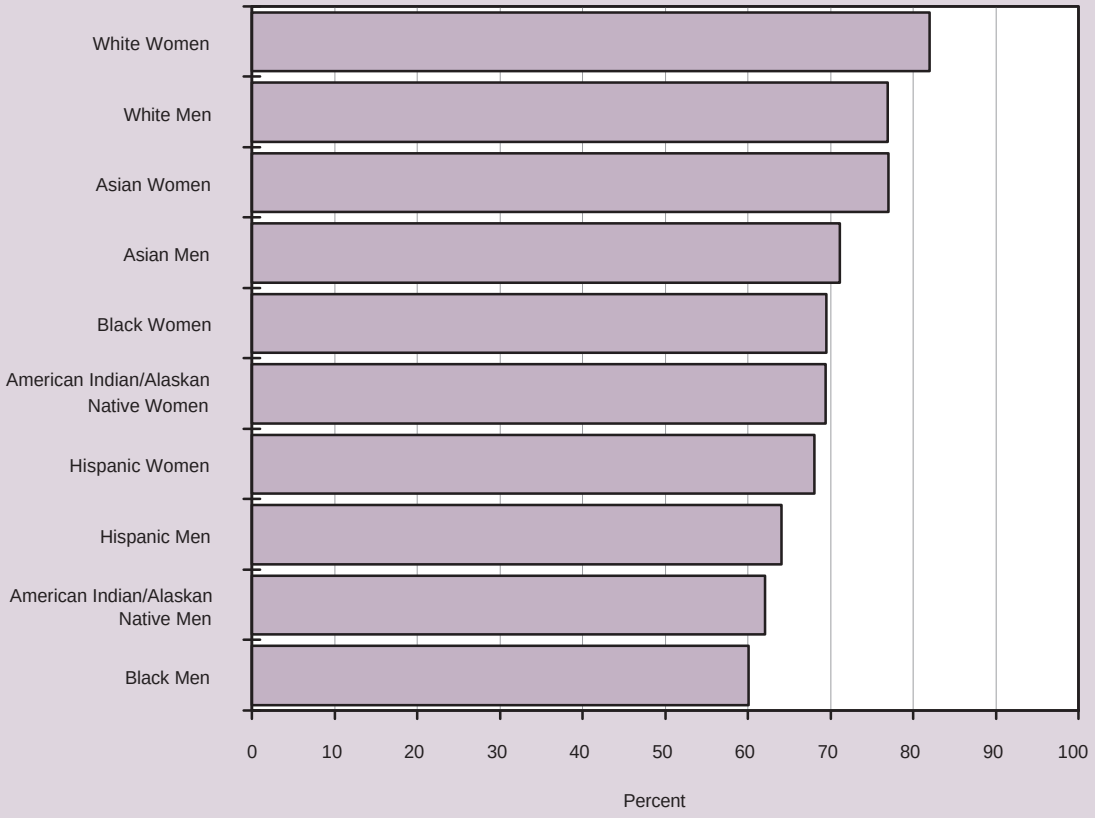
Figure 2-10.
**Percent of 1996 SAT takers who took the PSAT, by race/ethnicity and sex**




SOURCE: College Board, unpublished tabulations,1996.

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understand this process of planning for college, data on the percentage of SAT takers who had taken the PSAT earlier indicate that this process was not taking place for a higher percentage of students in these underrepresented groups. The students with the lowest percents who had taken the PSAT were Hispanic, American Indian, and black men; the next lowest percentages were among the women in these groups. (See figure 2-10.)

## Increased Preparation for College

The American College Testing service has been tracking the percentage of their test takers who have taken core courses in high school: 4 years of English and 3 years each of mathematics, science, and social studies. The number of students who have taken at least a core curriculum in high school has been increasing greatly, from 51 percent in 1991 to 61 percent in 1996. Among underrepresented minorities, the increases have been significant also: for blacks—an increase from 45 to 55 percent of test takers; for American Indians—an increase from 40 to 49 percent; and for Hispanics—an increase from 49 to 56 percent. The increase for Asians was 64 to 71 percent of test takers (American College Testing, 1996).

Data on test takers by race are also available by family income. Average ACT scores for each racial/ethnic group are higher for those with core curriculum preparation, as would be expected; average scores also increase with family income. (See appendix table 2-21.)

## College Credit From Advanced Placement

The number of high school students enrolling in AP courses and then taking AP tests for college credit has increased considerably in the last few years. Over half of the high schools in the United States offer AP college level classes; in 1996, over 500,000 students enrolled in AP classes. Of these, 40 percent qualified for college credit from their scores on AP exams taken in high school (College Board, 1996c).

## Studies on the Effects of California Proposition 209, *Hopwood* v. *Texas*, and the Use of Test Scores on Student Access at Selective Colleges and Universities

A new study (Nettles and Perna, 1997) by the Frederick T. Patterson Research Institute of The College Fund/UNCF addresses this issue. The authors, Michael Nettles and Laura Perna, discuss the challenge of admissions tests in the admissions process. "The way colleges and universities treat admissions test scores, such as the Scholastic Assessment Test (SAT), the American College Test (ACT) and the Advanced Placement (AP) examinations, in the admissions process plays a vital role in the number of African Americans and Hispanics who are admitted and who enroll. The variety and range of criteria including admissions tests and other characteristics of individuals (e.g., geographic origin, alumni relations, educational and career aspirations, etc.), as well as the weight assigned to each criterion, is important" (p. 19). To understand the role of affirmative action, The Patterson Research Institute plans to study further a sample of highly competitive universities to understand the possible impact of California Proposition 209 and *Hopwood* v. *Texas* on diversity.[15]

The Educational Testing Service is also completing a study called "Hopwood, Bakke, and Beyond in College Admissions" (Educational Testing Service, 1997). If college admissions are based more on test scores as a result of these, and since underrepresented minorities constitute only 4.1 percent of students who scored 1200 or higher on the SAT, it is important to know more about the students scoring between 1000 and 1200 on the SAT. This study examines the "educational striver" student pool.

Continuing earlier studies by Claude Steele at Stanford University (see National Science Foundation, 1994, 1996), a new study describes how negative stereotypes are achievement barriers and how they shape the intellectual identity of women and minorities. Steele's research shows that this "threat dramatically depresses the standardized test performance of women and African-Americans who are in the academic vanguard of their groups (offering a new interpretation of group differences in standardized test performance)." He offers strategies for policy and practice in schools that can reduce the threats to stereotyped groups (Steele, 1997, p. 613).

[15] California Proposition 209 is a California constitutional amendment that prohibits State and local agencies including public colleges and universities from using preferences based on race or gender. *Hopwood* v. *Texas* ruled that race may not be used as a factor in admissions, and the Texas Attorney General ruled that the ban must also include financial aid, recruiting, and undergraduate admissions.

Of the subjects offered for AP exams, 12 are in science or mathematics. The AP courses with the highest number of underrepresented minorities enrolled were calculus AB and biology. The proportion of underrepresented minorities among the AP candidates in these two subjects was 9 percent for both; for chemistry and physics B, the representation was 8 and 7 percent, respectively. (See appendix table 2-22.)

According to the American Association of Collegiate Registrars and Admissions Officers (AACRAO), admissions officers are impressed by Advanced Placement course taking—even if the test is not taken. This importance makes it necessary to understand some of the differential opportunities for minority students to take the AP classes. The Advanced Placement at the College Board indicated that the schools that don't offer AP classes fall into four categories:

- small religious schools,
- small rural schools,
- schools in Wyoming, the Dakotas, and a few other States, and
- large urban schools, particularly if they feed into academic magnet schools.

Although the first three groups may affect large numbers of American Indians, these and the last category may affect large numbers of black and Hispanic students. Wade Curry, head of the AP at the College Board, explained that "magnet high schools draw off the most academically inclined students and produce fairly large numbers of AP scholars. But the schools they draw from then tend not to offer the courses, leaving those students behind." He has found that "African American students who do well on the AP tests tend to be either in the urban magnets or in predominantly white, suburban school systems where there are between five and twenty African American students who take the courses" (Chenoweth, 1997, p. 22).

### Persons With Disabilities

Data on disability from the SAT and ACT are collected in two ways: from student questionnaires and from requests for special testing accommodations.

Text table 2-6.
**Average SAT verbal and mathematics scores by disability status: 1996**

| Indicated a disability | Verbal average | Mathematics average |
|---|---|---|
| Yes (N=42,789)[1] | 472 | 468 |
| No (N=921,317) | 509 | 512 |

[1] Includes those indicating blindness (5,548), deafness (3,262), paraplegia (167), learning disability (19,399), other neurological/orthopedic impairment (2,929), multiple disabilities (251), and "other" (11,233).

SOURCE: College Board, unpublished tabulations, 1996.

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## Student Questionnaires

When persons first register to take college placement exams, they are asked on the student questionnaires to (1) "Indicate any permanently disabling condition," with six response choices (SAT), or (2) "Please respond to this item only if you have a physical or diagnosed learning disability," with eight categories (ACT). The ACT states on the student questionnaire that the information is used by colleges only to provide financial aid and special services.

About 5 percent (over 40,000) of students taking the SAT in 1996 checked a category indicating a disability; the ACT also had 5 percent (almost 20,000) of students who indicated a disability category in 1996.

Text table 2-7.
**Average ACT scores by disability status: 1996**

| Indicated permanent: | Average ACT score |
|---|---|
| Blindness (N=4,503) | 17.2 |
| Hearing impairment (N=10,039) | 20.2 |
| Learning disability (N=7,904) | 16.1 |
| Attention deficit disorder (N=10,483) | 19.3 |
| Other neurological disorder (N=1,347) | 19.3 |
| Require wheelchair access (N=360) | 19.1 |
| Other orthopedic (N=1,634) | 20.3 |
| Multiple disabilities (N=980) | 19.8 |
| Other (N=7,256) | 17.8 |
| Did not indicate disability | 21.0 |

SOURCE: ACT, unpublished tabulations, 1996.

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Among college-bound seniors in 1996 who indicated a disability and took the SAT, 51 percent were male and 49 percent female; underrepresented minorities accounted for 18 percent of those indicating a disability (compared with 21 percent for all college-bound seniors) (ACT and SAT, unpublished tabulations).

The average SAT scores in 1996 of those who indicated a disability were lower than those who did not. (See text table 2-6.)

Data from the ACT are reported according to the category of disability and show variability among the groups of students in terms of their average scores in 1996. (See text table 2-7.)

## Special Testing Format/Conditions

Among SAT test takers, almost 20,000 students took the test under nonstandard conditions. These test takers had average scores (463 verbal and 452 mathematics) that were below the average of all test takers who indicated on the student questionnaire that they had a permanent disability yet did not request special testing formats (472 verbal and 468 mathematics) (College Board, unpublished data).

The ACT also has data available on the almost 20,000 students who requested special testing formats. (See text table 2-8.) Many of these students

Text table 2-8.
**Number of students with disabilities taking the ACT test with special formats, by type of disability: 1996**

| Special tested students (ACT) | Number in 1996 |
|---|---|
| Total based on disability | 19,526 |
| Learning disabled | 4,426 |
| Attention deficit disorder | 4,358 |
| Dyslexic | 2,849 |
| Developmental mathematics disorder | 2,724 |
| Developmental writing disorder | 2,394 |
| Visually impaired | 870 |
| Physically impaired | 511 |
| Deaf | 499 |
| Psychological disability | 295 |
| Anxiety disorder | 226 |
| Epilepsy | 132 |
| Tourette syndrome | 81 |
| Emotionally disabled | 75 |
| Other (cerebral palsy, homebound, etc.) | 86 |

SOURCE: ACT, unpublished tabulations, 1996.

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## Equity, Fairness, and Educational Testing

Achievement test scores are only one of many factors used to predict success in higher education. Reliance on test scores in decisions about individual students or in policy decisions involving groups of students raises issues of equity and fairness in the educational system and in the distribution of "rewards" for achievement. The following quotation from a Congressional report indicates how issues of equity and fairness have been linked with tests and their results (U.S. Office of Technology Assessment, 1992).

Steven Jay Gould's ... treatise on the history of intelligence testing is dedicated to "...the memory of Grammy and Papa Joe, who came, struggled, and prospered, Mr. Goddard notwithstanding."[1] ... As Gould explains midway through the book, Goddard had been one of a handful of prominent American psychologists who used test data to advance racist, xenophobic, and eugenicist ideologies. Although Goddard himself later recanted,[2] ... the atmosphere of the 1920s and 1930s gave tests "...the rather happy property of being a conservative social innovation. They could be perceived as justifying the richness of the rich and the poverty of the poor; they legitimized the existing social order."[3]...

Testing policy arouses the passions of Americans concerned with equal opportunity and social mobility. As in the past, those passions run in both directions: everyone may agree that testing can be a wedge, but some see the wedge forcing open the gates of opportunity while others see it as the doorstop keeping the gates tightly shut.

Consider, for example, the following excerpts ... :

> ...minority youngsters who...are disproportionately among the poor, tend to be relegated to poor schools, or tracked out of academic courses, just as young women are not encouraged to take math and science. Therefore, the differences in the "group" scores [on the Scholastic Aptitude Test]...represent anything but "bias." Rather, the score is a faithful messenger of the unequal distribution in our country of educational resources and encouragement.[4]
>
> Test makers claim that the lower test scores of racial and ethnic minorities and of students from low-income families simply reflect the biases and inequities that exist in American schools and American society. Biases and inequities certainly exist—but standardized tests do not merely reflect their impact; they compound them.[5]

... Both sides appear to agree that tests can be used to identify inequalities in educational opportunies.[6] But the question becomes how to use that information. Advocates of testing as a "gatekeeper" argue that ability and achievement, rather than family background, class, or the specific advantages that might accrue to students in wealthy school districts, should govern the distribution of opportunities and rewards in society. Moreover, they add, this system of distribution creates incentives for school systems to provide their students with the best possible chances for success.

On the other hand, opponents contend that ability and achievement scores are highly correlated with socioeconomic background factors[7] and with the quality of schooling children receive;[8] under these circumstances, "...no assessment can be considered equitable for students if there has been differential opportunity to access the material upon which the assessment is based."[9]

This debate will not be resolved easily or quickly; nor will it become moot with the advent of alternative methods of assessment. On the contrary, it could very well become even more heated and complex.[10]

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[1] Steven Jay Gould, *The Mismeasure of Man* (New York, NY: Norton, 1981), dedication, p. 7.

[2] See, e.g., Carl Degler, *In Search of Human Nature* (London, England: Oxford University Press, 1991).

[3] Sheldon White, "Social Implications of IQ," *The Myth of Measurability*, Paul Houts (ed.) (New York, NY: Hart Publishing Co., 1977), p. 38. See also Clarence Karier, "Testing for Order and Control in the Liberal Corporate State," *The IQ Controversy*, N. Block and G. Dworkin (eds.) (New York, NY: Random House, 1976), pp. 339–373. Karier's basic argument, as summarized by another historian of testing, was "...the tests...were biased in terms of social class, economic, cultural, and racial background. Their use in schools served to block opportunity for the lower classes and immigrants...[and fashion] a system of tracking in the schools that reinforced social inequality..." Paul Chapman, *Schools as Sorters* (New York, NY: New York University Press, 1988), p. 8. For opposing viewpoints see, e.g., Mark Snyderman and Stanley Rothman, *The IQ Controversy* (New Brunswick, NJ: Transaction Books, 1988); Arthur Jensen, *Bias in Mental Testing* (New York, NY: Free Press, 1980); or Richard Herstein, "IQ," *Atlantic Monthly*, vol. 228, September 1971, pp. 43–64.

[4] Donald Stewart, president, College Entrance Examination Board, "Thinking the Unthinkable: Standardized Testing and the Future of American Education," speech before the Columbus Metropolitan Club, Columbus, OH, Feb. 22, 1989.

## Equity, Fairness, and Educational Testing *(continued)*

[5] Monty Neill and Noe Medina, "Standardized Testing: Harmful to Educational Health," *Phi Delta Kappan*, Vol. 70, No. 9, May 1989, p. 691.

[6] For discussion of test bias and the effects of testing on minority students, see e.g., Walter Haney, Boston College, "Testing and Minorities," draft monograph, January 1991, p. 24.

[7] See, e.g., Christopher Jencks et al. *Inequality* (New York, NY: Basic Books, 1972).

[8] See, e.g., Ronald Ferguson, "Paying for Public Education: New Evidence on How and Why Money Matters," *Harvard Journal on Legislation*, Vol. 28, No. 2, Summer 1991, pp. 465–498.

[9] Shirley Malcom, "Equity and Excellence Through Authentic Science Assessment," *Science Assessment in the Service of Reform*, Gerald Kulm and Shirley Malcom (eds.) (Washington, DC: American Association for the Advancement of Science, 1991), p. 316. It is interesting to note that standardized test scores, viewed by some critics as blocking entry to education and work opportunities, have been used to justify major public programs to help minority and disadvantaged children: "...the preeminent example…was in the 1960s, when lower performance of minority and inner city children was used to bolster arguments for the war on poverty and to help propel passage of the landmark Elementary and Secondary Education Act of 1965..." (Haney, op. cit., footnote 7, p. 22.)

[10] Some minority educators, for example, fear that new assessment methods will stifle opportunities for minority students who have recently begun to do better on conventional tests. There is also uncertainty over whether or not tests should be used for placing children in remedial programs. Parents in California sued recently, not because their children were being tested but, on the contrary, because the State had followed the precedent set in the landmark *Hobson* v. *Hansen* case, and banned testing as a basis for diagnosing learning difficulties and placing children in remedial tracks. For further discussion of this and other legal issues, see ch. 2 [of source report].

do not fill out student questionnaires and, therefore, may not be included in the data presented above. Data from ACT on special testing formats are not nationally representative of any of the disability categories and do not include all students with disabilities (many of whom took the regular administration of the test). Still, it is interesting to note the variety of conditions of students who were taking the college placement tests under special testing administration (ACT, 1996, unpublished tabulations).

Students who take the ACT under special administration to accommodate a disability are often flagged as such when their test scores are provided to college admissions offices. The College Board funded a study on how the admissions process may be affected by these flags, as well as the validity of admissions tests scores for disabled applicants. The main finding of that study was that students with disabilities were admitted on much the same basis as the other applicants, though in some instances particular groups of applicants were somewhat less likely to be admitted than would be expected (learning disabled) or somewhat more likely to be admitted (for example, hearing impaired) to special programs. The report also states that "Admissions decisions predicted on the basis of either SAT or HSG (high school grades) correlated slightly less with actual decisions in the case of handicapped applicants than others. This result suggests that factors other than SAT and HSG play a slightly larger role in the case of handicapped applicants, though not necessarily to their advantage" (Willingham, 1988, p. 81).

Advanced Placement Exams do not collect data from the students on any possible disability. If requested and approved, however, AP exams are offered at the high school site in a variety of testing alternative procedures, which include special arrangements, extended time, use of a reader or sign language interpreter, or special test editions (for example, Braille, cassette, photo-enlarged). Students must have official certification of their disability on file at the school to verify the need for special testing arrangements. The number of AP science exams taken in May 1997 under special testing arrangements were

| | |
|---|---|
| Biology | 267 |
| Chemistry | 112 |
| Physics B | 55 |
| Physics A | 50 |

Note that these numbers would not include the disabled students who took AP exams under regular testing conditions.

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# CHAPTER 3

# THE UNDERGRADUATE EXPERIENCE IN SCIENCE, MATHEMATICS, AND ENGINEERING

The underrepresentation of women, minorities, and persons with disabilities in most areas of scientific and technical endeavors is an issue of continuing concern to educators, employers, and those organizations responsible for sponsoring research and development activities. Although the number of women graduating with bachelor's degrees from some scientific fields equals or exceeds the number of men, in many fields there are far fewer women than could be expected from their number in the general population or on college and university campuses (see "Indices of Representation" on page 63). Since 1989, the number of underrepresented minorities earning bachelor's degrees in science, mathematics, and engineering (SME) has risen each year. Underrepresented minorities earned over 17 percent of the total number of undergraduate SME degrees awarded in 1995, up from 12 percent in 1989. (See appendix table 3-1.) The continuing differences in the enrollment and graduation rates of different racial/ethnic groups in science, mathematics, and engineering at the undergraduate level need to be better understood.

This chapter examines factors that influence access, achievement, and educational outcomes for women, minorities, and persons with disabilities who attend 2-year and 4-year institutions. This review of undergraduate education looks at changes in enrollment, course-taking patterns, and outcomes over the past few decades at all institutions of higher learning. It examines patterns of courses taken and outcomes (degrees awarded, attrition) by age, race/ethnicity, and major. An examination of these factors provides a greater understanding of the reasons that disparity among groups entering the fields of science, mathematics, and engineering has persisted.

## Persistent Disparity in Science, Mathematics, and Engineering

Since 1980, more women than men have enrolled in college, and since 1982, women have earned more undergraduate degrees than have men. In 1995, women constituted 49 percent of the U.S. population ages 18 to 24 and earned 55 percent of all bachelor's degrees awarded, up from 43 percent in 1966. (See appendix tables 3-2 and 3-3.)

### Women

Despite impressive gains, the participation of women in the physical sciences, mathematics, and engineering still lags significantly behind that of white men and Asians, as evidenced by the following:

- Women accounted for 35 percent of the bachelor's degrees awarded in the physical and earth sciences, up from 14 percent in 1966.
- Approximately 1 in 6, or 17 percent, of engineering bachelor's degrees were awarded to women in 1995, an increase from less than 1 percent of the total in 1966.
- Women were awarded 35 percent of the bachelor's degrees in mathematics and computer science in 1995, a slight increase over 1966.

Women are, however, as well or more highly represented than men in some science fields. For example, they earned nearly half of the bachelor's degrees awarded in 1995 in the biological/agricultural sciences and social sciences and 73 percent of the degrees in psychology. (See appendix table 3-2.)

Systematic data on minority participation in science, mathematics, and engineering education have been collected only since the late 1970s. (See appendix tables 3-4 and 3-5.) The bulleted data below show disparities persisting over time. Recent studies provide insight into the role that precollege preparation, self-confidence, work and family, availability of role models, peer support, and teaching methods play in maintaining that disparity.

## Loss of Confidence as a Cause of Field Switching Among Undergraduate Women in Science, Mathematics, and Engineering Majors

A recent study shows that many young women bring to their experience of science, mathematics, and engineering (SME) disciplines a pattern of socialization that is entirely different from that of young men. Many aspects of SME majors, which have evolved largely to meet the educational needs of young men, force women into conflict with their own socialization experiences. The resolution of these conflicts is sometimes accomplished by leaving the major, sometimes by making personal adjustments to the dominant male social system.

Broadly speaking, men experience a life-long pressure to manifest an intrinsic sense of self-worth, to respond to challenge with displays of self-sufficiency and stoicism, and to show independence from the need for nurturing. By contrast, the socialization of young women (including their formal education) is biased toward the development of an extrinsic sense of identity. From earliest childhood, throughout the years of formal education, girls are encouraged to perform for the approval of others and to attach feelings of confidence and self-worth to signs that others are pleased by what they do. The degree to which any woman depends on others for her sense of achievement varies according to the mixture of cultural influences that constitute her socialization experiences. The tendency to perform for others is not gender-exclusive: depending on the circumstances of their upbringing and education, young men may also exhibit this trait. One important exception was found to be black women, who reflected a pattern of socialization that encouraged an independent self-image, self-reliance, and assertiveness in getting educational needs met. These women were distinctively inner-directed, compared with other women and most black men.

A pattern of performing for others—with negative consequences for persistence—appeared in several aspects of the study data. Many more women than men reported that they had chosen SME majors at the prompting of family or teachers, rather than for reasons of field or career interest.[1] Choices made primarily to please someone else did not withstand the rigors of an SME major and made students vulnerable to the attractions of other fields.

The study found a difference in the approach to education among young men and young women. An example is their different reasons for disliking large introductory classes. Men disliked them because they "have negative effects on grades," encourage "more competition for grades," and "are usually taught by less qualified faculty." Women disliked large classes because "you don't get to know the professor," "it's too impersonal," and "the professor doesn't care if you learn or attend class." These differences in judgments also suggest that women were more likely to enter college expecting to establish individual teacher-learner relationships.

This expectation was also reflected in the definitions of "good" and "bad" teachers offered by male and female students. Women commonly stressed the importance of a teacher's personal behavior toward them and defined the "bad" teacher as "unapproachable," "impersonal," and "intimidating." Good teachers were seen as "approachable," "friendly," and "patient"; they "really care about you, and want you to learn." Men were less concerned with faculty's openness to student contact than with their effectiveness in presenting the material.

Being raised to work for the approval of others explains why many women enter college without a clear view of what they want from their education and also why the openness of faculty to student contact is so central to many women's definition of the good teacher. For these women, engaging the teacher in a personal dialogue is critical both to the ease with which they can learn and to their level of confidence about their academic performance. The reluctance of many faculty to be drawn into pedagogical or advisory relationships with individual students is a major factor in the decision of many able young women to leave SME majors.[2]

The observations of the students in this study may offer a way to explain the recurrent finding of lowered confidence and self-esteem noted in other studies (Hall and Sandler, 1982; Ware and Dill, 1986; Arnold, 1987; Manis et al. 1993; see also reviews of this literature in Kimball, 1989 and Oakes, 1990). A female student whose confidence in her ability to do

[1] The stronger tendency of women to be drawn into SME majors through the influence of others was also found by Strenta et al. (1993).

[2] Manis, Sloat, Thomas, and Davis (1989) also found the "impersonality" of science and mathematics classes to be more problematic for women than for men.

## Loss of Confidence as a Cause of Field Switching Among Undergraduate Women in Science, Mathematics, and Engineering Majors *(continued)*

mathematics and science is overdependent on the judgments of others, does not know how to assess the adequacy of her performance. Her self-confidence may be already shaken by her abrupt reduction in status. In high school, she was treated as special; now, she is part of a minority who are often treated with a perceived hostility that she cannot explain. The consequence for some women is confusion, anxiety, and a strong sense of abandonment. In the study one young woman stated

> Some of my girlfriends and I used to take it really hard when we didn't seem to do so well—you know—hiring tutors, and just struggling and crying over grades—getting out old tests and working extra problems, and making flash cards, and just working extra, extra hard. And it was all because, as hard as we tried, we just could not seem to please the professors. We were just looking for some encouragement.... I used to get nauseated before exams. It took me a long time to get over that.... Eventually, I learned not to take it to heart. It's not you they're grading: it's just your work—and not always that. Men just blow it off. (Female white mathematics non-switcher)

Even when their performance is adequate or good, teacher-dependent students (whether women or men) have difficulty in motivating themselves and in knowing that they are "doing okay" without faculty reassurance. Some of the nonswitching seniors described how difficult it had been to forego the high level of interaction and support to which they had been accustomed throughout their earlier school years. Learning to develop an independent sense of their own ability and progress had been vital to their survival.

> One reason I did well in high school is because I cared about what the teachers thought about me. I knew I was doing well when people were pleased with me. I was always looking for that praise just so I knew I was doing okay. It took me a long time to get over that...I used to get very upset because, here, the teacher doesn't know who you are. (Female white engineering switcher)

Depending on teachers for performance evaluation, reassurance about progress, and as the basis for motivation, constitutes a serious handicap for the many women who enter college having learned how to learn in this manner. Persistence initiatives which do not take this into account simply will not be effective. Looking to a teacher for interpretation and validation of their academic performance is a learned dependence which people can change, or outgrow, but not without first experiencing anxiety and frustration which, for some, ends in field switching. To a much higher degree than is the case for young men, preserving the self-confidence which young women bring into college depends on periodic reinforcement by faculty. To be faced with the prospect of four years of relative isolation and perceived male hostility on the one hand, and the abrupt withdrawal of familiar sources of praise, encouragement, and reassurance by faculty on the other, is the most common reason for the loss of self-confidence that makes able women in the sciences and engineering vulnerable to field switching.

— Adapted from Elaine Seymour and Nancy M. Hewitt, *Talking About Leaving: Why Undergraduates Leave the Sciences* (Westview Press, 1997)

## Blacks

- In 1995, blacks, 12 percent of the total U.S. population, earned just over 7 percent of all bachelor's degrees and almost 7 percent of all science, mathematics, and engineering bachelor's degrees awarded in 1995, up slightly from 1989.
- Black women have greater representation than black men, earning over 4 percent of all undergraduate degrees and just over 4 percent of all science, mathematics, and engineering undergraduate degrees awarded in 1995.
- Black men earned over 2 percent of all degrees awarded and almost 3 percent of science, mathematics, and engineering degrees.

### Hispanics

- Hispanic men and women make up 10 percent of the U.S. population and earned almost 6 percent of all bachelor's degrees awarded in 1995 and over 5 percent of all undergraduate degrees awarded in science, mathematics, and engineering in that year.
- Hispanic women had slightly higher numbers than Hispanic men, earning over 3 percent of all bachelor's degrees and slightly less than 3 percent of science, mathematics, and engineering degrees awarded in 1995.

### Asians

- Asian men and women, who constitute 3 percent of the total U.S. population, continue to be well represented in science, mathematics, and engineering earning over 7 percent of all science, mathematics, and engineering bachelor's degrees awarded in 1995.
- White males earned 58 percent of the degrees in engineering; Asian men earn the second highest percentage with almost 16 percent of the bachelor's degrees.
- Asian women earned slightly over 3 percent of all science, mathematics, and engineering degrees in 1995 but slightly over 13 percent of the engineering degrees earned by women.

### American Indians

- The total number of bachelor's degrees awarded to American Indians is relatively

## American Indians in Higher Education

Data presented elsewhere in this chapter and the appendix (see "Technical Notes to Chapter 3" and appendix A) show American Indians have the lowest rates of enrollment in and graduation from both 2-year and 4-year undergraduate institutions. Interestingly, the index of representation in text table 3-1 shows that the proportion of American Indian females in college is higher than their proportion in the general population. Together, American Indian males and females earn fewer than 1 percent of bachelor's degrees awarded in all fields.

During the 30 years since Dineh College (formerly Navajo Community College), located in the heart of the Navajo Reservation, was founded, the number of tribal colleges has increased to 30 in 12 States. These colleges now enroll approximately 27,000 students. As Boyer notes, the possibility of American Indian participation in higher education is enhanced by the existence of these tribal colleges.

According to the Carnegie Foundation report, "Isolated by distance and culture, many [American Indians] have come to accept that they cannot complete school. College seems to many American Indians an impossible dream. Tribal colleges offer hope in this climate of despair...without sacrificing academic rigor, courses are often tailored to reflect the unique learning styles of American Indian students." (Boyer, 1977, p. 4)

Tribal colleges have become an integral part of the larger system of higher education for American Indians. Succeeding at a tribal college also appears to encourage students to continue their education and leads to increased employment opportunities.

Although no reliable studies have yet been done about graduation rates from tribal colleges, some tribal college presidents estimate that between 25 and 33 percent of students who enroll eventually receive a certificate or degree (Boyer, 1997). A survey of more than 500 graduates of Turtle Mountain College from 1980 to 1990 found that most graduates were either working or going to school. Fewer than 13 percent were unemployed, which "is in sharp contrast to the total rate of unemployment among Indian people." (Boyer, 1997, p. 68)

Research funded by the Alfred P. Sloan Foundation examined the experience of American Indians majoring in math, science, engineering, or business (McAfee, 1977). The phenomenon of stepping into, out of, and back into higher education emerged as a typical mode of college attendance. Strength of cultural identity had a significant impact on persistence and outcome of undergraduate education. McAfee's findings about the relationship between cultural identity and persistence to degree attainment reinforce the importance of tribal colleges for American Indians in higher education. In addition, McAfee's work suggests that the phenomenon of stepping out is a norm that needs to be better understood and accommodated by institutions of higher education.

small, less than one percent. The trend in number of degrees awarded in science, mathematics, and engineering has been increasing for American Indians at a rate similar to the total population.

Patterns of overrepresentation and underrepresentation of the racial/ethnic and gender groups were analyzed in more detail. To measure the extent to which the various groups were overrepresented, at parity, or underrepresented in the college population, an index of representation (IR) was computed. (See "Technical Notes to Chapter 3" for details.)

The IR for total college enrollment indicates that in 1980 white males and females, Asian males and females, and American Indian females had higher proportions among persons enrolled in college than they had among the general population of 18- to 24-year-olds. Asian males and females had the highest index scores. (See figure 3-1, text table 3-1, and appendix tables 3-6, 3-7, 3-8, and 3-9.) In 1980, black males and females, Hispanic males and females, and American Indian males were underrepresented in the college population. Hispanic males and black males had the lowest index scores. The IR score for American Indian females in 1980 indicates that their representation in the college population was higher than their representation in the general population.

Between 1980 and 1990, except for white females, persons from all racial/ethnic and gender categories were less represented in the college population than in the general population. After 1990, the representation scores of both white males and females decreased while those of the other categories increased. Racial/ethnic minorities have improved their representation in higher education. Black females had almost achieved parity by 1994. Their IR score in 1994 was essentially equal to that of white males whose proportional representation in the college population has systematically decreased below parity. On the other hand, Asian males and females, white females, and American Indian females continued through the beginning years of the 1990s to be overrepresented in the college population. The rate of improvement among black males has been slower than that of the other groups that improved. Hispanic males have caught up with black males in their proportional representation in the college population.

## Sources of Persistent Disparity

New research is beginning to identify reasons why more women, minorities, and persons with disabilities do not enroll in or receive bachelor's degrees in science, mathematics, and engineering. Astin and Sax (1996) cite the importance of role models, peer groups, curriculum and pedagogy, and faculty attitudes in the process of developing scientific talent in undergraduate women. Seymour and Hewitt (1997) have argued that problems arising from the nature of the undergraduate experience and the culture of the scientific or engineering discipline (for example, attitudes and practices of the faculty) at the undergraduate level have a significant impact on whether women and minorities stay in science, mathematics, and engineering or switch to other majors. Hanson (1997) found that pervasive gender discrimination still exists at all levels of education and that race and class have a significant impact on success in science.

## Two-Year Institutions

Community colleges and 2-year colleges have assumed an increasingly important role in postsecondary education. These institutions now meet many needs, serving those who want to complete requirements for a high school diploma, try out college-level coursework before transferring to a 4-year college, or take job-related courses (Adelman 1997).

The changing role of the community college is not revealed by enrollment statistics alone. Over the past three decades, community colleges have consistently accounted for just under one-quarter of all course enrollments (Adelman 1995). Community colleges attract more minority (particularly Hispanic) and low- to moderate-income students, veterans, and those students with lower grade-point averages and SAT scores.

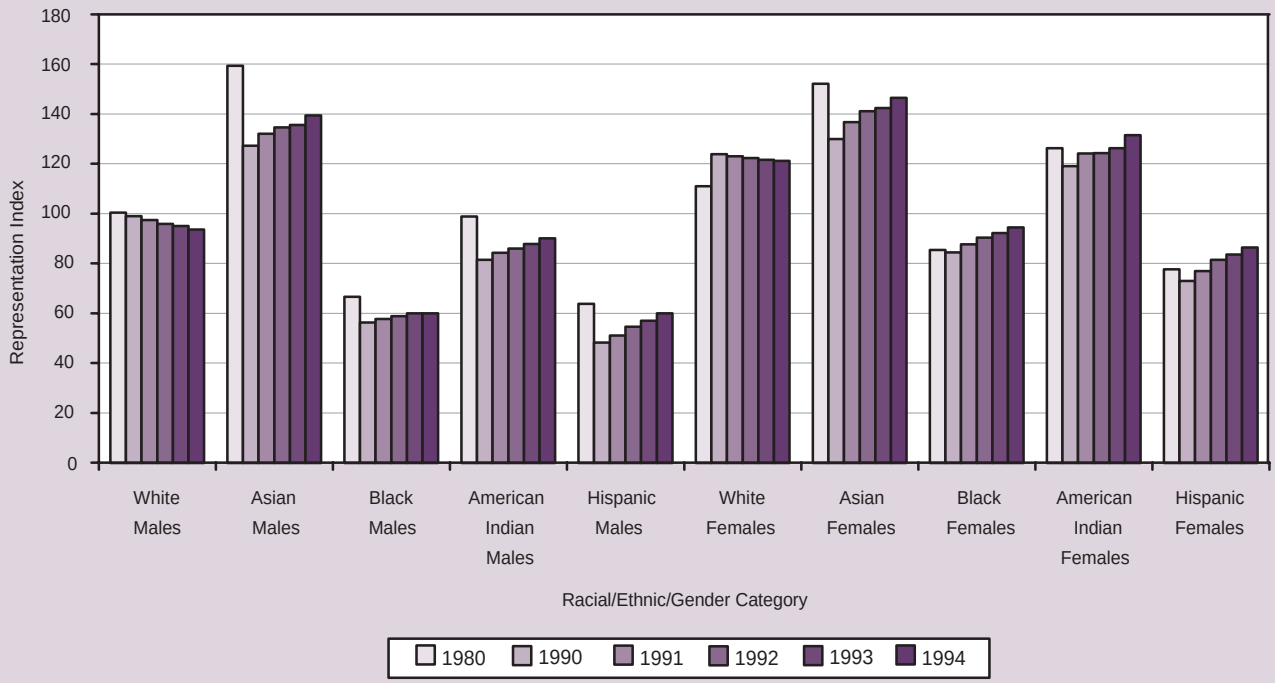
Some interesting differences in course participation patterns between 2-year and 4-year institutions emerged in an analysis conducted by Clifford Adelman of the U.S. Department of Education. According to Adelman, the most traditional way of assessing rates of participation in a field is to ask what proportion of students from a given group takes—and successfully completes—key courses in that field. Where there are considerable differences among groups, what are the reasons for those differences? Some answers may point to factors that cannot be changed, whereas others suggest strategies for better advisement and pre-college education.

Among those students who primarily attend 4-year institutions (see appendix table 3-10), there are several key issues:

- For women, there is no statistically significant difference from men in mathematics course taking until the level of precalculus. In terms of participation rates, women and men are roughly equivalent in college algebra, statistics, and finite/discrete mathematics.
- Women still lean more toward the life sciences than the physical sciences, though their strong participation rates in the two chemistry courses (appendix table 3-10) indicate the border of the physical sciences is accessible.

- The mathematics course-taking patterns of black students have an effect on their participation in other science, mathematics, and engineering fields. Participation rates are high at both the precollege level and at the levels of college algebra and precalculus. The participation rate is lower in calculus and lower than it should be in finite/discrete mathematics given the proportion of black students who major in computer science (see appendix table 3-10). If advisement could help influence the 22 percent who completed precalculus and help

Figure 3-1.
**Representation index of racial/ethnic/gender categories in total college enrollment: 1980–1994, selected years**

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Text table 3-1.
**Representation index of racial/ethnic/gender categories in total college enrollment: 1980, 1990–1994**[1]

| Racial/ethnic/gender category | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| White Males | 100.3 | 99.0 | 97.4 | 95.8 | 95.1 | 93.6 |
| Asian Males | 159.4 | 127.2 | 132.1 | 134.7 | 135.6 | 139.4 |
| Black Males | 66.6 | 56.2 | 57.7 | 58.8 | 60.0 | 60.0 |
| Hispanic Males | 63.8 | 48.2 | 51.1 | 54.6 | 57.0 | 59.9 |
| American Indian Males | 98.8 | 81.4 | 84.2 | 86.0 | 87.8 | 90.0 |
| White Females | 110.9 | 123.9 | 123.1 | 122.4 | 121.6 | 121.1 |
| Asian Females | 152.1 | 129.9 | 136.7 | 141.1 | 142.3 | 146.5 |
| Black Females | 85.4 | 84.4 | 87.7 | 90.3 | 92.3 | 94.5 |
| Hispanic Females | 77.6 | 73.0 | 77.0 | 81.4 | 83.6 | 86.4 |
| American Indian Females | 126.3 | 119.1 | 124.2 | 124.2 | 126.2 | 131.5 |

[1] Data used in the calculations of these indices are presented in appendix tables 3-6, 3-7, and 3-8.

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## Students With Disabilities

National data about persons with disabilities in all fields at the undergraduate level is insufficient to measure and describe the magnitude of the problems they face. For a description of undergraduate students who reported a disability, see appendix table 3-16.

The reasons that students with disabilities may not be majoring in science, mathematics, and engineering (SME) in greater numbers were examined in a recent study (Seymour and Hunter, 1998) conducted at one U.S. university. The study (see "Technical Notes to Chapter 3" for details on the study and its participants) suggests students with disabilities might be more likely to complete degrees in these fields if changes were made in faculty attitudes, financial aid requirements, and time allowed for degree completion. The study, which is described here, also showed the important role a university's disability services office can play in negotiating accommodations for students with disabilities.

Students with disabilities are significantly underrepresented in undergraduate and graduate majors in SME curricula. At first glance, one of the main causes of this is not unlike those of other underrepresented groups: the reason lies in the structure and culture of SME teaching. Students with disabilities face many unique issues and barriers in achieving success. Many students with disabilities simultaneously have a high potential for success and are at risk of dropping out or switching to another field. They must overcome significant obstacles to complete a university SME education. The three major barriers common to SME undergraduates with disabilities are faculty attitudes regarding certain accommodations, some aspects of the financial aid system, and the limitations of the disability itself.

A strong interest in their discipline, focused career aspirations, and support and accommodation in the early stages of their studies are characteristics common to successful graduates within SME. One distinguishing characteristic of those who persist from those who leave, regardless of their gender, ethnicity, or disability, is the development of particular attitudes and strategies. Students with disabilities who are most successful have communicated their needs and have identified appropriate accommodation and support. They have developed a combination of persistence, excellent organizational skills, knowledge of assistive technology, and the ability to invoke the necessary support systems or agencies when dealing with barriers.

### Faculty Attitudes

None of the Seymour and Hunter (1998) study participants recommended changes in the accommodation system administered by disability services offices. They did suggest that, in many cases, faculty attitudes had negative impact on the system and needed to be addressed.

Faculty responses to formal accommodation requests from students with disabilities included the following:

- Discounting the need for accommodation
- Refusing the accommodation as a way to "prepare" the student for "real world" competition
- Encouraging students to drop the class or change majors
- Placing the students in inappropriate testing places (subject to noise or periodic interruptions)
- Forgetting to send a test or not communicating changes or errors (if student arranged testing under disability services administration)
- Lowering grades for work done under accommodated conditions
- Insisting on knowing the nature of the student's disability, treatment, or medication in order to decide whether they will agree to the accommodation already requested and/or arranged by the disability services office
- Embarrassing student by talking about the disability or accommodations in front of peers

Study participants perceived, based on faculty responses to requests for accommodations, that some SME faculty "approved" certain conditions as "genuine disabilities" and exercised various degrees of skepticism about all others. The conclusion made by many students is that the rigors of the entirely unofficial process of approving accommodations already granted by the university has little to do with academic issues. For those faculty who act in the "gatekeeper" role, it may be seen as an appropriate way of testing for fitness to belong to the academic and professional communities based on SME disciplines. The essentially moral question raised by many requests for accommodations is if in granting it a student with a disability would be given an unfair advantage over other students.

## Students With Disabilities *(continued)*

### Financial Aid

The main difficulties of students who sought support through the university's financial aid office were that the rules that apply to all financial aid recipients do not make allowances for carrying less than a full class load, the nature of the disability, its variability or unpredictability, the effects of particular medications, problems of fatigue, and unexpected crises of mobility and transportation. These are issues which can make a full complement of classes very difficult or impossible for many students with disabilities. Taking a full load to qualify for financial aid very commonly creates a pattern of "incompletes," failures, and temporary withdrawals.

Some students in this study believed they would have spent less time, energy, and money repeating classes had they been allowed to work at a pace commensurate with the constraints of their disability.

### Attrition and the Stop-Go Phenomenon

Although the attrition rate of students with disabilities appears comparable with those of students of color, there are major differences. The "attrition" of students with disabilities is often temporary, more of a stop-go pattern to their progress rather than an abandonment of their education or their field.

Approximately one-third of the undergraduates in the study reported feeling sufficiently discouraged to consider leaving either their major or their institution. Four related issues recurred in the explanations of undergraduates with disabilities who were considering leaving or who had left: financial problems; intermittent troubles due to the disability; accumulation of "incompletes" in the record, related both to the disability and financial difficulties; and accommodation difficulties.

Most students with disabilities resumed their studies once a specific disability setback and/or their financial situation had improved, or they were able to resolve problems with their academic record. This is not, however, a pattern indicated in the SME attrition rates of students of color, women, or white males. Because time out of school was reported by the undergraduates with disabilities themselves to be, typically, one semester, the overall time taken to complete SME majors (i.e., a little over 5 years) is similar to time taken by those students without disabilities.

### Disability as a "Disadvantage of Time"

Coping with time-related problems was a universal feature of the experience of all study participants. It distinguishes their circumstances from those of other SME majors, is a facet of every type of barrier they encounter, and transcends differences of students with disabilities of different types. The time issues that participants raised were of five broad types: problems of pace; speed of learning, comprehension, and recall; temporal disruptions in physical and mental functions; time-related educational needs; and time expended in coping with difficulties raised by their disabilities.

Because SME faculty usually measure academic success (as opposed to demonstrations of knowledge and comprehension in other forms) by specific standards and time-related criteria, the slower pace at which students with many types of disabilities must work becomes a critical disadvantage. Students with learning and other disabilities must find alternative ways to absorb and apply class materials. Fluctuations in a disability or the side effects of medication may prevent students from concentrating on their studies. Basic educational requirements and activities of daily living take more time. Coping with these difficulties can be frustrating and take valuable time away from studies.

### Disability Services

To meet the needs of students with all types of disabilities, a university's Disability Services Office can play a significant role in helping to negotiate accommodations among students, faculty, university administration, and outside agencies. Students with disabilities identified the following Disability Services-arranged services and accommodations as having special value: preregistration, arranging priority access to particular classes, changing inaccessible or remote classrooms, getting textbooks recorded prior to the start of classes, arranging special test accommodations, and assistance in locating and trying out assistive technology.

move more of them forward into calculus, participation rates in the physical sciences might be higher.

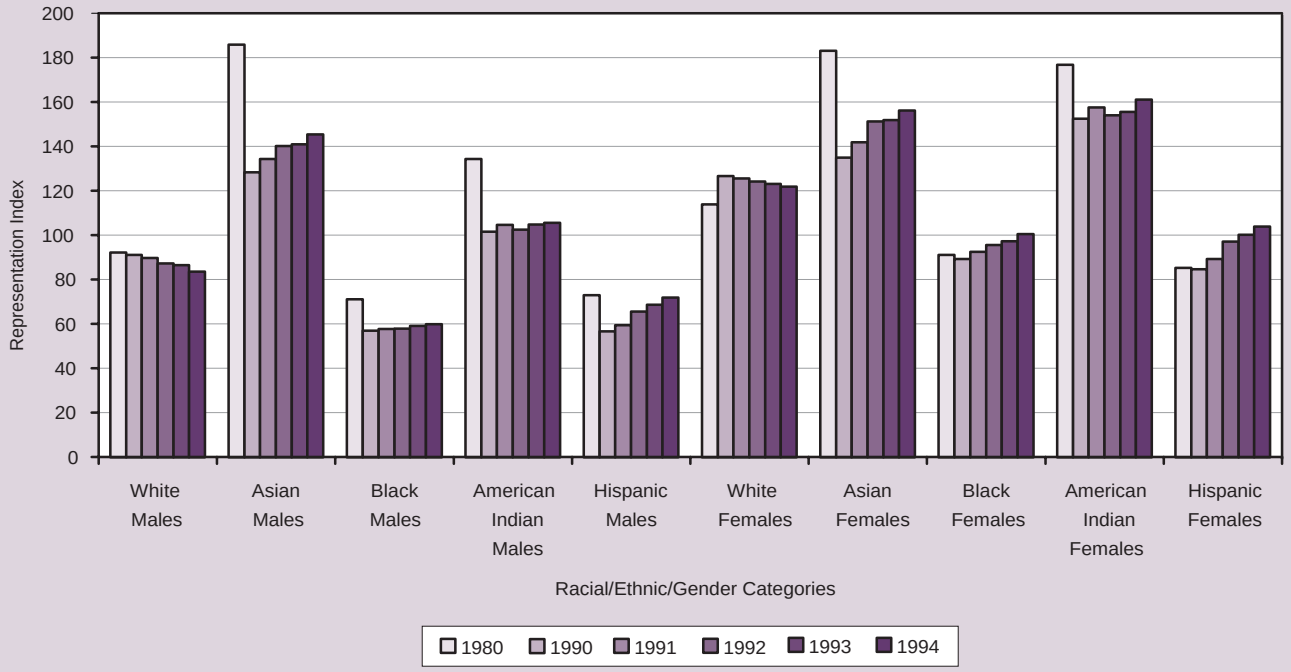
- Black students also show enrollment patterns in which physical science is more likely covered through an elective course rather than a required course. If students choose to maintain this pattern, these students will not reach intermediate-level knowledge in specific physical science disciplines.
- In general, Hispanic students have a stronger participation profile in the physical sciences than they do in the life sciences.

A similar picture of the course taking among those students taking courses primarily in 2-year institutions did not yield results rich enough for convincing analyses of the differences by race/ethnicity. There is no question that, when transfer students are excluded, however, the remaining group shows distinct gender differences in participation patterns. Appendix table 3-11 clearly shows this pattern of gender differences in technical mathematics (men) versus business mathematics (women), introductory computer science (men) versus data processing (women), and computer technology courses (men) versus the biology courses taken as part of associate's degree programs in nursing and allied health.

Although analysis of course taking by students in 2-year institutions is not feasible, detailed analyses were made of patterns of representation of racial/ethnic and gender categories among persons attending 2-year colleges. Analyses were made for the total enrollment of 2-year colleges in the United States. It is noted that racial/ethnic and gender patterns of total enrollment at 2-year colleges are similar to patterns of full-time enrollment at these institutions. (See appendix tables 3-12 and 3-13.)

The representation of white males among the 2-year college population has been proportionally decreasing since 1980. (See figure 3-2, text table 3-2, and appendix tables 3-14 and 3-15.) In fact, by 1994 only white males, black males, and Hispanic males had IR scores less than 100. The other groups are attending 2-year colleges at a higher rate than their population proportions would suggest. Since 1990, the 2-year college enrollment IR scores of Hispanic males and females, Asians males and females, and black females have been increasing dramatically. The IR scores for American Indian females, already at a high level, have increased slightly during the 1990s. The IR scores for black males have increased slightly. As of 1994, black males had the lowest proportional representation among persons attending 2-year institutions. (See appendix tables 3-12 and 3-13.)

Figure 3-2.
**Representation index of racial/ethnic/gender categories in the total enrollment at 2-year institutions: 1980, 1990–1994**

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Text table 3-2.
**Representation index of racial/ethnic/gender categories in the total enrollment at 2-year institutions: 1980, 1990–1994**[1]

| Racial/ethnic/gender category | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| White Males | 92.2 | 91.0 | 89.7 | 87.3 | 86.4 | 85.0 |
| Asian Males | 185.9 | 128.4 | 134.4 | 140.1 | 140.9 | 145.4 |
| Black Males | 71.1 | 56.9 | 57.7 | 57.9 | 59.0 | 59.9 |
| Hispanic Males | 73.0 | 56.6 | 59.4 | 65.5 | 68.6 | 71.8 |
| American Indian Males | 134.3 | 101.6 | 104.6 | 102.4 | 104.7 | 105.5 |
| White Females | 113.9 | 126.7 | 125.5 | 124.2 | 123.1 | 121.8 |
| Asian Females | 183.1 | 135.0 | 141.8 | 151.3 | 151.8 | 156.1 |
| Black Females | 91.0 | 89.2 | 92.4 | 95.5 | 97.3 | 100.4 |
| Hispanic Females | 85.2 | 84.6 | 89.2 | 97.1 | 100.2 | 103.9 |
| American Indian Females | 176.7 | 152.5 | 157.6 | 153.9 | 155.6 | 161.1 |

[1] Data used in the calculations of these indices are presented in appendix tables 3-14 and 3-15.

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## Four-Year Institutions

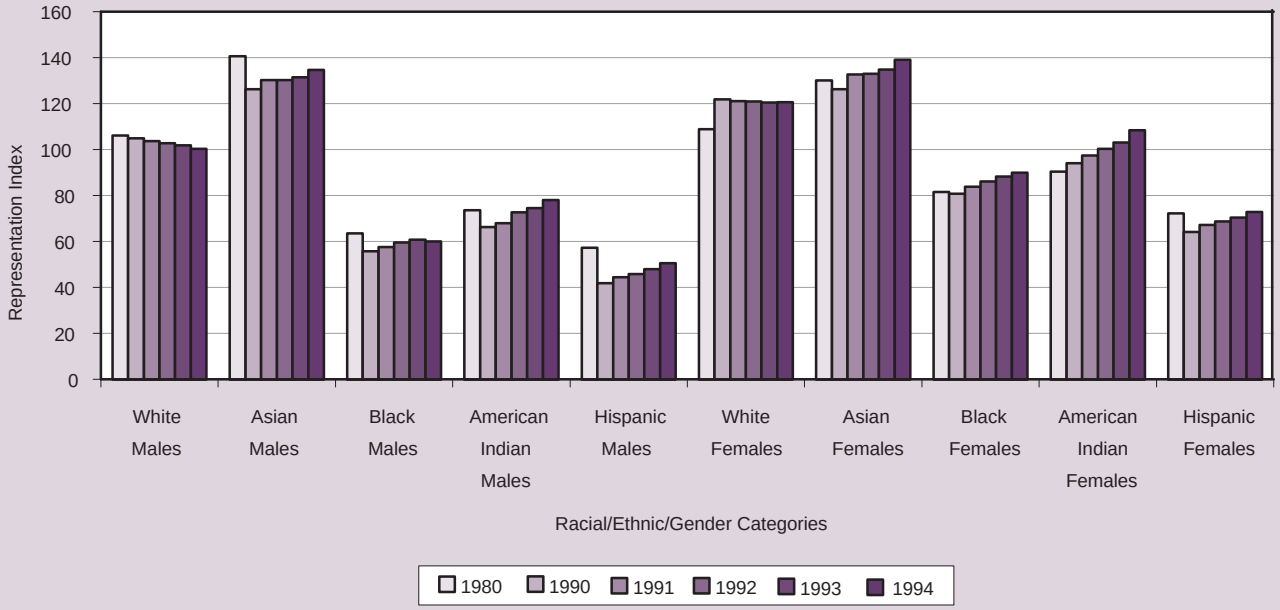
Although full-time enrollment at all undergraduate institutions has risen over the past 20 years (see appendix table 3-17), the enrollment of white men enrolled full time in 4-year institutions has declined by 10 percent from 1976 to 1994. At the same time, the enrollment of white women has remained almost constant (38 percent of total full-time enrollment at 4-year institutions). During the same period, the enrollment of all racial/ethnic minority groups has risen. The most notable increases in total full-time enrollment at all institutions during that period were for women, who increased from 46 percent to 54 percent; Hispanic students, who grew from 4 percent to 8 percent of the total full-time fall enrollment; and Asian students, who constituted 2 percent of the total full-time enrollment in fall 1976 and 6 percent in fall 1994. Racial/ethnic and gender patterns among total enrollment at 4-year institutions are similar to those for full-time enrollment at these institutions (see appendix tables 3-18 and 3-19).

The representation of the racial/ethnic and gender groups in 4-year institutions is similar to that in 2-year institutions in that there are more Asian males and females in both types of institutions than would be expected from their proportion in the population (see figure 3-3, text table 3-3, and appendix tables 3-20 and 3-21). This unexpected level was also found among American Indian females enrolled in 2-year institutions from 1980 through 1994. Although this group of American Indian females was underrepresented in 4-year institutions in 1980, since then it has increased its representation in these institutions and has achieved parity since 1992.

Additional findings from the IR analysis of particular interest are

- The representation of white males in both types of institutions has decreased since 1980, yet in 1994, white males were at parity in 4-year institutions.
- Hispanic males and females have increased their representation in 4-year institutions, although not to the same extent as they have done in 2-year institutions.
- Hispanic females achieved parity at 2-year institutions in 1993 and 1994; their IR score for enrollment in 4-year institutions was slightly less than 73 in 1994.
- The proportional representation of black males in 4-year institutions is about the same as it is in 2-year institutions, ranging from an IR score of slightly less than 56 to 60 during the 1990s. Black males have made very little progress in their enrollment patterns at both types of institutions.

Figure 3-3.
**Representation index of racial/ethnic/gender categories in the total enrollment of undergraduate students at 4-year institutions: 1980, 1990–1994**

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Text table 3-3.
**Representation index of racial/ethnic/gender categories in the total enrollment of undergraduate students at 4-year institutions: 1980, 1990–1994**[1]

| Racial/ethnic/gender category | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|
| White males | 106.1 | 104.9 | 103.6 | 102.7 | 101.9 | 100.4 |
| Asian males | 140.6 | 126.3 | 130.3 | 130.3 | 131.4 | 134.7 |
| Black males | 63.5 | 55.7 | 57.6 | 59.5 | 60.7 | 60.0 |
| Hispanic males | 57.3 | 41.9 | 44.5 | 45.8 | 47.9 | 50.6 |
| American Indian males | 73.6 | 66.3 | 67.9 | 72.7 | 74.4 | 78.0 |
| White females | 108.8 | 121.9 | 121.1 | 120.9 | 120.4 | 120.6 |
| Asian females | 130.1 | 126.2 | 132.6 | 133.0 | 134.8 | 139.0 |
| Black females | 81.5 | 80.7 | 83.9 | 86.1 | 88.3 | 90.0 |
| Hispanic females | 72.2 | 64.2 | 67.2 | 68.7 | 70.4 | 72.8 |
| American Indian females | 90.4 | 94.0 | 97.3 | 100.3 | 103.0 | 108.4 |

[1] Data used in the calculations of these indices are presented in appendix tables 3-20 and 3-21.

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- Although black females achieved parity at 2-year institutions in 1994, their IR score for 4-year institutions, though increasing, achieved only 90 in 1994.

## Bachelor's Degrees

The percentage of women of all racial/ethnic groups who have been awarded bachelor's degrees in science and engineering has risen dramatically over the past 30 years. (See appendix table 3-2.)[3] In 1966, women received 25 percent of all science and engineering bachelor's degrees awarded and 52 percent of degrees in non–science-and-engineering fields. By 1995, women received almost half (47 percent) of all science and engineering bachelor's degrees awarded and 58.7 percent of all non–science-and-engineering bachelor's degrees awarded. During the decade of the 1980s, the total number of bachelor's degrees awarded to all groups, especially women, increased. In the 10-year period between 1984 and 1994, the number of bachelor's degrees awarded to men increased by 10 percent, whereas those awarded to women rose by 29 percent. (See appendix tables 3-2 and 3-3.)

For both 1994 and 1995, approximately 40 percent of the bachelor's degrees earned by white males, American Indian males, and Hispanic males were in science and engineering. Fifty-seven percent of the bachelor's degrees earned by Asian males and 36 percent of the degrees earned by black males were in science and engineering. (See text tables 3-4 and 3-5 and appendix table 3-4.)

In 1994 and 1995, 40 percent of the bachelor's degrees earned by Asian females were in science and engineering. The percentage of degrees in science and engineering among the other female categories range from 27 to 30 percent for both years; black females had a higher percentage than the other female racial/ethnic categories. (See appendix table 3-5.)

White males continue to earn more than 60 percent of the bachelor's degrees awarded in engineering. White women had the next highest percentage—12 percent—of the engineering bachelor's degrees awarded in 1994 and 1995. Nine percent of these degrees were earned by Asian males. For both years, the percentage of the engineering degrees earned by Hispanic males was slightly higher than the percentage of these degrees earned by black males. Less than 1 percent of these degrees were earned by American Indians.

[3] Nonresident aliens and persons whose race/ethnicity are unknown are excluded from these tables.

Differences among racial/ethnic and gender categories by field are considerable.

### Physical, Computer, and Agricultural Sciences

- Fifty-four to 58 percent of the bachelor's degrees in these fields were earned by white males.
- White females earned 35 percent of the bachelor's degrees in agricultural science. They earned 27 percent of the bachelor's degrees in the physical sciences and 17 percent of the bachelor's degrees in computer science.
- Asian males earned 4 percent of the bachelor's degrees in the physical sciences and 7 percent of the degrees in computer science.
- Black males, Asian females, and black females each earned 3 percent of the bachelor's degrees in the physical sciences and 4 to 6 percent of the bachelor's degrees in computer science. Less than 1 percent of the bachelor's degrees in these areas were earned by American Indians.

### Mathematics

There is a small difference between white males and females in their percentage of the total number of bachelor's degrees earned in mathematics.

- White males earned 44 percent of the bachelor's degrees in mathematics in 1994 and 42 percent in 1995.
- White females earned 38 percent of the bachelor's degrees in mathematics in both years.
- Asians and blacks, both males and females, earned essentially the same percentage of the degrees in mathematics (4 percent) in 1995. In 1994, Asian females and black males earned 3 percent.
- Two percent of the bachelor's degrees in mathematics were earned by Hispanics.
- Less than 1 percent were earned by American Indians.

### Social Sciences

Differences between white males and females in social sciences are similar to those found in mathematics.

Text table 3-4.
**Distribution of earned bachelor's degrees, by field, race, ethnicity, and gender: 1995**

| Field of degree | Total | White males | Asian males | Black males | Hispanic males | American Indian males | White females | Asian females | Black females | Hispanic females | American Indian females |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 1,110,512 | 407,155 | 28,348 | 30,998 | 27,875 | 2,669 | 485,630 | 30,947 | 54,289 | 38,816 | 3,785 |
| Engineering | 57,228 | 36,785 | 5,340 | 1,846 | 2,895 | 176 | 6,941 | 1,445 | 999 | 756 | 45 |
| Physical science | 18,231 | 10,006 | 784 | 495 | 437 | 66 | 4,946 | 563 | 539 | 363 | 32 |
| Mathematical science | 12,897 | 5,456 | 519 | 476 | 315 | 29 | 4,887 | 446 | 519 | 221 | 29 |
| Computer science | 21,812 | 11,793 | 1,583 | 1,241 | 876 | 73 | 3,739 | 782 | 1,257 | 431 | 37 |
| Biological science | 54,277 | 19,790 | 3,467 | 981 | 1,340 | 128 | 20,838 | 3,576 | 2,250 | 1,750 | 157 |
| Agricultural science | 14,180 | 8,152 | 130 | 121 | 228 | 82 | 4,968 | 157 | 142 | 158 | 42 |
| Social science | 127,184 | 54,508 | 3,247 | 4,565 | 3,774 | 403 | 46,050 | 3,758 | 6,356 | 4,103 | 420 |
| Psychology | 69,936 | 15,241 | 969 | 1,402 | 1,166 | 120 | 40,673 | 2,362 | 4,339 | 3,377 | 287 |
| Non-science and engineering | 734,767 | 245,424 | 12,309 | 19,871 | 16,844 | 1,592 | 352,588 | 17,858 | 37,888 | 27,657 | 2,736 |
| Percentage distributions within race/ethnic/gender categories: | | | | | | | | | | | |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Engineering | 5.2% | 9.0% | 18.8% | 6.0% | 10.4% | 6.6% | 1.4% | 4.7% | 1.8% | 1.9% | 1.2% |
| Physical science | 1.6% | 2.5% | 2.8% | 1.6% | 1.6% | 2.5% | 1.0% | 1.8% | 1.0% | 0.9% | 0.8% |
| Mathematical science | 1.2% | 1.3% | 1.8% | 1.5% | 1.1% | 1.1% | 1.0% | 1.4% | 1.0% | 0.6% | 0.8% |
| Computer science | 2.0% | 2.9% | 5.6% | 4.0% | 3.1% | 2.7% | 0.8% | 2.5% | 2.3% | 1.1% | 1.0% |
| Biological science | 4.9% | 4.9% | 12.2% | 3.2% | 4.8% | 4.8% | 4.3% | 11.6% | 4.1% | 4.5% | 4.1% |
| Agricultural science | 1.3% | 2.0% | 0.5% | 0.4% | 0.8% | 3.1% | 1.0% | 0.5% | 0.3% | 0.4% | 1.1% |
| Social science | 11.5% | 13.4% | 11.5% | 14.7% | 13.5% | 15.1% | 9.5% | 12.1% | 11.7% | 10.6% | 11.1% |
| Psychology | 6.3% | 3.7% | 3.4% | 4.5% | 4.2% | 4.5% | 8.4% | 7.6% | 8.0% | 8.7% | 7.6% |
| Non-science and engineering | 66.2% | 60.3% | 43.4% | 64.1% | 60.4% | 59.6% | 72.6% | 57.7% | 69.8% | 71.3% | 72.3% |
| Percentage distributions within field of degree categories: | | | | | | | | | | | |
| Total | 100.0% | 36.7% | 2.6% | 2.8% | 2.5% | 0.2% | 43.7% | 2.8% | 4.9% | 3.5% | 0.3% |
| Engineering | 100.0% | 64.3% | 9.3% | 3.2% | 5.1% | 0.3% | 12.1% | 2.5% | 1.7% | 1.3% | 0.1% |
| Physical science | 100.0% | 54.9% | 4.3% | 2.7% | 2.4% | 0.4% | 27.1% | 3.1% | 3.0% | 2.0% | 0.2% |
| Mathematical science | 100.0% | 42.3% | 4.0% | 3.7% | 2.4% | 0.2% | 37.9% | 3.5% | 4.0% | 1.7% | 0.2% |
| Computer science | 100.0% | 54.1% | 7.3% | 5.7% | 4.0% | 0.3% | 17.1% | 3.6% | 5.8% | 2.0% | 0.2% |
| Biological science | 100.0% | 36.5% | 6.4% | 1.8% | 2.5% | 0.2% | 38.4% | 6.6% | 4.1% | 3.2% | 0.3% |
| Agricultural science | 100.0% | 57.5% | 0.9% | 0.9% | 1.6% | 0.6% | 35.0% | 1.1% | 1.0% | 1.1% | 0.3% |
| Social science | 100.0% | 42.9% | 2.6% | 3.6% | 3.0% | 0.3% | 36.2% | 3.0% | 5.0% | 3.2% | 0.3% |
| Psychology | 100.0% | 21.8% | 1.4% | 2.0% | 1.7% | 0.2% | 58.2% | 3.4% | 6.2% | 4.8% | 0.4% |
| Non-science and engineering | 100.0% | 33.4% | 1.7% | 2.7% | 2.3% | 0.2% | 48.0% | 2.4% | 5.2% | 3.8% | 0.4% |

NOTE: These data exclude nonresident aliens and U.S. citizens and permanent residents for whom their race/ethnicity was unknown.
SOURCE: National Science Foundation, Science and Engineering Degrees, by Race/Ethnicity of Recipients, 1987–1994, (NSF 96-329) (Arlington, VA, 1996).

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Text table 3-5.
**Distribution of earned bachelor's degrees, by field, race, ethnicity, and gender: 1994**

| Field of degree | Total | White males | Asian males | Black males | Hispanic males | American Indian males | White females | Asian females | Black females | Hispanic females | American Indian females |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | 1,123,862 | 420,211 | 26,420 | 30,106 | 25,860 | 2,562 | 497,913 | 28,255 | 52,210 | 36,823 | 3,502 |
| Engineering | 57,223 | 37,830 | 5,235 | 1,784 | 2,495 | 179 | 6,857 | 1,281 | 875 | 648 | 39 |
| Physical science | 17,449 | 9,958 | 648 | 464 | 415 | 52 | 4,658 | 448 | 457 | 318 | 31 |
| Mathematical science | 13,609 | 5,920 | 523 | 457 | 300 | 29 | 5,169 | 403 | 535 | 243 | 30 |
| Computer science | 21,674 | 12,022 | 1,476 | 1,161 | 719 | 59 | 3,794 | 771 | 1,237 | 416 | 19 |
| Biological science | 50,028 | 18,882 | 2,992 | 927 | 1,298 | 112 | 19,060 | 2,967 | 2,053 | 1,603 | 134 |
| Agricultural science | 12,619 | 7,333 | 82 | 137 | 193 | 66 | 4,400 | 91 | 131 | 143 | 43 |
| Social science | 132,989 | 58,409 | 3,204 | 4,644 | 3,774 | 395 | 48,454 | 3,522 | 6,191 | 3,974 | 422 |
| Psychology | 67,267 | 14,891 | 807 | 1,232 | 996 | 113 | 39,979 | 1,970 | 4,004 | 2,994 | 281 |
| Non-science and engineering | 751,004 | 254,966 | 11,453 | 19,300 | 15,670 | 1,557 | 365,542 | 16,802 | 36,727 | 26,484 | 2,503 |
| Percentage distributions within race/ethnic/gender categories: | | | | | | | | | | | |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Engineering | 5.1% | 9.0% | 19.8% | 5.9% | 9.6% | 7.0% | 1.4% | 4.5% | 1.7% | 1.8% | 1.1% |
| Physical scienc | 1.6% | 2.4% | 2.5% | 1.5% | 1.6% | 2.0% | 0.9% | 1.6% | 0.9% | 0.9% | 0.9% |
| Mathematical science | 1.2% | 1.4% | 2.0% | 1.5% | 1.2% | 1.1% | 1.0% | 1.4% | 1.0% | 0.7% | 0.9% |
| Computer science | 1.9% | 2.9% | 5.6% | 3.9% | 2.8% | 2.3% | 0.8% | 2.7% | 2.4% | 1.1% | 0.5% |
| Biological science | 4.5% | 4.5% | 11.3% | 3.1% | 5.0% | 4.4% | 3.8% | 10.5% | 3.9% | 4.4% | 3.8% |
| Agricultural science | 1.1% | 1.7% | 0.3% | 0.5% | 0.7% | 2.6% | 0.9% | 0.3% | 0.3% | 0.4% | 1.2% |
| Social science | 11.8% | 13.9% | 12.1% | 15.4% | 14.6% | 15.4% | 9.7% | 12.5% | 11.9% | 10.8% | 12.1% |
| Psychology | 6.0% | 3.5% | 3.1% | 4.1% | 3.9% | 4.4% | 8.0% | 7.0% | 7.7% | 8.1% | 8.0% |
| Non-science and engineering | 66.8% | 60.7% | 43.3% | 64.1% | 60.6% | 60.8% | 73.4% | 59.5% | 70.3% | 71.9% | 71.5% |
| Percentage distributions within field of degree categories: | | | | | | | | | | | |
| Total | 100.0% | 37.4% | 2.4% | 2.7% | 2.3% | 0.2% | 44.3% | 2.5% | 4.6% | 3.3% | 0.3% |
| Engineering | 100.0% | 66.1% | 9.1% | 3.1% | 4.4% | 0.3% | 12.0% | 2.2% | 1.5% | 1.1% | 0.1% |
| Physical science | 100.0% | 57.1% | 3.7% | 2.7% | 2.4% | 0.3% | 26.7% | 2.6% | 2.6% | 1.8% | 0.2% |
| Mathematical science | 100.0% | 43.5% | 3.8% | 3.4% | 2.2% | 0.2% | 38.0% | 3.0% | 3.9% | 1.8% | 0.2% |
| Computer science | 100.0% | 55.5% | 6.8% | 5.4% | 3.3% | 0.3% | 17.5% | 3.6% | 5.7% | 1.9% | 0.1% |
| Biological science | 100.0% | 37.7% | 6.0% | 1.9% | 2.6% | 0.2% | 38.1% | 5.9% | 4.1% | 3.2% | 0.3% |
| Agricultural science | 100.0% | 58.1% | 0.6% | 1.1% | 1.5% | 0.5% | 34.9% | 0.7% | 1.0% | 1.1% | 0.3% |
| Social science | 100.0% | 43.9% | 2.4% | 3.5% | 2.8% | 0.3% | 36.4% | 2.6% | 4.7% | 3.0% | 0.3% |
| Psychology | 100.0% | 22.1% | 1.2% | 1.8% | 1.5% | 0.2% | 59.4% | 2.9% | 6.0% | 4.5% | 0.4% |
| Non-science and engineering | 100.0% | 34.0% | 1.5% | 2.6% | 2.1% | 0.2% | 48.7% | 2.2% | 4.9% | 3.5% | 0.3% |

NOTE: These data exclude nonresident aliens and U.S. citizens and permanent residents for whom their race/ethnicity was unknown.
SOURCE: National Science Foundation, Science and Engineering Degrees, by Race/Ethnicity of Recipients, 1987–1994, NSF 96-329 (Arlington, VA, 1996).

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- White males earned 44 percent of the bachelor's degrees in social sciences earned in 1994 and 43 percent in 1995.
- Five percent of the bachelor's degrees in social sciences went to black females.
- Asian males and females and black males each earned around 2 percent of the bachelor's degrees in social sciences during these 2 years.
- Three percent of the bachelor's degrees in social sciences were earned by Hispanics.
- Less than 1 percent of degrees in social sciences were earned by American Indians.

### Psychology

- For both 1994 and 1995, almost 60 percent of the bachelor's degrees earned in psychology were earned by white females.
- White males earned 22 percent of these degrees.
- Six percent of the degrees were earned by black females, and 3 percent were earned by Asian females. Females in Hispanic and American Indian categories earned less than 2 percent of the degrees in psychology in 1994 and 1995.

## Indices of Representation

Indices of Representation were computed to assess the relative representation of racial/ethnic and gender groups in the awarding of bachelor's degrees. (See text tables 3-6 and 3-7 and appendix tables 3-22, 3-23, and 3-24.) In 1994, considering all fields, three of the ten racial/ethnic and gender categories had an IR score of 100 or greater: white males and females and Asian females. (See text tables 3-6 and 3-7 and appendix table 3-22.) Asian males had an IR score slightly less than 100, and American Indian females had an IR score of slightly more than 90. The scores for 1995 are not substantially different from the scores for 1994. Black males had the lowest IR scores for both 1994 and 1995.

The racial/ethnic and gender groups differ a great deal when their IR scores within fields of study are compared.

### Engineering

- Asian males are highly overrepresented in engineering, indicating that for 1994 and 1995 their proportion among persons earning bachelor's degrees in engineering was well over three times their proportion among full-time, first-time, first-year college students.
- All of the male racial/ethnic categories, except black males, have IR scores in engineering higher than 100 for these 2 years. Asian females have IR scores just below 100 for the 2 years.
- In 1994 and 1995, except for Asian females, females in each racial/ethnic category had IR scores for bachelor's degrees in engineering of less than 32.

### Physical Sciences and Mathematics

- For both 1994 and 1995, the IR scores of Asians (both males and females), American Indian males, and white males are higher than 100 for bachelor's degrees in the physical sciences and mathematical sciences.
- White females are not far away from parity in earning bachelor's degrees in mathematical sciences.

### Computer Sciences

- In 1994 and 1995, Asian males had the highest IR score for bachelor's degrees in the computer sciences. They are followed by Asian females and white males.
- The proportion of degrees in computer sciences earned by black males and Hispanic males in 1994 and 1995 was higher than their proportion among full-time, first-time, first-year students in 1990.
- In 1995, all the male racial/ethnic categories had an IR over 100 for degrees in the computer sciences.
- Black females had an IR score below parity for both years, but those scores were much higher than those of Hispanic females, white females, and American Indian females.

### Biological Sciences

- Asian males and females earned bachelor's degrees in 1994 and 1995 in the biological sciences at a rate that was over two times their proportion among full-time, first-time, first-year students in 1990 and 1991.
- The proportion of white males among those earning bachelor's degrees in 1994 and 1995 in the biological sciences was slightly higher than their proportion among full-time, first-time, first-year students in 1990 and 1991, respectively.

Text table 3-6.

**Representation index of racial/ethnic/gender categories in earned bachelor's degrees by field: 1994** [1]

| Race/ethnicity/gender | All fields | Engineering | Physical sciences | Mathe-matical sciences | Computer sciences | Biological sciences | Agricultural sciences | Social sciences | Psychology | Non-science and engineering |
|---|---|---|---|---|---|---|---|---|---|---|
| White, non-Hispanic males | 101.5 | 179.4 | 154.9 | 118.1 | 150.5 | 102.4 | 157.7 | 119.2 | 60.1 | 92.1 |
| Asian or Pacific Islander males | 98.9 | 384.8 | 156.2 | 161.6 | 286.4 | 251.5 | 27.3 | 101.3 | 50.5 | 64.1 |
| Black, non-Hispanic males | 57.9 | 67.4 | 57.4 | 72.5 | 115.7 | 40.0 | 23.5 | 75.4 | 39.6 | 55.5 |
| Hispanic males | 76.2 | 144.5 | 78.8 | 73.0 | 109.9 | 86.0 | 50.7 | 94.0 | 49.1 | 69.1 |
| American Indian or Alaskan Native males | 79.0 | 108.4 | 103.2 | 73.8 | 94.3 | 77.5 | 181.2 | 102.9 | 58.2 | 71.8 |
| White, non-Hispanic females | 110.9 | 30.0 | 66.8 | 95.1 | 43.8 | 95.4 | 87.3 | 91.2 | 148.8 | 121.8 |
| Asian or Pacific Islander females | 105.9 | 94.3 | 108.2 | 124.8 | 149.9 | 249.9 | 30.4 | 111.6 | 123.4 | 94.3 |
| Black, non-Hispanic females | 72.1 | 23.7 | 40.6 | 61.0 | 88.5 | 63.7 | 16.1 | 72.2 | 92.3 | 75.9 |
| Hispanic females | 87.7 | 30.3 | 48.8 | 47.8 | 51.4 | 85.8 | 30.3 | 80.0 | 119.1 | 94.4 |
| American Indian or Alaskan Native females | 93.2 | 20.4 | 53.1 | 65.9 | 26.2 | 80.1 | 101.9 | 94.9 | 124.9 | 99.7 |

[1] Data used in the calculations of these indices are presented in appendix table 3-22.

NOTE: These data exclude nonresident aliens and U.S. citizens and permanent residents for whom their race/ethnicity was unknown.

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Text table 3-7.

**Representation index of racial/ethnic/gender categories in earned bachelor's degrees by field: 1995**[1]

| Race/ethnicity/gender | All fields | Engineering | Physical sciences | Mathe-matical sciences | Computer sciences | Biological sciences | Agricultural sciences | Social sciences | Psychology | Non-science and engineering |
|---|---|---|---|---|---|---|---|---|---|---|
| White, non-Hispanic males | 102.0 | 178.9 | 152.8 | 117.7 | 150.5 | 101.5 | 160.0 | 119.3 | 60.7 | 93.0 |
| Asian or Pacific Islander males | 102.0 | 372.9 | 171.9 | 160.8 | 290.0 | 255.3 | 36.6 | 102.0 | 55.4 | 66.9 |
| Black, non-Hispanic males | 57.4 | 66.3 | 55.8 | 75.8 | 116.9 | 37.1 | 17.5 | 73.8 | 41.2 | 55.6 |
| Hispanic males | 75.7 | 152.6 | 72.3 | 73.7 | 121.1 | 74.5 | 48.5 | 89.5 | 50.3 | 69.1 |
| American Indian or Alaskan Native males | 82.2 | 105.2 | 123.8 | 76.9 | 114.4 | 80.6 | 197.7 | 108.3 | 58.7 | 74.1 |
| White, non-Hispanic females | 111.2 | 30.8 | 69.0 | 96.4 | 43.6 | 97.6 | 89.1 | 92.1 | 147.9 | 122.0 |
| Asian or Pacific Islander females | 105.8 | 95.9 | 117.3 | 131.3 | 136.1 | 250.2 | 42.0 | 112.2 | 128.2 | 92.3 |
| Black, non-Hispanic females | 73.6 | 26.3 | 44.5 | 60.6 | 86.7 | 62.4 | 15.1 | 75.2 | 93.4 | 77.6 |
| Hispanic females | 84.5 | 31.9 | 48.1 | 41.4 | 47.8 | 78.0 | 26.9 | 78.0 | 116.8 | 91.0 |
| American Indian or Alaskan Native females | 94.7 | 21.8 | 48.8 | 62.5 | 47.1 | 80.4 | 82.3 | 91.8 | 114.0 | 103.5 |

[1] Data used in the calculations of these indices are presented in appendix table 3-23.

NOTE: These data exclude nonresident aliens and U.S. citizens and permanent residents for whom their race/ethnicity was unknown.

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- The IR score of white females for 1994 and 1995 indicated that they were just below parity in degrees earned in the biological sciences.

### Agricultural Sciences

- American Indian males have the highest IR score among the racial/ethnic and gender groups for earning bachelor's degrees in agricultural sciences in 1994 and 1995.
- White males had an IR score well above parity for these 2 years.
- With the exception of white females and American Indian females, the IR scores of the other racial/ethnic and gender groups were low for both 1994 and 1995.

### Social Sciences

- White males, Asian males and females, and American Indian males had IR scores above 100 for degrees in social sciences in 1994 and 1995.
- The IR scores for the other racial/ethnic and gender categories for degrees in social sciences ranged between 72 and 95 for these 2 years.
- Not one racial/ethnic and gender category has an extremely low IR score for degrees in social sciences.

### Psychology

- For 1994 and 1995, not one male racial/ethnic category has an IR score higher than 61.
- Except for black females, every female category has an IR score for psychology that is higher than 100 for both 1994 and 1995.
- Black females had an IR score in the 90s for these 2 years.

### Non–Science-and-Engineering

- White females had an IR score around 122 for degrees in non–science-and-engineering fields in both 1994 and 1995.
- American Indian females had a score essentially at parity in 1994 and slightly more than parity in 1995 for degrees in non–science-and-engineering areas.
- White males and Asian females had an IR score in the lower 90s in both 1994 and 1995 for degrees in non–science-and-engineering areas.
- The IR scores for the other three racial/ethnic and gender categories ranged from slightly less than 56 to slightly less than 78.

## Mathematics and Science Experiences of Young Women

Young women in the United States continue to be more likely than young men to stop taking courses, earn lower grades, and lose interest in mathematics and science during the high school years. As early as 7th grade, girls are less likely than boys to aspire to mathematics and science jobs or to believe science knowledge is needed for a good job.

When the mathematics and science experiences of women in race and class subgroups are examined, class affects these experiences in an expected manner. For example, women from upper SES (socioeconomic status) families are over three times as likely as those from lower SES families to have scored in the upper quartile on mathematics and science achievement indicators at some time during their high school years. Race, however, does not always work in the expected way. In fact, equally qualified black women are more likely to have positive mathematics and science achievement and to be taking mathematics and science courses than are their white counterparts. Analyses of these young black women's resources suggests that their advantage may come from mothers who have high expectations and are very involved in their daughters' lives.

An understanding of gender and science requires a longitudinal look at experiences in multiple areas of mathematics and science. Ebbs and flows in science interest and aptitude are common. Most women do not permanently leave the science pipeline until the post–high-school years.

— Sandra L. Hanson, Associate Professor of Sociology, Catholic University, Adapted from *Lost Talent: Women in the Sciences*

## The Engineering Path[4]

Research conducted by the U.S. Department of Education examines the routes students take to earn an undergraduate degree in engineering.[5] In its most elaborate configuration, this route, or engineering path (EPATH) sets forth 11 "stations beyond the threshold" for bachelor's degree candidates. Each station describes student history (for example, "Mediocre Performance, Leaves Engineering for a different science, mathematics, engineering, or technology (SMET) field" or "Completes Bachelor's in Engineering, Architecture, or Engineering Technology and Continues to Graduate School in a non-SMET field").

Text table 3-8 aggregates these heuristics for academic career histories into three stations and compares men and women. The story told by these and allied data is complex. On the one hand, the academic background of women, particularly in mathematics, was stronger than for men. At the same time, however, their degree completion rate in engineering

[4] The data used in this analysis come from a national age-cohort longitudinal study and rely heavily on the college transcripts of participants in that study. That study, conducted over 13 years by the National Center for Education Statistics, followed the high school graduating class of 1982, known as the High School and Beyond Sophomore Cohort (HS&B/So). The college transcripts were gathered in 1993, when the members of this cohort were 29 to 30 years old.

[5] Engineering path (EPATH) is an empirically derived model for describing what happens to all students who cross a curricular threshold that would qualify them to pursue degrees in engineering, architecture, or engineering technologies. For a full explication, see Adelman, C., *Women and Men of the Engineering Path: A Model for Analysis of Undergraduate Careers*. Washington, DC: U.S. Department of Education and the National Institute for Science Education, 1998.

Text table 3-8.
**Students who reached at least the threshold of the engineering curriculum in 4-year colleges, by gender, progress in engineering, and selected high school background characteristics: 1982–1993 cohort**

| Gender | Progress in Engineering | | |
|---|---|---|---|
| | Completed only threshold courses in engineering | Took engineering courses beyond threshold but left engineering | Completed bachelor's in engineering, architecture, or engineering technologies |
| Academic career history (row percentages)[1] | | | |
| Men | 18.3 | 20.0 | 61.6 |
| Women | 22.7 | 35.4 | 41.9 |
| Percent who had planned to major in engineering when in high school: | | | |
| Men | 64.22 | 60.52 | 72.8 |
| Women | 59.82 | 56.02 | 53.8 |
| Percent who had completed calculus in high school: | | | |
| Men | 20.2 | 21.22 | 25.7 |
| Women | 60.4 | Low N [2] | 36.3 |

[1] Because of rounding, rows may not add to 100 percent.
[2] Male/female comparisons are not statistically significant.

NOTES: Universe: All students who reached at least the threshold of the engineering curriculum in 4-year colleges. Weighted N = 149,841. Degree completion covers engineering, architecture, and engineering technologies.

SOURCE: NCES, High School and Beyond/Sophomore Cohort, 1982–1993 Cohort

## The Engineering Path *(continued)*

was significantly lower, even though the grade-point averages (GPAs) of female degree-completers were almost identical to those of men (men: 2.88, standard deviation = .561; women: 2.98, standard deviation = .437). Among degree completers, a far lower percentage of women had planned to major in engineering when they were seniors in high school, suggesting that some programs have been successful in changing women's attitudes toward the field.

Over a third (35.4 percent) of the women who reached the curricular threshold continued, but then changed fields. Compared to men who left the engineering path, this group had slightly weaker mathematics backgrounds and slightly lower GPAs (2.71 to 2.83), but a much higher proportion of bachelor's degree completers (80 percent for women versus 60 percent for men). Where did they go? The physical sciences (not the life sciences) and computer science took most (44 percent) of the women who left engineering and completed bachelor's degrees in other fields. (See text table 3-9.) These choices may reflect prior academic investments in mathematics and interest in more theoretical SMET fields.

Text table 3-9.
**Major fields of those who left engineering but completed bachelor's degrees: 1982–1993 cohort, by gender [percentage distribution]**

| Major field | Men | Women | All |
|---|---|---|---|
| Computer science | 31.4 | 14.3 | 27.1 |
| Business (including accounting, finance, marketing, etc.) | 25.4 | 14.9 | 22.7 |
| Physical sciences | 17.3 | 29.5 | 20.4 |
| Social sciences | 11.41 | Low N[1] | 10.91 |
| Life sciences | Low N[1] | 15.11 | 6.2 |
| All other | 11.31 | 17.01 | 12.7 |

[1] Male/female comparisons are not statistically significant.

SOURCE: NCES, High School and Beyond/Sophomore Cohort, 1982–1993 Cohort

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

—Clifford Adelman, Senior Research Analyst, U.S. Department of Education

## Changes in Course Participation, 1972–1993

College transcripts from two longitudinal studies sponsored by the U.S. Department of Education's National Center for Education Statistics provide the basis for generating time-series data on college course taking.[6] The analysis focuses on students who primarily attend 4-year institutions. Text table 3-10 displays the changes in the proportion of students in each cohort who completed courses in four key categories of mathematics. (There are 20 course categories in the mathematics taxonomy used in these studies.) With few exceptions, participation rates increased for all subgroups in all four of the categories. A principal reason for this expansion may lie in a jump in the proportion of bachelor's degree recipients majoring in business fields from 17 percent to 25 percent; simultaneously, the mathematics requirements for business degrees increased.

Nonetheless, with respect to participation, the following conclusions can be reached:

- Women reached virtual "participation parity" with men in college algebra and statistics taught in mathematics departments.
- The ratio of men to women completers of calculus courses dropped from 2.43:1 to 1.75:1. There is another category of calculus course not included in this table, "Calculus for Life Sciences, Economics, or Business," in which women reached near participation parity with men (for the High School and Beyond/Sophomore Cohort, 4.3 percent of women completed this "applied calculus" course compared to 4.8 percent of men).
- Among underrepresented racial/ethnic groups, Hispanic students evidence the most dramatic increase in participation in calculus; black students have the lowest participation rate.

[6] The first of these cohorts was the high school graduating class of 1972 (NLS-72); the second was the high school graduating class of 1982 (High School and Beyond/Sophomore Cohort). The college records of these two cohorts, gathered at approximately age 30 in both cases, cover the period from 1972 to 1993. There are some striking differences in the undergraduate course participation rates of students in these two cohorts.

## Changes in Course Participation, 1972–1993 *(continued)*

Text table 3-11 shows the proportion of students reaching midlevel course work in key laboratory sciences. The midlevel courses were chosen to illustrate the extent to which students from different groups persist beyond introductory courses. Because the courses are midlevel, the percentage of students taking them will be comparatively small. Where there are major changes in these percentages, for example in genetics or organic chemistry, it must be determined whether these changes are caused by changes in fields of concentration. Partly for this reason, the courses selected are generally less dependent on a student's major than others. Such courses as microbiology, anatomy and physiology, or organic biochemistry (all of which are part of the Nursing curriculum) were not selected for this analysis because they distort the issue of women's participation in science beyond the introductory level. Nursing and allied sciences, like engineering, are still gender-segmented fields.[7]

There were considerable declines in participation rates in both basic and midlevel laboratory science courses from 1972 to 1982, a trend in the opposite direction of that in mathematics. In text table 3-11, these declines are noticeable in both genetics and organic chemistry, particularly among men. Only among Asian students did participation rates not decline.

[7] Of the courses selected, organic chemistry is somewhat of an outlier because it is a de facto "service course" for premeds, regardless of major. The same cannot be said for genetics, physiological psychology, or biochemistry.

Text table 3-10.
**Percent of 4-year college students who completed key mathematics courses, in two age cohorts**

| Course, gender, and race/ethnicity | 1972–1984 Cohort | 1982–1993 Cohort |
|---|---|---|
| College algebra | | |
| Men | 19.8 | 26.7 |
| Women | 12.9 | 24.9 |
| White | 16.8 | 26.1 |
| Asian | Small sample[1] | 16.5 |
| Black | 17.1 | 26.1 |
| Hispanic | 18.3 | 21.5 |
| Precalculus | | |
| Men | 22.3 | 26.5 |
| Women | 11.6 | 17.9 |
| White | 17.8 | 21.7 |
| Asian | 32.3 | 48.7 |
| Black | 12.1 | 22.1 |
| Hispanic | 12.4 | 15.5 |
| Statistics[2] | | |
| Men | 22.7 | 27.4 |
| Women | 17.1 | 24.7 |
| White | 20.4 | 26.9 |
| Asian | 34.1 | 28.5 |
| Black | 17.0 | 20.5 |
| Hispanic | 16.1 | 20.9 |
| Calculus | | |
| Men | 34.5 | 40.3 |
| Women | 14.2 | 23.0 |
| White | 25.9 | 32.2 |
| Asian | 49.1 | 63.3 |
| Black | 14.5 | 18.5 |
| Hispanic | 16.1 | 26.3 |

[1] Sample size insufficient to produce a reliable estimate.
[2] Statistics courses include only those offered in mathematics departments.

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Text table 3-11.
**Percent of 4-year college students who completed selected midlevel laboratory science courses, in two age cohorts**

| Course, gender, and race/ethnicity | 1972–1984 Cohort | 1982–1993 Cohort |
|---|---|---|
| Biochemistry | | |
| Men | 6.5 | 4.4 |
| Women | 5.6 | 5.5 |
| White | 6.2 | 4.8 |
| Asian | 10.2 | 15.9 |
| Black | 4.2 | 3.8 |
| Hispanic | Small sample[1] | 4.5 |
| Genetics | | |
| Men | 10.7 | 6.2 |
| Women | 7.8 | 5.8 |
| White | 9.3 | 6.1 |
| Asian | 12.9 | 12.9 |
| Black | 7.9 | 3.8 |
| Hispanic | 7.3 | Small sample[1] |
| Organic chemistry | | |
| Men | 16.1 | 9.6 |
| Women | 10.6 | 9.6 |
| White | 13.5 | 9.5 |
| Asian | 22.5 | 24.8 |
| Black | 10.2 | 7.3 |
| Hispanic | 11.5 | 5.6 |
| Physiological psychology | | |
| Men | 2.7 | 3.2 |
| Women | 3.9 | 4.2 |
| White | 3.4 | 3.7 |
| Asian | 8.7 | 8.9 |
| Black | Small sample[1] | 2.2 |
| Hispanic | Small sample[1] | 5.8 |

[1] Sample size insufficient to produce a reliable estimate.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

## Baccalaureate Origins of Black Women Earning Doctorates

Historically Black Colleges and Universities (HBCUs) play a critical role in educating black women who go on to earn doctorates in science and engineering. A study examining the baccalaureate origins of 1,465 black women who went on to earn doctoral degrees between 1975 and 1992 in the fields of biological sciences, physical sciences, and the social sciences noted that, in 1992, black women earned 49 percent of the science and engineering (S&E) doctorates awarded to black U.S. citizens (Leggon and Pearson, 1997). Of these, the greatest number earned was in the social sciences (1,217), followed by the biological sciences (211), and the physical sciences (37).

Across fields, 52 percent earned their undergraduate degrees from predominantly white colleges and universities (PWCUs), 38 percent from HBCUs, and 10 percent from women's colleges, but there were significant differences by field.

Among black women earning doctorates in the biological sciences, almost 75 percent earned undergraduate degrees from HBCUs. Of the remaining 25 percent, half received bachelor's degrees from PWCUs and half from women's colleges. A similar pattern holds for black women earning doctorates in the physical sciences. Slightly more than two-thirds had baccalaureate origins in HBCUs. Equal proportions of the remaining one-third had such origins in women's colleges and PWCUs.

For those in the social sciences, almost 60 percent earned the baccalaureate from PWCUs; approximately 30 percent from HBCUs; and less than 10 percent from women's colleges. Of the 27 biological scientists earning undergraduate degrees in women's colleges, 18, or two-thirds, earned them from the two historically black women's colleges—Spelman and Bennett. Of the six African American women earning a doctorate in the physical sciences between 1975 and 1992, four did so from Spelman College. Among the 115 African American women earning social science doctorates, Spelman and Bennett produced more than all of the Seven Sisters colleges—54 and 51, respectively.[8]

Across fields, Spelman and Bennett Colleges produced slightly more than half of the black women earning doctorates, the Seven Sisters produced approximately two-fifths, and other women's colleges produced one-tenth.

— Cheryl B. Leggon, Wake Forest University

The continuing importance of HBCUs to the undergraduate science and engineering education of black men and women, whether or not they go on to earn doctorates, can be seen in text tables 3-12 to 3-14.

[8] The "Seven Sisters" colleges are Barnard, Bryn Mawr, Mount Holyoke, Radcliffe, Smith, Wellesley, and Vassar (now coed).

Text table 3-12.
**Percentage of all science and engineering bachelor's degrees awarded to blacks by HBCUs, by field, selected years: 1987–1994**

| Year | Engineering | Physical sciences | Mathematics | Computer sciences | Biological sciences | Agricultural sciences | Psychology | Social sciences |
|---|---|---|---|---|---|---|---|---|
| 1987 | 24.1 | 42.0 | 51.0 | 42.1 | 37.8 | 49.7 | 19.0 | 22.9 |
| 1991 | 26.4 | 47.5 | 45.5 | 37.5 | 37.5 | 59.3 | 22.8 | 22.9 |
| 1994 | 25.9 | 45.7 | 45.3 | 37.7 | 40.2 | 50.0 | 25.0 | 24.9 |

NOTE: Physical sciences includes earth and atmospheric sciences.

SOURCES: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics and IPEDS Completions Surveys, 1987–1994. See appendix tables 3-25, 3-26, and 3-27.

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## Baccalaureate Origins of Black Women Earning Doctorates *(continued)*

Text table 3-13.
**Percentage of bachelor's degrees awarded to black men by HBCUs, by field, selected years: 1987–1994**

| Year | Engineering | Physical sciences | Mathematics | Computer sciences | Biological sciences | Agricultural sciences | Psychology | Social sciences |
|---|---|---|---|---|---|---|---|---|
| 1987 | 23.1 | 36.0 | 53.4 | 39.1 | 36.5 | 58.0 | 16.9 | 24.7 |
| 1991 | 24.2 | 41.7 | 43.2 | 34.3 | 33.2 | 60.0 | 20.6 | 20.3 |
| 1994 | 23.8 | 42.5 | 39.6 | 32.8 | 36.0 | 50.4 | 23.8 | 22.8 |

NOTE: Physical sciences includes earth and atmospheric sciences.

SOURCES: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics and IPEDS Completions Surveys, 1987–1994. See appendix tables 3-25, 3-26, and 3-27.

Text table 3-14.
**Percentage of bachelor's degrees awarded to black women by HBCUs, by field, selected years: 1987–1994**

| Year | Engineering | Physical sciences | Mathematics | Computer sciences | Biological sciences | Agricultural sciences | Psychology | Social sciences |
|---|---|---|---|---|---|---|---|---|
| 1987 | 26.2 | 48.7 | 48.7 | 44.6 | 38.6 | 35.1 | 19.7 | 24.4 |
| 1991 | 30.9 | 53.9 | 47.6 | 40.4 | 39.6 | 58.1 | 23.5 | 24.9 |
| 1994 | 30.3 | 49.0 | 50.1 | 42.3 | 42.0 | 49.6 | 25.3 | 26.5 |

NOTE: Physical sciences includes earth and atmospheric sciences.

SOURCES: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics and IPEDS Completions Surveys, 1987–1994. See appendix tables 3-25, 3-26, and 3-27.

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## Degree Recipients in Science and Engineering From Universities in Puerto Rico

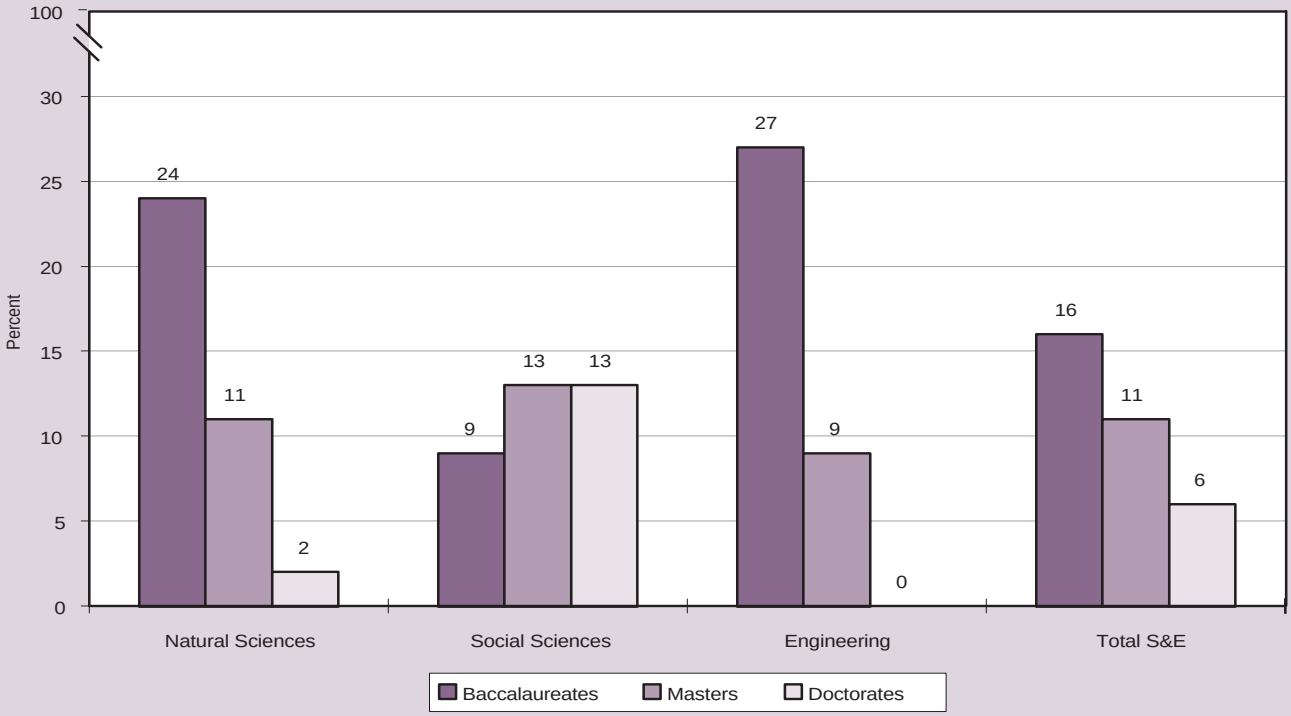
Since 1991, the number of bachelor's, master's, and doctoral degrees in science and engineering (S&E) fields conferred by institutions in Puerto Rico has increased. In 1995, institutions in Puerto Rico accounted for a significant proportion of Hispanics in the United States earning S&E degrees—16 percent of bachelor's, 11 percent of master's, and 6 percent of doctoral degrees (see figure 3-4 and appendix tables 3-28, 3-29, and 3-30).

Universities in Puerto Rico accounted for 27 percent of the engineering bachelor's degrees awarded to Hispanics in the United States in 1995. Among natural science fields, Puerto Rican universities accounted for 26 percent of biological science and 39 percent of physical science bachelor's degrees awarded to Hispanics (NSF, 1997).

Of recent science and engineering bachelor's degree recipients from institutions in Puerto Rico, 35 percent attended graduate school. Of those who earned their bachelor's degree from Puerto Rican institutions and then earned a doctorate in science and engineering from 1991 to 1995, 75 percent earned their doctorates from universities on the continent and 25 percent from universities in Puerto Rico. Two universities in Puerto Rico—University of Puerto Rico at Rio Piedras and University of Puerto Rico at Mayaguez—provided doctorate education to the majority of science and engineering doctorate recipients from universities in Puerto Rico.

## Degree Recipients in Science and Engineering From Universities in Puerto Rico *(continued)*

Figure 3-4.
**Degrees conferred by institutions in Puerto Rico as a percentage of all degrees awarded to Hispanics in the United States**




SOURCE: National Science Foundation/SRS. Science and Engineering Degrees, by Race/Ethnicity of Recipients: 1989–1995, tables 22-30.

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## Transition to Graduate Education

Analysis of data from the Graduate Record Examination (GRE) General Test shows that there are differences in mean scores among men and women in different racial/ethnic groups (Educational Testing Service, 1996). These findings may reflect differences in enrollment and outcome described elsewhere in this chapter.

According to a report on GRE performance released by the Educational Testing Service in 1996

- Men and women tend to have similar mean scores on the verbal and analytical measures; however, men have higher mean scores on the quantitative measure.
- Mean scores for non-U.S. citizens are higher than those for U.S. citizens on the quantitative measure and lower on the verbal and analytical measures.
- Whites tend to have higher mean scores than all other racial/ethnic groups on the verbal and analytical measures, whereas Asian Americans have higher mean scores on the quantitative measure.
- Mean scores on all measures are lowest for black and Puerto Rican examinees.
- Mean scores on each measure are higher for men than women across all racial/ethnic groups and measures.

## Conclusion

The patterns described in this chapter provide evidence that disparity yet exists among racial/ethnic, gender, and disability categories. Although most bachelor's degrees in engineering, physical sciences, computer science, and agricultural sciences are earned by white males, trends suggest movement toward a greater representation of minorities within these fields. In some fields, women now earn half or more than half of all degrees awarded.

In addition to highlighting historical trends in enrollment and outcomes at the undergraduate level, several interesting findings emerged from the indices of representation. The proportion of white males

and females enrolled as undergraduates has declined since 1980, whereas racial/ethnic minorities have improved their representation in all undergraduate fields, including science, mathematics, and engineering. The rate of improvement among black males has been slower than that of all other minority groups. During the decade of the 1980s, the total number of bachelor's degrees awarded to all underrepresented minorities increased, including degrees in science and engineering.

Data on enrollment and outcomes for students with disabilities is insufficient for detailed analysis. One recent study (Seymour and Hunter, 1998) examines factors that may discourage students with disabilities from completing undergraduate degrees in science and engineering.

Also noteworthy was the role that Historically Black Colleges and Universities and colleges and universities in Puerto Rico play in educating black women and Hispanic students who go on to earn graduate degrees in the sciences and engineering.

# Technical Notes to Chapter 3

## Indices of Representation: College Enrollment (pages 43–50)

Indices of representation were computed by dividing the proportion of the category enrolled in college by the proportion of the category in the general population 18 through 24 years of age and then multiplying the results by 100.[9] For example, if white males were 35 percent of the general population 18 through 24 years of age in 1994, and 35 percent of the persons enrolled in 4-year institutions of higher education, the IR for white males would be 100. (See appendix table 3-20.) If a category is represented in the college population in the same proportion as it is represented in the general population, its index score will be 100. The term "parity" is used in this chapter to describe this situation. If a category has a higher proportion in the general population than it has in the college population, its index score will be less than 100. The term "underrepresentation" is used to describe this situation.

On the other hand, if a category has a lower proportion in the general population than it has in the college population, its index score will be greater than 100. The term "overrepresentation" is used to describe this situation. It should be kept in mind that a category may have a high index score, yet constitute a small proportion of the college population. For instance, if Asian females constitute 1.95 percent of the general population 18 through 24 years of age, and 2.71 percent of the persons enrolled in 4-year institutions of higher education, their IR score would be 139. (See appendix tables 3-20.)

## Indices of Representation: Bachelor's Degrees Awarded (pages 50–56)

Indices of representation were computed to assess the relative representation of racial/ethnic and gender groups in the awarding of bachelor's degrees in 1994 and 1995. For 1994, the proportions of the racial/ethnic and gender groups among full-time, first-time, first-year students in 1990 were divided into the proportion of the racial/ethnic and gender groups receiving bachelor's degrees, and then multiplied by 100. Similarly, for 1995, the proportions of the racial/ethnic and gender groups among full-time, first-time, first-year students in 1991 were divided into the proportion of the racial/ethnic and gender groups receiving bachelor's degrees, and then multiplied by 100. This index can be interpreted similarly as the IR in college enrollment discussed earlier. It is noted that students take different lengths of time to complete a bachelor's degree program, and some programs, notably engineering, are longer than 4 years, but the IR should indicate patterns of differences among the racial/ethnic and gender groups in earning bachelor's degrees. The data for the development of the IRs excluded nonresident aliens and U.S. citizens and permanent residents for whom their race/ethnicity was unknown.

## Students With Disabilities (pages 45–46)

Researchers selected the University of Minnesota for the study because of its strong reputation in science, mathematics, and engineering; a record of enrolling a significant number of students with disabilities; and its well-established Office of Disability Services. Within the University of Minnesota, the Institute of Technology (IT) offers degrees in several engineering disciplines, as well as physics, astronomy, chemistry, geology, mathematics, and computer science. University of Minnesota IT students who had registered with the Disabled Services (DS) office of the university were invited to participate in this confidential study. They included 41 of the 93 full-time undergraduates registered at the IT in fall 1993, and a small (N=19) sample of recent graduates (that is, 1 to 5 years since graduation) who were working in the Twin Cities area.

[9] Population estimates from the U.S. Bureau of the Census were used for the general population data. These data included nonresident aliens, persons excluded from the college enrollment data. This difference will have the effect of reducing the Index of Representation for all of the categories. The Census data were obtained from the following reports: U.S. Bureau of the Census, *Current Population Reports, P25-1092*, "Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1992 to 2050." U.S. Government Printing Office, Washington, DC 1992; U.S. Bureau of the Census, *Current Population Reports, P25-1095*, "U.S. Population Estimates, by Age, Sex, Race, and Hispanic Origin: 1980 to 1991." U.S. Government Printing Office, Washington, DC 1993; U.S. Bureau of the Census, *Current Population Reports, P25, No. 601*, "Projections of the Population of the United States: 1975 to 2050," U.S. Government Printing Office, Washington, DC, 1975.

The total number of participants was 65, of whom 60 were IT undergraduates or graduates, and 5 of whom were undergraduates with disabilities majoring in disciplines other than science, mathematics, and engineering.

The students participated in interviews and focus groups, varying in length from 45 to 90 minutes. Interviews were conducted in the style of a focused conversation.

Like students in both public and private institutions, students who register themselves as having a disability at the University of Minnesota have access through the Office of Disability Services to a system of services. Such services were developed first in compliance with the Federally mandated 504 Regulations (1977), which required postsecondary institutions to make all programs accessible to qualified students with disabilities and provide reasonable accommodations, in accordance with the Americans with Disabilities Act (1990).

### American Indians in Higher Education (page 42)

The McAfee (1997) study was ethnographic in nature, it examined the experiences of 43 American Indians enrolled in nine undergraduate institutions in eight western states. Of those, 23 had left school. Of that number, only 22 percent were perceived to have a strong identity with their traditional cultures. By comparison, 50 percent of the 16 who had completed baccalaureate degrees were thought to have strong ties to their American Indian heritage.

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# CHAPTER 4

# GRADUATE EDUCATION

## Enrollment

### Overview

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 education constitutes a critical step in the preparation of most scholars and professionals. In pursuing graduate training, students must be more focused and directed in what courses they take.

Graduate school enrollment in the United States in science and engineering continued to increase over the 1985–1995 decade, from 358,126 students in 1985 to 423,922 students in 1995. (See appendix table 4-1.) In the most recent years (1993–1995), however, enrollment decreased by 3 percent. In addition, the composition of enrollment in graduate education in science and engineering fields became more diverse.

Women increased not only their numbers but also their share of total graduate enrollment, slowly becoming a majority in graduate enrollment in all fields combined (Syverson and Welch, 1996). Progress has been slower in science and engineering fields, where women and minorities (with the exception of Asian students) continue to be underrepresented in graduate school.[1] Women registered gains over the 1985–1995 decade in graduate enrollment, however, and underrepresented minorities made more limited progress.

### Women

#### *Enrollment Composition*

Women's graduate enrollment in the science and engineering fields, at 160,864 students in 1995, has increased 45 percent from 1985 enrollment of 110,662. (See figure 4-1 and appendix table 4-2.) During the same period, the number of male science and engineering graduate students reached 263,058, a 6 percent increase from 247,464 in 1985. (See appendix table 4-3.) Graduate enrollment steadily increased in almost all fields until 1993 when small changes within fields resulted in decreases. In some cases, this was the first time in 20 years that decreases had occurred. These changes had an effect on total graduate enrollment in 1995. (See appendix table 4-1.) Although total enrollment decreased 3 percent and male enrollment decreased 6 percent between 1993 and 1995, the number of female students grew by 3 percent from 156,757 in 1993 to 160,864 in 1995. (See appendix table 4-2.) Most of the increase in the number of women graduate students can be attributed to increased enrollment in the social sciences, (to 42,274), psychology (to 38,142), and the biological sciences (to 28,819) in 1995. Not surprisingly, biological sciences, psychology, and social sciences command the largest proportions of women science students: 20 percent, 27 percent, and 30 percent, respectively, and the largest numbers of female graduate students. (See figures 4-2 and 4-3.)

#### *Changes in Enrollment*

Female graduate science enrollment rose by 43 percent from 99,582 in 1985 to 142,712 in 1995. The increase has slowed recently, however; an increase of only 3 percent occurred from 1993 to 1995. As a proportion of total female science and engineering graduate enrollment, women enrolling in engineering increased from 10 to 11 percent. (See appendix table 4-2.) Female enrollment in the physical sciences increased 40 percent between 1985 and 1995, although it has decreased 1 percent since 1993. Other major science fields in which female enrollment decreased from 1993 to 1995 were mathematics (6 percent) and computer science (4 percent). (See appendix table 4-2.)

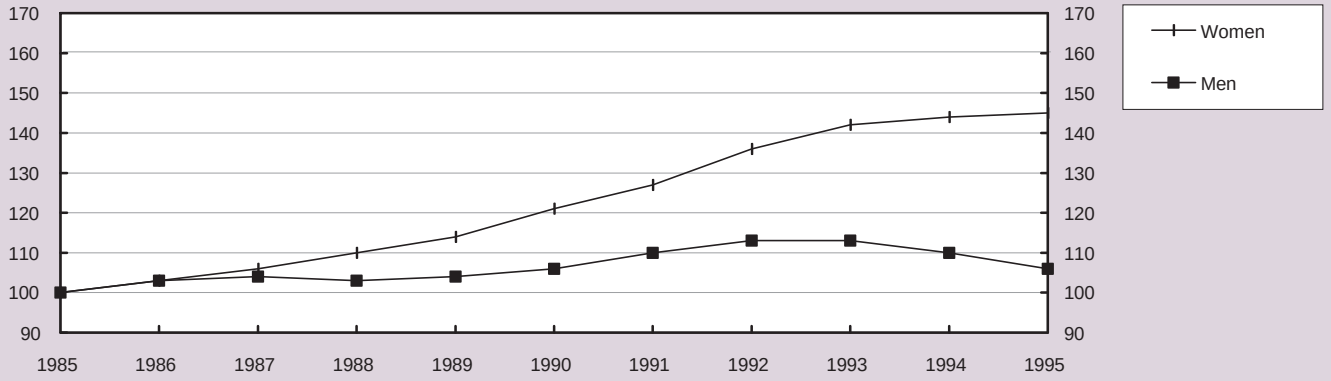
Female enrollment in earth, atmospheric, and ocean sciences increased by 40 percent between 1985 and 1995. As noted previously, most female graduate enrollment is concentrated in the biological sciences, psychology, and social sciences, and all had increases

[1] It must be noted that over the last decade women and minorities have made progress in the proportion of their participation in science and engineering fields. Because of the nature of calculating percentage changes, in many instances the largest increases are often within the populations that had the lowest numbers at the outset. Therefore, the reader is cautioned that the percentage change data for certain minority groups, although impressive, may not reflect very large increases in absolute numbers.

Figure 4-1.

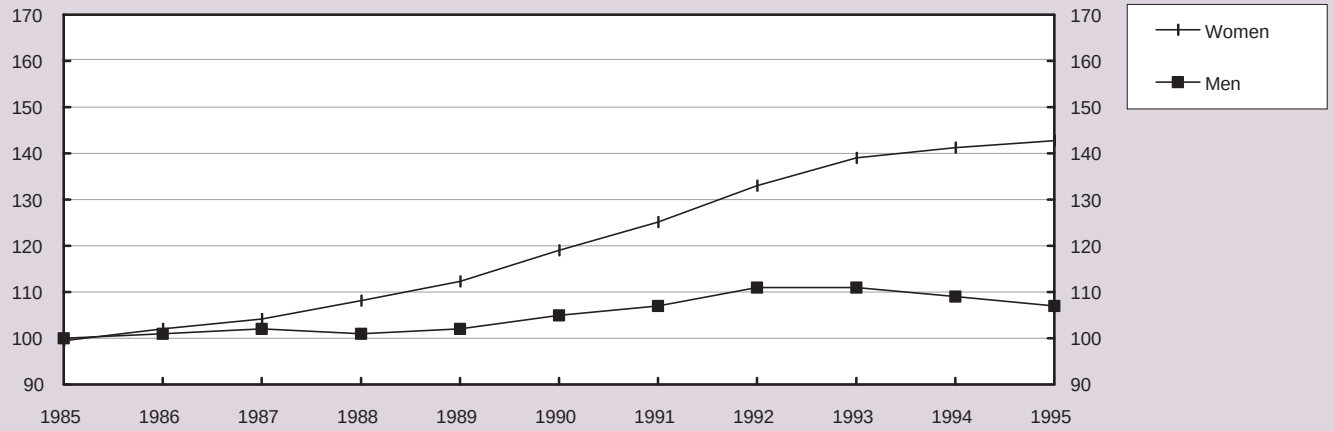
**Graduate science and engineering enrollment growth rate by sex: 1985–1995**

Index: 1985 = 100



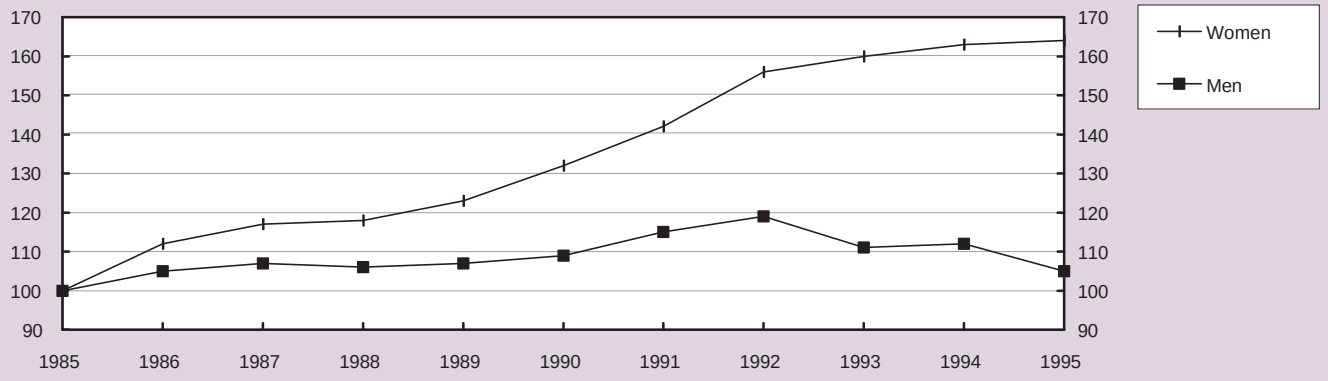

**Graduate science enrollment growth rate by sex: 1985–1995**

Index: 1985 = 100




**Graduate engineering enrollment growth rate by sex: 1985–1995**

Index: 1985 = 100

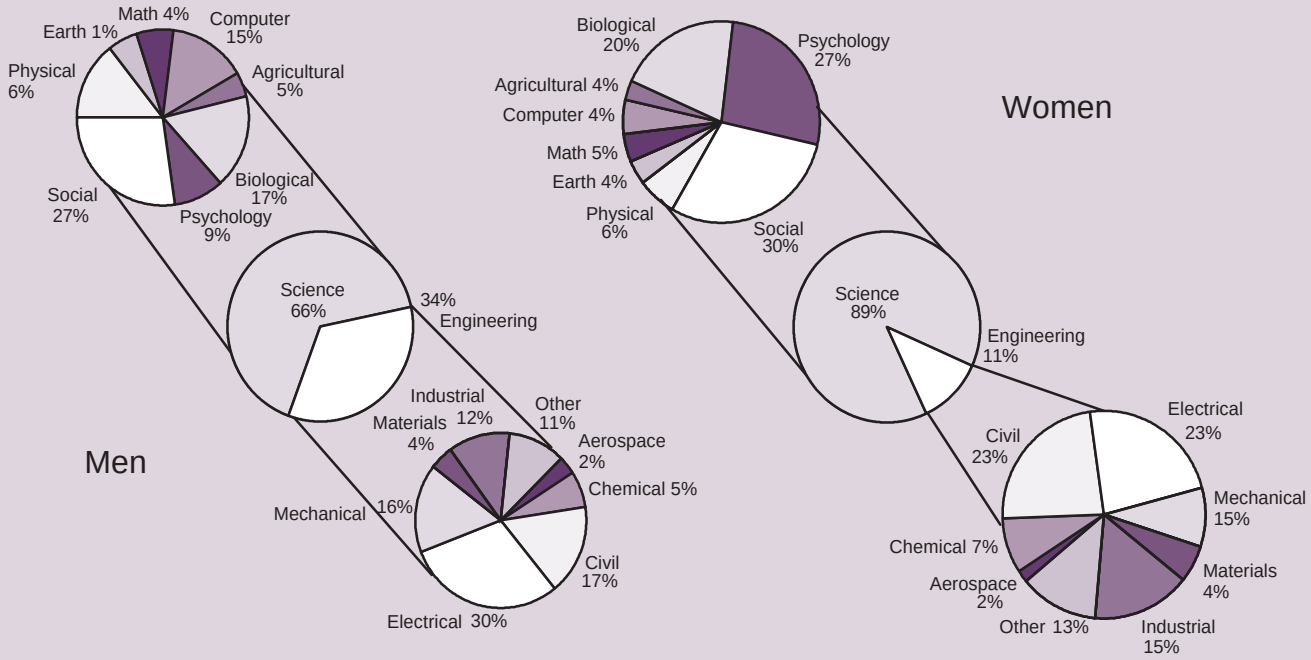



See appendix tables 4-2 and 4-3.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

Figure 4-2.

**Science and engineering graduate students, by field of enrollment: 1995**

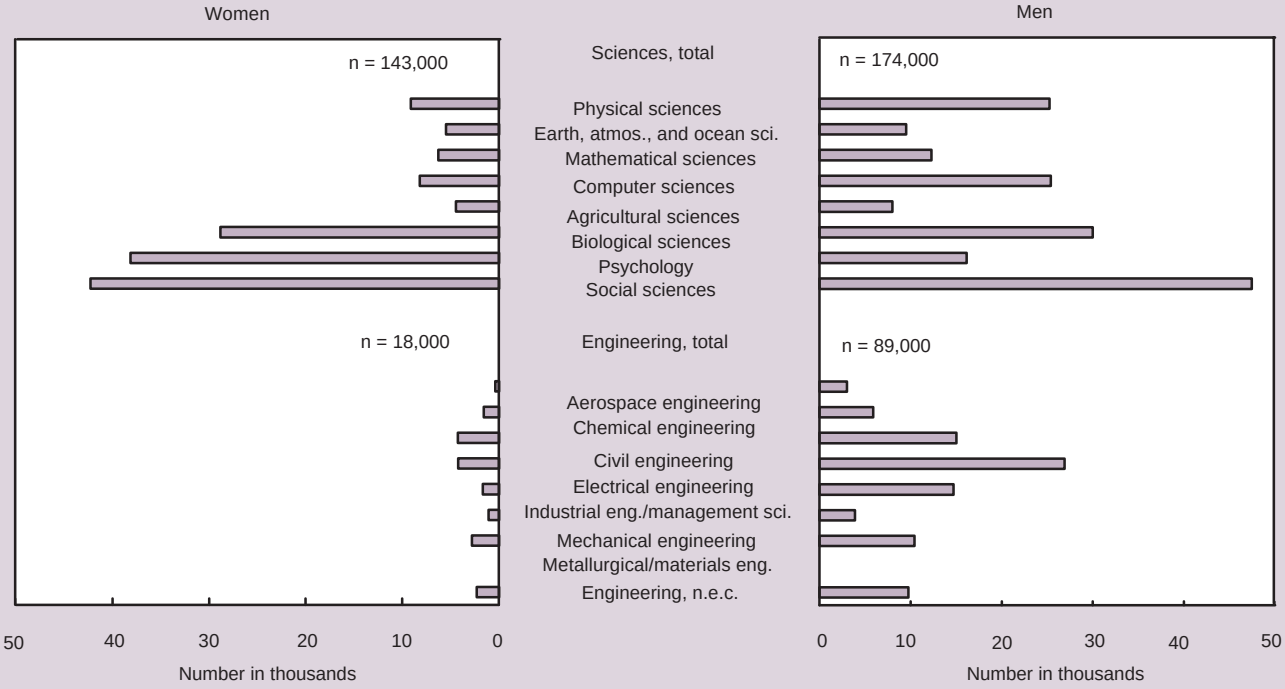



See appendix tables 4-2 and 4-3.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

Figure 4-3.

**Science and engineering enrollment, by field and gender: 1995**




See appendix tables 4-2 and 4-3.

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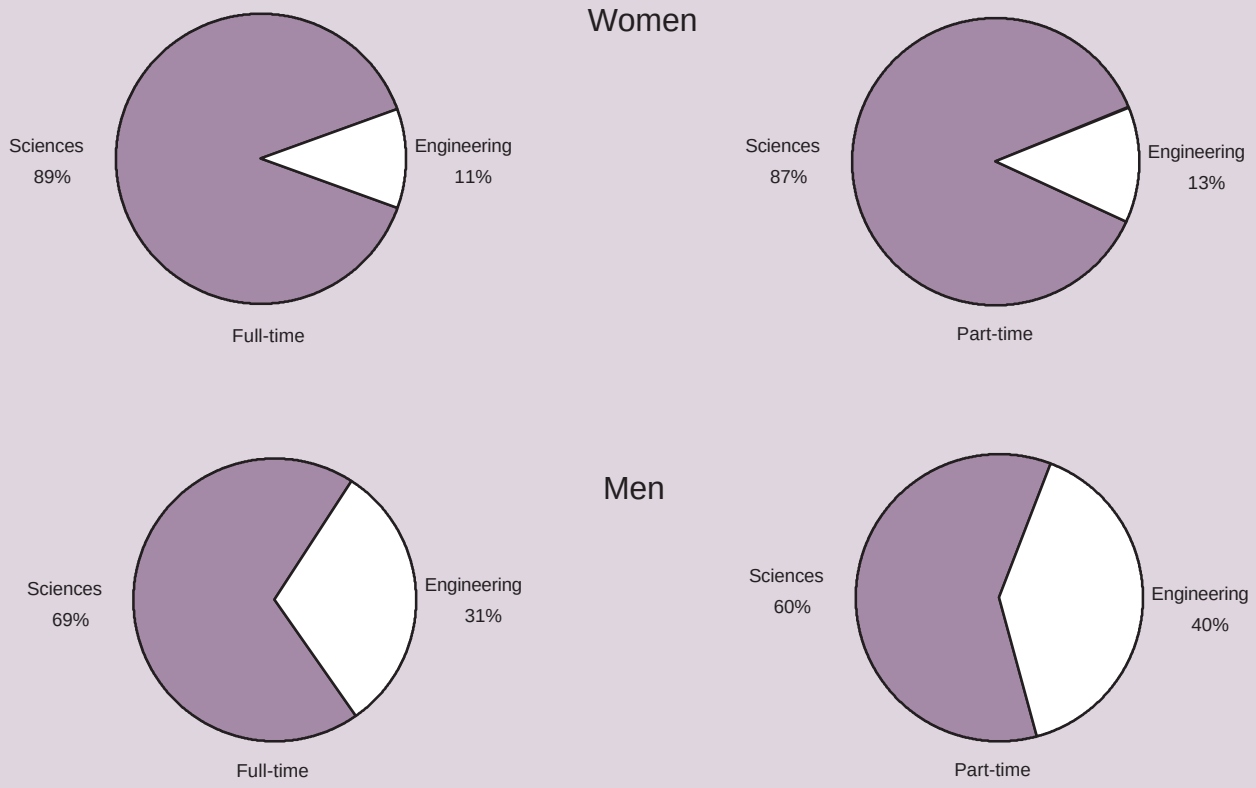
of approximately 50 percent between 1985 and 1995. (See appendix table 4-2.) Female enrollment in engineering fields increased 64 percent between 1985 and 1995, with the increase slowing to 3 percent between 1993 and 1995. Three of the eight engineering fields had decreases in the number of women graduate students between these 2 years: aerospace (2 percent), electrical (3 percent), and mechanical (6 percent). Engineering comprises 11 percent of female science and engineering enrollment; civil engineering and electrical engineering both comprise less than 3 percent. Astronomy, other geosciences,[2] and aerospace engineering had the largest increases in the number of women graduate students from 1985 to 1995 (107, 172, and 115 percent, respectively), although their share of total science and engineering remains very small. (See appendix table 4-2.)

[2] "Other geosciences" includes such fields as conservation, environmental chemistry, environmental science, environmental science/planning, environmental studies, and natural resources.

## Enrollment Status

An increasing percentage of the full-time graduate science and engineering student population are women. (See appendix tables 4-4 and 4-5.) Of the 107,805 women enrolled in science and engineering full time, 89 percent were in science fields in 1995 compared to full-time male science enrollment of 69 percent. (See figure 4-4.) Full-time female enrollment in graduate science and engineering programs increased 54 percent from 1985, compared to a male enrollment increase of 10 percent. Since 1993, female enrollment increased 4 percent when male enrollment decreased 6 percent. (See appendix tables 4-5 and 4-6.) Male enrollment continues to dominate the engineering fields, though there has been a 10 percent decrease in full-time male enrollment since 1993. (See appendix table 4-6.) Women, on the other hand, slightly increased their full-time engineering enrollment by 3 percent from 1993 to 1995. Women made long strides overall from 1985 to 1995 with an 84 percent increase

Figure 4-4.
**Science and engineering graduate students by enrollment status and gender: 1995**




See appendix tables 4-5, 4-6, 4-8, and 4-9.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

in full-time engineering enrollment compared to men's 14 percent increase during the same period. Male enrollment in full-time science and engineering programs decreased in every field except biological sciences since 1993.

Female part-time graduate student enrollment in science was 87 percent of all female part-time science and engineering enrollment compared to men's 60 percent in 1995. (See figure 4-4.) Unlike the increase in female full-time enrollment, the part-time graduate enrollment in science and engineering for women of 53,059 in 1995 (39 percent of all part-time science and engineering graduate students) represented a 1 percent decline from the 1993 enrollment of 53,502. (See appendix table 4-7 and 4-8.) In comparison, however, enrollment for men also declined between 1993 and 1995: the 1995 enrollment of 82,847 was smaller than the 1993 enrollment of 88,504 by 6 percent. (See appendix table 4-9.) Female part-time enrollment decreased in the sciences but increased in engineering from 1993 to 1995 by 2 percent. Part-time female graduate enrollment increased 30 percent between 1985 and 1995. (See appendix table 4-8.) Male part-time graduate enrollment decreased 1 percent during that same period. (See appendix table 4-9.)

### Sources of Financial Support

In 1995, both men and women in graduate engineering programs reported comparable means of financial support. The proportions relying primarily on self support were nearly the same, 27 percent for men and 29 percent for women. (See figure 4-5.) Only in the aerospace engineering field was there a notable gender difference in the proportions of students relying on self support, 20 percent for men and 13 percent for women. (See appendix table 4-10.)

In science, institutional support was the primary source of support for 45 percent of male and 43 percent of female graduate students. Female graduate students were more likely than males to be self supported (35 percent versus 26 percent). In computer sciences, psychology, and social sciences, close to 50 percent of women and about 40 percent of men relied on self support. In mathematics, almost equal proportions of men, 69 percent, and women, 67 percent, received institutional support.

### Graduate Schools

The graduate school with the largest number of female graduate students in 1995 was the University of Minnesota (all campuses), which had 1,880 female graduates enrolled. (See figure 4-6.) This university has been the top graduate school in female enrollment for 8 of the past 10 years. George Washington University increased its female enrollment over 100 percent, from 818 students in 1985 to 1,662 in 1995. Indiana University (all campuses) also increased its female enrollment by 100 percent, from 587 female students in 1985 to 1,423 female students in 1995. (See appendix table 4-11.)

In 1995, 4,489 science and engineering graduate students enrolled in Historically Black Colleges and Universities (HBCUs) of which 2,206 were women. Female graduate students increased their enrollment in HBCUs by 68 percent from 1985 to 1995. (See appendix tables 4-12 and 4-13.)

## Minorities

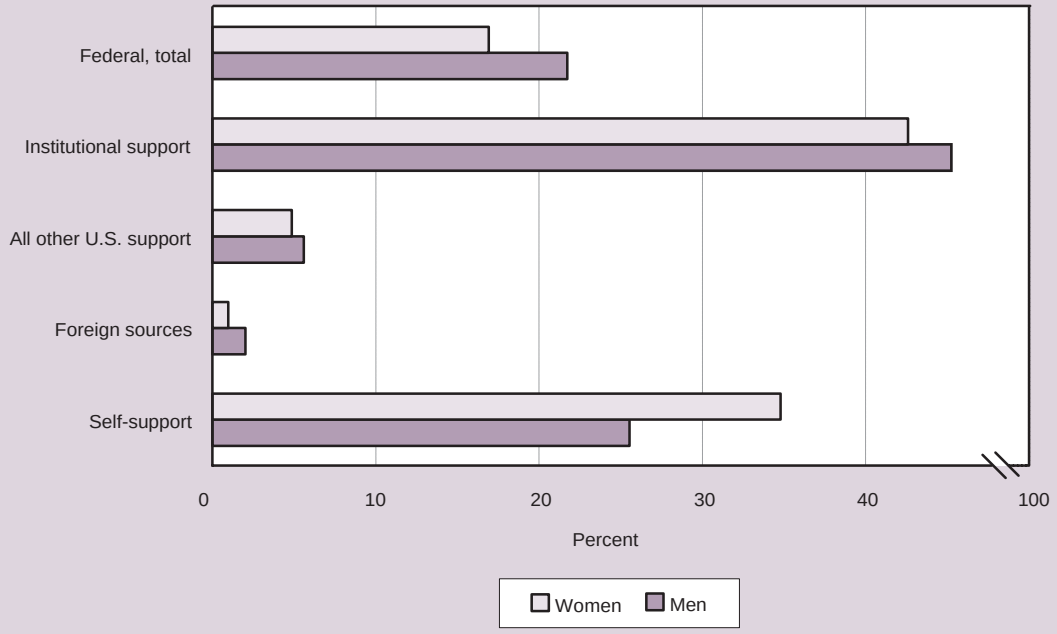
### Enrollment Composition

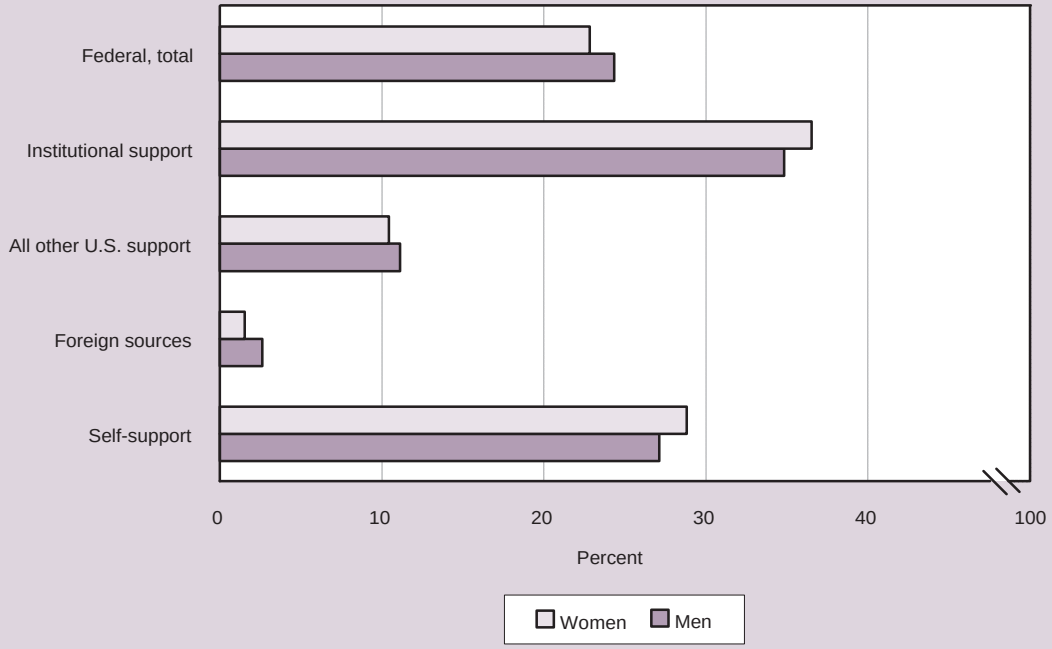
Of the 325,135 U.S. citizen and permanent resident students enrolled in graduate science and engineering programs in 1995 (both full time and part time) (see appendix table 4-14), 14 percent were minorities. Blacks (6 percent), American Indians (1 percent), and Hispanics (4 percent), continued to be substantially underrepresented. (See appendix tables 4-15, 4-16, and 4-17.) Asian students were 8 percent of graduate science and engineering enrollment. (See appendix table 4-18.)

#### Blacks

For black students, the increase in graduate science and engineering enrollment from 1985 to 1995 was 76 percent, an increase of approximately 8,000 students. In science, black enrollment was up 71 percent from 1985, from 9,066 students to 15,494 in 1995. (See figure 4-7.) Of the major fields, agricultural science, although numbers are small, increased its enrollment of black graduate students from 137 in 1985 to 293 students in 1995. Psychology and computer science fields almost doubled their enrollment of black graduate students during this period increasing 91 percent, adding 1,632 students into these fields. Over a third of black students were enrolled in social science. (See figure 4-8.) Of the 6,907 social science students enrolled in 1995, the largest field was political science with 3,559 students. Physics, atmospheric science, other geosciences, anthropology, and history of science, whose black enrollment more than doubled or tripled between 1985 and 1995, increased their black enrollment in these fields combined by 214 students. Engineering enrollment also doubled for blacks between 1985 and 1995, increasing 107 percent from 1,387 in 1985 to 2,872 in 1995, adding 1,485 students. Between 1993 and 1995, decreases

Figure 4-5.
**Primary source of support for full-time science and engineering graduate students in science, by sex: 1995**

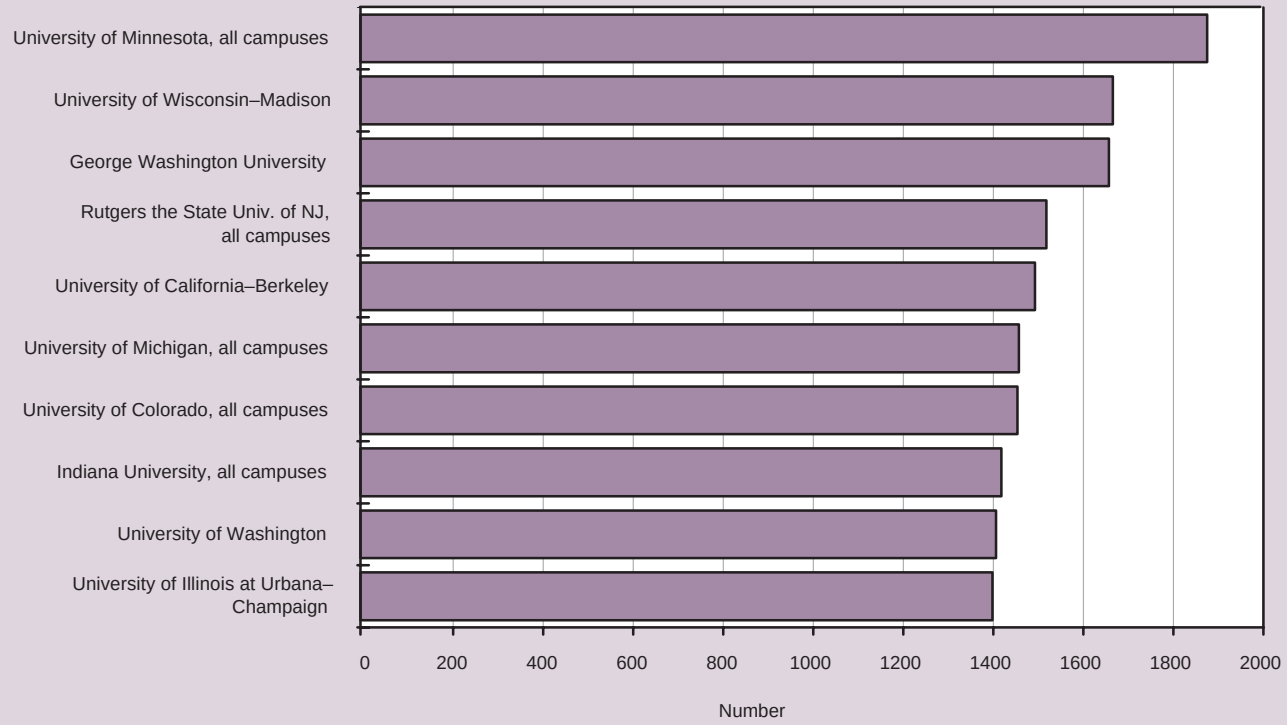



See appendix table 4-10.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

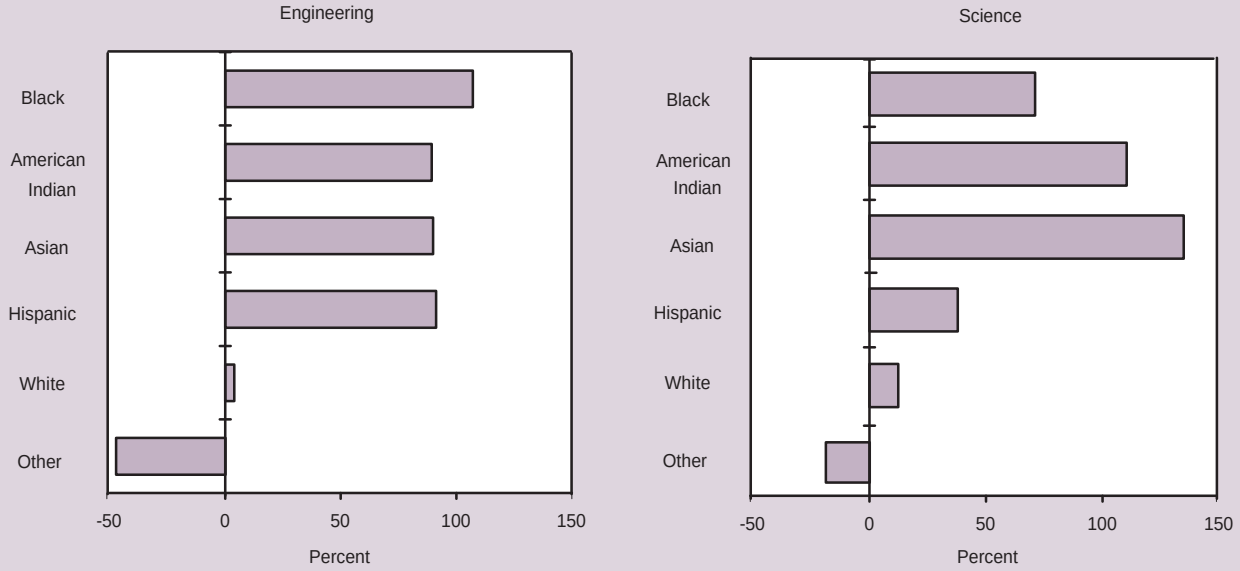
Figure 4-6.
**Female graduate science and engineering enrollment, by institutional rank: 1995**




See appendix table 4-11.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

Figure 4-7.
**Percentage change in science and engineering enrollment, by field and race/ethnicity of U.S. citizens and permanent residents: 1985–1995**




See appendix tables 4-15 and 4-20.

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in black student enrollment were small, losing fewer than 80 students in science subfields and fewer than 50 students in engineering subfields. (See appendix table 4-15.)

### American Indians

There were 1,524 American Indians enrolled in science and engineering in 1995, an increase of 107 percent from 737 students enrolled in 1985.[3] In science, enrollment increased 110 percent adding 688 students from 1985 to 1995. The fields with the largest concentrations of these graduate students were biological sciences (214 students), psychology (331 students), and social sciences (434 students). American Indian enrollment in engineering increased over 100 students from 1985 to 1995. (See appendix table 4-16.)

### Hispanics

Hispanic students increased their graduate science and engineering enrollment by 64 percent between 1985 (8,614) and 1995 (14,089). Students enrolling in science fields totaled 11,258 students in 1995, a 58 percent increase from 7,133 in 1985. Enrollment in all major fields of science increased between 1985 and 1995, except in agricultural sciences which decreased 10 percent. Biological science (1,810), psychology (2,777), and social science (4,221) have the largest numbers and proportions of Hispanic graduate students in science. (See figure 4-8.) Political science is the largest of the social science fields and comprised 14 percent of all Hispanic science and engineering student enrollment. Engineering enrollment for Hispanics increased 5 percent from 1,481 students in 1985 to 2,831 students in 1995. (See appendix table 4-17.)

### Asians

Asian students increased their graduate enrollment in science and engineering by 117 percent, from 12,003 in 1985 to 26,015 in 1995. Asian graduate student enrollment in science fields in 1995 (16,897) increased 135 percent from 1985 (7,198), and doubled, tripled, and sometimes quadrupled within some fields. Asian student enrollment in engineering (9,118) increased 90 percent. The largest numbers of Asian engineering students are in the subfields of civil engineering (1,360), mechanical engineering (1,243), and electrical engineering (3,762). Although the combined Asian enrollment in science and engineering yielded an increase of 8 percent between 1993 and 1995, there were decreases of about 400 students combined in various subfields of physical sciences, earth sciences, and engineering. (See appendix table 4-18.)

### Whites

White students increased their science and engineering enrollment by 10 percent between 1985 (223,682) and 1995 (246,776). (See appendix table 4-19.) Students enrolling in science fields totaled 194,663 students in 1995, a 12 percent increase from 173,541 in 1985. For nearly half of the major fields in science, however, enrollment decreased. Engineering enrollment increased 4 percent between 1985 and 1995. White graduate student enrollment in science and engineering decreased 4 percent between 1993 and 1995; in engineering only, enrollment decreased 9 percent.

### Unknown Race/Ethnicity

Graduate students in science and engineering whose race and ethnicity were not specified were 9 percent of U.S. citizen and permanent resident graduate students in 1985 and 6 percent in 1995 (a decrease in numbers of 29 percent), probably reflecting better reporting of race/ethnicity; however, this group increased 5 percent during 1993 to 1995. (See appendix table 4-20.)

## *Race by Gender*

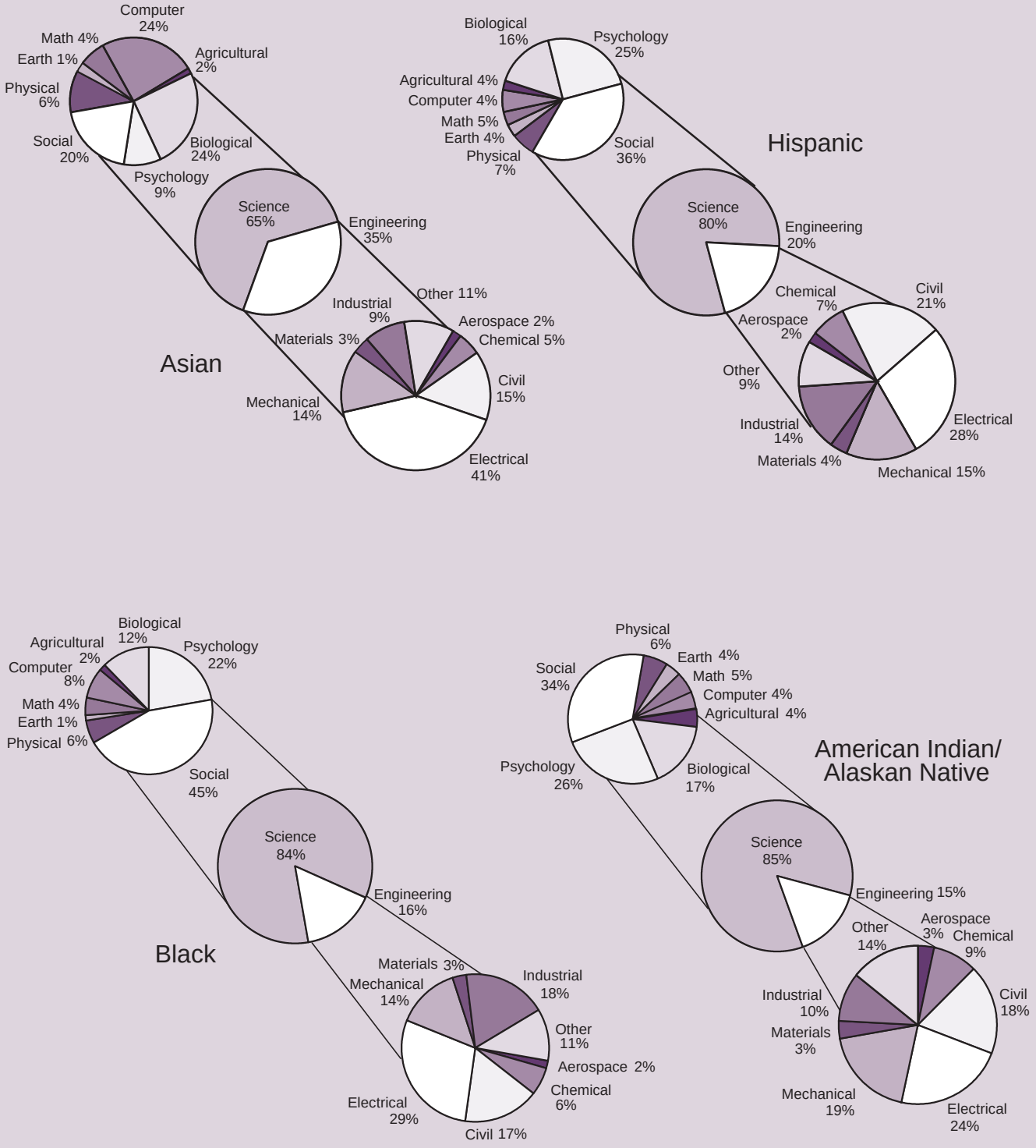
Of the 325,135 U.S. citizen and permanent resident science and engineering graduate students enrolled in colleges and universities in this country in 1995, 134,643 were female, representing 41 percent (see appendix table 4-21). Of the female science and engineering students in 1995, 21 percent were minorities; in 1994, 20 percent. Blacks represented 8 percent, American Indians 1 percent, Asians 7 percent, and Hispanics 5 percent. Of the male graduate science and engineering students (190,492) in 1995, the portion who were black was 4 percent, American Indians less than 1 percent, Asians 9 percent, and Hispanics 4 percent.

The enrollment of racial/ethnic minority graduate students is most prominent in the social sciences except for Asian students who are prominent in engineering fields. Black, American Indian, and Hispanic females tend to be concentrated in the social sciences, whereas Asian female students are concentrated in the biological sciences. White female students are in

[3] Some of this increase may be due to changes in racial identification. Between the 1970 and 1980 censuses and between the 1980 and 1990 censuses, the number of American Indians increased in excess of natural increase because many multiracial persons who had not previously self-identified as American Indian changed their racial identity to American Indian (Eschbach et al. 1998).

Figure 4-8.

**Science and engineering graduate students, by field of enrollment: 1995**




See appendix tables 4-15 to 4-18.

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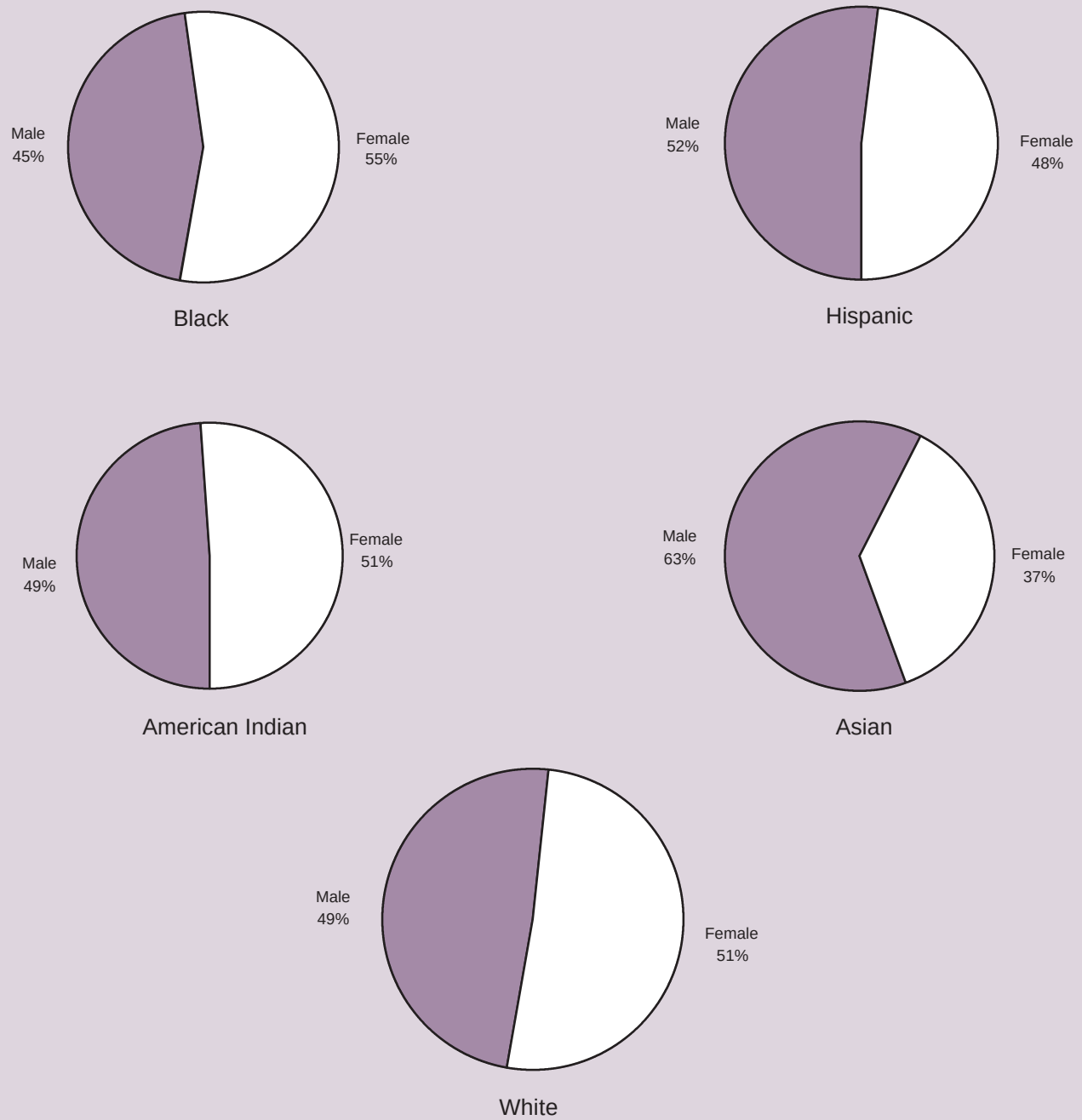
psychology and social sciences. Of the male graduate students, all minorities except Asian men are most heavily represented in social sciences. Asian and white males' enrollment is concentrated in engineering. Women were 55 percent of black science and engineering enrollment, 51 percent of American Indian science and engineering enrollment, 37 percent of Asian science and engineering enrollment, and 48 percent of Hispanic science and engineering enrollment. (See figure 4-9 and appendix table 4-21.)

Figure 4-9.

**Science and engineering graduate students by race and gender: 1995**




See appendix table 4-21.

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### Foreign

Foreign students enrolled in U.S. science and engineering graduate programs totaled 98,787 students in 1995, up 29 percent from 76,812 students in 1985. There were 63,300 foreign students enrolled in science fields, up 32 percent from 47,990 in 1985. Enrollment in all major science fields increased for foreign students between 1985 and 1995. Though enrollment in social sciences combined increased, enrollment in three social science fields decreased between 1985 and 1995; sociology (down 17 percent), linguistics (down 7 percent), and history of science (down 7 percent). Engineering enrollment for foreign students was up 23 percent between 1985 and 1995. Civil engineering (5,600), electrical engineering (11,308), and mechanical engineering (5,442) had the largest portions of foreign enrollment in the engineering fields. (See appendix table 4-22.)

Between 1993 and 1995, enrollment of foreign graduate students in science and engineering decreased 7 percent, science by 5 percent, and engineering by 10 percent. Foreign enrollment in all major science fields decreased during this period except for psychology, which was up 11 percent. Foreign enrollment in all engineering fields also decreased between 1993 and 1995. (See appendix table 4-22.)

### Full Time and Part Time

In 1995, 68 percent of graduate science and engineering students were enrolled full time and 32 percent were enrolled part time. Among U.S. citizen and permanent resident graduate science and engineering students, 89 percent were full time and 11 percent were part time. (See appendix table 4-23.)

Between 1985 and 1995, minority U.S. citizen and permanent resident graduate students increased their full-time enrollment in science and engineering: black graduate students (91 percent); American Indian graduate students (122 percent); Asian graduate students (132 percent); and Hispanics (76 percent). Full-time foreign science and engineering graduate student enrollment increased by 27 percent between 1985 and 1995. Part-time enrollment for minority U.S. citizen and permanent resident graduate students, and for foreign students also increased between 1985 and 1995. Between 1993 and 1995, full-time foreign student and white U.S. citizen and permanent resident student enrollment decreased 7 percent and 2 percent, respectively. Part-time enrollment of Hispanic graduate students decreased between 1993 and 1995 by 3 percent, as did part-time enrollment of white graduate students (down 7 percent) and foreign graduate students (down 4 percent). (See appendix table 4-23.)

## Pursuit of Graduate Study After the Bachelor's

Analysis of data from the National Science Foundation's National Survey of Recent College Graduates reveals that women and men are similar in their pursuit of graduate study after the bachelor's degree. Among 1993 science and engineering bachelor's degree recipients who were surveyed in 1995, 27 percent of women and 25 percent of men had a master's or higher degree or were enrolled full time in 1995. (See text table 4-1.) Although men and women in the aggregate were similar in their pursuit of graduate studies, differences existed within fields. For example, among those with a 1993 bachelor's degree in biological sciences, 41 percent of women, but 49 percent of men, had a master's or higher degree or were enrolled full time in 1995. In physical sciences, women were the more likely to pursue graduate study: 48 percent of women with a 1993 bachelor's degree and 40 percent of men had a master's or higher degree or were enrolled full time in 1995. Among those not pursuing further education, men and women gave, for the most part, similar reasons for not taking courses after graduation, although women were more likely than men to cite financial reasons (53 percent of women compared with 38 percent of men with bachelor's science degrees, and 37 percent of women compared with 30 percent of men with bachelor's engineering degrees). (See text table 4-2.)

Racial/ethnic groups are similar in their pursuit of graduate study after the bachelor's degree, with the exception of Asians. Among 1993 science and engineering bachelor's degree recipients, 34 percent of Asians had a master's or higher degree or were enrolled full time in 1995, compared to 26 percent of the total. (See text table 4-1.)

Persons with disabilities, who represent 2.4 percent of the 1993 bachelor's science and engineering graduates, were less likely than others to pursue graduate education or to be employed. Among 1993 science and engineering bachelor's degree recipients, 76 percent of those with disabilities were not students in 1995, compared to 67 percent of the total. (See text table 4-3.) Recent bachelor's graduates with disabilities were also less likely to be employed—30 percent were not employed in 1995 compared to 16 percent of the total.

## Pursuit of Graduate Study After the Bachelor's *(continued)*

Text table 4-1.

**Percent of 1993 science and engineering bachelor's degree recipients who have master's or higher degree and/or were enrolled full time, by sex, race/ethnicity, and field of degree: April 1995**

| Major field | Total recipients | Percentage having master's or higher as of April 1995 or enrolled full time on April 15, 1995 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | All | Sex | | Race/ethnicity | | | | |
| | | | Male | Female | White, non-Hispanic | Asian or Pacific Islander | Black, non-Hispanic | Hispanic | American Indian/ Alaskan Native |
| *All science and engineering fields* | 348,900 | 26 | 25 | 27 | 26 | 34 | 25 | 24 | 28 |
| **Major type** | | | | | | | | | |
| Total science | 290,500 | 28 | 28 | 28 | 28 | 36 | 26 | 25 | 31 |
| Total engineering | 58,400 | 18 | 18 | 18 | 15 | 31 | 20 | 17 | S |
| **Major field** | | | | | | | | | |
| *Computer and mathematical sciences, total* | 35,200 | 14 | 14 | 15 | 14 | S | S | S | S |
| Computer science and information sciences | 18,700 | 6 | S | S | S | S | S | S | S |
| Mathematics and related sciences | 16,500 | 24 | 26 | 21 | 24 | S | S | S | S |
| *Life and related sciences, total* | 58,600 | 40 | 43 | 38 | 39 | 50 | 49 | 35 | S |
| Agricultural and food sciences | 6,200 | 15 | S | 25 | 16 | S | S | S | S |
| Biological sciences | 50,000 | 45 | 49 | 41 | 44 | 52 | 50 | 40 | S |
| Environmental life sciences including forestry sciences | 2,500 | S | S | S | S | S | S | S | S |
| *Physical and related sciences, total* | 16,500 | 42 | 40 | 48 | 40 | S | 43 | S | S |
| Chemistry, except biochemistry | 8,600 | 50 | 46 | 54 | 47 | S | S | S | S |
| Earth sciences, geology, and oceanography | 3,900 | 26 | 26 | S | 25 | S | S | S | S |
| Physics and astronomy | 3,900 | 43 | 41 | S | 43 | S | S | S | S |
| Other physical sciences | S | S | S | S | S | S | S | S | S |
| *Social and related sciences, total* | 180,200 | 25 | 25 | 25 | 25 | 30 | 21 | 22 | 29 |
| Economics | 21,800 | 19 | 17 | 23 | 18 | S | S | S | S |
| Political science and related sciences | 44,700 | 33 | 32 | 34 | 35 | S | S | S | S |
| Psychology | 65,300 | 27 | 28 | 27 | 28 | S | S | S | 50 |
| Sociology and anthropology | 28,600 | 17 | 19 | 16 | 16 | S | S | S | S |
| Other social sciences | 19,800 | 20 | 21 | 19 | 18 | S | S | S | S |
| *Engineering, total* | 58,400 | 18 | 18 | 18 | 15 | 31 | 20 | 17 | S |
| Aerospace and related engineering | 2,300 | 28 | 28 | S | 25 | S | S | S | S |
| Chemical engineering | 4,300 | 18 | 20 | S | 13 | S | S | S | S |
| Civil and architectural engineering | 8,600 | 16 | 16 | S | 15 | S | S | S | S |
| Electrical, electronic, computer, communications engineering | 20,000 | 16 | 16 | S | 14 | S | S | S | S |
| Industrial engineering | 3,300 | 13 | S | S | S | S | S | S | S |
| Mechanical engineering | 13,900 | 15 | 15 | S | 12 | S | S | S | S |
| Other engineering | 6,100 | 30 | 28 | S | 26 | S | S | S | S |

KEY: S = Data with weighted values less than 100 or unweighted sample sizes less than 20 are suppressed for reasons of respondent confidentiality and/or data reliability.

NOTE: Details may not add to totals because of rounding. Percents calculated on unrounded data.

SOURCE: National Science Foundation/SRS, National Survey of Recent College Graduates, 1995.

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Text table 4-2.

**Percentage of 1993 science and engineering bachelor's degree recipients who have not taken courses since most recent degree and percent choosing selected reasons for not taking courses, by sex and field of degree: April 1995**

| Major field | Percentage not taking courses | Reasons for not taking courses | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Achieved education goals | Waiting for term to start | Financial reasons | Had job; needed work | Family respon-sibility | Moved | Uncertain as to field | Needed break | Other |
| All science and engineering fields | 57 | 69 | 6 | 43 | 82 | 12 | 10 | 23 | 51 | 5 |
| Total science | | | | | | | | | | |
| Male | 59 | 69 | 6 | 38 | 82 | 11 | 7 | 20 | 49 | 5 |
| Female | 54 | 67 | 7 | 53 | 82 | 15 | 11 | 30 | 54 | 5 |
| White, non-Hispanic | 57 | 70 | 5 | 44 | 82 | 11 | 9 | 26 | 52 | 5 |
| Black, non-Hispanic | 53 | 45 | 12 | 58 | 84 | 24 | 9 | 17 | 51 | 5 |
| Hispanic | 54 | 62 | 11 | 44 | 79 | 19 | 11 | 35 | 55 | 6 |
| Asian or Pacific Islander | 51 | 71 | 15 | 51 | 83 | 14 | 9 | 22 | 44 | 3 |
| American Indian/Alaskan Native | 55 | 56 | S | 47 | 84 | 21 | S | S | 36 | S |
| Total engineering | | | | | | | | | | |
| Male | 66 | 71 | 4 | 30 | 84 | 11 | 12 | 14 | 50 | 4 |
| Female | 57 | 64 | 9 | 37 | 83 | 9 | 14 | 29 | 54 | 5 |
| White, non-Hispanic | 65 | 72 | 4 | 30 | 84 | 9 | 13 | 15 | 53 | 5 |
| Black, non-Hispanic | 63 | 60 | S | 44 | 70 | 22 | 14 | 21 | 45 | S |
| Hispanic | 59 | 56 | 16 | 30 | 93 | 20 | 15 | 10 | 37 | S |
| Asian or Pacific Islander | 58 | 59 | 9 | 33 | 86 | 14 | 8 | 21 | 44 | 3 |
| American Indian/Alaskan Native | 58 | 95 | S | S | S | S | S | S | S | S |

KEY: S = Data with weighted values less than 100 or unweighted sample sizes less than 20 are suppressed for reasons of respondent confidentiality and/or data reliability.

NOTE: Details will not add to totals because respondents could choose more than one reason for not taking courses. Percents calculated on unrounded data.

SOURCE: National Science Foundation/SRS, National Survey of Recent College Graduates, 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

Text table 4-3.
**Enrollment, degree attainment, and employment status for the 1993 science and engineering bachelor's degree recipients: April 1995**

| Status | Total number | Enrollment status April 15, 1995 | | | | | | Degree attainment April 1995 | | | | Employment status April 15, 1995 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Full-time student | | Part-time student | | Not student | | Attained an MA or higher by April 30, | | Not attained an MA or higher by April | | Employed full time | | Employed part time | | Not employed | |
| | | Number | % | Number | % | Number | % | Number | % | Number | % | Number | % | Number | % | Number | % |
| *Recent Science and Engineering Graduates, total* | 348,900 | 82,000 | 24 | 34,600 | 10 | 232,300 | 67 | 11,600 | 3 | 337,400 | 97 | 250,500 | 72 | 42,600 | 12 | 55,900 | 16 |
| Women | 162,600 | 40,600 | 25 | 18,500 | 11 | 103,500 | 64 | 4,700 | 3 | 157,900 | 97 | 109,900 | 68 | 22,900 | 14 | 29,800 | 18 |
| Black, non-Hispanic | 19,800 | 4,500 | 23 | 1,900 | 9 | 13,400 | 68 | 600 | 3 | 19,300 | 97 | 14,100 | 71 | 2,200 | 11 | 3,500 | 18 |
| Hispanic | 18,200 | 4,100 | 22 | 1,500 | 8 | 12,600 | 69 | 500 | 3 | 17,700 | 97 | 12,500 | 69 | 1,900 | 11 | 3,800 | 21 |
| Disabled | 8,400 | 1,100 | 13 | S | S | 6,400 | 76 | S | S | 8,300 | 99 | 4,500 | 54 | 1,300 | 16 | 2,500 | 30 |

KEY: S = Data with weighted values less than 100 or unweighted sample sizes less than 20 are suppressed for reasons of respondent confidentiality and/or data reliablilty.

NOTE: Details may not add to totals because of rounding. Percents calculated on unrounded data.

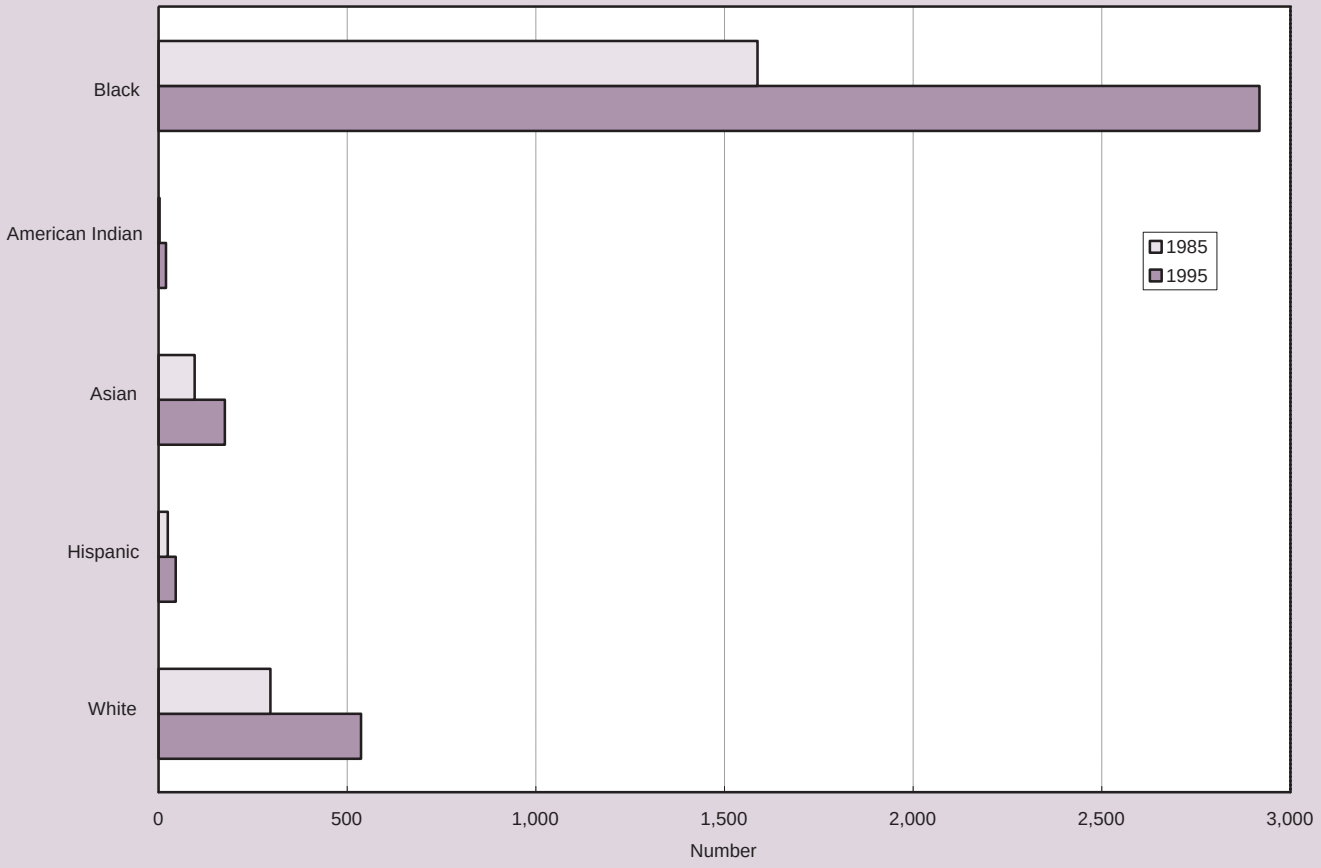
SOURCE: National Science Foundation/SRS, National Survey of Recent College Graduates, 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

### *Historically Black Colleges and Universities*

There were 3,834 U.S. citizen and permanent resident graduate science and engineering students enrolled in Historically Black Colleges and Universities (HBCUs) in this country in 1995, up 72 percent between 1985 and 1995. In 1995, black students were the largest portion of enrollment at 76 percent; American Indian students, 1 percent; Asian students, 5 percent; Hispanic students, 2 percent; and white students, 14 percent. (See figure 4-10.) Within HBCUs in 1995, black student enrollment was concentrated in social sciences (32 percent), American Indian students in physical sciences (79 percent), Asian students in mathematical sciences (29 percent), Hispanic students in physical sciences and biological sciences (both 20 percent), and white students in psychology (26 percent). (See appendix table 4-24.)

Figure 4-10.
**Science and engineering graduate students attending HBCUs: 1985 and 1995**




See appendix table 4-24.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

## Persons With Disabilities

About 3 percent of graduate students studying in all fields, science and engineering as well as non–science-and-engineering fields, reported a disability in 1996. (See appendix table 4-25.) Students with disabilities were more likely to be enrolled in health fields than students without disabilities, and were less likely to be enrolled in life and physical sciences and in engineering/computer science/mathematics fields.

# Outcomes: Master's Degrees and Doctorates in Science and Engineering

## Overview

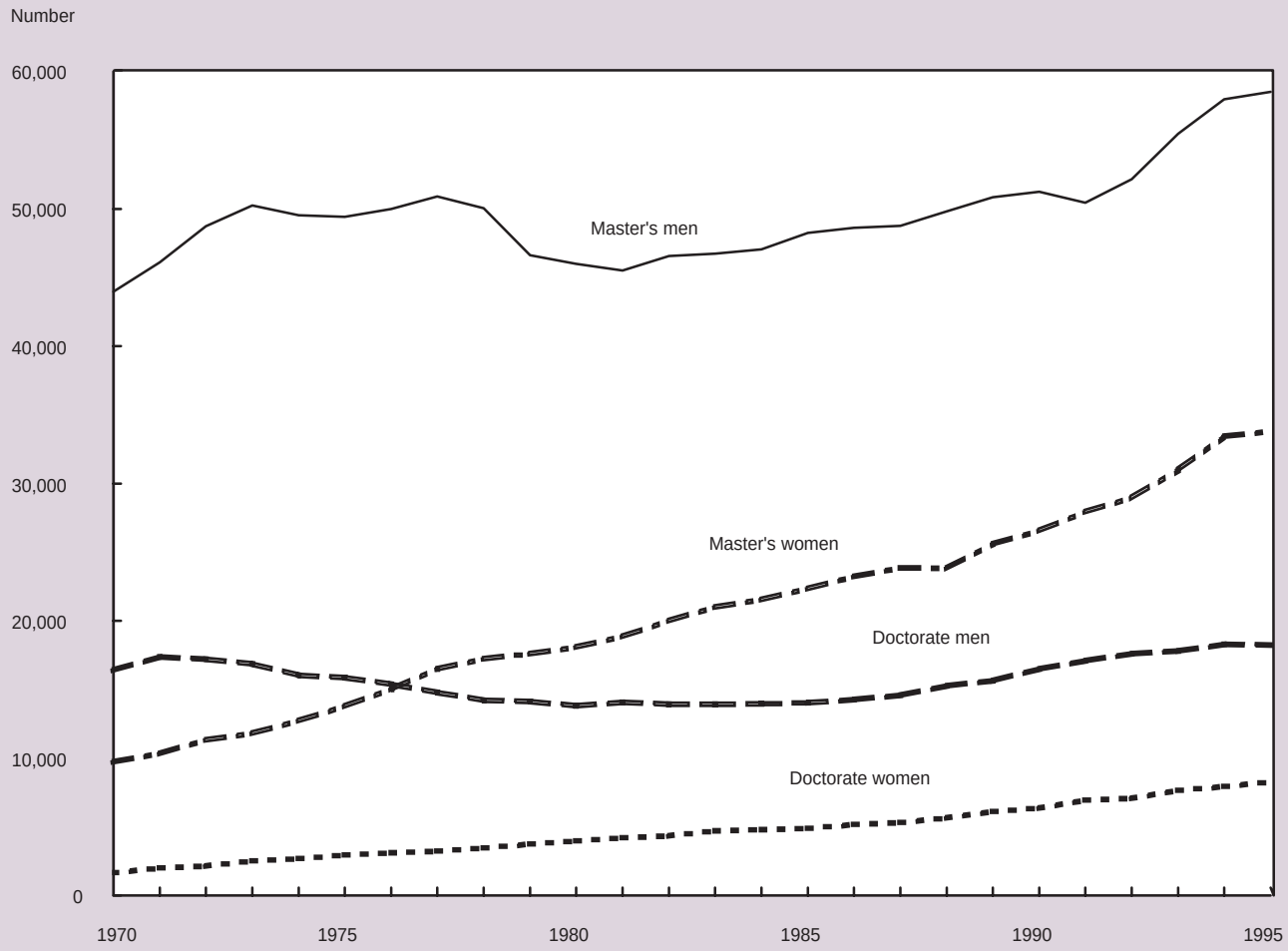
Degrees marking the formal outcomes of graduate education are important credentials for those pursuing science and engineering careers. Data on these outcomes

provide benchmarks for measuring the progress of women and various racial/ethnic population groups in increasing their representation.

Graduate education has expanded significantly during the almost three decades between 1966 and 1995. The overall expansion in degrees awarded encompasses an uneven pattern of growth, however. For about 10 years, from the mid-1960s until the mid-1970s, growth was sustained and rapid; for approximately the next 10 years, increases in total degrees and in science and engineering degrees were much slower. The slowdown in science and engineering degrees, however, was almost exclusively caused by a decline until the early 1980s in the number of men earning these degrees.

The number of female science and engineering doctoral degree recipients increased in every year since 1966, and the number of female science and engineering master's degree recipients increased in every year but one. (See appendix tables 4-26, 4-27, and 4-28.) The pattern was different for men. After increasing from the outset, the number of master's degrees in science and engineering awarded to men decreased between 1974 and 1981 in all but 2 years. The number of master's degrees then began a period of growth so gradual that it took until 1990 to surpass the number of degrees awarded in any year during the 1970s. The pattern was similar but even more pronounced for male doctorate recipients in science and engineering. The number of degrees awarded decreased every year between 1972 and 1980. Following that decline it took until 1992 for the number of science and engineering doctorates awarded to men again to reach the total achieved in 1971. (See figure 4-11.)

Figure 4-11.
**Total science and engineering master's and doctorate recipients by sex: 1970–1995**




See appendix table 4-27.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

Notwithstanding the increased participation of women over the last three decades, traditionally more men than women have participated in advanced graduate education. As a result, in general the more advanced the degree, the lower the proportion of female degree recipients. For example, the proportion of the degrees awarded to women in both science and engineering fields and non–science-and-engineering fields was higher at the master's level than for the doctorate. The same pattern holds true for science and engineering degrees at the bachelor's/master's level: women as a percentage of all degree recipients was higher at the bachelor's degree level than at the master's degree level. Since 1988, however, that pattern has reversed for non–science-and-engineering degrees: women received a higher proportion of total master's degrees in non–science-and-engineering fields than the proportion they received for bachelor's degrees. (See appendix tables 4-26, 4-27, and 4-28.)

## Women

### *Master's Degrees*

Women have constituted at least half of all master's degree recipients since 1986. They have made great strides in their participation in science and engineering master's degrees over the last 10 years (although they continue to receive fewer science and engineering degrees than men). Women's science and engineering master's degrees increased by 60 percent over the 10-year period between 1985 and 1995. Their 35,791 degrees awarded in 1995 were 38 percent of the total science and engineering degrees in that year, up from 22,331, or 32 percent of the total, in 1985. In contrast, since 1975 women have received the majority of all non–science-and-engineering master's degrees. They received 60 percent of the total non–science-and-engineering master's degrees in 1995, up from 56 percent of the total 10 years earlier. Women received a higher *number* of non–science-and-engineering degrees throughout this period, but the increase was at a slower *rate* than for those in science and engineering—52 percent, from 121,166 in 1985 to 184,439 in 1995. (See appendix table 4-29.)

### Science Master's Degrees

The number of master's degrees awarded to women in all sciences increased 55 percent over the 10-year period between 1985 and 1995. This increase exceeded the 35 percent increase in natural sciences,[4] in which the numbers increased from 7,731 in 1985 to 10,428 in 1995. (The greater increase in all sciences combined was due to larger increases in the number of women in psychology and the social science fields.) (See appendix table 4-29.)

#### Natural Sciences

Women as a proportion of all natural science master's degree recipients rose from 32 percent of the total in 1985 to 36 percent in 1995. The total number of recipients of degrees in earth, atmospheric, and ocean sciences decreased for both men and women over the 10-year period, but the decrease was faster for men (27 percent fewer degrees, to 994 in 1995) than for women (13 percent fewer, to 451 in 1995). Mathematics and computer sciences were the only fields in which women had a smaller share of the total master's degrees in 1995 than they did in 1985, although the change was minimal: their proportion of degrees awarded decreased from 31 to 30 percent of the total number in those fields. This decrease in *proportion* came despite an increase in absolute *numbers* (from 3,053 in 1985 to 4,365 in 1995). Thus, although an increased number of women were interested in pursuing master's degrees in mathematics and computer science, these disciplines continued to be even more attractive to men.

#### Psychology and the Social Sciences

Women increased their proportion of total master's degrees in psychology, rising from 63 percent of total master's degrees awarded in that field in 1985 (5,417) to 72 percent of the total in 1995 (9,397). Social sciences degrees awarded to women also increased over the 10-year period, from 6,939 in 1985 to 11,334 in 1995 (representing an increase from 40 to 49 percent in the proportion of the total social science degrees awarded to females in 1985 and 1995).

### Engineering Master's Degrees

The largest percentage increase in master's degrees awarded to women was in engineering (a 106 percent increase over the 1985–1995 period), although women constituted a smaller percentage of degrees in engineering than in any other major field (16 percent of total master's degrees in 1995). Nevertheless, the number of women receiving engineering master's degrees more than doubled in the 10-year period, from 2,244 in 1985 to 4,632 in 1995. (The numbers of men receiving master's degrees in engineering, although still in the majority, increased only 28 percent in numbers over the same 10-year period, from 18,728 in 1985 to 23,998 in 1995.)

[4] The social sciences and psychology are excluded from the tabulation of natural sciences, but are included in the tabulation of all sciences.

## Doctoral Degrees

### Doctoral Degrees in All Fields

In both science and engineering and non–science-and-engineering fields, the proportion of degrees awarded to women in 1995 was lower for the doctorate than for the master's degree. (See figure 4-12.) The increase since 1985 in the number of doctoral degrees awarded in every major field was, however, higher for women than for men. As a result, women increased their proportionate share of all doctoral degrees over the 10-year period. (See figure 4-13.)

The total number of doctorates awarded in all fields increased by 33 percent since 1985 (see appendix table 4-30), but the increase for women was faster—52 percent over the same time period. Women received 16,333 doctoral degrees in 1995, 39 percent of the doctorates awarded; this was up from 34 percent of the total in 1985. (See appendix table 4-31.) Women have earned the majority of non–science-and-engineering doctoral degrees since 1989. The *proportion* of the non–science-and-engineering degrees awarded to women increased from 47 percent in 1985 to 53 percent in 1995. The 8,060 female doctorate recipients in the non–science-and-engineering fields were particularly concentrated in education, where they received 62 percent of the education doctorates in 1995, and in health degrees,[5] where 63 percent of the degrees were awarded to women. (See appendix table 4-32.)

### Doctoral Degrees in Science and Engineering

Interestingly, although women make up a greater percentage of non–science-and-engineering doctorate recipients, since 1993 women have received more science and engineering doctoral degrees than non–science-and-engineering doctoral degrees. The number of science and engineering doctoral degrees awarded to women increased faster than the increase in non–science-and-engineering degrees—69 percent versus 38 percent over the 10-year period. The *proportion* of total science and engineering doctoral degrees that were awarded to women increased from 26 percent of total science and engineering degrees in 1985 to 31 percent in 1995. (See appendix table 4-32.)

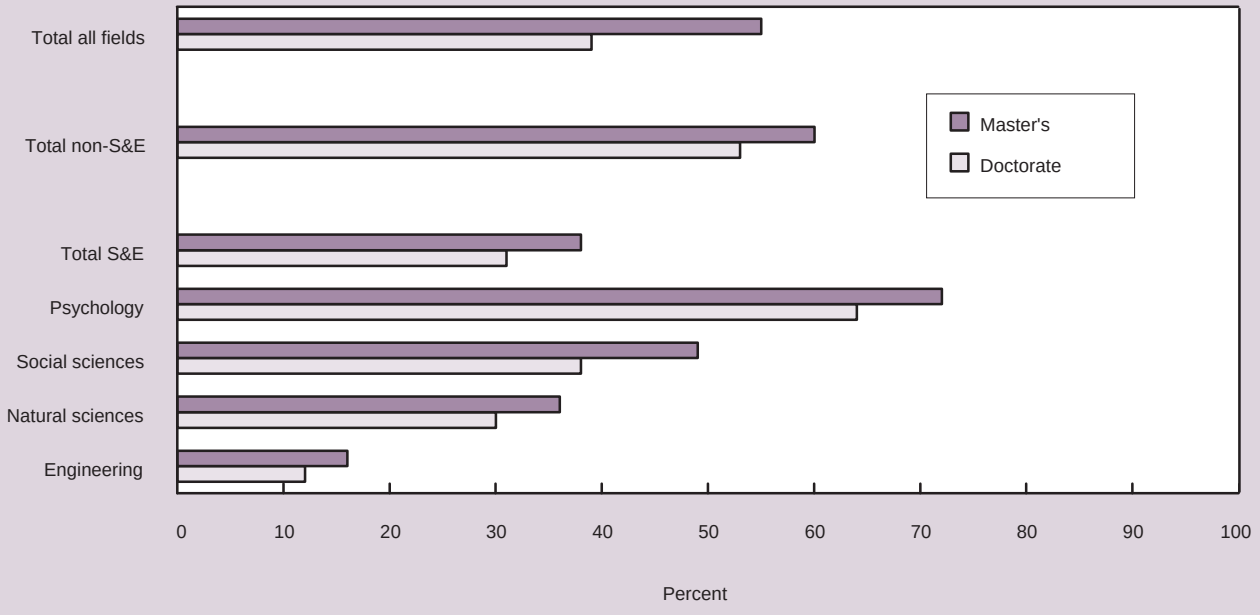
### Science Doctoral Degrees

#### Psychology and the Social Sciences

Psychology was the only science and engineering field in which women received more doctorates than

[5] Health fields include such fields as nursing, pharmacy, veterinary medicine, public health, and epidemiology.

Figure 4-12.
**Women as a percent of master's and doctorate recipients, by major field: 1995**




See appendix tables 4-26 to 4-28.

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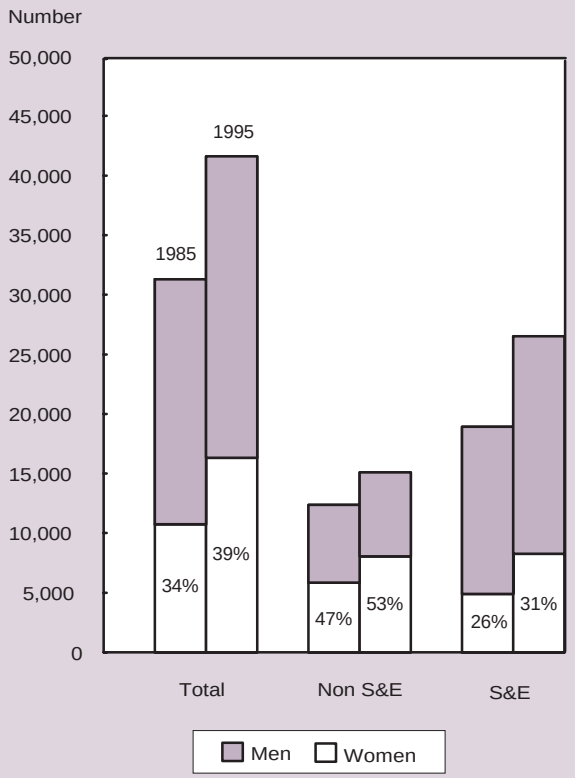
Figure 4-13.
**Total doctoral degrees awarded and percentage received by women: 1985 and 1995**




See appendix tables 4-26 to 4-28.

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men. Of all doctoral degrees awarded in psychology, the proportion awarded to women rose from 51 percent in 1985 to 64 percent in 1995. Women received 38 percent of the social science degrees overall in 1995, but their participation within the *subfields* of the major field of social science was not even. For example, although women received 24 percent of the economics degrees, they received 58 percent of all the anthropology doctoral degrees and 53 percent of the sociology degrees. (See appendix table 4-31 for a detailed breakdown by major field and subfield of women's participation in doctoral degrees.)

### Natural Sciences

Women received 30 percent of the doctorates in the natural sciences in 1995. Within that category they received 41 percent of the biology degrees and 23 percent of total physical sciences degrees. Physical sciences included 31 percent of the chemistry degrees and 17 percent of the astronomy degrees but only 12 percent of the physics doctoral degrees awarded in 1995. Women earned 22 percent of three other natural science disciplines: earth, atmospheric, and ocean sciences; mathematics; and agricultural sciences. They received 19 percent of the computer science degrees. (See figure 4-14.)

## Engineering Doctoral Degrees

The smallest proportion of women doctorate recipients in any broad field was in engineering. Men earned 5,313 engineering doctoral degrees in 1995 whereas women earned 694 engineering degrees, just 12 percent of the total engineering doctorates. This figure represented a sizable increase over the 10-year period, however; women had earned only 7 percent of the engineering doctorates in 1985. The distribution of women is not equal within the various engineering subfields. The highest absolute number of engineering doctorates awarded to women in 1995 was in electrical engineering (173), but women constituted only 10 percent of the total 1,731 degrees conferred. The next highest number of female doctorates in engineering was in chemical engineering (109), but they represented only 15 percent of the total 708 chemical engineering degrees awarded in 1995.

Proportionately the highest concentration of women in engineering was in those subfields that were related in some way with health matters; nevertheless, even in these subfields the number of women was also very small. For example, women constituted 25 percent of the doctorate recipients in bioengineering/biomedical engineering, but the total was only 48 women. Similarly, 25 percent of environmental health engineering doctorates were awarded to women, but the absolute number receiving those degrees was even smaller—21 women doctorates. (See appendix table 4-32.)

## The Top 50 Institutions Granting Science and Engineering Doctorates to Women

The top 50 institutions, ranked by the number of science and engineering doctorates earned by women, awarded 52 percent (4,308) of all the science and engineering doctorates awarded to women in 1995 (8,273). Women received the majority of doctorates in only two of those institutions, however.[6] Overall, women received 30 percent of the doctoral degrees awarded by these institutions in 1995. They received 35 percent of the science doctoral degrees at these institutions, much higher than the proportion of engineering doctorates they received at the same institutions (12 percent). (See appendix table 4-33.)

[6] The California School of Professional Psychology at Los Angeles and at San Diego.

## Financial Support for the Training of Women Doctorate Recipients

External financial support during doctoral study is often crucial for completion of the degree; few students and/or their families can pay all the bills on their own. Because it is important to track the sources of support for doctorate recipients, each year a question on the Survey of Earned Doctorates asks doctorate recipients to list the source of their *primary* means of support. In 1995, about half of the women (49 percent) reported that they were supported by university-administered support mechanisms (teaching and research assistantships,[7] and fellowships and traineeships). The other half (51 percent) were supported through "other" means. "Other" mechanisms include self-, family-, or industry-financed costs or loans.[8] (See appendix table 4-34.)

## University-Administered Means of Support

More doctoral recipients were supported by research assistantships than by any other university-administered mode of support: 32 percent of all men and 25 percent of all women. The second highest category of university-administered support mechanisms was teaching assistantships: 13 percent of women and 14 percent of men received this form of support as their primary source of money throughout the doctoral degree process. In addition, 11 percent of women and 8 percent of men received traineeships or fellowships as their primary means of support.

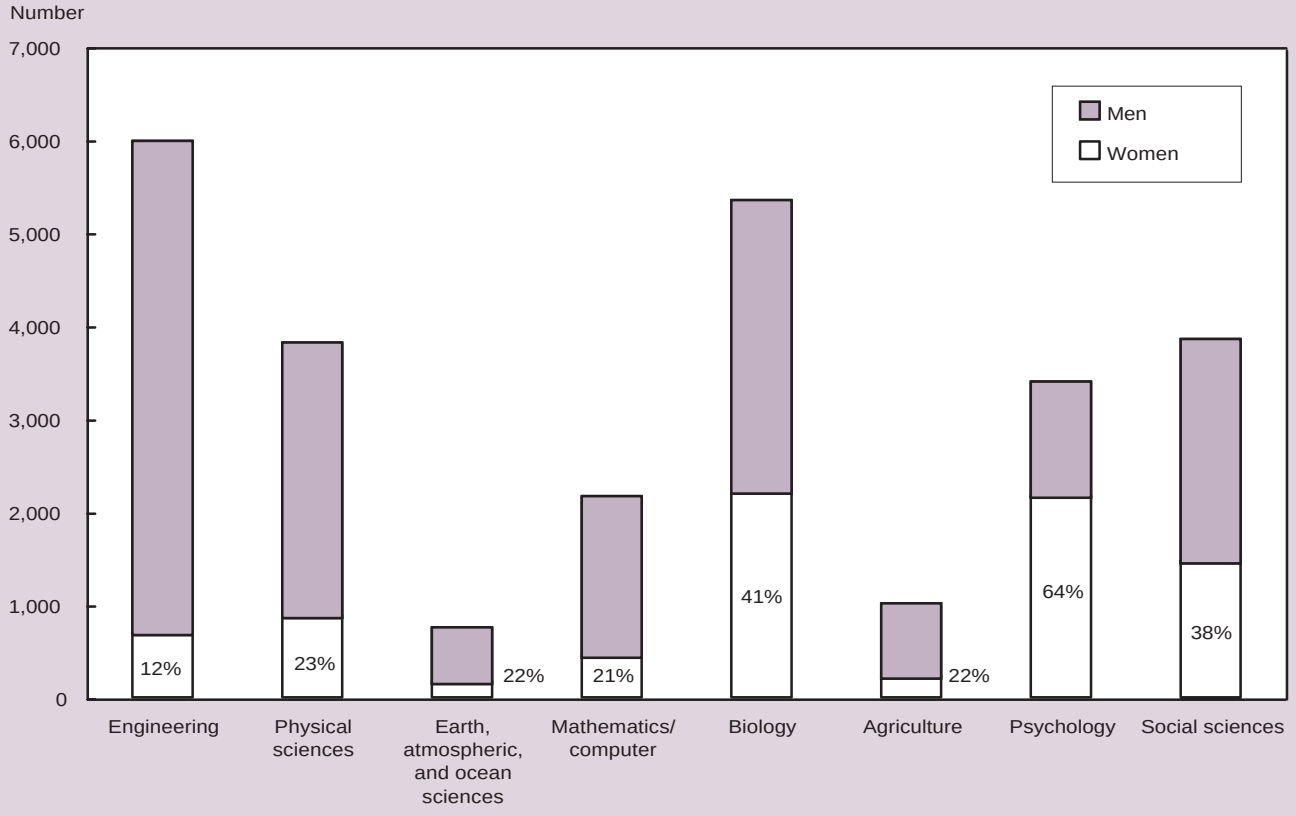
In general, the proportion of each sex receiving these modes of support was roughly even with the proportion

[7] Because a respondent to the survey may not know the true source of research assistantship support, all research assistantships are classified here as being university-administered. The Federal government or State governments may have been the primary source for the funds for some of these assistantships, however.

[8] The tabulation of this "other" category also included those who did not answer the question.

Figure 4-14.

**Number of science and engineering doctoral degrees awarded and percentage received by women: 1995**




See appendix table 4-31.

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of each sex who received doctoral degrees. For example, women constituted 31 percent of the science and engineering doctorates in 1995, and they received 26 percent of the research assistantships and 30 percent of the teaching fellowships. They earned slightly more than their proportional share of all fellowships and traineeships (40 percent).

In three fields—physical sciences, engineering, and biology—over 60 percent of the women doctorate recipients received their primary support from one of the four university-administered methods, rather than their own resources or other support mechanisms. In contrast, psychology and social sciences had the lowest proportion of women receiving one of the four university-administered methods of support.

## Baccalaureate Origin Institutions

Large universities enroll the greatest number of undergraduate students and, therefore, would be expected to be the baccalaureate origin of the majority of students who go on to earn higher degrees, but liberal arts colleges in general, and women's liberal arts colleges in particular, also play an important role in the education of women receiving bachelor's degrees who continue their education and subsequently earn doctorates in science and engineering.

The list of the 50 baccalaureate-granting institutions that awarded the greatest number of baccalaureate degrees to women who subsequently earned science and engineering doctorates between 1991 and 1995 is shown in appendix table 4-35.[9] The list includes liberal arts colleges and women's colleges as well as large universities. These 50 academic institutions were particularly strong in the science and engineering preparation of women undergraduates. In 39 of those 50 baccalaureate-origin institutions, of all the female graduate students who went on to receive a doctorate degree of any kind, a majority earned those doctorates in science and engineering fields. It is interesting to note that the remaining 11 baccalaureate-origin institutions were all universities; that is, of those institutions in which the majority of female undergraduates who went on to receive a doctorate degree received those doctorates in non–science-and-engineering fields, none were liberal arts colleges or women's liberal arts colleges.

[9] For corresponding data for racial/ethnic minority groups, see "Undergraduate Origins of Recent (1991–1995) Science and Engineering Doctorate Recipients" (NSF 96-334). Also, see tables 12, 14a, 14b, 14c, and 15.

Psychology—which had the highest percentage of women recipients—had the highest percentage supported by "other" sources: just 28 percent of the female doctorates (and 31 percent of the male doctorates) reported one of the listed four university-administered mechanisms as their primary means of support.

It is through research assistantships that many students are able to enter into mentoring situations, and research assistantships are often an opportunity to participate in complex cutting-edge research. Obtaining a research assistantship is thus a very helpful early step leading to a future research career. For this reason research assistantships are carefully monitored by academic policymakers. The highest percentage of research assistantships offered in any field was in the physical sciences: 44 percent of the 1995 doctorate recipients in this field received their primary means of support from research assistantships. Forty-two percent of the women doctorate recipients and 44 percent of the men cited this method as their primary support. Next highest in proportion offering research assistantships was engineering. Forty-seven percent of all the women engineering doctorate recipients mentioned this as their primary mode of support (versus 42 percent of the men). In contrast, only 11 percent of women psychology recipients (and 12 percent of men) reported receiving research assistantships as their primary means of support. Social sciences had the smallest percentage receiving research assistantships—11 percent of both women and men.

### Postgraduation Plans

With few exceptions, the postgraduation plans of women and men science and engineering doctorate recipients who were U.S. citizens and permanent residents were remarkably similar in proportion—63 percent of the women and 62 percent of the men had definite postgraduation plans at the time of graduation. Roughly one-quarter of the doctoral recipients planned postdoctoral study (27 percent of the women and 25 percent of the men). Seventeen percent of the women planned academic employment, and 13 percent of the men had those plans. The percentage going into industry was nearly twice as high for the men as for the women, however: 14 percent of men planned industrial employment versus 8 percent for women. (See appendix table 4-36.)

In 1995, women constituted 36 percent of the doctorate recipients who were U.S. citizens and permanent residents, and they constituted 37 percent of the doctorate recipients who had firm postgraduation plans. The percentages for their participation in each of the postgraduation options were generally close to their proportionate sizes with two exceptions: women were planning only 25 percent of all the entrances into industry for

science and engineering doctorates, and they constituted just 26 percent of all those planning employment abroad. (See appendix table 4-36.)

Forty-three percent of the science and engineering doctorate recipients entering academic employment in 1995 were women, higher than their overall percentage of 36 percent of the science and engineering doctorates. These percentages of postgraduation plans parallel overall employment data taken from the 1995 Survey of Doctorate Recipients, in which 46 percent of instructor/lecturers were women. (The proportion of women decreases as the faculty rank gets higher. In 1995, for example, women constituted only 15 percent of tenured faculty. They made up 24 percent of faculty who were associate professors and 11 percent of the faculty who were full professor appointments.[10])

## Minorities

### *Master's Degrees*

#### Master's Degrees to Nonresident Aliens Versus U.S. Citizens and Permanent Residents

In 1995, 399,428 master's degrees were awarded in the United States; 88,431, or 22 percent, were in science and engineering fields. (See appendix table 4-37.) The pattern of science and engineering degrees awarded to nonresident aliens was different from the pattern for U.S. citizens and permanent residents: nonresidents had a higher concentration in science and engineering fields. They received 12 percent of the total master's degrees in 1995, but 24 percent of the master's degrees in science and engineering fields.

The field with the highest concentration of nonresident aliens was computer science, in which they received 38 percent of total master's degrees, up from 24 percent in 1987. The second highest concentration was in engineering, where nonresidents received 34 percent of the total master's degrees awarded in 1995 (up from 26 percent in 1987).

#### Master's Degrees to U.S. Citizens and Permanent Residents[11]

In contrast, the bulk of master's degrees awarded to U.S. citizens and permanent residents were in non–science-and-engineering fields; just 19 percent of the total, or 67,110, were awarded in science and engineering fields. (See appendix table 4-37.) Since 1987 the increase in non–science-and-engineering degrees awarded (34 percent over the 8-year period ) was more rapid than the increase in science and engineering fields (25 percent during the same time span).

#### Master's Degrees by Racial/Ethnic Group

In 1995, whites earned the highest number of master's degrees in both science and engineering fields and non–science-and-engineering fields. Asians earned the next largest number of science and engineering degrees, followed in order by blacks, Hispanics, and American Indians. (See appendix table 4-37.) That hierarchy has not changed over the 8-year period since 1987, but there have been changes in many fields in the proportion of the total held by each racial/ethnic group.

The largest change was in computer science. Whites and American Indians experienced decreases since 1987 in the number of computer science degrees earned. Whites had an 11 percent drop in degrees from 4,717 in 1987 to 4,205 in 1995. American Indians experienced a 27 percent decrease in degrees (although the number was small—from 22 recipients in 1987 to 16 in 1995). All the other racial/ethnic groups increased the number of their recipients of computer science degrees: blacks (from 207 to 347, a 68 percent increase), Hispanics (from 123 to 198, a 61 percent increase), and Asians (from 779 to 1,239, a 59 percent increase). Asians increased their *proportion* of computer science degrees the most—from 12 percent of total degrees in 1987 to 19 percent in 1995).

With the exception of the decrease for American Indians in computer sciences and a 3 percent decline in the number of biological science master's degrees for blacks, every minority group had an increase in both the percentage of degrees awarded and the number of total master's degrees awarded in every field between 1987 and 1995. As a consequence, there was a decrease in the *percentage* of total degrees awarded to whites in every field. There was also a decrease in the *number* of degrees they received in computer science, physical sciences, and biological sciences. The actual number of degrees awarded to whites increased in all other fields.

#### Women Master's Degree Recipients by Racial/Ethnic Group

##### Women as a Percentage of Each Racial/Ethnic Group

Women who were members of underrepresented minority groups received a higher proportion of total science and engineering master's degrees awarded to

[10] There are many reasons for the smaller proportion of women in the higher academic faculty posts. See discussion of academic employment in chapter 5.

[11] Beginning in 1987, there was a change in the way racial/ethnic questions were asked of master's degree recipients; therefore no consistent comparisons can be made with data earlier than 1987. The discussion of master's trend data by race/ethnicity of recipients includes only the period between 1987 and 1995. (A full 10-year trend was presented above for all doctorate data and for master's degree data by sex of recipients.)

their respective racial/ethnic group than did either white women or Asian women. Black women were the only women in any racial/ethnic group to earn a majority of science and engineering master's degrees—in 1995, they earned 54 percent of those master's degrees awarded to blacks. American Indian women had the next highest proportion, 49 percent of all science and engineering master's degrees awarded to American Indians. Hispanic women earned 44 percent of all science and engineering degrees awarded to Hispanics. Whites and Asians—the two groups that had the highest proportion of total degrees in science and engineering—had the lowest proportion of female science and engineering master's degree recipients. White women earned 41 percent of all science and engineering master's degrees awarded to whites, and Asian women earned just 34 percent of science and engineering master's degrees earned by Asians.

Black women earned 30 percent of all the engineering master's degrees awarded to blacks—the highest proportion of engineering degrees of all the female racial/ethnic groups. Asian women were the next highest, earning 21 percent of engineering degrees awarded to Asians. Hispanic women were third highest with 19 percent. White women earned 16 percent of the total number of engineering master's degrees awarded to whites. American Indian women earned by far the smallest proportion of engineering degrees for a racial/ethnic group—only 7 percent of engineering master's degrees awarded to American Indians were awarded to females. (See appendix table 4-38.)

#### Women in Racial/Ethnic Groups as a Percentage of All Women Science and Engineering Degree Recipients

White women earned 77 percent of all the science and engineering master's degrees awarded to women. Their proportion of the total in each field was generally close to their proportion in the overall female population for most disciplines except for computer science, where they constituted only 56 percent of all women master's recipients. (See appendix table 4-38.)

Asian women represented approximately 7 percent of all female master's degree recipients in science and engineering, but 27 percent of the computer science degrees and 17 percent of the engineering degrees awarded to women. Proportionately more Asian women received computer science degrees than other degrees—23 percent of all Asian women earned their science and engineering master's degrees in computer science.

Women in the underrepresented minority groups received their science and engineering master's degrees in various fields in approximate proportion to their representation in the total: blacks (7 percent), Hispanics (4 percent), and American Indians (less than 1 percent).

## *Doctoral Degrees*

### Doctoral Degrees to Nonresident Aliens Versus U.S. Citizens and Permanent Residents

It is important to note that (similar to master's degrees) there was also a difference to the pattern of doctoral degrees awarded to nonresident aliens versus those awarded to U.S. citizens and permanent residents. The total number of doctoral degrees awarded to nonresident aliens increased by 68 percent between 1985 and 1995 (from 5,227 to 8,806); this increase was higher than the 29 percent rise in doctorates awarded to U.S. citizens and permanent residents over the same 10-year period (from 24,694 in 1985 to 31,910 in 1995). As a result, nonresident aliens constituted 21 percent of total doctorate recipients in 1995, up from 17 percent in 1985. These individuals are very interested in pursuing doctoral degrees in science and engineering. Seventy-nine percent of the nonresident aliens acquiring doctoral degrees in the United States in 1995 chose science and engineering fields. This percentage was much higher than the science and engineering proportion of total degrees awarded to U.S. citizens and permanent residents—59 percent. (See figure 4-15.) Twenty-nine percent of the nonresident aliens awarded doctoral degrees received their degrees in engineering versus 10 percent of the doctorate recipients who were U.S. citizens and permanent residents.

Nonresident aliens received 21 percent of doctoral degrees overall, but 42 percent of all the engineering doctoral degrees awarded in 1995 and 25 percent of the natural science degrees. They received only 5 percent of the psychology degrees, 12 percent of social science degrees, and 12 percent of the non–science-and-engineering degrees.

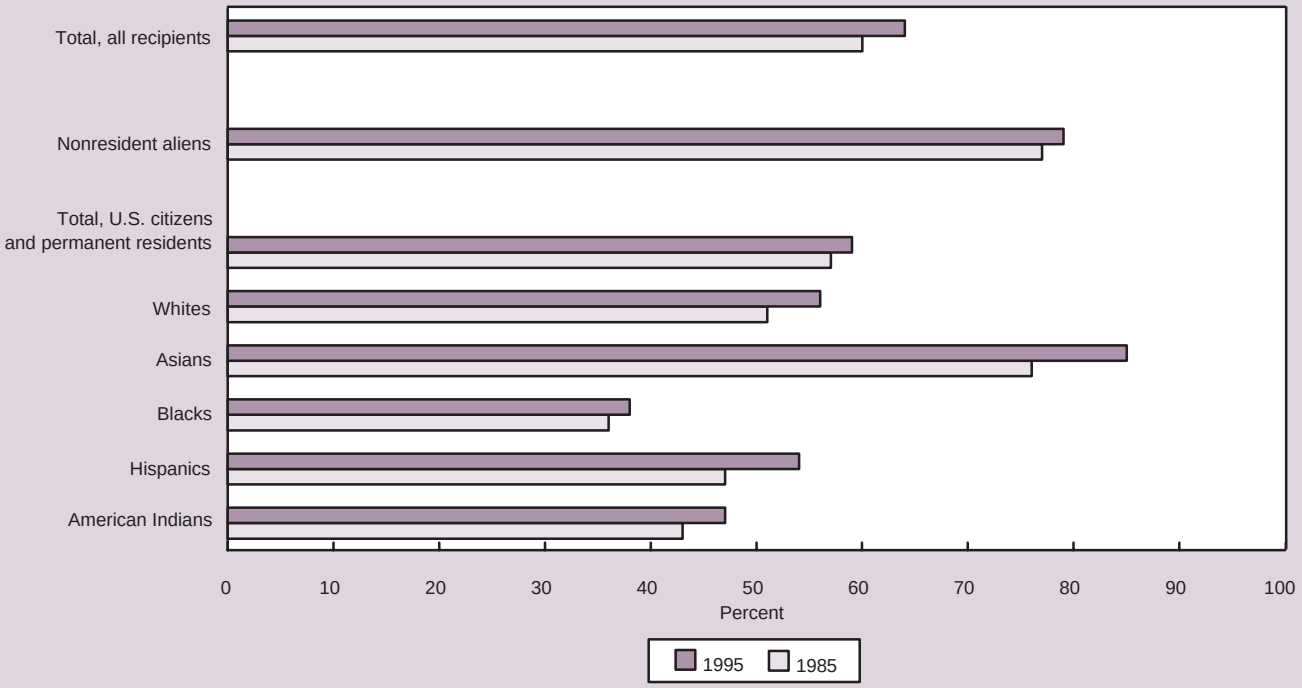
### Doctoral Degrees Awarded to U.S. Citizens and Permanent Residents by Racial/Ethnic Group[12]

#### Doctoral Degrees in All Fields

All racial/ethnic groups enjoyed an increase in the total number of doctoral degrees between 1985 and 1995. Although the percentage increases were very

[12] The data in this section are taken from the annual Survey of Earned Doctorates. In discussing the changes in achievement by the various ethnic groups within the U.S. citizens and permanent residents group, it must be noted that some degree recipients did not fill in the racial/ethnic question on the survey. The number of these recipients, labeled "U.S. citizens and permanent residents—race/ethnicity unknown" decreased by two-fifths between 1985 and 1995, from 376 to 222. This decrease reflects an apparent increase in the willingness of doctorate recipients to report their race/ethnicity. It is not known what proportion of the previously unreported category now is reflected in each of the various racial/ethnic groups; therefore, some of the increases described in this section may also reflect the more accurate reporting patterns of the doctorate recipients. Nevertheless, there was an increase in science and engineering degrees awarded to every racial/ethnic group between 1985 and 1995.

Figure 4-15.
**Science and engineering degrees as a percentage of total doctoral degrees awarded, by racial/ethnic group: 1985 and 1995**




See appendix table 4-30.

*Women, Minorities, and Persons With Disabilities in Science and Engineering:1998*

different, Asians had the largest percentage growth of all the racial/ethnic groups—their total degrees awarded increased fourfold, from 1,070 in 1985 to 4,300 in 1995. (See appendix table 4-30.) The increases in doctorate recipients for each one of the underrepresented minority groups were higher than the increase for whites, but none of those increases matched the rate of increase in Asian degree recipients. Of the underrepresented minorities, blacks received the highest number of doctoral degrees overall. In 1995 they received 1,455 doctoral degrees, a 40 percent increase over the 1,043 doctoral degrees awarded to blacks in 1985. Blacks accounted for approximately 3 percent of total doctoral degrees awarded in 1995 and 5 percent of the degrees awarded to U.S. citizens and permanent residents. (See appendix table 4-30.)

Hispanics received 1,055 doctoral degrees in 1995, a 66 percent increase over the 634 received in 1985. Similar to the overall proportion of doctorate recipients for blacks, Hispanics also accounted for approximately 3 percent of total doctoral degrees awarded and 5 percent of degrees awarded to U.S. citizens and permanent residents. (See appendix table 4-30.)

American Indians received 148 doctoral degrees in 1995, a 54 percent increase over the 96 degrees received in 1985. American Indians made up lessthan 1 percent of both total doctoral degrees and doctoral degrees awarded to U.S. citizens and permanent residents.

## Doctoral Degrees in Science and Engineering

As with total doctoral degrees, there was a general increase in the popularity of science and engineering degrees in the decade since 1985, but the increase was not uniform among the various racial/ethnic groups. All minority racial/ethnic groups had a greater percentage increase in science and engineering doctoral degrees than whites. Although whites received the highest number of doctoral degrees in both 1985 and 1995 (21,306 and 24,608, respectively), they experienced the smallest percentage increase of any racial/ethnic group over the 10-year period (16 percent). (See appendix table 4-39 for 10-year trends by detailed field.)

In both 1985 and in 1995, Asians received the second highest number of science and engineering doctoral degrees awarded to any racial/ethnic group, but the number of those degrees awarded to Asians increased 353 percent during that time period, from 809 degrees in 1985 to 3,666 in 1995. As shown in appendix table 4-39, the largest increase in Asian doc-

## Latino Experiences in Graduate Education

In a study supported by the Council of Graduate Schools and funded by the Ford Foundation, cultural anthropologist Robert A. Ibarra (1996) sought to uncover some of the reasons why the presence of Latinos[13] in graduate school or academia is not proportionate to their numbers in the general U.S. population. This qualitative ethnographic study involved 77 semistructured interviews with samples drawn from Latino faculty, administrators, and graduate students working on master's or doctoral degrees. The interviews elicited personal insights into the graduate school experience. Ibarra reported that Latinos were not a homogeneous group, but that there were differences among Mexican Americans, Puerto Ricans, Cuban Americans, and other Latinos relating to ethnic, socioeconomic, and educational backgrounds. He found, however, that those had less impact than the hidden ethnic conflicts between Latinos and the graduate education process. Latinos, like almost all graduate students, had problems adjusting to a new academic community and facing the rigors of graduate work. In this study, Ibarra found that the difficulties for Latinos in adjusting to graduate school were characterized by *academic cultural shock, ethnic renewal or recognition, and survival.*

### *Academic Culture Shock*

Many respondents mentioned the difficulty of adjusting to an academic culture that was basically competitive rather than the cooperative culture to which they were accustomed.

### *Ethnic Renewal or Recognition*

Ibarra reported that adjustments to graduate school in many cases differed by ethnic group. For instance, some had the experience of becoming aware of one's "minority status" for the first time. This experience was encountered more frequently by island Puerto Ricans, Cubans, and other Latinos. Others found that they experienced an "identity journey" in which the graduate experience was instrumental in defining their identity (Ibarra, 1996, pp. 38, 39).

### *Survival*

Survival experiences, reported Ibarra, were coping strategies common to all underrepresented populations in higher education and were defined as defense mechanisms designed to surmount perceived cultural or academic deficiencies. For some Latinos, coping strategies ranged from aggression and overwork to withdrawal and self doubt. For still others, "survival issues included learning when to speak out and how to define their mission as cultural brokers within an alien environment" (Ibarra, 1996, p. 42).

Ibarra reported that these Latino adjustments to graduate school "occurred in various ways depending upon circumstances…[E]thnic-specific issues became masked by assumptions that most Latino behaviors are identical regardless of ethnic differences. Ethnic renewal and minority recognition, for example, had different implications for Mexican Americans...than for Puerto Ricans or Cubans. Differences relating to immigrant-like experiences were detected even between mainland and island Puerto Ricans. Yet rarely are such distinctions recognized, let alone incorporated into graduate programs" (Ibarra, 1996, p. 43).

Ibarra also reported that according to his respondents, "three factors were considered critical for completing a degree successfully: faculty mentorship, consistent financial support, and student support groups. Without these many respondents admitted they would not have attended or completed their degrees" (Ibarra, 1996, p. 64).

[13] Ibarra used the Spanish term "Latino" in the study, referring to "people representing a superset of nationalities originating from, or having a heritage related to, Latin America." He found that most participants in his study preferred "Latino" over "Hispanic" as a pan-national identifier.

torate recipients occurred since 1993.[14] Degrees awarded to Asians were heavily concentrated in science and engineering. Eighty-five percent of the doctoral degrees awarded to Asians in 1995 were in these fields, up from 76 percent in 1985; this percentage increase was the largest in science and engineering participation exhibited by any racial/ethnic group. Asians were particularly heavily concentrated in engineering: they earned 17 percent of the total of all engineering doctorates and 31 percent of the engineering doctorates that were awarded to U.S. citizens and permanent residents. Twenty-four percent of all Asian doctoral degrees in 1995 were in engineering, by far the highest concentration in that field of any racial/ethnic group. An additional 51 percent of their total degrees were in the natural sciences.

[14] For example, science and engineering degrees earned by Asians doubled in the 8 years between 1985 and 1993 but then jumped by an additional 127 percent in the 2 years between 1993 and 1995. A large part of this rapid rise was due to a change in citizenship status of Chinese students in the aftermath of the Tiananmen Square massacre in 1989. The Chinese Student Protection Act of 1992 made thousands of Chinese in the United States eligible to apply for permanent residency. The reclassification for this data tabulation of those doctorate recipients who received permanent residency status under this program increased the ranks of recipients who were labeled "U.S. citizens and permanent residents."

The number of Hispanics receiving doctoral degrees in science and engineering increased by 92 percent over the 10-year period (from 296 in 1985 to 568 in 1995). Beginning in 1986, Hispanics became the underrepresented minority group receiving the highest number of science and engineering doctoral degrees awarded. Proportionate participation of Hispanics in science and engineering degrees increased as well: science and engineering degrees accounted for 47 percent of all Hispanic doctoral degrees in 1985 and increased to a majority of 54 percent of all degrees in 1995. Hispanics were the only underrepresented minority group to have over 50 percent of their doctoral degrees awarded in science and engineering fields. Approximately 7 percent of Hispanic doctorate recipients earned their degrees in engineering and 24 percent in the natural sciences. (See appendix table 4-39.)

The number of blacks receiving science and engineering doctoral degrees increased by 49 percent between 1985 and 1995 (from 374 to 557). Science and engineering degrees as a proportion of their total doctorates also increased but at the smallest rate of increase for underrepresented minorities: from 36 percent of degrees awarded in 1985 to 38 percent in 1995. The greatest concentration of blacks in science and engineering fields was in biology (13 percent of total degrees awarded to blacks) and in psychology (11 percent of total degrees). Five percent of black doctorate recipients earned their doctoral degrees in engineering, the smallest percentage for any racial/ethnic group. Most blacks (62 percent) earned their doctorates in non–science-and-engineering degrees; education was the most popular field, with 42 percent of black doctorates in that field alone. (See appendix table 4-39.)

American Indians increased their numbers of doctoral degrees in science and engineering by 68 percent over the 10-period, although the numbers were quite small in both years—41 in 1985 and 69 in 1995. Their percentage in science and engineering fields also increased, from 43 percent in 1985 to 47 percent in 1995. In 1995, 7 percent of American Indians earned their doctoral degrees in engineering. Almost 12 percent earned their doctorates in the social sciences and 10 percent in the biological sciences. Fifty-three percent earned their doctorates in non–science-and-engineering fields. Education was the most popular field for American Indians as well, with 27 percent of all their doctorates in that field. (See appendix table 4-39.)

The greatest number of science and engineering doctoral degrees continued to be awarded to whites (13,879, or 73 percent of the total science and engineering degrees to U.S. citizens and permanent residents). This number, however, represented an increase of only 14 percent since 1985, when whites received 12,169 science and engineering degrees. Whites were the only racial/ethnic group for which the *proportion* of total degrees awarded to science and engineering recipients was less in 1995 than in 1985, although the decrease was slight: from 57 percent of all doctoral degrees awarded to whites in 1985 to 56 percent in 1995. Although whites received 66 percent of the engineering degrees awarded to U.S. citizens and permanent residents in 1995, only 8 percent of their total degrees were received in engineering. (See appendix table 4-39.)

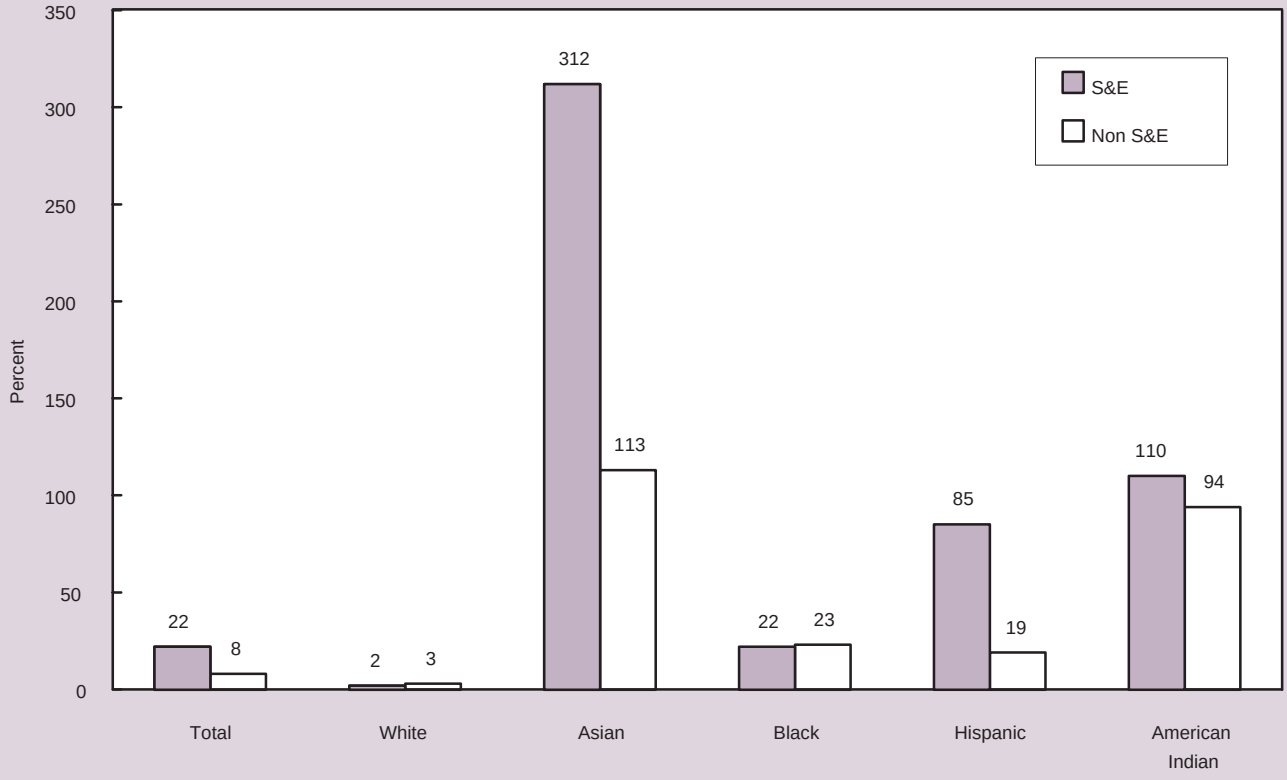
## Doctorate Recipients by Sex and Racial/Ethnic Group

With one exception, since 1985 women from each racial/ethnic group outpaced the men from the same group in the rate of increase in doctorates awarded in both science and engineering fields and non–science-and-engineering fields. (See appendix tables 4-39 and 4-40.) The exception was the American Indians, in which women's percentage increase in doctorate degrees was much slower than the men's increase in all fields. For example, American Indian men doubled their number of total doctorate recipients over the 10-year period, from 40 to 81 degrees awarded. During the same time span, American Indian women increased their number of degrees by only 20 percent, from 56 doctorate degrees in 1985 to 67 degrees in 1997. (See figures 4-16 and 4-17.)

White women had a 7 percent increase in doctoral degrees overall, from 8,125 in 1985 to 11,123 in 1995. Their number of doctorates increased even faster (43 percent) in science and engineering, whereas their increase in non–science-and-engineering degrees was 32 percent. They tripled the number of engineering degrees they received over the 10-year time span, although the number of white women receiving an engineering doctorate was small in both years—106 in 1985 and 320 in 1995. Only 3 percent of white women earned their doctoral degrees in engineering in 1995. White women experienced a 38 percent increase in the number of science degrees awarded. On the other hand, white men were the only group—of both men and women of all racial/ethnic groups—to experience a decrease in the number of science degrees awarded. (See appendix table 4-40.)

Asian women received half the number of doctoral degrees in 1995 as Asian men (1,432 for women versus 2,868 for men), but the percentage growth in all fields was greater for women. Asian women increased their number of science degrees earned by 181 percent over the 10-year period and the number of engineering degrees by 700 percent. As for all women, the *number* of engineering degrees for Asian women

Figure 4-16.
**Percentage increase in doctoral degrees awarded to male U.S. citizens and permanent residents, by racial/ethnic group: 1985–1995**




See Appendix table 4-40.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

was also very small (168), but the *proportion* of Asian women receiving their degrees—15 percent of total degrees awarded to Asian females—was the highest for any women's group.

Women received a minority of science and engineering doctoral degrees in every racial/ethnic group—although black women were awarded close to half, receiving 48 percent of total science and engineering degrees awarded to blacks. Hispanic women received 41 percent of total science and engineering degrees awarded to Hispanics. Asian women received the lowest proportion of total doctorate degrees—they were the only women in any racial/ethnic group to earn a minority of non–science-and-engineering degrees (33 percent of total) as well as a minority of science and engineering degrees (30 percent). Black women were awarded a larger percentage of engineering degrees than any other female racial/ethnic group (21 percent of all black engineering degrees).

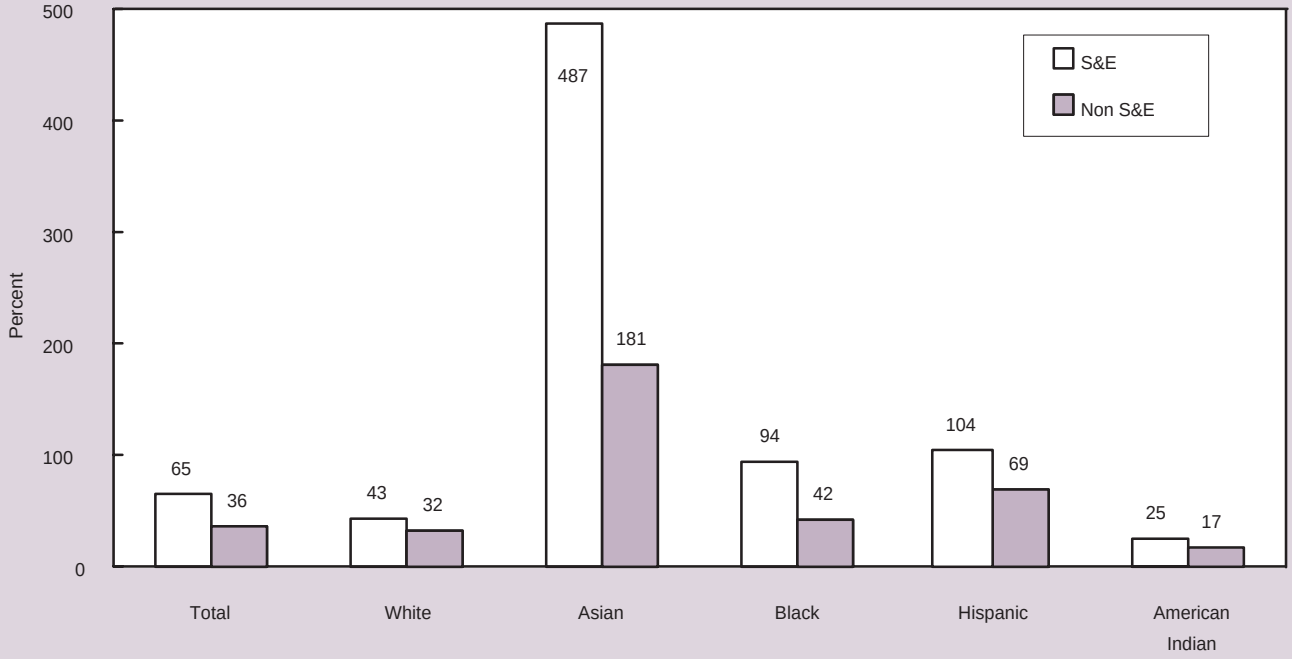
## Financial Support to U.S. Citizens and Permanent Residents for Funding of Doctoral Expenses

As reported by the Survey of Earned Doctorates, 53 percent of the U.S. citizens and permanent residents who received science and engineering doctoral degrees in 1995 supported themselves primarily through university-administered support mechanisms, such as research assistantships (29 percent), teaching assistantships (14 percent), and fellowships and traineeships (11 percent). (See appendix table 4-41.) Approximately 47 percent of the U.S. citizens and permanent residents were financed by the "other" sources—loans or self-, family-, or industry-support.[15]

In general the receipt of the four university-administered modes of support reported by U.S. citizens and

[15] The tabulation of this "other" category also included those who did not answer the question.

Figure 4-17.
**Percentage increase in doctoral degrees awarded to female U.S. citizens and permanent residents, by racial/ethnic group: 1985–1995**




See Appendix table 4-40.

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## Elapsed Time Between Bachelor's and Doctoral Degrees for Scientists and Engineers

There are many reasons why some doctorate recipients take longer to complete their degrees than others—some of the mitigating factors include family, cultural, or societal considerations; extent of financial support received while studying; and full-time or part-time enrollment by choice or necessity. The choice of degree is also very important, because this often dictates the availability of university-administered financial assistance available. (See the sections on financial support for women and for minorities.) In general, however, three observations can be made about the amount of time beyond the bachelor's degree that is required for recipients to earn doctoral degrees:[16]

1. Persons without disabilities generally earn their doctoral degrees faster than persons with reported disabilities. In 1995, for instance, 82 percent of all doctorate recipients without reported disabilities had earned their degrees within 15 years of receiving the bachelor's degree. For persons with disabilities, only 72 percent had received their doctoral degrees within 15 years.

2. Men in general earn their doctorates faster than women. Of the total doctorate recipients in 1995, 83 percent of all men versus 79 percent of all women received the doctorate degree within 15 years of receipt of the bachelor's degree.

3. In general, Asians and whites earn their doctorates faster than the underrepresented minorities; among underrepresented minorities, blacks in general take longer to earn their doctorates than Hispanics or American Indians.

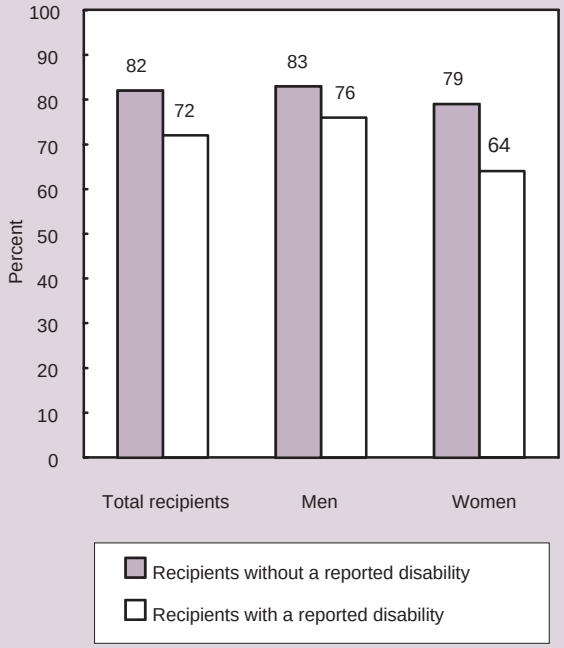
[16] In this discussion, time-to-degree denotes elapsed time between the bachelor's and doctoral degrees; that is not necessarily the amount of registered time pursuing the degree.

# Elapsed Time Between Bachelor's and Doctoral Degrees for Scientists and Engineers *(continued)*

### *Time-to-Degree for Women With Disabilities*

The first two generalized observations combine for women with disabilities, so that women with disabilities take considerably longer to receive their degrees than either men with disabilities or women in general. (See figure 4-18.) Seventy-nine percent of all women without reported disabilities and 76 percent of men with disabilities received their doctoral degrees within 15 years of a baccalaureate degree; only 64 percent of women with disabilities received their doctoral degrees within that time span. In fact, almost one quarter (22 percent) of women with disabilities took longer than 21 years to receive their doctoral degree. In comparison, 12 percent of men with disabilities, 8 percent of women without reported disabilities, and only 4 percent of men without reported disabilities took that long to receive their doctoral degrees. (See appendix table 4-46.)

Figure 4-18.
**Percentage of science and engineering doctorate recipients who received their doctoral degrees within 15 years of receipt of their bachelor's degree, by disability status and sex: 1995**




See appendix table 4-46.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

### *Time-to-Degree for Racial/Ethnic Groups*

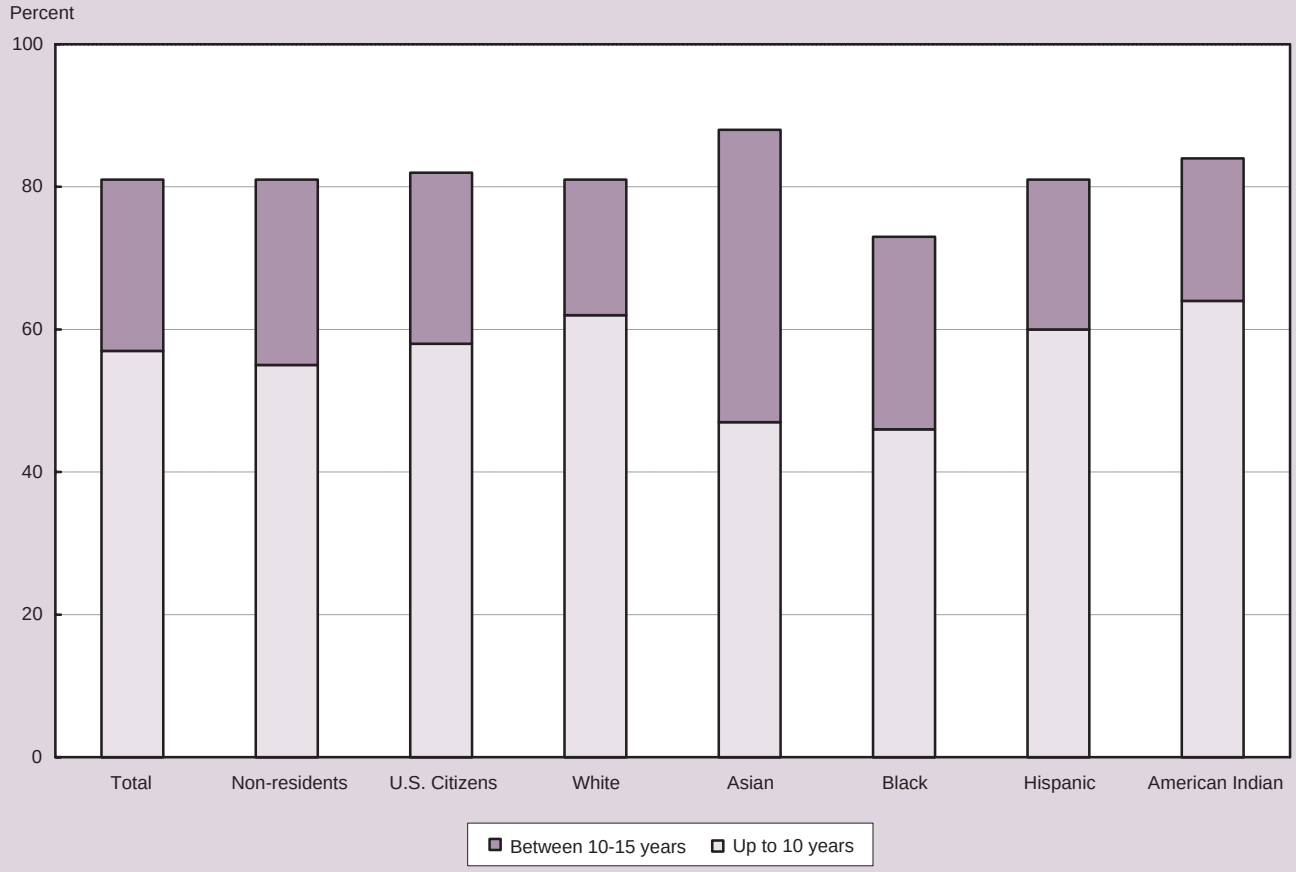
The same restrictions of choice of degree hold for racial/ethnic groups as well; some fields of study offer far fewer opportunities for university-administered support to the degree candidate. For all degrees combined, 82 percent of all doctorate recipients received their degrees within 15 years of receiving the bachelor's degree. The data are very similar for both nonresident aliens (82 percent received the degree within 15 years) and U.S. citizens and permanent residents (81 percent).

For the latter recipients, however, there are striking differences in the proportion of the different racial/ethnic groups who received the doctorate degree within the relatively short 10 years from the baccalaureate degree and those receiving their degrees during the next 5 years (for a total of 15 years from the baccalaureate). For those who receive their doctoral degrees within 10 years, the *proportion* taking the shortest time were American Indians (64 percent of total American Indian recipients had received their degrees by 10 years after the baccalaureate, although the total number of recipients is very small—42 recipients). Whites had the next highest proportion, 62 percent, and Hispanics were close behind with 60 percent of the recipients receiving the doctoral degree by 10 years after the baccalaureate. Asians (47 percent) and blacks (46 percent) had much smaller proportions of their recipients on this fast track in the early years.

The picture changes by 15 years after the baccalaureate, however. (See figure 4-19.) Forty-one percent of Asians received their doctorate in the next 5 years, so that Asians led the percentage of doctorate recipients (87 percent) who received their science and engineering doctorates within 15 years of the baccalaureate. All other racial/ethnic groups, except for blacks, had over 80 percent of their doctorate recipients receiving their degrees within 15 years of the baccalaureate degree—American Indians (84 percent, although the numbers remained small—just 58 recipients received their science and engineering degrees within 15 years of the baccalaureate); Hispanics (82 percent); and whites (81 percent). Only 73 percent of blacks had received their science and engineering degrees within 15 years of the baccalaureate, however. (See figure 4-19.) A larger proportion of black doctorate recipients (10 percent) and whites (9 percent) than other racial/ethnic groups took over 20 years from the baccalaureate to receive the doctoral degree. Only 3 percent of the Asian doctorate recipients took that long to receive their science and engineering doctoral degrees. (See appendix table 4-47.)

## Elapsed Time Between Bachelor's and Doctoral Degrees for Scientists and Engineers *(continued)*

Figure 4-19.
**Percentage of science and engineering doctorate recipients who received their doctoral degrees within 10 years and within 15 years of their bachelor's degree, by race/ethnicity: 1995**




See appendix table 4-47.

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permanent residents reflected each group's proportion of the total numbers of doctorates awarded. For example, whites constituted 73 percent of doctoral degree recipients and received approximately 73 percent of the teaching assistantships and fellowships and traineeships. They constituted 68 percent of the research assistantships.

Asians received 19 percent of total doctoral degrees awarded to U.S. citizens and permanent residents in 1995. They received 28 percent of all research assistantships, 22 percent of all teaching assistantships, and 14 percent of the fellowships and traineeships.

The underrepresented minorities were more likely to receive traineeships and fellowships (many of which are minority-targeted) and less likely to receive research and teaching assistantships. For example, blacks constituted about 3 percent of total doctoral degrees received by U.S. citizens and permanent residents but received 7 percent of the fellowships and traineeships. They received 1 percent of the research assistantships and 2 percent of the teaching assistantships.

Like blacks, Hispanics also constituted approximately 3 percent of the total doctorate recipients who were U.S. citizens and permanent residents. They received 5 percent of the fellowships and traineeships and 2 percent of both research assistantships and teaching assistantships.

American Indians constituted less than 0.5 percent of the total doctorate recipients who were U.S. citizens

and permanent residents. They received just over 0.5 percent of the traineeships and fellowships and less than 0.5 percent of all the other sources of support.

The broad field offering the largest proportion of research assistantships was the physical sciences; 45 percent of recipients of physical science doctorates received their primary means of support from research assistantships. Over one-third of the physical sciences doctorates of each racial/ethnic group, except for blacks, received research assistantships—34 percent of the Hispanics, 45 percent of the whites, 47 percent of the Asians, and 67 percent of the American Indians (again their numbers were small, with only six physical science recipients in 1995). Blacks had a much smaller percentage: only 9 percent of black physical science doctorates received their primary means of support from research assistantships. This group was the smallest in terms of numbers; only four blacks received research assistantships in the physical sciences.

The field offering the next largest proportion of research assistantships was engineering; 42 percent of all engineering doctorate recipients reported this mechanism as their primary means of support. Asians received a larger proportion of research assistantships in engineering than their proportion of the engineering population. They received 31 percent of all engineering doctorates to U.S. citizens and permanent residents in 1995 and held 38 percent of all the engineering research assistantships. (See appendix table 4-41.) Whites received 63 percent of the total engineering doctoral degrees awarded to U.S. citizens and permanent residents in 1995 and 59 percent of the research assistantships. Blacks and Hispanics each received about 2 percent of total engineering degrees and about 1 percent of the research assistantships in engineering.

As a proportion of each racial/ethnic group, a larger proportion of Asians than other racial/ethnic groups received research assistantships in engineering. Fifty-two percent of Asian engineering doctorate recipients received their primary means of support by this method. In contrast, 40 percent of the white engineering recipients, 30 percent of the American Indian (but a small number—three total), 22 percent of Hispanics, and 17 percent of black engineering doctorates listed research assistantships as their primary means of support.

## Doctoral Degrees Received by Persons With Disabilities[17]

The number of persons with reported disabilities who received science and engineering doctoral degrees in 1995 was very small, but the total has been increasing rapidly: the 355 recipients in 1995 were a 78 percent increase from the 200 science and engineering recipients in 1989. Persons reporting disabilities constituted 1.3 percent of all doctorate recipients in 1995, up from 0.9 percent of the total in 1989. (See appendix table 4-42.)

In science and engineering fields, the concentration pattern for persons with disabilities was different from the concentration pattern for persons with no reported disability. Forty percent of all science and engineering doctorates received by persons with disabilities were in the social sciences and psychology (20 percent in each field.) This segment was much larger than the 28 percent of science and engineering doctorates in these two fields received by persons with no reported disability (15 percent of all recipients received their doctorates in social sciences, and 13 percent received their doctorates in psychology). (See appendix table 4-43.) Persons with disabilities made up approximately 2 percent of the total number of doctorates in each of these two fields.

Only 18 percent of persons with disabilities received their doctoral degree in engineering versus 23 percent of the doctorate recipients without disabilities. However, since 1989 the percentage of degrees awarded to persons with disabilities has risen faster in engineering than in any other field. There was an increase of 152 percent in the number of engineering degrees awarded to persons with disabilities, from 25 in 1989 to 63 in 1995 (see appendix table 4-42); during the same time span, the number of engineering doctorate recipients overall rose only 32 percent. The total number of persons with disabilities who were awarded doctoral degrees in science also increased faster than the total number of degrees: the number of science recipients with reported disabilities increased 67 percent (from 175 in 1989 to 292 in 1995), whereas the overall increase in science degrees between 1989 and 1995 was 19 percent.

### Types of Disabilities

Overall, 27 percent of doctorate recipients with disabilities reported a visual disability, and 27 percent reported that they had a disability in mobility. Engineering recipients with disabilities were more likely to have visual impairments (37 percent) than recipients of science doctorates (25 percent). Mobility disabilities were the most common reported by science doctorate recipients (28 percent). The proportion was little changed from 1989. (Appendix table 4-44 depicts the types of disabilities reported by the doctoral recipients in 1989 and 1995.)

The number of doctorate recipients with disabilities who had vocal problems was only 1 percent overall and very small in both sexes. Fewer of the female recipients with disabilities (9 percent) reported auditory problems than the males (15 percent). (See appendix table 4-45.)

[17] There are no comparable data collected for master's degree recipients.

### Women With Disabilities

Women overall received 31 percent of the total science and engineering doctorates, but they received 34 percent of the science and engineering degrees awarded to persons with disabilities. Women with disabilities generally took longer to receive their doctoral degrees than did either men with disabilities or all doctorate recipients. (See "Elapsed Time Between Bachelor's and Doctoral Degrees for Scientists and Engineers.")

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# CHAPTER 5

# EMPLOYMENT

## Overview

This chapter examines the participation and employment characteristics of women, minorities, and persons with disabilities in the science and engineering labor force in 1995.[1] Representation is examined, in most cases, in terms of age, field of employment,[2] and highest degree level. These factors influence employment patterns; to the extent that men and women, minorities and nonminorities, and persons with and without disabilities differ on these factors, their employment patterns are likely to differ as well.

Within the science and engineering labor force, the age distributions of women compared to men, and of minorities compared to the majority, are quite different. Because large numbers of women and minorities have entered science and engineering fields only relatively recently, women and minority men are generally younger and have fewer years of experience. Age or stage in career is an influence on such employment-related factors as salary, rank, tenure, and work activity. Employment patterns also vary by field, and these field differences may influence employment in science and engineering jobs, unemployment, salaries, and work activities. Highest degree earned is also an important influence on employment, particularly on primary work activity and salary.

## Women Scientists and Engineers

### Representation in Science and Engineering

Women were slightly more than one-fifth (22 percent) of the science and engineering labor force, but close to half (46 percent) of the U.S. labor force in 1995. (See text table 1-1.) Although changes in the National Science Foundation (NSF) surveys do not permit analysis of long-term trends in employment, short-term trends show some increase in the representation of doctoral women in science and engineering employment: women were 22 percent of doctoral scientists and engineers in the United States in 1995 (see appendix table 5-1), compared with 20 percent in 1993 and 19 percent in 1991.[3]

### Age Distribution

As will be seen, many of the differences in employment characteristics between men and women are partially due to differences in age. Women in the science and engineering workforce are younger, on average, than men: 18 percent of women and 12 percent of men employed as scientists and engineers were younger than age 30 in 1995. (See appendix table 5-2.)

### Field of Science and Engineering

As is the case in degree fields (see chapters 3 and 4), women and men differ in field of employment. Women are more highly represented in some science and engineering fields than in others. For example, women are more than half of psychologists and 47 percent of sociologists, but 12 percent of physicists and 9 percent of engineers. (See figure 5-1 and appendix table 5-1.) Within engineering, women are also more highly represented in some fields than in others, for example, women are 13 percent of chemical and industrial engineers, but 6 percent of aerospace, electrical, and mechanical engineers.

### Educational Background

Women scientists have, in many occupational fields, a lower level of educational attainment than men. In the science labor force as a whole, 15 percent of women and 21 percent of men hold doctoral

[1] The data in this chapter are from the 1995 SESTAT Integrated Data Files—a combination of three NSF surveys measuring the employment, education, and demographic characteristics of scientists and engineers in the United States. The surveys were substantially revised in the 1990s and differ from those conducted in the 1980s in terms of the sample, design, question wording, and response rates. In most cases, therefore, it is not possible to present trend data.

[2] Throughout this chapter, scientists and engineers are defined in terms of field of employment not degree field. See appendix A for the SESTAT classification of science and engineering and non–science-and-engineering fields.

[3] For 1991 figures, see *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1994*, p. 95. For 1993 figures, see *Women, Minorities, and Persons with Disabilities in Science and Engineering: 1996*, p. 63.

Figure 5-1.
**Women as a percentage of the U.S. labor force and of the science and engineering labor force, by field of science and engineering: 1995**

See appendix table 5-1 and text table 1-1.

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degrees. (See appendix table 5-1.) In biology, 25 percent of women and 41 percent of men hold doctoral degrees; in chemistry, 13 percent of women and 27 percent of men hold doctoral degrees; and in psychology, 22 percent of women and 39 percent of men hold doctoral degrees. Differences in highest degree influence differences in the type of work performed, employment in science and engineering jobs, and salaries. In engineering, only about 5 percent of both men and women have doctoral degrees.

## Labor Force Participation, Employment, and Unemployment

Men scientists and engineers are more likely than women to be in the labor force, to be employed full time and to be employed in their field of highest degree. Women are more likely than men to be out of the labor force, to be employed part time, and to be employed outside their field. Some of these differences are due to differences in the age distributions of men and women, and some are due to family-related reasons, such as demands of a spouse's job or presence of children.

The labor force participation rates of men and women with current or former science and engineering occupations are similar—87 percent of women and 88 percent of men are in the labor force. Conversely, 13 percent of women and 12 percent of men are not in the labor force (that is, not working and not seeking employment). Among those in the labor force, moreover, unemployment rates[4] of men and women scientists and engineers are similar: 2.0 percent of women and 2.2 percent of men were unemployed in 1995. (See appendix table 5-3.)

Overall similarities in labor force participation, however, mask differences within age groups. Although similar percentages of men and women are out of the labor force, the women who are out of the labor force are younger than the men who are out of the labor force. Most (60 percent) of the women who are out of the labor force are younger than age 45, but most (86 percent) of the men who are out of the labor force are age 55 or older.

Reasons for not working (whether out of the labor force or unemployed) differ in some respects by sex. Women were more likely than men to cite family responsibilities (40 percent versus 1 percent), and men were more likely than women to cite retirement (75 percent versus 21 percent). (See appendix table 5-4.) These differences reflect differences in the age distributions of men and women as well as differences in role responsibilities.

Women scientists and engineers were less likely than men to be employed full time in their field.[5] Of those who were employed, 74 percent of women and 86 percent of men were employed full time in their degree field. (See appendix table 5-3.) The fraction employed full time outside their degree field, however, was roughly similar for men and women: 10 percent of women and 9 percent of men were employed full time outside their degree field. For the most part, the reasons given for working outside their degree field were similar for both sexes: 36 percent of men and 37 percent of women cited pay or promotion opportunities and 23 percent of both cited change in career or professional interests. (See appendix table 5-5.) Women, though, were more likely than men to cite family-related reasons (for example, children, spouse's job moved) (7 percent versus 2 percent).

A major reason for the lower percentage of women scientists and engineers in full-time employment is their higher percentage in part-time employment. Of those who were employed, 16 percent of women and 5 percent of men were employed part time. (See appendix table 5-3.) Women who were employed part time were far more likely than men to cite family responsibilities as the reason. Forty-two percent of the women working part time and 7 percent of the men cited family responsibilities as the reason for working part time. (See appendix table 5-6.) Thirty-one percent of men and 4 percent of women cited retirement as the reason for part-time employment. As was the case with unemployment, the differences in age distribution of men and women, as well as differences in role responsibilities, account for these differences in reasons for part-time employment.

## Sector of Employment

Within fields, women are about as likely as men to choose industrial employment. For example, among physical scientists, 54 percent of women and 50 percent of men are employed in business or industry. (See appendix table 5-7.) Among employed scientists and engineers as a whole, women are less likely than men to be employed in business or industry and are more likely to be employed in educational institutions: 50 percent of women and 65 percent of men are employed in for-profit business or industry and 26 percent of women and 15 percent of men are employed in educational institutions. These differences in sector,

[4] The unemployment rate is the ratio of those who are unemployed and seeking employment to the total labor force (that is, those who are employed plus those who are unemployed and seeking employment). Those who are not in the labor force (that is, those who are unemployed and not seeking employment) are excluded from the denominator.

[5] A respondent is employed "in field" if he or she responded that his or her current work is "closely related" or "somewhat related" to field of highest degree.

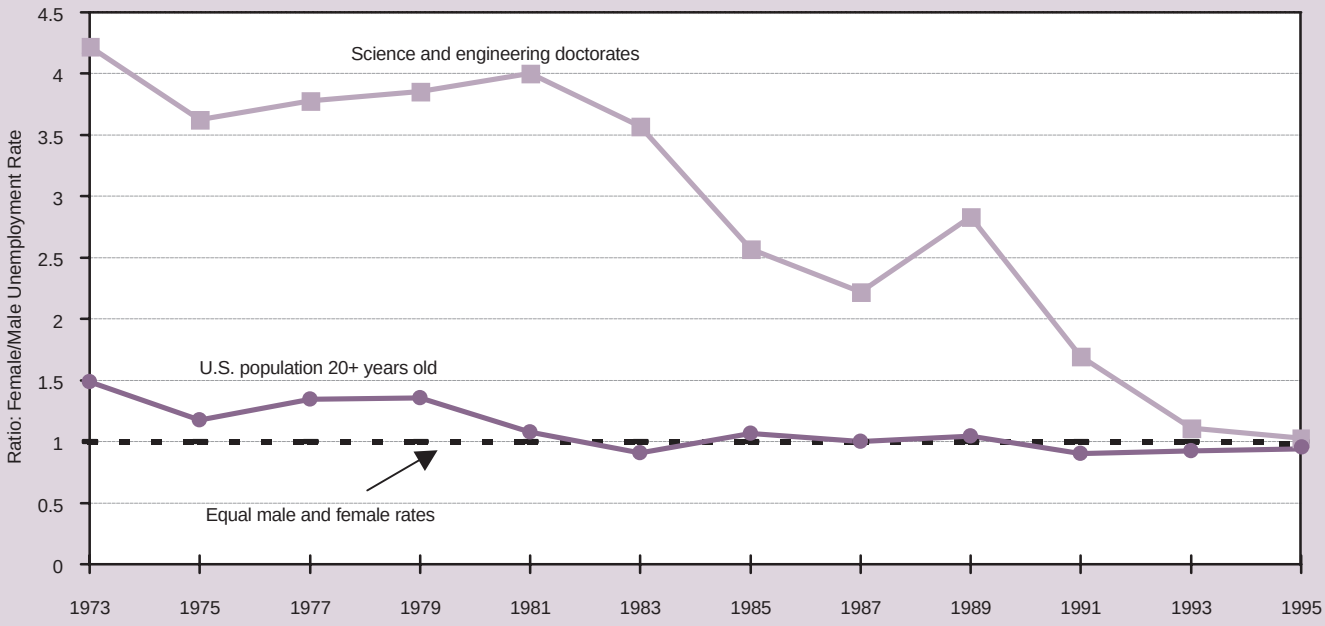
## Is the Gender Gap in Unemployment Disappearing?

In 1995, the unemployment rate for both men and women who hold doctoral degrees in science and engineering was 1.5 percent. This figure is in stark contrast to the situation in 1973, when Maxfield et al. (1976, p. 5) found "the unemployment rate for women...substantially higher than that for men (3.9 percent versus 0.9 percent)." In the intervening years, the gender gap in unemployment, measured by the ratio of female to male unemployment, steadily narrowed. (See figure 5-2.)

Results of studies of the gender gap, controlling for other factors are consistent with the premise that the gender gap in unemployment among those with doctoral science and engineering degrees is disappearing. Maxfield et al. (1976) found that in 1973 in all age groups and all degree fields, women had considerably higher unemployment rates than men. The smallest reported difference was in the field of mathematics where the rate was 1.9 percent for women, compared to 1.4 percent for men. An NSF study of factors affecting unemployment in the 1993 doctoral science and engineering population (NSF, 1997) found no statistically significant difference between men and women, after controlling for such variables as field of degree and years since degree.

The vanishing gender gap in the doctoral science and engineering population is a reflection of a similar trend in the general population (U.S. Department of Labor, 1994, p. 32). In 1973, the unemployment rate for women in the general U.S. population age 20 and over was substantially higher (4.9 percent) than that for men (3.3 percent). The gender gap in the general population had been eliminated by the early 1980s, approximately a decade before its disappearance in the science and engineering doctoral population.

Figure 5-2.
**Ratio of female to male unemployment rates of persons with doctoral degrees in science and engineering and persons 20 years of age and over in the overall population: 1973–1995**




SOURCES: Doctoral statistics from National Science Foundation/SRS, Survey of Doctorate Recipients. General population figures from Bureau of Labor Statistics, Current Population Survey.

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## Preferences for Careers in Science and Engineering

Preferences for nonacademic, academic research, or academic teaching careers differ by sex and by field (Fox and Stephan, 1996). Preferences for academic research careers were found to be higher for men than for women, preferences for academic teaching careers were found to be higher for women than for men, and preferences for nonacademic careers did not differ by sex. These overall differences or similarities are confounded by field differences. Differences between men's and women's preferences for academic research careers were greatest in chemistry, microbiology, and computer science. Differences between men's and women's preferences for nonacademic careers, although nonexistent in the aggregate, were evident in computer science, electrical engineering, and physics. These findings are the result of a survey of 3,800 doctoral students in departments of chemistry, computer science, electrical engineering, microbiology, and physics in 1993–1994 of which 2,348 (62 percent) responded.

however, are mostly related to differences in field of degree. Women are less likely than men to be engineers or physical scientists, who tend to be employed in business or industry.

### Academic Employment

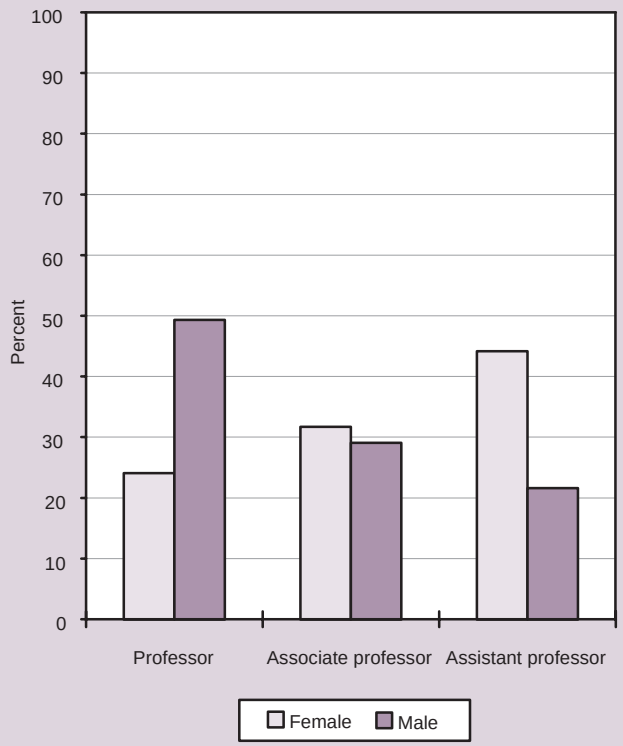
The career patterns of women in academic employment are quite different from those of men. Women differ from men in terms of type of school, rank, tenure, and research productivity. Among all scientists and engineers in academic employment, women are more likely than men to be employed in elementary or secondary schools (11 percent versus 4 percent) and in 2-year colleges (12 percent versus 9 percent). (See appendix table 5-8.)

In 4-year colleges and universities, women scientists and engineers hold fewer high-ranked positions than men. Women are less likely than men to be full professors and are more likely than men to be assistant professors. (See figure 5-3.) Among ranked science and engineering faculty, 49 percent of men and 24 percent of women are full professors. Part of this difference in rank can be explained by age differences, but differences in rank remain even after controlling for age. For example, among those ages 45 to 54, 40 percent of women and 61 percent of men are full professors. (See appendix table 5-9.)

Women are also less likely than men to be tenured. Thirty-five percent of full-time employed women science and engineering faculty are tenured, compared to 59 percent of men. As was the case with rank, some, but not all, of the differences in tenure may be attributable to differences in age. Among full-time employed science and engineering faculty ages 45 to 54, 57 percent of women and 76 percent of men are tenured. (See appendix table 5-10.)

Part of the difference in rank and tenure may be due to research productivity (as measured by number of publications). The most important factors influencing promotion in academia are time in rank and productivity (Long et al., 1993). Although roughly the same proportion of men and women had no publications (17 percent of women and 18 percent of men), women had fewer publications in refereed journals than men in the 5-year period 1990–1995. Among doctoral scientists and engineers who were employed full time in colleges or universities and who received their doctorates in 1990 or earlier, 45 percent of women and 34

Figure 5-3.
**Academic rank of full-time employed ranked science and engineering faculty in 4-year colleges and universities, by sex: 1995**




See appendix table 5-9.

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## Do Men and Women Have Different Styles of Doing Science?

Some believe that gender influences the way scientists work and their choice of research subject (Sonnert and Holton, 1995a). This research suggests that many women follow a "niche" approach in selecting research problems—they create their own area of expertise rather than competing with other researchers in "hot" fields. Sonnert and Holton's interviews with 92 men and 108 women who had received postdoctoral fellowships in the sciences from NSF, the National Research Council, the Bunting Institute of Radcliffe College, or who had been Bunting finalists suggest that women may publish fewer papers because they take longer on a project, are more thorough and perfectionist, and take on broader projects than men. Women's articles have been found to have more citations per article than men's (Long, 1992; Garfield, 1993; Sonnert, 1995b.)

percent of men had one to five publications, and 38 percent of women and 48 percent of men had more than five publications. (See appendix table 5-11.) Differences in field as well as differences in age or years since doctorate are likely to explain some of the differences in publication rates.

Patent activity follows a pattern similar to publication activity: women are less likely than men to have patents. Among full-time employed doctoral natural scientists and engineers[6] who are employed in colleges or universities and who received their doctorates in 1990 or earlier, 7 percent of women and 11 percent of men had been named on applications for patents since 1990. (See appendix table 5-11.)

Differences in research support do not appear to be a factor in differences in publications and patents. Women faculty are as likely as men to be supported on Federal contracts or grants—44 percent of women and 45 percent of men faculty were supported by Federal contracts or grants. (See appendix table 5-12.)

### Nonacademic Employment

Differences in field influence differences in primary work activities. For example, men are more likely than women to be engineers and physical scientists and are thus more likely to be engaged in research and development. Therefore, it is not surprising that the primary work activity of women scientists and engineers in business or industry differs from that done by men. For example, 28 percent of women and 40 percent of men report research and development as their primary work activity. Women, however, are as likely as men to be in management or administration—22 percent of men and 18 percent of women cite management or administration as their primary work activity.[7] (See appendix table 5-13.) Among those of similar ages, even less difference in managerial status is evident. For example, among scientists and engineers between the ages of 35 and 44, 19 percent of women and 21 percent of men are managers or administrators.

Although men and women of similar ages are about equally likely to be managers, men have more subordinates.[8] Women who are first-line supervisors have, on average, fewer total (direct plus indirect) subordinates than men. Women supervisors have, on average, 8 direct and indirect subordinates, whereas men have 12. (See appendix table 5-14.) This disparity in number of subordinates holds true among age groups as well.

The size of one's employer is an important factor in opportunities for promotion and advancement, salaries, and benefits. Potentially, employer size could explain some of the differences in opportunities and salaries experienced by men and women. Men and women scientists and engineers, however, do not differ in terms of employer size—4 percent of both work for very small firms (under 10 employees) and 44 percent of women and 45 percent of men work for large firms (5,000 or more employees.) (See appendix table 5-15.)

Publications are less important to one's career in business or industry than they are in academic employment. Almost half of both men and women PhDs employed in business or industry have no publications. Among doctoral scientists and engineers who were employed full time in business or industry and who received their doctorates in 1990 or earlier, 49 percent of women and 46 percent of men had no publications. Unlike the case in academic employment, women in business or industry have as many publications in

[6] The prevalence of patents by social scientists was so low they were excluded from this analysis.

[7] This difference is not statistically significant.

[8] It should be noted that in the SESTAT data files, only first-line supervisors are considered scientists and engineers. Midlevel and top managers and administrators are not considered to be in science and engineering occupations. Because this analysis was limited to people employed as scientists and engineers, those midlevel and top managers and administrators were excluded.

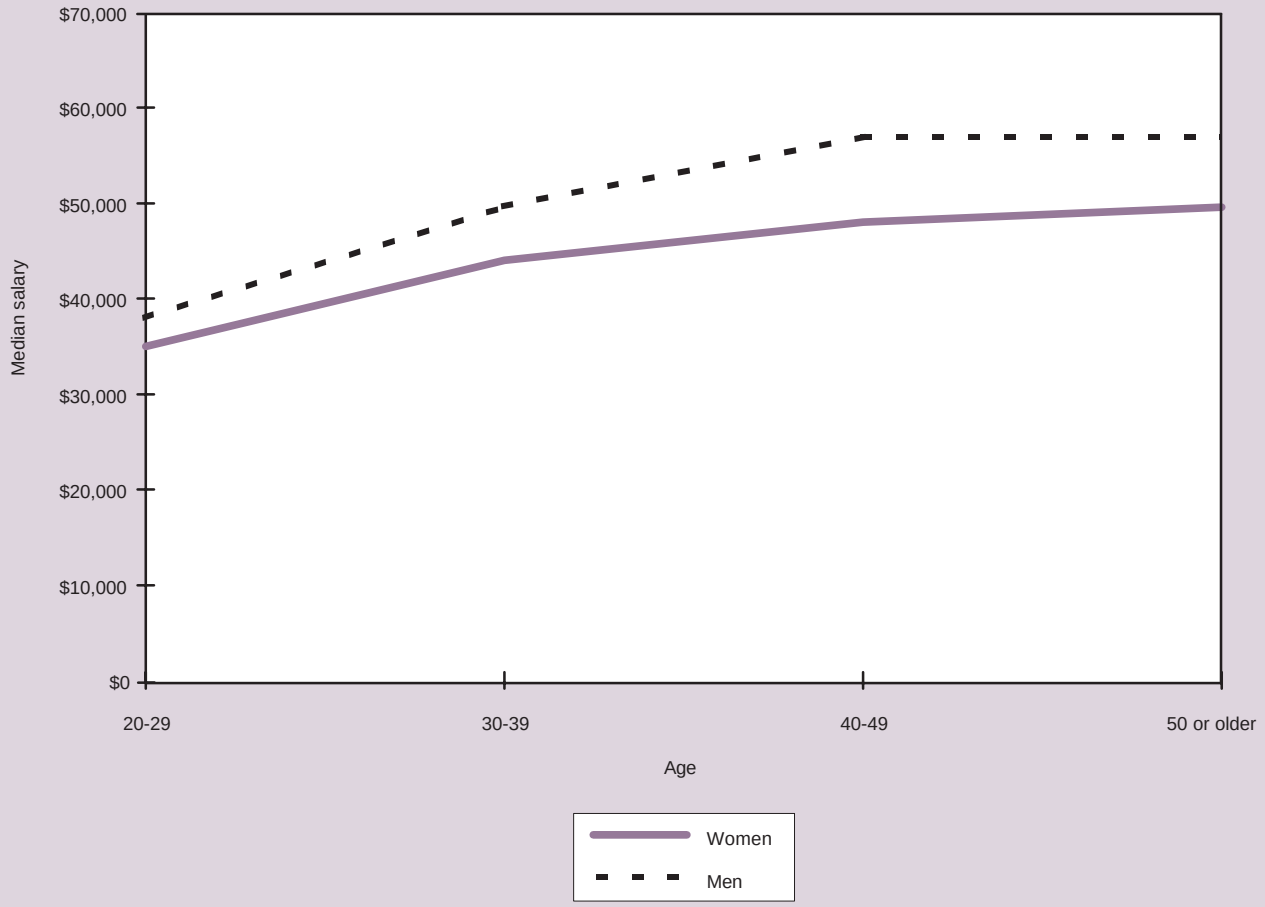
refereed journals as men: 14 percent of women and 15 percent of men had more than five publications. (See appendix table 5-16.)

In contrast to publications, patents are of greater importance among scientists and engineers employed in industry. Women, though, are less likely than men to have patents. Among natural scientists employed in business or industry in 1995, 28 percent of women and 39 percent of men had been named on applications for patents since 1990. (See appendix table 5-16.)

## Salaries

Full-time employed women scientists and engineers generally earn less than men, but differences in salary by gender are due primarily to differences in age and field. Women scientists and engineers are younger, on average, than men and are less likely than men to be in computer science or engineering, fields which command higher salaries. The overall median salary for women ($42,000) is much lower than that for men ($52,000) but within fields and within younger age categories, the median salaries of men and women vary considerably, but are more nearly the same. (See appendix table 5-17.) For example, among computer and mathematical scientists with bachelor's degrees between the ages of 20 and 29, the median salary for women was $35,000, and for men it was $38,000 in 1995. With increasing age, however, the gap in salaries of men and women widens. (See figure 5-4.) For example, among computer and mathematical scientists with bachelor's degrees between the ages of 40 and 49, the median salary for women was $48,000 and for men was $57,000. The lesser prevalence of women in higher positions in academe and industry explains some

Figure 5-4.
**Median annual salaries of bachelor's computer scientists, by sex and age: 1995**




See appendix table 5-17.

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of this difference. Comparisons of men and women in the same field, the same age group, the same rank or position, and with a similar number of subordinates, would reveal salaries more nearly the same. See the previous version of this report (NSF, 1996) for a more detailed explanation of the influences on salaries for men and women.

## Minority Scientists and Engineers[9]

### Representation in Science and Engineering

With the exception of Asians, minorities are a small proportion of scientists and engineers in the United States. Asians were 10 percent of scientists and engineers in the United States in 1995, although they were 3 percent of the U.S. population. Blacks, Hispanics, and American Indians as a group were 23 percent of the U.S. population and 6 percent of the total science and engineering labor force in 1995.[10] Blacks and Hispanics were each about 3 percent, and American Indians were less than half of 1 percent of scientists and engineers. (See figure 5-5.)

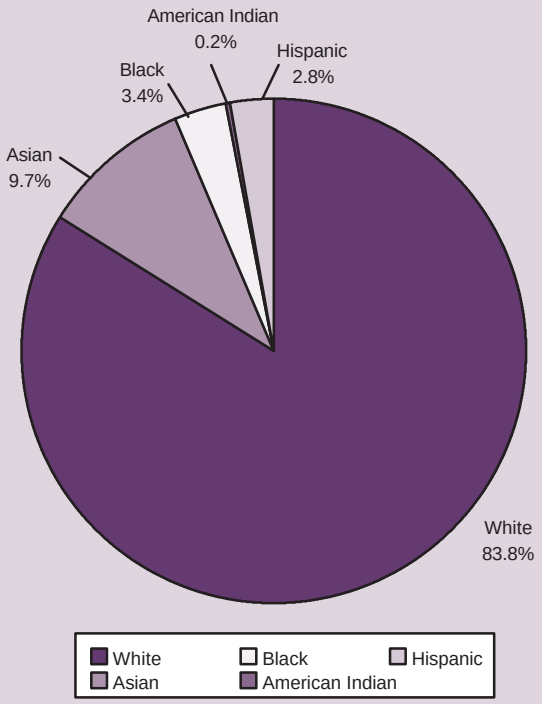
### Age Distribution

The age distributions of minorities, including Asians, differ from that of white scientists and engineers. As noted earlier, these differences influence differences in employment characteristics. About 13 percent of employed white scientists and engineers are younger than age 30, compared with between 16 and 20 percent of Asian, black, and Hispanic scientists and engineers. (See appendix table 5-2.)

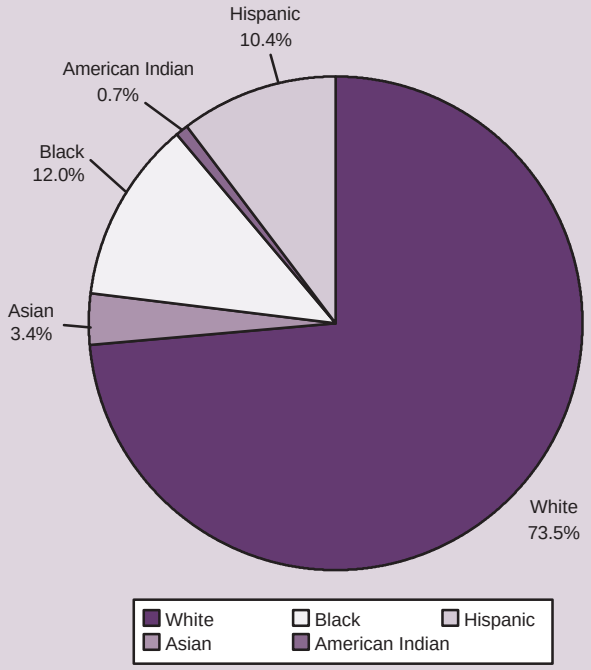
### Field of Science and Engineering

Black, Asian, and American Indian scientists and engineers are concentrated in different fields than white and Hispanic scientists and engineers. (See figures 5-6 to 5-10.) Asians are less represented in social sciences than they are in other fields. They are 4 percent of social scientists but 10 percent of engineers and computer scientists. A higher proportion of black scientists and engineers are in social sciences and in computer and mathematical sciences than they are in other fields. They are 5 percent of social scientists, 4 percent of computer and mathematical scientists, and roughly 3 percent of physical scientists, life scientists,

Figure 5-5.
**Scientists and engineers in the labor force, by race/ethnicity: 1995**




**The resident population of the United States, by race/ethnicity: 1995**




See text table 1-1.

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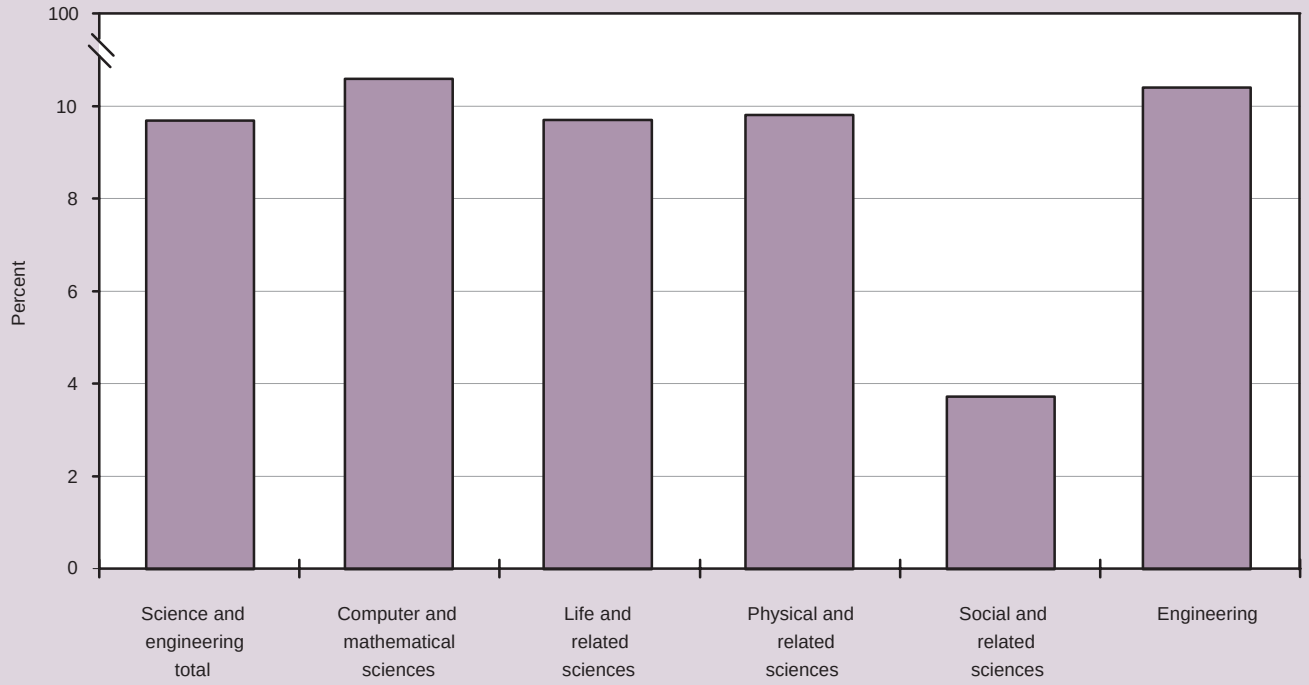
[9] The data reported in this section include all scientists and engineers, regardless of citizenship or country of origin, unless otherwise noted.

[10] The science and engineering field in which blacks, Hispanics, and American Indians earn their degrees influences participation in the science and engineering labor force. Blacks, Hispanics, and American Indians are disproportionately likely to earn degrees in the social sciences (defined by NSF as degrees in science and engineering) and to be employed in social services occupations, e.g., social worker, clinical psychologist, that are defined by NSF as non–science-and-engineering occupations. See appendix A for NSF's classification of science and engineering fields.

Figure 5-6.
**Asians as a percentage of the science and engineering labor force, by occupation: 1995**




See appendix table 5-18.

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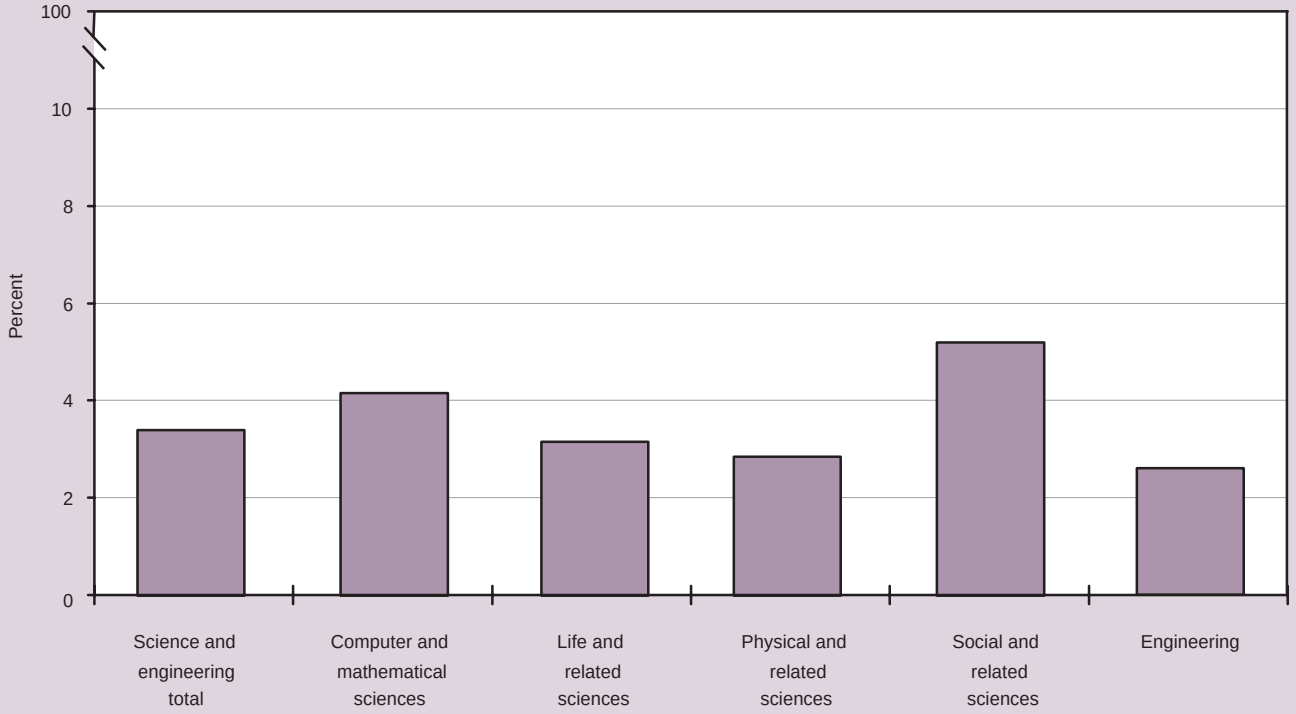
Figure 5-7.
**Blacks as a percentage of the science and engineering labor force, by occupation: 1995**




See appendix table 5-18.

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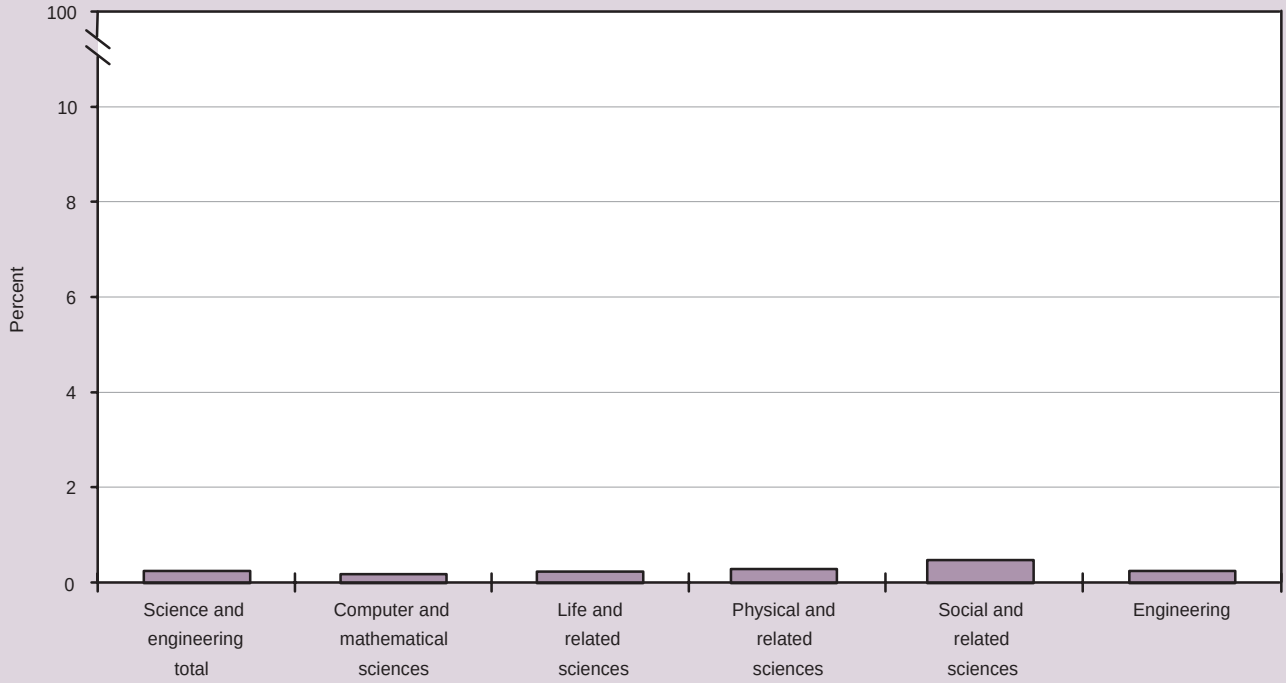
Figure 5-8.
**American Indians as a percentage of the science and engineering labor force, by occupation: 1995**




See appendix table 5-18.

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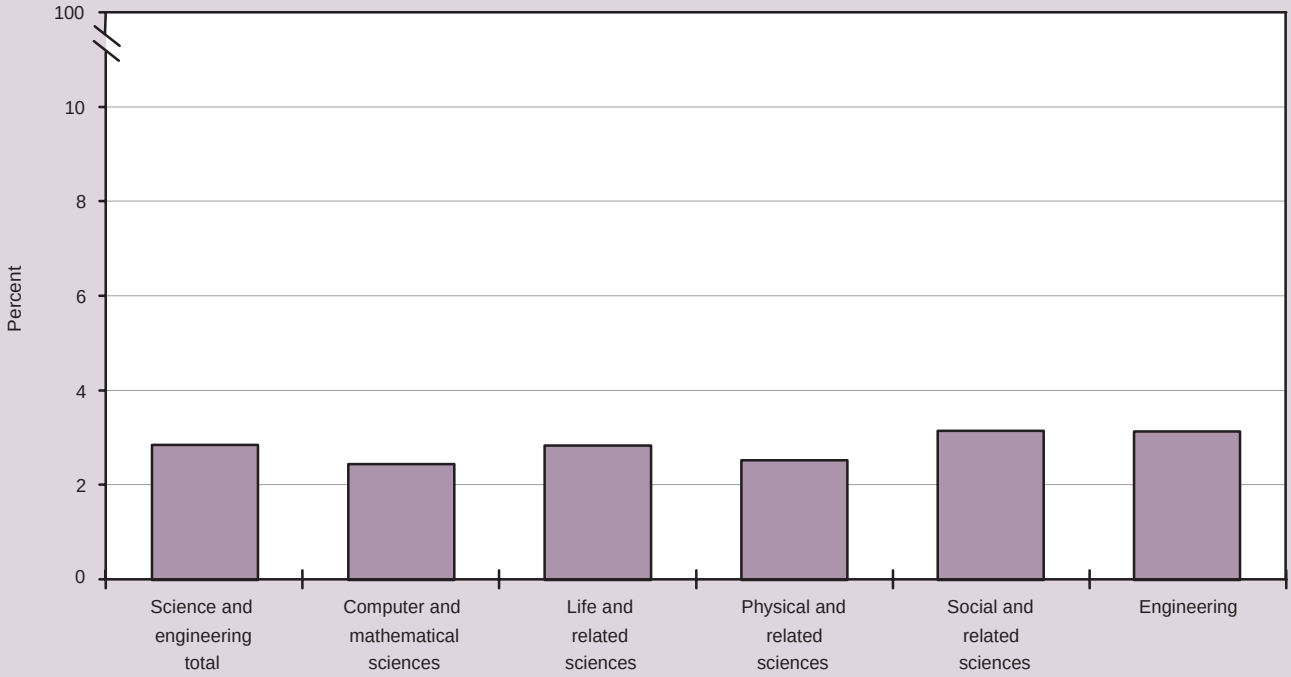
Figure 5-9.
**Hispanics as a percentage of the science and engineering labor force, by occupation: 1995**




See appendix table 5-18.

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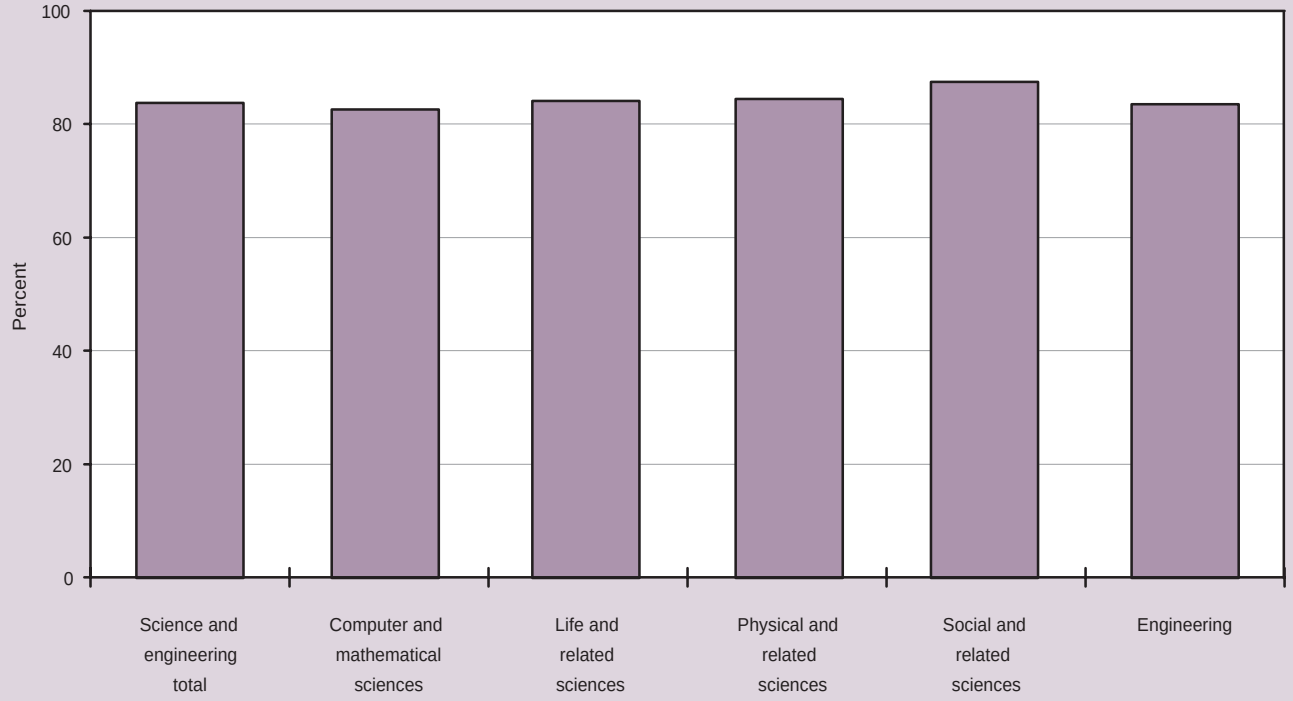
Figure 5-10.
**Whites as a percentage of the science and engineering labor force, by occupation: 1995**




See appendix table 5-18.

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and engineers. Although the numbers are small, American Indians appear to be concentrated in the social sciences. They are 0.5 percent of social scientists and 0.3 percent or less of other fields. Hispanics are more proportionally represented among fields. They are roughly 2.5 to 3 percent of scientists and engineers in each field.

Distributions of field for racial/ethnic groups differ also by nativity. Among doctoral scientists and engineers, U.S.-born Asians are more similar to other racial/ethnic groups in terms of field than are non-U.S.-born Asians. (See text table 5-1.) Both U.S.-born and non-U.S.-born Asians are less likely than other racial/ethnic groups to be in social sciences and more likely to be in engineering; however, the differences are less among U.S.-born scientists and engineers. (See appendix table 5-19.)

## Educational Background

The educational attainment of scientists and engineers differs among racial/ethnic groups. Black scientists and engineers have, on average, a lower level of educational attainment than scientists and engineers of other racial/ethnic groups. Black scientists and engineers are more likely than white, Hispanic, or Asian scientists and engineers to have a bachelor's as the terminal degree: 66 percent of black scientists and engineers in the U.S. labor force have a bachelor's as the highest degree compared to 58 percent of all scientists and engineers in 1995. (See appendix table 5-18.)

## Labor Force Participation, Employment, and Unemployment

Labor force participation rates vary by race/ethnicity. Minority scientists and engineers were more likely than whites to be in the labor force (i.e., employed or looking for employment). Between 91 and 94 percent of black, Asian, Hispanic, and American Indian scientists and engineers were in the labor force in 1995, compared to 87 percent of white scientists and engineers. (See appendix table 5-20.) Age differences are part of the explanation. White scientists and engineers are older, on average, than scientists and engineers of other racial/ethnic groups: 22 percent of white scientists and engineers were age 50 or older in 1995, compared with between 15 and 18 percent of Asians, blacks, and Hispanics. (See appendix table 5-2.) Among those in similar age groups, the labor force participation rates of white and minority scientists and engineers are similar. (See appendix table 5-3.)

Text table 5-1.
**Doctoral scientists and engineers in the labor force, by occupation and race/ethnicity: 1993**

**U.S.-born doctoral scientists and engineers:**
[Percentage distribution]

| Occupation | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian |
|---|---|---|---|---|---|---|
| Total, all fields | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Computer and mathematics | 11.6 | 11.6 | 9.5 | 12.7 | 10.0 | 9.2 |
| Life sciences | 24.7 | 24.8 | 32.1 | 19.2 | 22.7 | 17.0 |
| Physical sciences | 18.5 | 18.8 | 15.5 | 11.3 | 16.3 | 9.5 |
| Social sciences | 31.6 | 31.2 | 23.9 | 49.2 | 35.1 | 54.8 |
| Engineering | 13.6 | 13.6 | 19.0 | 7.6 | 16.0 | 9.4 |

**Non-U.S.-born doctoral scientists and engineers:**
[Percentage distribution]

| Occupation | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian |
|---|---|---|---|---|---|---|
| Total, all fields | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | — |
| Computer and mathematics | 16.5 | 17.0 | 16.2 | 12.7 | 15.4 | — |
| Life sciences | 24.0 | 24.2 | 23.5 | 21.0 | 29.8 | — |
| Physical sciences | 20.2 | 21.9 | 19.3 | 20.5 | 15.8 | — |
| Social sciences | 12.7 | 17.2 | 7.7 | 26.4 | 22.0 | — |
| Engineering | 26.6 | 19.7 | 33.3 | 19.3 | 17.0 | — |

See appendix table 5-19.

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Although minorities, for the most part, are less likely to be out of the labor force, among those who are in the labor force, minorities are more likely to be unemployed. In 1995, the unemployment rate of white scientists and engineers was significantly lower than that of other racial/ethnic groups. (See appendix table 5-20.) The unemployment rate for whites was 2.0 percent, compared with 2.8 percent for Hispanics, 2.4 percent for blacks, and 3.4 percent for Asians. The differences in unemployment rates were evident within fields of science and engineering as well as for science and engineering as a whole. For example, the unemployment rate for white engineers was 2.5 percent; for black and Asian engineers, it was 4.0 percent.

## Sector of Employment

Racial/ethnic groups differ in employment sector, partly because of differences in field of employment. Among employed scientists and engineers in 1995, 51 percent of black, 57 percent of Hispanic, and 54 percent of American Indian, compared with 62 percent of white and 64 percent of Asian scientists and engineers were employed in for-profit business or industry. (See appendix table 5-7.) Blacks and American Indians are concentrated in the social sciences, which are less likely to offer employment in business or industry, and are underrepresented in engineering, which is more likely to offer employment in business or industry. Asians, on the other hand, are overrepresented in engineering and thus are more likely to be employed by private for-profit employers.

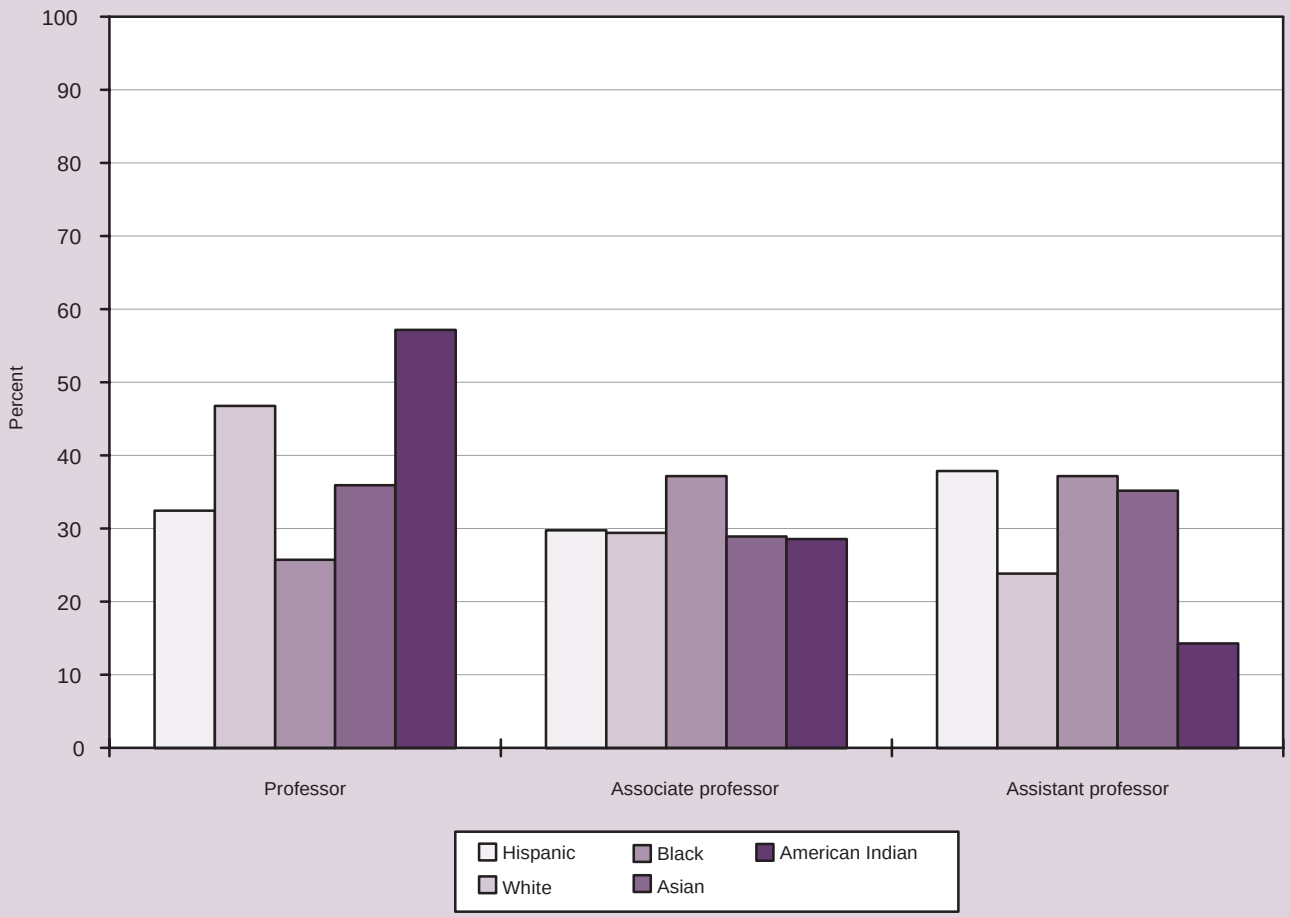
Black, Hispanic, and American Indian scientists and engineers are also more likely than other groups to be employed in government (Federal, state, or local): 22 percent of black, 17 percent of Hispanic, and 19 percent of American Indian scientists and engineers were employed in government in 1995, compared with 14 percent of white and 12 percent of Asian scientists and engineers.

## Academic Employment

Racial/ethnic groups differ in academic employment characteristics such as rank and tenure. Minorities represented 15 percent of full-time ranked doctoral science and engineering faculty in 1995: blacks constituted 2.4 percent, Asians 9.2 percent, American Indians 0.5 percent, and Hispanics 2.7 percent. Although Asians are not underrepresented in science and engineering employment, like underrepresented minorities, they are less likely to be full professors. (See figure 5-11.) Among full-time ranked science and engineering faculty, 35 percent of Asians, 25 percent of blacks, and 31 percent of Hispanics, compared with 47 percent of whites, are full professors. These differences are largely explained by differences in age. Black, Hispanic, and Asian scientists and engineers are younger on average than white and American Indian scientists and engineers. When age differences are accounted for, most differences in rank and tenure are reduced. Among ranked faculty between the ages of 45 and 54, 50 percent of Hispanic faculty, 55 percent of Asian faculty and 59 percent of white faculty were full professors. (See appendix table 5-9.) Among black faculty in that age group, however, 25 percent were full professors.

Black, Hispanic, and Asian faculty are also less likely than white faculty to be tenured. Forty-seven percent of black faculty, 41 percent of Hispanic faculty, and 35 percent of Asian faculty compared to 57 percent of white faculty are tenured. (See appendix table 5-10.) Some, but not all, of these tenure differences are related to age differences. Among younger faculty (age 35 to 44), 29 percent of Hispanic, 21

Figure 5-11.
**Academic rank of full-time employed ranked doctoral science and engineering faculty in 4-year colleges and universities, by race/ethnicity: 1995**




See appendix table 5-9.

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percent of black, 25 percent of Asian, and 37 percent of white faculty are tenured.

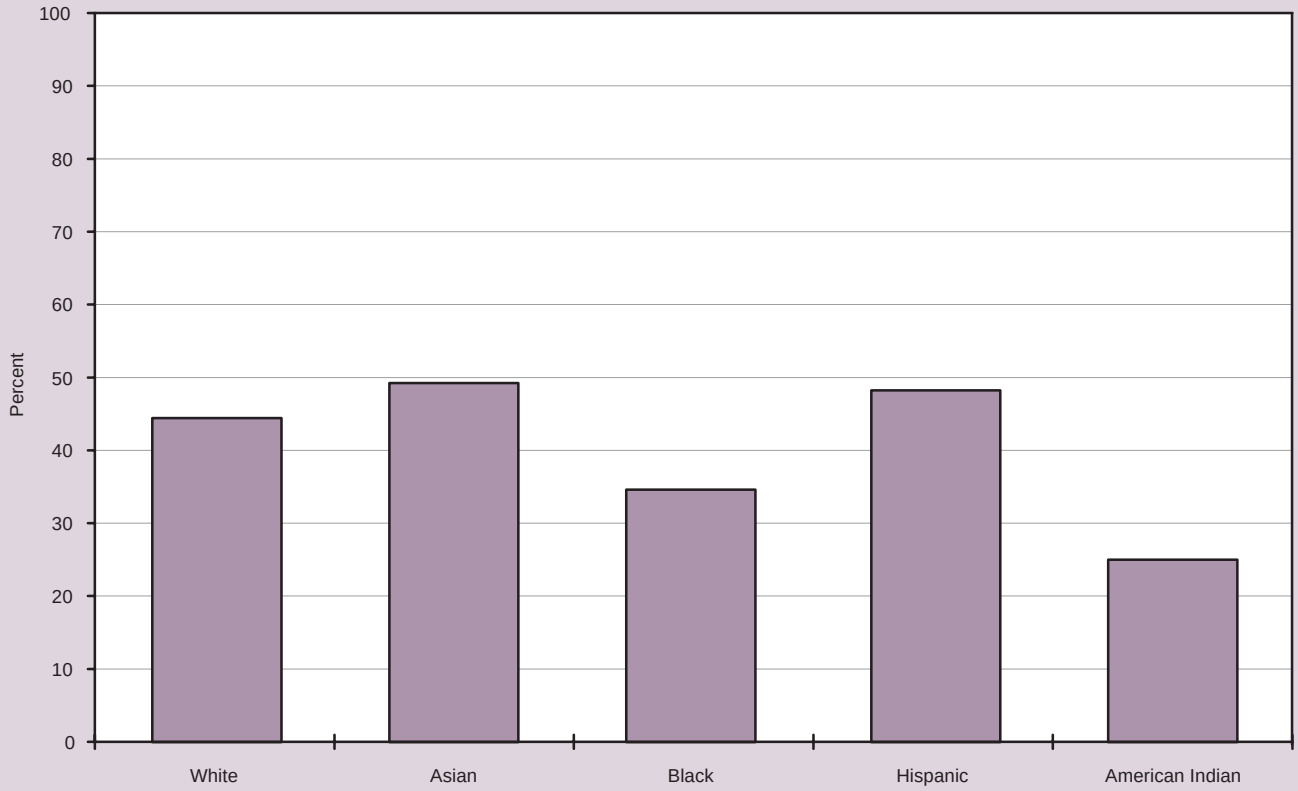
Black faculty had fewer publications than faculty in other racial/ethnic groups since 1990. (See appendix table 5-11.) Among doctoral scientists and engineers who received their doctorates in 1990 or earlier and who work in 4-year colleges or universities, 28 percent of black faculty had no publications since 1990 compared with 15 percent of Hispanic, 18 percent of white, and 12 percent of Asian faculty.

Black and American Indian faculty are also less likely than other groups to have received Federal grants or contracts. (See figure 5-12.) Thirty-five percent of black and 25 percent of American Indian doctoral scientists and engineers employed in colleges or universities are supported by Federal contracts or grants compared to 44 percent of white and 49 percent of Hispanic and Asian doctoral scientists and engineers employed full time in colleges or universities. (See appendix table 5-12.)

## Nonacademic Employment

Racial/ethnic groups differ in some respects in their primary work activity. Black and Asian scientists and engineers are more likely than other groups to be engaged primarily in computer applications—34 percent of black and 36 percent of Asians compared with 27 percent of Hispanic and 28 percent of white scientists and engineers. (See appendix table 5-13.) Asians are less likely than other groups to be in management or administration (14 percent of Asians compared with roughly 22 percent of Hispanic, white, and black scientists and engineers). Age differences do not explain this difference in managerial activity. Among 35 to 44 year olds, Asians remain less likely to be in management—13 percent of Asians and between 20 and 23 percent of other groups are in management or administration. Among supervisory scientists and engineers, Asians also have fewer subordinates. The average number of direct and indirect subordinates is 8 for Asians,

Figure 5-12.
**Percent of full-time employed doctoral scientists and engineers in 4-year colleges or universities who are supported by contracts or grants from the U.S. government, by race/ethnicity: 1995**




See appendix table 5-12.

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9 for American Indians, and roughly 11 for Hispanic, white, and black scientists and engineers. (See appendix table 5-14.)

White and Hispanic scientists and engineers work for similarly sized employers. Black and American Indian scientists and engineers are more likely to work for very large firms (55 percent and 54 percent, respectively) than are white scientists and engineers (45 percent). (See appendix table 5-15.)

Black scientists and engineers are less likely to have patents than other racial/ethnic groups. In business and industry among natural scientists and engineers who received degrees in 1990 or earlier, 17 percent of blacks, compared with 50 percent of Hispanics, 38 percent of whites, and 36 percent of Asians, were named as an inventor on a patent since 1990. (See appendix table 5-16.)

### Salaries

Salaries for scientists and engineers differ little among racial/ethnic groups. Among all scientists and engineers, the median salaries by racial/ethnic group are $50,500 for whites, $50,000 for Asians, $45,000 for blacks, $47,000 for Hispanics, and $48,000 for American Indians, with the biggest differences being between whites and blacks. Within fields and age categories, median salaries of scientists and engineers by race/ethnicity are not dramatically different and do not follow a consistent pattern. (See appendix table 5-21.) For example, the median salary of engineers with bachelor's degrees who are between the ages of 20 and 29 ranges from $36,000 for American Indians to $40,000 for blacks. Among those between the ages of 40 and 49, the median salary ranges from $53,000 for Asians and Hispanics to $58,000 for whites.

## Minority Women

### Representation in Science and Engineering

Minority women are 19 percent of all women in the science and engineering labor force and 4.2 percent of all scientists and engineers in the labor force. (See text table 1-1 and appendix table 5-22.) Black women are 1.3 percent, Hispanic women are 0.6 percent, American Indian women are 0.1 percent, and Asian women are 2.2 percent of scientists and engineers in the labor force. Within every racial/ethnic group, women are a smaller proportion of the science and engineering labor force than are men.

### Field of Science and Engineering

Field choices of minority women are more similar to those of white women than they are to those of minority men. Higher proportions of women than men within each racial/ethnic group are in computer or mathematical sciences, life sciences, and social sciences and lower proportions are in engineering. Asian women differ from women in other racial/ethnic groups in that a relatively small proportion are in social sciences. (See appendix table 5-22.)

### Labor Force Participation, Employment, and Unemployment

Black and Asian women scientists and engineers are more likely than women from other racial/ethnic groups to be in the labor force and to be employed full time in a field related to their degree. Seventy-one percent of black and 72 percent of Asian women scientists and engineers compared with 61 percent of white women, 68 percent of Hispanic women, and 65 percent of American Indian women were employed full time in their field. (See appendix table 5-23.) Conversely, more white women (15 percent) than black women (9 percent) and Asian women (7 percent) are employed part time.

The unemployment rate for white women scientists and engineers is much lower than is the case for other racial/ethnic groups: 1.8 percent compared with 2.3 percent for Hispanic women, 2.7 percent for black women, and 3.0 percent for Asian women.

### Sector of Employment

#### *Academic Employment*

As previously discussed, men and women and racial/ethnic groups differ in academic employment characteristics, such as rank and tenure. Women are less likely than men to be full professors, and minority faculty are less likely than white faculty to be full professors. Minority women are less likely than white women and less likely than men of any racial/ethnic group[11] to be full professors. (See appendix table 5-24.) As in other cases, these rank and tenure differences may be related to age differences.

Tenure differences may also be related to rank. Minority women are less likely than white women or men of any racial/ethnic group to be tenured. Twenty-five percent of Hispanic women, 36 percent of black women, and 17 percent of Asian women compared to 38 percent of white women, 62 percent of white men, and between 39 and 50 percent of Hispanic, black and Asian men are tenured. (See appendix table 5-25.) The small percentage of Asian women who are tenured is also related to differences in academic position. A relatively larger proportion of Asian men and women are in positions for which tenure does not apply, for example, postdoctoral fellows and nonfaculty research appointments.

[11] Excluding American Indians for whom data are unreliable due to small sample size.

### *Nonacademic Employment*

Minority women scientists and engineers in business or industry have, for the most part, similar work activities as white women and minority men. For example, from 26 to 34 percent of women in most racial/ethnic groups are primarily engaged in research, and from 17 to 21 percent of women in most racial/ethnic groups are in management or administration (the exception being 13 percent of Asian women in management). (See appendix table 5-26.) Women, regardless of racial/ethnic group, are more likely than men to work in computer applications and are less likely than men to work in research and development.

### Salaries

Median annual salaries of minority women are similar to those of both white women and minority men, controlling for field and age. Among engineers in the 20- to 29-year-old age group, for example, the median salary of Hispanic women was $40,000, for black women $42,000, for Asian women $37,700, and for white women $38,800. Median salaries for men engineers in the same age group ranged from $38,000 to $40,000. (See appendix table 5-27.)

## Scientists and Engineers With Disabilities

### Representation in Science and Engineering

Persons with disabilities are also underrepresented in science and engineering occupations. Comparisons of data on participation of persons with disabilities are difficult because of differences in definition.[12] It appears, however, that persons with disabilities are a smaller proportion of the science and engineering labor force than they are of the labor force in general. About 20 percent of the U.S. population have some form of disability, and about 10 percent have a severe disability[13] (McNeil, 1993). Persons with disabilities are 14 percent of all employed persons[14] and 5 percent of employed scientists and engineers. (See text table 1-1 and appendix table 5-7.)

The representation of persons with disabilities in the science and engineering population can be estimated by comparing the results of the NSF SESTAT surveys with similar results from the Bureau of the Census Survey of Income and Program Participation (SIPP).[15] The 1993–1994 SIPP used

[12] 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. Second, data about disabilities are frequently not included in comprehensive institutional records (e.g., in registrars' records in institutions of higher education). 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 decisions to self-identify, not objective measures. Finally, data users should understand that sample sizes for the population of disabled persons may be small and care should be taken in interpreting the data.

[13] Estimates of the proportion of the population with disabilities vary due to differing definitions of "disability." See appendix A for a discussion of the limitations of estimates of the size of this group.

[14] U.S. Department of Commerce, Bureau of the Census. 1994. "Americans with Disabilities" Statistical Brief SB/94-1.

[15] Since there were several differences between the two surveys, comparisons can be made only for certain segments of the two populations.

## 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.

NSF's surveys use 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]?"[16] 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. Although 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.[17]

[16] The full wording of these alternatives in the survey forms 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."

[17] Additional measures of types of disability were omitted from the surveys due to practical limitations. The disability questions included in the questionnaires 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 surveys. This would be especially true if the surveys requested information on highly sensitive disabilities.

questions for measuring disability that are quite similar to those in the NSF surveys (McNeil, 1993). This provides an opportunity to make some approximate comparisons between the science and engineering population and the larger population.

Comparisons of the two survey results indicate that persons with sight and hearing disabilities are not underrepresented and persons with mobility impairments are underrepresented among scientists and engineers. The Survey of Income and Program Participation found that in 1994–1995, 2.4 percent of the population of 15 to 64 years olds reported that they were unable to see words and letters even when wearing glasses or contact lenses. The comparable figure from the 1995 NSF Surveys was 2.3 percent. In the total population, 2.7 percent were unable to hear normal conversations even when using a hearing aid, compared with 3.0 percent of the scientists and engineers. On the other hand, 4.8 percent of the general population reported being unable to lift a 10-pound bag of groceries, compared with 1.6 percent of the scientists and engineers. Of the total population, 5.2 percent were unable to walk unassisted or climb stairs compared with 1.4 percent of the scientists and engineers. (See appendix table 5-28.)[18] [19]

## Age Distribution

The proportion of scientists and engineers with disabilities increases with age. More than half became disabled at age 30 or older. (See figure 5-13.) Only 7 percent had been disabled since birth, and 30 percent had been disabled before the age of 20. (See appendix table 5-29.)

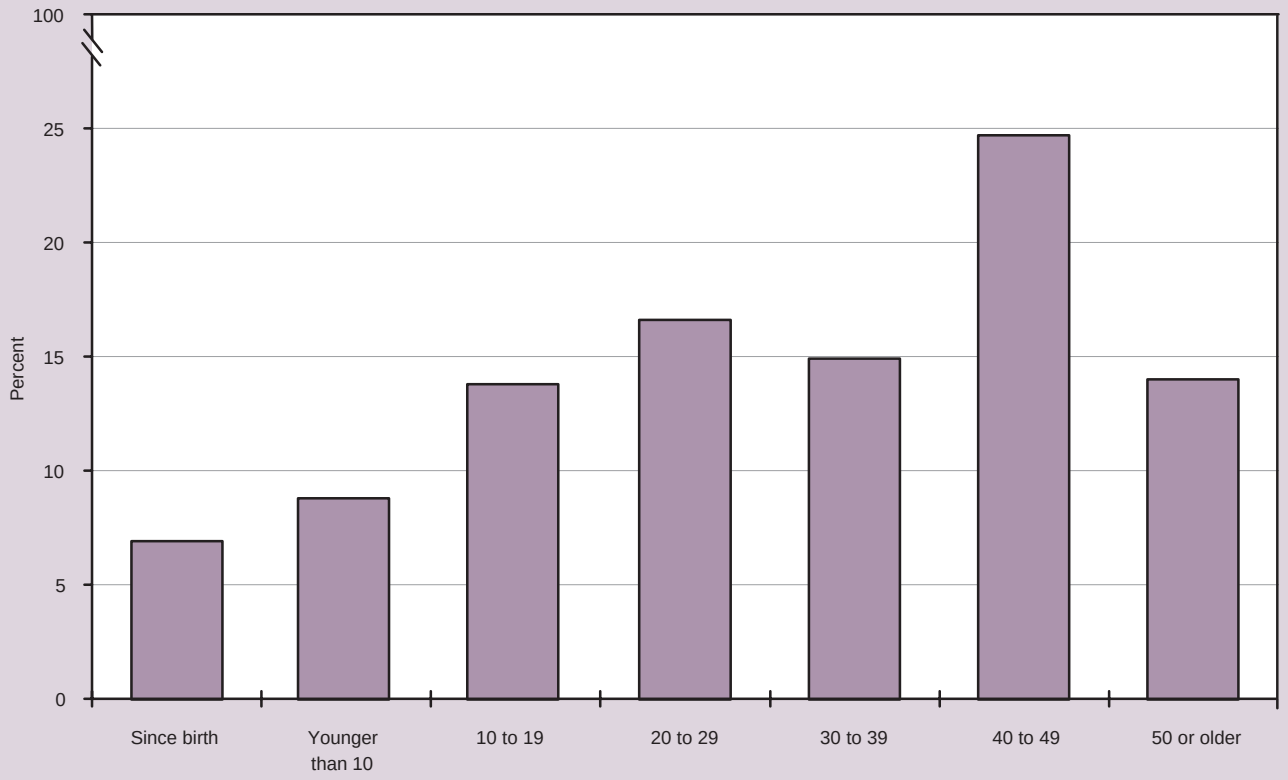
## Labor Force Participation, Employment, and Unemployment

The labor force participation rates of scientists and engineers with and without disabilities are quite different. Almost one-third of scientists and engineers

[18] The question used in the SESTAT surveys combined stair climbing and walking, whereas the Survey of Income and Program participation asked about these two activities separately. The rate reported for the latter survey is for the activity with the higher reported disability rate.

[19] Small cell sizes restrict the analysis of types of disability to overall percentages of the science and engineering population.

Figure 5-13.
**Percent of scientists and engineers with disabilities who are in the labor force, by age at onset of disability: 1995**




See appendix table 5-29.

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with disabilities are out of the labor force, compared with 11 percent of those without disabilities. (See appendix table 5-30 and figure 5-14.) Age accounts for some, but not all, of the differences in labor force participation. Scientists and engineers with disabilities are older than those without disabilities (40 percent of those with disabilities are age 50 or older compared with 20 percent of those without disabilities), and older scientists and engineers are likely to be out of the labor force due to retirements. Age, however, does not explain all of the differences in labor force participation. Within age categories, scientists and engineers with disabilities are still more likely than those without disabilities to be out of the labor force. For example, among those between the ages of 35 and 44, 7 percent of scientists and engineers with disabilities are unemployed or out of the labor force compared with 4 percent of those without disabilities. Among those age 55 or older, 61 percent of scientists and engineers with disabilities are out of the labor force compared with 42 percent of those without disabilities.

Although age accounts for some of the tendency for persons with disabilities to be out of the labor force, chronic illness or permanent disability is also a factor. The primary reason for not working for both persons with and without disabilities was retirement (75 percent versus 60 percent), but 21 percent of persons with disabilities and 2 percent of those without disabilities cited chronic illness or permanent disability. (See appendix table 5-4.)

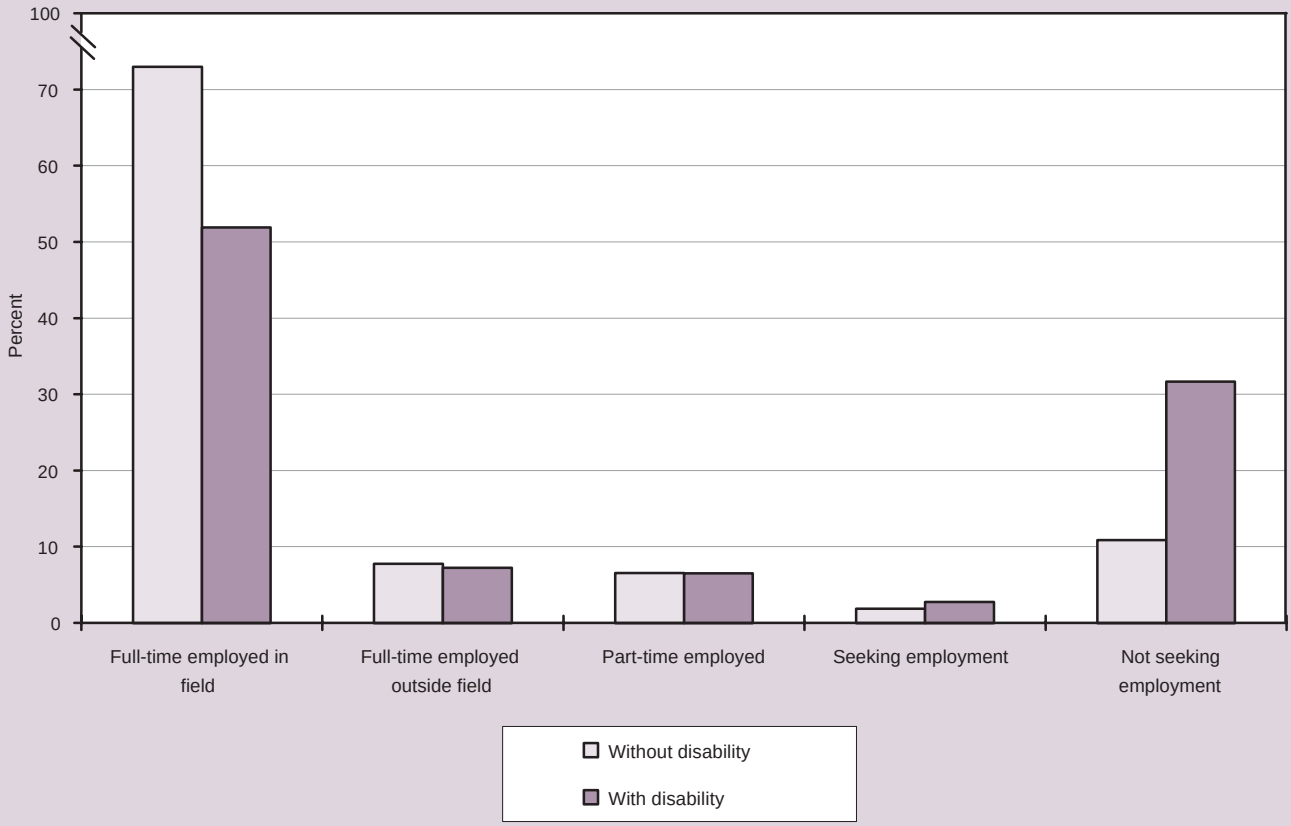
Among those in the labor force, persons with disabilities are more likely than those without disabilities to be unemployed. The 1995 unemployment rate for scientists and engineers with disabilities was 4.0 percent compared to 2.1 percent for those without disabilities. (See appendix table 5-30.)

The percentage of scientists and engineers in the labor force who were employed part time in 1995 was the same for those with and without disabilities (6 percent).

## Field of Science and Engineering

Persons with disabilities are not particularly concentrated in certain fields: 30 percent of scientists and

Figure 5-14.
**Employment status of scientists and engineers by disability status: 1995**




See appendix table 5-30.

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## Misconceptions Can Limit Job Opportunities

Misconceptions about the ability of those with physical or learning disabilities to succeed in science and engineering persist. These misconceptions deter many young people with disabilities from pursuing careers in science and engineering and can limit the job opportunities for both those who obtain degrees in science and engineering and those who develop disabilities later in life (Woods, 1997). Young people can be discouraged by parents, teachers, and others from pursuing careers in science. As one working chemist with limited vision recalls, "Nobody wanted me to be a chemist...everyone thought it was crazy for a kid, almost blind, to major in chemistry. I had to fight my parents, the school, teachers, guidance counselors, and the state vocational rehabilitation agency" (p. 9). Safety is often the primary concern of parents, teachers, and employers, yet with proper training and accommodations, scientists and engineers with disabilities present no more of a safety hazard than those without disabilities.

According to the American Chemical Society's Committee on Chemists with Disabilities, not all chemists with disabilities require accommodations, and many of those who do require few accommodations, most of which are not costly. For example, making an emergency shower wheelchair accessible can simply require adding a chain. In interviews with a number of working chemists with disabilities, the committee found that the accommodations needed varied depending on the nature of the work and the nature of the disability. Decisions on what accommodations are needed were arrived at jointly between the employee and the employer or the student and the university.

Accommodations used by working chemists varied from simple and common procedures and technologies to more high-tech equipment. Some are as simple as allowing the scientist to work at home; planning in advance; providing simple encouragement and patience while a disabled colleague finds ways to adapt; providing flexible work hours; having access to computers, e-mail, voicemail, and faxes; and making adjustments in height of equipment, desks, valves, switches, ramps, or platforms. Some involve more complicated but nevertheless commonly available technology, such as voice recognition software, TTD, visual alarms, voice-synthesizer cards for computers, and printers that output Braille.

The committee found that attitudes are often the most important accommodation—a focus by both the employee and the employer on what they can rather than what they cannot do.

engineers both with and without disabilities were in computer science and mathematics occupations and 9 percent of both were in physical sciences. (See appendix table 5-31.) Similar proportions of scientists and engineers with and without disabilities were in engineering (41 percent versus 42 percent), in life sciences (8 percent versus 10 percent), and in social sciences (12 percent versus 10 percent).

### Educational Background

Scientists and engineers with disabilities do not differ in educational background from those without disabilities: 13 percent of both have the doctorate as their highest degree. (See appendix table 5-31.)

### Sector of Employment

Scientists and engineers with disabilities are less likely than those without disabilities to be employed in for-profit business or industry. Fifty-five percent of scientists and engineers with disabilities compared with 62 percent of those without disabilities were employed in for-profit business or industry in 1995. Eighteen percent of those without disabilities and 19 percent of those with disabilities are employed in educational institutions. (See appendix table 5-7.)

### *Academic Employment*

Faculty who have disabilities are more likely than those without disabilities to be full professors and to be tenured. (See appendix tables 5-9 and 5-10.) These differences in rank and tenure between persons with or without disabilities, as was noted in the discussions of women and minorities, can be explained by differences in age. Because incidence of disability increases with age, scientists and engineers with disabilities tend to be older and to have greater years of professional work experience than those without disabilities. Among doctoral scientists and engineers employed full time in 4-year colleges or universities of similar ages, rank and tenure status are more similar. For example, among those between 45 and 54 years old, 70 percent of those with disabilities and 73 percent of those without disabilities are tenured. (See appendix table 5-10.) Similarly, among those in that same age group, 57 percent

of faculty both with and without disabilities are full professors.

Science and engineering faculty with disabilities are less likely to have publications than those without disabilities. Twenty-two percent of those with disabilities and 17 percent of those without disabilities had no publications since 1990. (See appendix table 5-11.) Faculty with disabilities had fewer publications than those without disabilities—43 percent of those with disabilities and 46 percent of those without disabilities had 6 or more publications since 1990. Faculty with disabilities (38 percent) were also less likely than those without disabilities (45 percent) to have been supported on federal grants or contracts. (See appendix table 5-12.)

### *Nonacademic Employment*

The type of work that scientists and engineers with disabilities do is similar to the type of work done by those without disabilities. The primary work activity of 37 percent of scientists and engineers with disabilities is research and development, compared to 38 percent of those without disabilities. Twenty-five percent of scientists and engineers with disabilities and 21 percent of those without disabilities are in management or administration. (See appendix table 5-13.) Among those with supervisory responsibilities, persons with and without disabilities have about the same number of subordinates. The average number of subordinates for persons with disabilities is 12 and the average number of subordinates for persons without disabilities is 11. (See appendix table 5-14.)

Persons with disabilities do not differ from those without disabilities in terms of employer size—45 percent of those without disabilities and 46 percent of those with disabilities work for large firms (5,000 or more employees). Four percent of both work for very small firms (fewer than 10 employees). (See appendix table 5-15.)

Natural scientists and engineers with disabilities were less likely than those without disabilities to have patents—32 percent of those with disabilities and 38 percent of those without disabilities had been named as an inventor on a patent since 1990. (See appendix table 5-16.)

### Salaries

Median salaries of scientists and engineers with disabilities do not differ substantially from median salaries for those without disabilities. Among all scientists and engineers, the median salary for those with disabilities is $51,000; for those without disabilities, it is $50,000. Salaries differ little within fields and age groups as well. For example, the median salary for engineers with bachelor's degrees and between the ages of 20 and 29 is $41,000 for those with disabilities and $38,000 for those without disabilities. Among those age 50 or older, the median salary for engineers with disabilities is $60,000 and the median salary for engineers without disabilities is $61,000. (See appendix table 5-32.)

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# APPENDIX A

## TECHNICAL NOTES

### General Information

The data in this report come from many sources, including surveys conducted by NSF, other Federal agencies and by non-Federal sources. 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, and so forth.

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 being unable or unwilling to provide complete, correct information. Errors can also arise during the processing of responses, such as recording and keying errors.

### 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. Because 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, the operational definitions of "disability" vary and 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 Chapter 2, p. 22.)

Second, data about disabilities frequently are 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. Because persons with disabilities constitute a relatively small portion of the population and because oversampling is not possible, 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 considerable information is 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 Non-NSF Sources

The following non-NSF sources were used for data tables in this report.

### Survey of Income and Program Participation

**Contact:**
Current Population Reports
Bureau of the Census
U.S. Department of Commerce
Washington, DC 20233
Tel: (301) 763-8300

The Survey of Income and Program Participation conducted by the Census Bureau provides information on the economic situation of households and persons in the United States. The survey collects data on basic social and demographic characteristics of persons in households, labor force activity, type and amount of income, participation status in various programs, and various supplementary modules, for example, work history, health characteristics (including disability), assets and liabilities, and education and training.

A combined sample from the 1992 and 1993 panels of the Survey of Income and Program Participation provides the latest available data on the disability status of the noninstitutionalized population of the United States. A supplement containing an extensive set of questions about disability status was included as part of the ninth wave of the 1992 panel and the sixth wave of the 1993 panel. Both of these waves were fielded between September and December 1994. The total sample size for this study was approximately 40,000 interviewed households.

The disability supplements that have been asked in SIPP were designed to be consistent with the ADA definition of disability. The supplements obtain information on the ability to perform specific functional activities (seeing, hearing, having one's speech understood, lifting and carrying, climbing stairs, and walking); certain ADLs or activities of daily living (getting around inside the home, getting in and out of a bed or chair, bathing, dressing, eating, and toileting), and certain IADLs or instrumental activities of daily living (going outside the home, keeping track of money and bills, preparing meals, doing housework, and using the telephone). The survey also collects information on the use of such special aids as wheelchairs and canes, the presence of certain conditions related to mental functioning, and the ability to work at a job or business.

### National Assessment of Educational Progress

**Contact:**
National Center for Education Statistics
U.S. Department of Education
555 New Jersey Avenue, NW
Washington, DC 20208-5653
Tel: (202) 219-1761

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, and history. 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).

Since 1986, NAEP has included both main and long-term trend assessments. Both assessments use a

complex multistage stratified sample of schools that are selected to ensure adequate representation of schools with high enrollment of blacks and Hispanics. Both assessments historically excluded students with limited English proficiency and students receiving special education services whom school officials judged unable to respond meaningfully to the assessment either because the students had limited English proficiency or because they had a severe mental or physical disability.

Beginning with NAEP assessments in 1996, attempts were made to have more of the students who were classified as having disabilities or limited English proficiency included in the assessment. Accommodations were implemented for students who would have been excluded in the past. Spanish-speaking students classified as Limited English Proficiency were given the option of using a bilingual test booklet in mathematics in a portion of the sample. In addition, English-Spanish glossaries were provided at all three grades for designated science books. Other accommodations (such as earphones for the hearing impaired, signers for the deaf, magnifying equipment, and translators) were allowed if provided by the school and specified in the student's Individual Education Plan. A study to determine the impact of the revised inclusion rules and accommodations is taking place with the 1996 assessment. Students classified as disabled or with limited English proficiency who cannot be accommodated, either by the administrators of NAEP or by the schools, are excluded from the assessment.

The main assessments estimate student achievement at a cross-sectional point in time. The cross-sectional samples use innovations in assessment methodology and population definition. In 1996, data were collected from approximately 35,000 students in grades 4, 8, and 12 for the science assessments and from approximately 33,000 students in grades 4, 8, and 12 for the mathematics assessments. Data were also collected from these students' principals and a sample of their teachers.

The long-term trend assessments estimate the current status of achievement using the same sampling and assessment methodology used in previous years. In 1996, approximately 15,000 students ages 9, 13, and 17 were tested in mathematics and in science.

Performance data are reported for the Nation, and for various subgroups categorized by such variables as region, gender, race/ethnicity, parental education, type of school, and type and size of community. Also initiated in 1983 was the reporting of performance data by scaled proficiency levels. Beginning with the 1990 assessment, National Assessment Governing Board established three reporting levels for reporting NAEP results: basic, proficient, and advanced. Currently, NAEP is conducted every other year in even-numbered years.

### 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 1994, approximately 892,000 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 1984–1985 school year, national norms have been based on the most recent ACT test scores available from all students taking the test and who are 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, 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 Assessment Test (SAT)

**Contact:**
College Entrance Examination Board
Educational Testing Service
Princeton, NJ 08541
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The Admissions Testing Program of the College Board comprises a number of college admissions tests, including the Scholastic Assessment 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 21 subject areas; these exams are generally taken by students who are applying to the more competitive schools. In 1994, approximately 1.1 million students took the SAT examination, and more than 200,000 took at least one Achievement Test.

In 1987 the College Board initiated a review of the Admissions Testing Program and made significant changes in the SAT Program in 1993–1994. Through the January 1994 test administration, SAT Program tests included the SAT, the Test of Standard Written English (TSWE), and the Achievement Tests. Beginning in March 1994, 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 (formerly known as the Achievement Tests, with the revisions beginning in May 1994).

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 rather than SAT scores; thus, the proportion of students taking the SAT in some states is very low.

### The Integrated Postsecondary Education Data System Survey: Fall Enrollment, Completions and Institutional Characteristics

**Contact:**
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Tel: (202) 219-1373

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 of 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, whereas 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 schools.

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 surveys of institutions of higher education.

### The National Postsecondary Student Aid Survey

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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. NPSAS was first administered in the fall of the 1986–1987 academic year. NCES conducted subsequent cycles of NPSAS for the 1989–1990, 1992–1993, and 1995–1996 school years. The 1989–1990 cycle contained enhancements to the methodology used in the 1987 cycle. Estimates from the 1996 NPSAS sample are generally comparable to those from the 1993 and 1990 samples but not to those from the 1987 sample.

The 1995–1996 survey gathered information from about 60,000 undergraduate and graduate students selected from registrar lists of enrollees at about 800 postsecondary institutions. The sample included students who did and did not receive financial aid, as well as students' parents. 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. Parents of students were also sampled to compile data concerning family composition and parental financial characteristics. Biennial follow-up data collections are expected.

## Primary NSF Sources

The following NSF sources were used for data tables in this publication. Published data tables from these surveys may be accessed on the NSF Web page *(http://www.nsf.gov/sbe/srs)*. In addition, researchers may access the data directly through the SESTAT or WebCASPAR database systems on the Web.

### Survey of Earned Doctorates

The Survey of Earned Doctorates (SED) has been conducted annually since 1957. Until 1996, it was conducted under contract with 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 PhD 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 contacted through graduate deans at all U.S. universities. 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. No imputations are made, however, 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.

### Survey of Graduate Students and Postdoctorates in Science and Engineering

The data collected in the fall 1995 Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS) represent national estimates of graduate enrollment and postdoctoral employment at the beginning of academic year 1995–1996 in all academic institutions in the United States that offer doctorate or master's degree programs in any science or engineering field. Included are data for all branch campuses, affiliated research centers, and separately organized components, such as medical or dental schools, schools of nursing, public health. The survey universe consisted of 722 reporting units at 602 graduate institutions. Data are collected at the academic department level.

Available information includes full-time graduate students by source and mechanism of support, including 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, including separate data on those holding first-professional doctorates in the health fields; summary information on other doctorate nonfaculty research personnel is also included.

The National Science Foundation has collected data on graduate science and engineering enrollment and postdoctoral appointees since 1966. From fall 1966 through fall 1971, data from a limited number of doctorate-granting institutions were collected through the NSF Graduate Traineeship Program, which requested data only on those science and engineering fields supported by NSF. Beginning with the fall 1972 survey, this data- collection effort was assigned to the Universities and Nonprofit Institutions Studies Group of SRS. It was gradually expanded during the period 1972–1975 to include additional science and engineering fields as well as all institutions known to have programs leading to the master's or doctorate degree. Because of this expansion, data for 1974 and earlier years are not strictly comparable with 1975 and later data.

### NSF's SESTAT Data System

In the 1990s, NSF redesigned its data system about scientists and engineers. Termed SESTAT, the new data system integrates data from three NSF surveys (the Survey of Doctorate Recipients, the National Survey of College Graduates, and the National Survey of Recent College Graduates). The integration of the SESTAT surveys requires complementary sample populations and reference periods, matching survey questions and procedures, as well as weighting adjustments for any overlapping populations.

The surveys provide data on educational background, occupation, employment, and demographic characteristics. These surveys are of individuals and have a combined sample size of about 105,000, covering a population of about 12 million scientists and engineers. SESTAT defines scientists and engineers as those who either received a college degree (bachelor's level or higher) in a science or engineering field or

who work as a scientist or engineer. Each of the three surveys that make up the SESTAT data system collects new data every 2 years. The data reported in this publication were collected in 1995.

SESTAT has as its target population residents of the United States with a baccalaureate degree or higher who, as of the study's reference period, were noninstitutionalized, age 75 or less, and either trained as or working as a scientist or engineer (S&E). A baccalaureate-or-higher degree is a bachelor's, master's, doctorate, or professional degree. To meet the S&E requirement, the U.S. resident had to (1) have at least one baccalaureate-or-higher degree in an S&E field or (2) have a baccalaureate-or-higher degree in a non-S&E field and work in an S&E occupation as of the reference week. For the 1995 SESTAT, the reference period was the week of April 15, 1995.

Some elements of SESTAT's desired target population were not included within the target populations of any of the three SESTAT component surveys. Bachelor's- and master's-level S&E-trained personnel missing from the survey frames are predominately

- residents whose S&E bachelor's and/or master's degrees were received prior to April 1990 or from a foreign institution, who resided outside the United States on April 1, 1990, but not as U.S. armed forces stationed abroad;
- residents with no baccalaureate or higher degree in any field as of April 1, 1990, who were awarded an S&E degree after June 1994 by a U.S. institution or after April 1990, by a foreign institution.

Doctorate level S&E-trained personnel missing from the survey frames are predominately

- residents with S&E doctorates received after June 1994 or from a foreign institution, with no baccalaureate-or-higher degree in any field as of April 1, 1990, and no bachelor's or master's S&E degree received from a U.S. institution between April 1, 1990, and June 1994;
- residents with S&E doctorates received after June 1994 or from a foreign institution but with no bachelor's or master's S&E degree received from a U.S. institution between April 1, 1990, and June 1994, who resided outside the United States on April 1, 1990, but not as U.S. armed forces stationed abroad.

SESTAT classifies the following broad occupation categories as S&E occupations: computer and mathematical scientists, life and related scientists, physical and related scientists, social and related scientists, and engineers. Postsecondary teachers are included within each of these groups. The following are considered non-S&E occupations: top and midlevel managers; teachers, except S&E postsecondary teachers; technologists, including computer programmers; people in health and related occupations, social services and related occupations, sales and marketing occupations, and other non-S&E occupations (for example, artists, broadcasters, editors, entertainers, public relations specialists, writers, clerical and administrative support personnel, farmers, foresters, fishermen, lawyers, judges, librarians, archivists, curators, actuaries, food service, historians (except science and technology), construction trades people, mechanics and repairers, and those involved in precision/production occupations, operators (for example, machine set-up, machine operators and tenders, fabricators, assemblers) and related occupations, transportation/material moving occupations and protective and other service occupations.)

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**Appendix table 1-1. Resident population of the United States, by race/ethnicity and sex: July 1995**



| Race/ethnicity and sex | Number (in thousands) | Percent |
|---|---|---|
| All races/ethnicities | 262,890 | 100.0 |
| Men | 128,569 | 48.9 |
| Women | 134,321 | 51.1 |
| White, non-Hispanic | 193,281 | 73.5 |
| Men | 94,410 | 35.9 |
| Women | 98,871 | 37.6 |
| Asian | 8,836 | 3.4 |
| Men | 4,279 | 1.6 |
| Women | 4,557 | 1.7 |
| Black, non-Hispanic | 31,565 | 12.0 |
| Men | 14,932 | 5.7 |
| Women | 16,634 | 6.3 |
| Hispanic | 27,277 | 10.4 |
| Men | 13,998 | 5.3 |
| Women | 13,278 | 5.1 |
| American Indian | 1,931 | 0.7 |
| Men | 950 | 0.4 |
| Women | 981 | 0.4 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Bureau of the Census, PPL-57. *United States Population Estimates, by Age, Sex, Race, and Hispanic Origin, 1990 to 1996.*

**Appendix table 1-2. Civilian labor force age 20 and older, by race, sex, and Hispanic origin: 1995**



| Race/ethnicity and sex | Number (in thousands) | Percent |
|---|---|---|
| All races | 124,539 | 100.0 |
| Men | 67,324 | 54.1 |
| Women | 57,215 | 45.9 |
| White | 105,405 | 84.6 |
| Men | 57,719 | 46.3 |
| Women | 47,686 | 38.3 |
| Black | 13,905 | 11.2 |
| Men | 6,730 | 5.4 |
| Women | 7,175 | 5.8 |
| Hispanic | 11,418 | 9.2 |
| Men | 6,898 | 5.5 |
| Women | 4,520 | 3.6 |

NOTES: Details will not add to totals because data for "other races" group are not presented and Hispanics include both white and black population groups.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 1-3. Number and percent of persons of all ages, by sex and disability status: 1994**



| Race/ethnicity and sex | Number (in thousands) | Percent |
|---|---|---|
| All persons | 261,749 | 100.0 |
| Men | 127,908 | 48.9 |
| Women | 133,840 | 51.1 |
| With any disability | 53,907 | 20.6 |
| Men | 25,335 | 9.7 |
| Women | 28,572 | 10.9 |
| With a severe disability | 25,969 | 9.9 |
| Men | 10,635 | 4.1 |
| Women | 15,334 | 5.9 |
| With no disability | 207,842 | 79.4 |
| Men | 102,574 | 39.2 |
| Women | 105,268 | 40.2 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1994-1995 data from the Survey of Income and Program Participation.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 1-4. Number and percent of employed persons of all ages, by sex and disability status: 1994**



| Race/ethnicity and sex | Number (in thousands) | Percent |
|---|---|---|
| All persons | 125,591 | 100.0 |
| Men | 67,937 | 54.1 |
| Women | 57,654 | 45.9 |
| With any disability | 17,507 | 13.9 |
| Men | 9,530 | 7.6 |
| Women | 7,977 | 6.4 |
| With a severe disability | 4,243 | 3.4 |
| Men | 2,004 | 1.6 |
| Women | 2,238 | 1.8 |
| With no disability | 108,084 | 86.1 |
| Men | 58,407 | 46.5 |
| Women | 49,677 | 39.6 |

NOTE: Because of rounding, details may not add up to totals.

SOURCE: U.S. Department of Commerce, Bureau of the Census, 1994-1995 data from the Survey of Income and Program Participation.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 1-5. Employed scientists and engineers, by sex, race/ethnicity, and disability status: 1995**



| Sex, race/ethnicity and disability status | Number | Percent |
|---|---|---|
| All persons | 3,185,600 | 100.0 |
| Women | 713,500 | 22.4 |
| Men | 2,472,100 | 77.6 |
| White | 2,673,600 | 83.9 |
| Asian | 304,600 | 9.6 |
| Black | 107,500 | 3.4 |
| Hispanic | 90,100 | 2.8 |
| American Indian | 8,000 | 0.3 |
| With no disability | 3,031,200 | 95.2 |
| Women | 682,200 | 21.4 |
| Men | 2,349,000 | 73.7 |
| White | 2,541,800 | 79.8 |
| Asian | 291,600 | 9.2 |
| Black | 103,600 | 3.3 |
| Hispanic | 85,200 | 2.7 |
| American Indian | 7,300 | 0.2 |
| With a disability | 154,400 | 4.9 |
| Women | 31,300 | 1.0 |
| Men | 123,100 | 3.9 |
| White | 131,900 | 4.1 |
| Asian | 13,000 | 0.4 |
| Black | 3,900 | 0.1 |
| Hispanic | 4,900 | 0.2 |
| American Indian | 700 | 0.0 |

NOTES: Because of rounding, details may not add to totals.
SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 2-1. Percentage of public and private school students who were minority: 1987-1988, 1990-1991, and 1993-1994**



| Year | Total | Public | Private |
|---|---|---|---|
| All minorities | | | |
| 1987-1988 | 28.0 | 29.3 | 18.9 |
| 1990-1991 | 30.4 | 31.4 | 21.7 |
| 1993-1994 | 31.5 | 32.7 | 22.1 |
| Asian | | | |
| 1987-1988 | 2.6 | 2.5 | 3.2 |
| 1990-1991 | 3.0 | 2.9 | 4.1 |
| 1993-1994 | 3.4 | 3.4 | 4.1 |
| Black, non-Hispanic | | | |
| 1987-1988 | 15.3 | 16.3 | 8.1 |
| 1990-1991 | 15.3 | 16.1 | 8.3 |
| 1993-1994 | 15.5 | 16.3 | 9.3 |
| Hispanic | | | |
| 1987-1988 | 9.1 | 9.4 | 7.1 |
| 1990-1991 | 10.8 | 11.1 | 8.6 |
| 1993-1994 | 11.5 | 11.9 | 8.0 |

SOURCE: Henke, Robin R., Susan B. Choy, and Sonya Geis.1996. U.S. Department of Education/NCES. Schools and Staffing Survey: 1987-1988, 1990-1991, and 1993-1994 (School questionnaire).

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 2-2. Percentage of teachers who were minority, by sector: 1987-1988, 1990-1991, and 1993-1994**



| Year | Total | Public | Private |
|---|---|---|---|
| 1987-1988 | 11.9 | 12.5 | 6.9 |
| 1990-1991 | 12.8 | 13.5 | 7.8 |
| 1993-1994 | 12.8 | 13.5 | 8.1 |

SOURCE: Henke, Robin R., Susan B. Choy, and Sonya Geis. 1996. U.S. Department of Education/NCES. Schools and Staffing Survey: 1987-1988, 1990-1991, and 1993-1994 (Teacher questionnaire).

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 2-3. Students age 6-21 with disabilities receiving special education services, by educational environment: 1988-1994 school years**

[Percent distribution]



| Year | Regular class | Resource room | Separate class | Public separate facility | Private separate facility | Public residential facility | Private residential facility | Homebound/ hospital |
|---|---|---|---|---|---|---|---|---|
| 1987-1988 | 29.1 | 40.0 | 24.7 | 3.5 | 1.4 | 0.5 | 0.3 | 0.7 |
| 1988-1989 | 30.6 | 38.8 | 24.2 | 3.2 | 1.3 | 0.6 | 0.3 | 0.8 |
| 1989-1990 | 31.7 | 37.5 | 24.8 | 3.2 | 1.3 | 0.6 | 0.3 | 0.6 |
| 1990-1991 | 33.1 | 36.3 | 25.0 | 2.9 | 1.3 | 0.6 | 0.3 | 0.5 |
| 1991-1992 | 34.9 | 36.3 | 23.5 | 2.5 | 1.4 | 0.6 | 0.3 | 0.5 |
| 1992-1993 | 39.8 | 31.7 | 23.4 | 2.4 | 1.2 | 0.6 | 0.2 | 0.5 |
| 1993-1994 | 43.4 | 29.4 | 22.7 | 2.2 | 1.0 | 0.5 | 0.3 | 0.6 |

SOURCES: U.S. Department of Education, Office of Special Education and Rehabilitative Services, *Eighteenth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act, 1996* and *Digest of Education Statistics,* 1989 to 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 2-4. Students age 6-21 with disabilities receiving special education services, by type of disability and educational environment: 1993-1994 school year**

[Percent distribution]



| Disability | Regular class | Resource room | Separate class | Separate school | Residential facility | Homebound/ hospital |
|---|---|---|---|---|---|---|
| All disabilities | 43.4 | 29.5 | 22.7 | 3.1 | 0.7 | 0.6 |
| Specific learning disabilities | 39.3 | 41.0 | 18.8 | 0.6 | 0.1 | 0.1 |
| Speech or language impairments | 87.5 | 7.6 | 4.5 | 0.3 | 0.0 | 0.1 |
| Mental retardation | 8.6 | 26.1 | 57.0 | 7.0 | 0.7 | 0.5 |
| Serious emotional disturbance | 20.5 | 25.8 | 35.3 | 13.4 | 3.2 | 1.8 |
| Multiple disabilities | 9.1 | 19.8 | 44.1 | 21.8 | 3.2 | 2.0 |
| Hearing impairments | 30.6 | 20.0 | 30.6 | 7.0 | 11.6 | 0.2 |
| Orthopedic impairments | 37.4 | 20.7 | 33.3 | 5.3 | 0.5 | 2.9 |
| Other health impairments | 40.0 | 27.0 | 21.3 | 1.8 | 0.4 | 9.4 |
| Visual impairments | 45.2 | 21.3 | 18.3 | 4.1 | 10.6 | 0.5 |
| Autism | 9.6 | 8.1 | 54.5 | 23.4 | 3.9 | 0.5 |
| Deaf-blindness | 7.7 | 8.0 | 34.6 | 24.3 | 23.2 | 2.2 |
| Traumatic brain injury | 22.3 | 23.5 | 30.2 | 18.3 | 2.6 | 3.0 |

SOURCE: U.S. Department of Education, Office of Special Education and Rehabilitative Services. 1996. *Eighteenth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act.*

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 2-5. Percentage of high school graduates taking selected mathematics and science courses in high school, by sex: 1982, 1987, 1990, and 1994**



| Mathematics and science courses (credits) | 1982 [1] | | | 1987 [1] | | | 1990 [1] | | | 1994 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| Mathematics [2] | | | | | | | | | | | | |
| Any mathematics (1.00) | 98.5 | 98.8 | 98.3 | 98.9 | 98.7 | 99.1 | 99.6 | 99.5 | 99.6 | 99.6 | 99.5 | 99.6 |
| Algebra I (1.00) | 53.9 | 52.2 | 55.4 | 64.0 | 62.3 | 65.7 | 64.2 | 61.7 | 66.5 | 66.4 | 64.7 | 68.1 |
| Geometry (1.00) | 45.5 | 45.0 | 45.9 | 59.7 | 58.8 | 60.4 | 63.4 | 62.4 | 64.4 | 70.4 | 68.3 | 72.4 |
| Algebra II (0.50) | 32.2 | 32.4 | 32.0 | 48.6 | 47.3 | 48.9 | 51.7 | 50.0 | 53.3 | 58.6 | 55.4 | 61.6 |
| Trigonometry (0.50) | 12.1 | 13.2 | 11.1 | 18.6 | 19.5 | 17.6 | 18.2 | 18.1 | 18.2 | 17.2 | 16.6 | 17.8 |
| Analysis/precalculus (0.50) | 5.9 | 6.2 | 5.6 | 12.6 | 13.5 | 11.6 | 13.4 | 14.0 | 12.8 | 17.3 | 16.3 | 18.2 |
| Statistics/probability (0.50) | 1.0 | 1.1 | 0.9 | 1.3 | 1.1 | 1.2 | 1.0 | 1.2 | 0.8 | 2.0 | 2.0 | 2.1 |
| Calculus (1.00) | 4.6 | 5.1 | 4.1 | 6.0 | 7.4 | 4.6 | 6.5 | 7.5 | 5.6 | 9.2 | 9.4 | 9.1 |
| AP calculus (1.00) | 1.5 | 1.6 | 1.4 | 3.2 | 3.8 | 2.7 | 4.1 | 5.0 | 3.4 | 7.0 | 7.2 | 6.8 |
| Science | | | | | | | | | | | | |
| Any science (1.00) | 96.6 | 96.4 | 96.7 | 98.7 | 98.4 | 99.0 | 99.4 | 99.1 | 99.6 | 99.5 | 99.3 | 99.8 |
| Biology (1.00) | 76.4 | 74.2 | 78.4 | 87.8 | 86.3 | 89.4 | 91.3 | 90.0 | 92.5 | 93.5 | 92.3 | 94.7 |
| AP/honors biology (1.00) | 6.6 | 6.1 | 7.1 | 2.7 | 2.8 | 2.6 | 4.9 | 4.4 | 5.4 | 4.6 | 4.0 | 5.1 |
| Chemistry (1.00) | 30.9 | 31.9 | 30.0 | 43.7 | 44.3 | 43.2 | 49.0 | 47.9 | 50.0 | 56.0 | 53.2 | 58.7 |
| AP/honors chemistry (1.00) | 2.9 | 3.5 | 2.3 | 3.3 | 3.9 | 2.7 | 3.5 | 4.1 | 2.9 | 3.9 | 4.1 | 3.7 |
| Physics (1.00) | 14.2 | 18.8 | 10.0 | 19.2 | 24.0 | 14.6 | 21.5 | 25.4 | 18.0 | 24.4 | 26.9 | 22.0 |
| AP/honors physics (1.00) | 1.0 | 1.4 | 0.7 | 1.6 | 2.4 | 0.9 | 2.0 | 2.5 | 1.6 | 2.4 | 3.0 | 1.8 |
| Engineering (1.00) | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | [3] 0.0 | 0.3 | 0.4 | 0.2 |
| Astronomy (0.50) | 1.1 | 1.3 | 0.9 | 1.0 | 1.1 | 0.8 | 1.2 | 1.4 | 1.1 | 1.7 | 2.0 | 1.5 |
| Geology/earth science (0.50) | 13.2 | 14.2 | 12.3 | 14.5 | 15.0 | 13.8 | 24.8 | 25.7 | 24.1 | 23.0 | 22.8 | 23.2 |
| Biology and chemistry (2.00) | 28.1 | 28.2 | 28.0 | 42.1 | 42.2 | 42.0 | 47.6 | 46.4 | 48.8 | 53.8 | 50.9 | 56.6 |
| Biology, chemistry, physics (3.00) | 10.6 | 13.4 | 7.9 | 16.4 | 20.2 | 12.8 | 18.8 | 21.8 | 16.1 | 21.3 | 23.1 | 19.6 |

[1] Numbers were revised from previously published figures.

[2] These data report only the percentage of students who earned credit in each mathematics course while in high school and do not count those students who took these courses prior to entering high school. In 1992, for example, approximately 93 percent of students had taken algebra I at some point before graduating high school, either before or during high school, and about 70 percent had taken geometry.

[3] Percent is less than 0.05 and is rounded to 0.

SOURCE: Smith, Thomas D., Charlene M. Hoffman, and Claire M. Geddes. 1997. U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1996* (NCES 96-304), supplemental table 29-1.

**Appendix table 2-6. Average NAEP scale scores in science and mathematics in grades 4, 8, and 12, by sex and race/ethnicity: 1996**



| | Mathematics | | | Science [1] | | |
|---|---|---|---|---|---|---|
| | Grade 4 | Grade 8 | Grade 12 | Grade 4 | Grade 8 | Grade 12 |
| All students | 224 | 272 | 304 | 150 | 150 | 150 |
| Male | 226 | 272 | 305 | 151 | 151 | 152 |
| Female | 222 | 272 | 303 | 149 | 149 | 148 |
| White | 232 | 282 | 311 | 160 | 159 | 159 |
| Asian | 232 | * | 319 | 151 | 152 | 149 |
| Black | 200 | 243 | 280 | 124 | 121 | 124 |
| Hispanic | 206 | 251 | 287 | 128 | 129 | 130 |
| American Indian | 216 | 264 | 279 | 144 | 148 | 145 |

[1] NAEP science scales were developed independently for each grade assessed; therefore, results are not comparable across grades. Science scale scores for all grades range from 0 to 300.

*Quality-control activities and special analyses involving state assessment data raised concerns about the accuracy and precision of national grade 8 Asian results. Therefore, they are omitted from this table.

NOTES: Standard errors are included in source publication. Mathematics scale scores range from 0 to 500 across all three grades.

SOURCES: Reese et al. 1997. *NAEP 1996 Mathematics Report Card for the Nation and the States* and O'Sullivan et al. 1997. *NAEP 1996 Science Report Card for the Nation and the States*, Washington, DC: U.S. Department of Education.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 2-7. Average mathematics scale scores, by sex and race/ethnicity: 1990, 1992, and 1996**



| | 1990 | 1992 | 1996 |
|---|---|---|---|
| Grade 4 | | | |
| All students | 213 | 220 | 224 |
| Male | 214 | 221 | 226 |
| Female | 213 | 219 | 222 |
| White | 220 | 228 | 232 |
| Asian | 228 | 232 | 232 |
| Black | 189 | 193 | 200 |
| Hispanic | 198 | 202 | 206 |
| American Indian | 208 | 211 | 216 |
| Grade 8 | | | |
| All students | 263 | 268 | 272 |
| Male | 263 | 268 | 272 |
| Female | 262 | 269 | 272 |
| White | 270 | 278 | 282 |
| Asian | 279 | 288 | ** |
| Black | 238 | 238 | 243 |
| Hispanic | 244 | 247 | 251 |
| American Indian | 246 | 255 | 264 |
| Grade 12 | | | |
| All students | 294 | 299 | 304 |
| Male | 297 | 301 | 305 |
| Female | 291 | 298 | 303 |
| White | 301 | 306 | 311 |
| Asian | 311 | 316 | 319 |
| Black | 268 | 276 | 280 |
| Hispanic | 276 | 284 | 287 |
| American Indian | * | * | 279 |

* Sample size insufficient to permit a reliable estimate.
**Quality-control activities and special analyses involving state assessment data raised concerns about the accuracy and precision of national grade 8 Asian results. Therefore, they are omitted from this table.

NOTE: Mathematics scale scores range from 0 to 500 across all three grades.

SOURCE: Reese et al. 1997. *NAEP 1996 Mathematics Report Card for the Nation and the States*. Washington, DC: U.S. Department of Education.

**Appendix table 2-8. Percentage attaining mathematics proficiency levels on the National Assessment of Educational Progress for grades 4, 8, and 12, by sex and race/ethnicity: 1990-1996, selected years**



| | 1990 | | | | 1992 | | | | 1996 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Advanced | At or above proficient | At or above basic | Below basic | Advanced | At or above proficient | At or above basic | Below basic | Advanced | At or above proficient | At or above basic | Below basic |
| Grade 4 | | | | | | | | | | | | |
| All students | 1 | 13 | 50 | 50 | 2 | 18 | 59 | 41 | 2 | 21 | 64 | 36 |
| Male | 2 | 13 | 51 | 49 | 2 | 19 | 60 | 40 | 3 | 24 | 65 | 35 |
| Female | 1 | 12 | 49 | 51 | 1 | 16 | 57 | 43 | 1 | 19 | 63 | 37 |
| White | 2 | 16 | 59 | 41 | 2 | 23 | 70 | 30 | 3 | 28 | 76 | 24 |
| Asian | 3 | 23 | 65 | 35 | 4 | 30 | 75 | 25 | 5 | 26 | 73 | 27 |
| Black | 0 | 1 | 19 | 81 | 0 | 3 | 23 | 77 | 0 | 5 | 32 | 68 |
| Hispanic | 0 | 5 | 31 | 69 | 0 | 5 | 35 | 65 | 0 | 8 | 41 | 59 |
| American Indian | 0 | 5 | 44 | 56 | 2 | 10 | 43 | 57 | 1 | 8 | 52 | 48 |
| Grade 8 | | | | | | | | | | | | |
| All students | 2 | 15 | 52 | 48 | 3 | 21 | 58 | 42 | 4 | 24 | 62 | 38 |
| Male | 2 | 17 | 52 | 48 | 3 | 21 | 57 | 43 | 4 | 25 | 62 | 38 |
| Female | 2 | 14 | 52 | 48 | 3 | 21 | 58 | 42 | 3 | 23 | 63 | 37 |
| White | 3 | 19 | 61 | 39 | 4 | 27 | 69 | 31 | 5 | 31 | 74 | 26 |
| Asian | 5 | 32 | 71 | 29 | 13 | 40 | 76 | 24 | ** | ** | ** | ** |
| Black | 0 | 5 | 22 | 78 | 0 | 2 | 21 | 79 | 0 | 4 | 28 | 72 |
| Hispanic | 0 | 5 | 32 | 68 | 1 | 6 | 34 | 66 | 1 | 9 | 39 | 61 |
| American Indian | 0 | 6 | 33 | 67 | 0 | 7 | 39 | 61 | 2 | 13 | 51 | 49 |
| Grade 12 | | | | | | | | | | | | |
| All students | 1 | 12 | 58 | 42 | 2 | 15 | 64 | 36 | 2 | 16 | 69 | 31 |
| Male | 2 | 15 | 60 | 40 | 2 | 17 | 65 | 35 | 3 | 18 | 70 | 30 |
| Female | 1 | 9 | 56 | 44 | 1 | 13 | 63 | 37 | 1 | 14 | 69 | 31 |
| White | 2 | 14 | 66 | 34 | 2 | 18 | 72 | 28 | 2 | 20 | 79 | 21 |
| Asian | 5 | 23 | 75 | 25 | 4 | 30 | 81 | 19 | 7 | 33 | 81 | 19 |
| Black | 0 | 2 | 27 | 73 | 0 | 2 | 34 | 66 | 0 | 4 | 38 | 62 |
| Hispanic | 0 | 4 | 36 | 64 | 0 | 6 | 45 | 55 | 0 | 6 | 50 | 50 |
| American Indian | * | * | * | * | * | * | * | * | 0 | 3 | 34 | 66 |

* Sample size insufficient to permit a reliable estimate.
**Quality-control activities and special analyses involving assessment data raised concerns about the accuracy and precision of national grade 8 Asian results. Therefore, they are omitted from the table.

NOTE: Standard errors are included in source publication.

SOURCE: Reese et al. 1997. *NAEP 1996 Mathematics Report Card for the Nation and the States.* Washington, DC: U.S. Department of Education.

**Appendix table 2-9. Percentage of high school graduates taking selected science and mathematics courses in high school, by race/ethnicity: 1982, 1987, 1990, and 1994**



| | 1982 [1] | | | | | 1987 [1] | | | | | 1990 | | | | | 1994 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Courses (credits) | White | Black | Hispanic | Asian | American Indian | White | Black | Hispanic | Asian | American Indian | White | Black | Hispanic | Asian | American Indian | White | Black | Hispanic | Asian | American Indian |
| Mathematics [2] | | | | | | | | | | | | | | | | | | | | |
| Any mathematics (1.00) | 98.7 | 99.2 | 97.2 | 100.0 | 99.6 | 98.9 | 98.2 | 99.1 | 99.8 | 98.7 | 99.5 | 99.5 | 99.9 | 99.9 | 100.0 | 99.6 | 99.3 | 99.2 | 100.0 | 98.9 |
| Algebra I (1.00) | 57.8 | 42.4 | 42.4 | 55.5 | 33.2 | 66.1 | 54.6 | 53.6 | 63.6 | 60.9 | 64.2 | 65.1 | 64.8 | 63.2 | 61.7 | 67.5 | 65.0 | 70.7 | 61.7 | 58.7 |
| Geometry (1.00) | 51.0 | 28.8 | 25.6 | 64.9 | 33.2 | 63.0 | 42.2 | 39.6 | 81.1 | 43.2 | 65.6 | 56.2 | 53.6 | 70.6 | 55.7 | 72.7 | 58.1 | 69.4 | 75.8 | 60.0 |
| Algebra II (0.50) | 36.0 | 22.0 | 18.0 | 45.6 | 10.8 | 51.6 | 30.8 | 29.2 | 66.4 | 27.6 | 55.0 | 41.4 | 35.7 | 59.9 | 47.1 | 61.6 | 43.7 | 51.0 | 66.6 | 39.2 |
| Trigonometry (0.50) | 13.7 | 6.0 | 6.4 | 26.8 | 3.0 | 20.4 | 10.6 | 9.8 | 41.3 | 4.2 | 19.3 | 14.0 | 10.8 | 35.1 | 14.7 | 18.6 | 13.6 | 9.8 | 25.3 | 6.7 |
| Analysis/precalculus (0.50) | 6.8 | 2.2 | 2.8 | 14.5 | 1.8 | 13.2 | 5.1 | 7.3 | 39.4 | 5.4 | 14.8 | 6.2 | 7.2 | 25.3 | 7.6 | 18.2 | 9.8 | 13.9 | 33.9 | 8.7 |
| Statistics/probability (0.50) | 1.2 | 0.5 | 0.1 | 1.7 | [3] 0.0 | 1.4 | 0.3 | 0.2 | 1.5 | 0.0 | 1.0 | 1.1 | 0.9 | 1.5 | 0.3 | 2.3 | 1.7 | 1.0 | 1.1 | 1.2 |
| Calculus (1.00) | 5.4 | 1.3 | 1.7 | 12.8 | 4.0 | 5.6 | 2.2 | 3.6 | 29.4 | 0.4 | 6.9 | 2.8 | 3.8 | 18.5 | 4.2 | 9.6 | 3.8 | 6.0 | 23.4 | 3.8 |
| AP calculus (1.00) | 1.8 | 0.3 | 0.4 | 5.5 | 0.1 | 2.7 | 1.4 | 2.6 | 23.5 | 0.4 | 4.2 | 1.2 | 3.0 | 15.6 | 3.0 | 7.3 | 2.0 | 4.6 | 21.0 | 2.2 |
| Science | | | | | | | | | | | | | | | | | | | | |
| Any science (1.00) | 96.9 | 97.4 | 93.8 | 96.2 | 92.1 | 98.8 | 98.1 | 98.6 | 99.3 | 99.8 | 99.3 | 99.6 | 99.3 | 99.8 | 100.0 | 99.7 | 99.5 | 99.3 | 99.3 | 99.7 |
| Biology (1.00) | 78.3 | 73.0 | 68.2 | 83.7 | 66.7 | 88.7 | 84.7 | 85.4 | 91.5 | 90.2 | 91.5 | 91.3 | 90.3 | 90.4 | 90.5 | 94.4 | 91.3 | 94.0 | 90.9 | 91.2 |
| AP/honors biology (1.00) | 7.4 | 4.6 | 3.1 | 11.9 | 0.6 | 2.7 | 1.4 | 1.6 | 4.2 | 0.3 | 5.0 | 3.8 | 2.4 | 6.3 | 1.9 | 4.6 | 2.7 | 3.3 | 8.3 | 1.7 |
| Chemistry (1.00) | 34.1 | 21.9 | 15.5 | 52.8 | 25.9 | 46.6 | 28.4 | 29.1 | 69.8 | 26.4 | 51.5 | 40.3 | 38.4 | 63.6 | 35.5 | 58.5 | 43.8 | 46.5 | 69.3 | 41.3 |
| AP/honors chemistry (1.00) | 3.3 | 1.6 | 1.3 | 5.8 | 0.9 | 3.4 | 1.1 | 2.2 | 15.3 | 0.6 | 3.7 | 2.5 | 1.1 | 7.7 | 4.5 | 4.3 | 2.1 | 2.5 | 7.7 | 0.6 |
| Physics (1.00) | 16.3 | 7.3 | 5.7 | 34.8 | 8.1 | 20.6 | 9.7 | 9.9 | 46.5 | 8.3 | 23.1 | 14.6 | 13.3 | 38.4 | 14.7 | 26.1 | 14.7 | 16.0 | 42.3 | 10.3 |
| AP/honors physics (1.00) | 1.2 | 0.9 | 0.4 | 3.4 | [3] 0.0 | 1.6 | 0.4 | 0.8 | 5.6 | 1.4 | 2.1 | 0.7 | 1.0 | 5.9 | 0.5 | 2.5 | 1.4 | 1.8 | 6.0 | 0.3 |
| Engineering (1.00) | 0.2 | 0.1 | 0.1 | [3] 0.0 | [3] 0.0 | 0.1 | 0.4 | 0.1 | 0.4 | [3] 0.0 | 0.1 | 0.1 | [3] 0.0 | [3] 0.0 | [3] 0.0 | 0.2 | 0.4 | 0.1 | 1.0 | [3] 0.0 |
| Astronomy (0.50) | 1.3 | 0.4 | 0.7 | [3] 0.0 | [3] 0.0 | 0.9 | 0.3 | 0.7 | 0.7 | 0.5 | 1.4 | 0.4 | 1.1 | 0.7 | 1.7 | 2.0 | 0.6 | 0.4 | 0.8 | 2.2 |
| Geology/earth science (0.50) | 14.0 | 10.0 | 11.2 | 9.6 | 18.8 | 14.0 | 18.1 | 11.6 | 12.4 | 12.3 | 27.6 | 15.9 | 14.0 | 15.7 | 31.0 | 23.8 | 23.3 | 15.3 | 16.7 | 23.2 |
| Biology and chemistry (2.00) | 31.3 | 19.7 | 14.2 | 48.5 | 21.9 | 45.1 | 27.2 | 27.9 | 66.3 | 24.8 | 50.2 | 39.5 | 36.5 | 60.1 | 34.2 | 56.4 | 42.2 | 45.1 | 64.8 | 39.6 |
| Biology, chemistry, and physics (3.00) | 12.2 | 4.8 | 3.9 | 28.4 | 7.8 | 17.6 | 8.3 | 8.2 | 41.8 | 6.2 | 20.6 | 12.0 | 10.2 | 33.7 | 10.8 | 22.7 | 13.0 | 13.4 | 37.2 | 8.0 |

[1] Numbers were revised from previously published figures.
[2] These data report only the percentage of students who earned credit in each mathematics course while in high school and do not count those students who took these courses prior to entering high school. In 1992, for example, approximately 93 percent of students had taken algebra I at some point before graduating high school, either before or during high school, and about 70 percent had taken geometry.
[3] Percent is less than 0.05 and is rounded to 0.

SOURCE: Smith et al. 1996. U.S. Department of Education, National Center for Education Statistics, The 1994 High School Transcript Study Tabulations: Comparative Data on Credits Earned and Demographics for 1994, 1990, 1987, and 1982 High School Graduates, 1996, in *The Condition of Education: 1996, p. 255.*

**Appendix table 2-10. Students age 6–21 in federally supported programs for students with disabilities, by type of disability: 1994–1995 school year**

Page 1 of 1

| Disability | Number | Percent |
|---|---|---|
| All disabilities | 4,915,168 | 100.0 |
| Specific learning disabilities | 2,513,977 | 51.1 |
| Speech or language impairments | 1,023,665 | 20.8 |
| Mental retardation | 570,855 | 11.6 |
| Serious emotional disturbance | 428,168 | 8.7 |
| Multiple disabilities | 89,646 | 1.8 |
| Hearing impairments | 65,568 | 1.3 |
| Orthopedic impairments | 60,604 | 1.2 |
| Other health impairments | 106,509 | 2.2 |
| Visual impairments | 24,877 | 0.5 |
| Autism | 22,780 | 0.5 |
| Deaf-blindness | 1,331 | 0.0 |
| Traumatic brain injury | 7,188 | 0.1 |

NOTES: Because of rounding, percentages may not add to 100. Includes students served under IDEA, Part B.

SOURCE: U.S. Department of Education, Office of Special Education and Rehabilitative Services. 1996. *Eighteenth Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act.*

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**Appendix table 2-11. Total units in mathematics and science completed by students in the 12th grade in 1992 and average high school grade, by disability status and type of disability: 1992**



| | Average mathematics units | Average science units | Average high school grade in mathematics | Average high school grade in science |
|---|---|---|---|---|
| Students without disabilities | 2.9 | 2.7 | 7.63 | 7.43 |
| Students with disabilities | 2.4 | 2.2 | 8.37 | 8.32 |
| Multiple disabilities | 2.5 | 1.9 | 8.27 | 8.70 |
| Learning disability | 2.3 | 2.1 | 8.51 | 8.60 |
| Health problems | 2.4 | 2.1 | 8.07 | 8.06 |
| Physical or emotional problems | 2.6 | 2.1 | 8.26 | 8.25 |
| Physical | 2.6 | 2.3 | 7.98 | 7.89 |
| Emotional | 2.5 | 1.8 | 8.67 | 8.92 |
| Sensory | 2.4 | 2.2 | 8.12 | 8.08 |

NOTES: Students were identified as disabled by parents. High school credit units in mathematics and science are as reported on their high school transcripts. Data represent the eighth-grade panel population Grade is based on a 1-13 scale, where 1.0 = A+ and 13 = F.

SOURCE: Rossi, Robert, Jerald Herting, and Jean Wolman. 1997. U.S. Department of Education/NCES, *Profiles of Students with Disabilities as Identified in NELS:88* (NCES 97-254)

**Appendix table 2-12. Proficiency in mathematics and science of students in the 12th grade, by disability status and type of disability: 1992**

[In percentages]



| | Below level 1 | Level 1 | Level 2 | Level 3 | Level 4 | Level 5 | Percent change in number right in mathematics, from 1988 to 1992 |
|---|---|---|---|---|---|---|---|
| Students without disabilities | 6.5 | 20.8 | 14.4 | 24.2 | 30.0 | 4.1 | 11.8 |
| Students with disabilities | 14.9 | 33.3 | 17.9 | 17.2 | 13.4 | 3.3 | 10.0 |
| Multiple disabilities | 19.9 | 38.1 | 15.7 | 15.9 | 9.9 | 0.5 | 8.9 |
| Learning disability | 22.9 | 38.2 | 17.6 | 15.1 | 5.7 | 0.4 | 8.7 |
| Health problems | 7.2 | 27.1 | 16.2 | 20.0 | 20.7 | 8.7 | 11.9 |
| Physical or emotional problems | 12.1 | 32.0 | 16.3 | 18.8 | 17.0 | 3.8 | 10.6 |
| Physical | 16.2 | 29.1 | 12.9 | 18.2 | 15.1 | 8.6 | 12.2 |
| Emotional | 11.7 | 41.6 | 9.9 | 26.4 | 8.6 | 1.8 | 10.6 |
| Sensory | 11.9 | 32.2 | 19.6 | 13.0 | 20.8 | 2.5 | 9.7 |

NOTES: Students were identified as disabled by parents. Data represent the eighth-grade panel population. Percentage represents the distribution within each disability status. Proficiency measures are based on standardized cognitive tests administered to all NELS:88 student participants in 1988, 1990, and 1992. Students achieved a specific proficiency level if they correctly answered at least three of the four questions within a proficiency level. Students at particular skill levels were assumed to have mastered the lower skill levels; likewise, students were assumed not to have mastered higher level skills. Only students with complete and consistent response patterns were assigned proficiency levels.

SOURCE: Rossi, Robert, Jerald Herting, and Jean Wolman. 1997. U.S. Department of Education/NCES, *Profiles of Students with Disabilities as Identified in NELS:88* (NCES 97-254).

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**Appendix table 2-13. Percentage of persons who have completed high school, by race/ethnicity and sex: 1975, 1985, and 1995**



| | 25 years old and over | | | 25 to 29 years old | | |
|---|---|---|---|---|---|---|
| | 1975 | 1985 | 1995 | 1975 | 1985 | 1995 |
| Total | 62.5 | 73.9 | 81.7 | 83.1 | 86.1 | 86.9 |
| Men | 63.1 | 74.4 | 81.7 | 84.5 | 85.9 | 86.3 |
| Women | 62.1 | 73.5 | 81.6 | 81.8 | 86.4 | 87.4 |
| White, non-Hispanic | 65.8 | 77.5 | 85.9 | 86.6 | 89.5 | 92.5 |
| Black, non-Hispanic | 42.6 | 59.9 | 73.8 | 71.1 | 80.5 | 86.7 |
| Hispanic | 38.5 | 47.9 | 53.4 | 53.1 | 60.9 | 57.2 |

SOURCES: Day, Jennifer, and Curry, Andrea. 1996. *Educational Attainment in the United States: March 1995.* Current Population Reports P20-489. Washington, DC.: U.S. Department of Commerce.

Snyder, Thomas D., Charlene M. Hoffman, and Claire M. Geddes. 1998. *Digest of Education Statistics 1997* (NCES 98-015). Washington, DC: U.S. Government Printing Office.

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**Appendix table 2-14. Percentage of students with disabilities age 14 and older exiting special education, by type of disability and basis of exit: 1993-1994**



| Type of disability | Total | Graduated with diploma | Graduated with certificate | Reached maximum age | Returned to regular education | Moved, known to be continuing | Moved, not known to be continuing | Died | Dropped out |
|---|---|---|---|---|---|---|---|---|---|
| All disabilities | 26.8 | 7.5 | 1.6 | 0.3 | 4.0 | 5.5 | 2.8 | 0.1 | 5.1 |
| Specific learning disabilities | 25.9 | 8.4 | 1.2 | 0.1 | 3.8 | 5.0 | 2.5 | 0.1 | 4.9 |
| Speech or language impairments | 38.2 | 7.0 | 1.0 | 0.2 | 17.0 | 4.9 | 4.2 | 0.1 | 3.8 |
| Mental retardation | 21.9 | 5.8 | 3.8 | 1.0 | 0.9 | 4.1 | 2.0 | 0.2 | 4.2 |
| Serious emotional disturbance | 37.0 | 6.0 | 0.9 | 0.2 | 4.3 | 10.7 | 5.8 | 0.1 | 9.2 |
| Multiple disabilities | 12.8 | 3.2 | 1.7 | 1.4 | 0.8 | 3.1 | 0.8 | 0.3 | 1.4 |
| Hearing impairments | 22.0 | 9.7 | 1.7 | 0.2 | 2.3 | 3.9 | 1.6 | 0.1 | 2.5 |
| Mobility impairments | 26.9 | 9.0 | 1.7 | 0.8 | 7.3 | 3.7 | 1.6 | 0.5 | 2.4 |
| Other health impairments | 39.8 | 8.5 | 0.7 | 0.2 | 17.9 | 5.8 | 2.0 | 0.4 | 3.8 |
| Visual impairments | 22.2 | 10.3 | 1.2 | 0.6 | 2.4 | 3.6 | 1.8 | 0.2 | 2.2 |
| Autism | 12.1 | 2.9 | 2.1 | 1.4 | 0.9 | 2.6 | 1.3 | 0.1 | 1.0 |
| Deaf-blindness | 24.9 | 6.0 | 4.6 | 1.4 | 1.9 | 5.6 | 3.0 | 1.1 | 1.4 |
| Traumatic brain injury | 26.7 | 9.5 | 1.8 | 1.0 | 3.0 | 6.4 | 1.9 | 0.1 | 3.0 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education, Office of Special Education Programs. 1996. *Eighteenth Annual Report to Congress on the Implementation of The Individuals with Disabilities Education Act.*

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**Appendix table 2-15. SAT average scores, by family income: 1996**



| Family income | SAT I test takers | Percent | | SAT I verbal | SAT I mathematics |
|---|---|---|---|---|---|
| | Number | Male | Female | Mean scores | Mean scores |
| Less than $10,000 | 45,841 | 37 | 63 | 429 | 444 |
| $10,000-$20,000 | 86,005 | 41 | 59 | 456 | 464 |
| $20,000-$30,000 | 108,048 | 43 | 57 | 482 | 482 |
| $30,000-$40,000 | 130,075 | 45 | 55 | 497 | 495 |
| $40,000-$50,000 | 108,641 | 47 | 53 | 509 | 507 |
| $50,000-$60,000 | 102,562 | 48 | 52 | 517 | 517 |
| $60,000-$70,000 | 78,463 | 48 | 52 | 524 | 525 |
| $70,000-$80,000 | 63,841 | 49 | 51 | 531 | 533 |
| $80,000-$100,000 | 74,691 | 49 | 51 | 541 | 544 |
| More than $100,000 | 100,429 | 51 | 49 | 560 | 569 |
| No response | 186,129 | - | - | - | - |

NOTE: - = Not applicable.

SOURCE: College Board, 1996a. Profile of College-Bound Seniors National Report.

**Appendix table 2-16. Course-taking patterns of college-bound seniors, by mathematics and science fields: 1996**



| Mathematics | SAT I test takers | | Percent | | SAT I mean scores | |
|---|---|---|---|---|---|---|
| | Number | Percent | Male | Female | Verbal | Mathematics |
| Years of study | | | | | | |
| 4 or more years | 671,345 | 68 | 46 | 54 | 522 | 530 |
| 3 years | 279,791 | 28 | 44 | 56 | 477 | 465 |
| 2 years | 29,238 | 3 | 45 | 55 | 448 | 428 |
| 1 year | 1,724 | - | 50 | 50 | 417 | 418 |
| One-half year or less | 1,090 | - | 43 | 57 | 438 | 438 |
| No response | 101,537 | - | - | - | - | - |
| Course Work | | | | | | |
| Algebra | 974,657 | 96 | 46 | 54 | 506 | 508 |
| Geometry | 951,031 | 94 | 46 | 54 | 511 | 514 |
| Trignometry | 536,834 | 53 | 47 | 53 | 534 | 547 |
| Precalculus | 389,321 | 38 | 47 | 53 | 555 | 576 |
| Other mathematics courses | 240,080 | 24 | 44 | 56 | 484 | 482 |
| Calculus | 231,410 | 23 | 50 | 50 | 579 | 612 |
| Computer mathematics | 91,003 | 9 | 56 | 44 | 519 | 538 |
| Honors course taken | 286,219 | 29 | 47 | 53 | 576 | 598 |

| Natural sciences | SAT I test takers | | Percent | | SAT I mean scores | |
|---|---|---|---|---|---|---|
| | Number | Percent | Male | Female | Verbal | Mathematics |
| Years of study | | | | | | |
| 4 or more years | 463,982 | 48 | 47 | 53 | 536 | 544 |
| 3 years | 367,245 | 38 | 44 | 56 | 492 | 488 |
| 2 years | 116,435 | 12 | 45 | 55 | 458 | 454 |
| 1 year | 17,652 | 2 | 46 | 54 | 430 | 438 |
| One-half year or less | 7,452 | 1 | 41 | 59 | 413 | 426 |
| No response | 111,959 | - | - | - | - | - |
| Course Work | | | | | | |
| Biology | 938,372 | 97 | 46 | 54 | 507 | 509 |
| Chemistry | 857,688 | 84 | 46 | 54 | 518 | 523 |
| Physics | 480,632 | 47 | 50 | 50 | 542 | 559 |
| Geology, earth science, or space science | 441,018 | 43 | 46 | 54 | 499 | 496 |
| Other sciences | 377,829 | 37 | 42 | 58 | 500 | 498 |
| Honors course taken | 281,448 | 29 | 45 | 55 | 577 | 587 |

NOTE: - = Not applicable.

SOURCE: College Board, 1996a. Profile of College-Bound Seniors National Report.

**Appendix table 2-17. Advanced Placement (AP) candidates, by selected subjects and sex: 1996**



| AP exam subject | Total | Male | Female | Percent female |
|---|---|---|---|---|
| Biology | 64,651 | 28,746 | 35,905 | 55 |
| Chemistry | 37,462 | 21,808 | 15,834 | 42 |
| Physics B | 18,644 | 12,195 | 6,449 | 35 |
| Physics C, mechanics | 11,072 | 8,158 | 2,914 | 26 |
| Physics C, (electronics and magnetism) | 5,662 | 4,392 | 1,270 | 22 |
| Calculus AB | 102,029 | 54,202 | 47,827 | 47 |
| Calculus BC | 20,823 | 13,006 | 7,817 | 38 |
| Computer science A | 6,488 | 5,217 | 1,271 | 20 |
| Computer science AB | 4,577 | 4,029 | 548 | 12 |
| Psychology | 14,308 | 4,986 | 9,322 | 65 |
| Economics-micro | 10,025 | 5,995 | 4,030 | 40 |
| Economics-macro | 13,252 | 7,691 | 5,561 | 42 |

NOTE: An AP exam candidate may have taken exams in more than one subject.

SOURCE: The College Board, 1996b. Advanced Placement Program National Summary Reports, pp. 3-5.

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**Appendix table 2-18. Trends in average (mean) SAT mathematics and verbal scores, by race/ethnicity: 1991–1996**



| Race/ethnicity | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1991 to 1996 change | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Number | Percent |
| Total | | | | | | | | |
| Number of students..... | 1,032,685 | 1,034,131 | 1,044,465 | 1,050,386 | 1,067,993 | 1,084,725 | 52,040 | 5 |
| SAT V - mean..... | 499 | 500 | 500 | 499 | 504 | 505 | 6 | - |
| SAT M - mean..... | 500 | 501 | 503 | 504 | 506 | 508 | 8 | - |
| White | | | | | | | | |
| Number of students..... | 687,231 | 680,806 | 670,965 | 662,107 | 674,343 | 681,053 | (6,178) | -1 |
| SAT V - mean..... | 518 | 519 | 520 | 520 | 525 | 526 | 8 | - |
| SAT M - mean..... | 513 | 515 | 517 | 519 | 521 | 523 | 10 | - |
| Asian American | | | | | | | | |
| Number of students..... | 76,703 | 78,387 | 78,693 | 81,097 | 81,514 | 84,319 | 7,616 | 10 |
| SAT V - mean..... | 485 | 487 | 489 | 489 | 492 | 496 | 11 | - |
| SAT M - mean..... | 548 | 551 | 553 | 553 | 555 | 558 | 10 | - |
| Black | | | | | | | | |
| Number of students..... | 100,209 | 99,126 | 102,939 | 102,679 | 103,872 | 106,573 | 6,364 | 6 |
| SAT V - mean..... | 427 | 428 | 429 | 428 | 432 | 434 | 7 | - |
| SAT M - mean..... | 419 | 419 | 421 | 421 | 422 | 422 | 3 | - |
| Mexican American | | | | | | | | |
| Number of students..... | 28,602 | 30,336 | 32,355 | 35,397 | 36,323 | 36,689 | 8,087 | 28 |
| SAT V - mean..... | 454 | 449 | 451 | 448 | 453 | 455 | 1 | - |
| SAT M - mean..... | 459 | 457 | 459 | 458 | 458 | 459 | 0 | - |
| Puerto Rican[1] | | | | | | | | |
| Number of students | 12,065 | 12,091 | 12,645 | 13,036 | 13,056 | 13,103 | 1,038 | 9 |
| SAT V - mean..... | 436 | 442 | 443 | 444 | 448 | 452 | 16 | - |
| SAT M - mean..... | 439 | 438 | 440 | 442 | 444 | 445 | 6 | - |
| Latin American | | | | | | | | |
| Number of students..... | 25,584 | 26,766 | 28,420 | 29,395 | 30,713 | 32,193 | 6,609 | 26 |
| SAT V - mean..... | 458 | 459 | 460 | 460 | 465 | 465 | 7 | - |
| SAT M - mean..... | 462 | 463 | 463 | 464 | 468 | 466 | 4 | - |
| American Indian | | | | | | | | |
| Number of students..... | 7,843 | 7,412 | 7,488 | 8,150 | 8,936 | 8,737 | 894 | 11 |
| SAT V - mean..... | 470 | 472 | 477 | 473 | 480 | 483 | 13 | - |
| SAT M - mean..... | 468 | 471 | 476 | 470 | 476 | 477 | 9 | - |
| Other | | | | | | | | |
| Number of students..... | 16,300 | 17,771 | 19,614 | 22,198 | 25,113 | 28,099 | 11,799 | 72 |
| SAT V - mean..... | 486 | 491 | 497 | 500 | 507 | 511 | 25 | - |
| SAT M - mean..... | 492 | 498 | 501 | 504 | 510 | 512 | 20 | - |

[1] Excludes students in Puerto Rico.

NOTES: - = not applicable. V = verbal, M = mathematics. Total includes persons of unknown race/ethnicity.

SOURCE: College Board, 1996 unpublished tabulations.

**Appendix table 2-19. Trends in average ACT composite scores, by race/ethnicity: 1991-1996**



| Race/ethnicity | Number | Mean ACT score |
|---|---|---|
| Total | | |
| 1991 | 796,983 | 20.6 |
| 1992 | 832,217 | 20.6 |
| 1993 | 875,603 | 20.7 |
| 1994 | 891,714 | 20.8 |
| 1995 | 945,369 | 20.8 |
| 1996 | 924,663 | 20.9 |
| White | | |
| 1991 | 588,060 | 21.3 |
| 1992 | 604,469 | 21.3 |
| 1993 | 625,242 | 21.4 |
| 1994 | 623,366 | 21.4 |
| 1995 | 650,664 | 21.5 |
| 1996 | 654,377 | 21.6 |
| Asian American/Pacific Islander | | |
| 1991 | 20,854 | 21.6 |
| 1992 | 22,771 | 21.6 |
| 1993 | 24,754 | 21.7 |
| 1994 | 26,168 | 21.7 |
| 1995 | 27,784 | 21.6 |
| 1996 | 27,847 | 21.6 |
| African-American/Black | | |
| 1991 | 72,681 | 17.0 |
| 1992 | 75,356 | 17.0 |
| 1993 | 80,401 | 17.1 |
| 1994 | 81,806 | 17.0 |
| 1995 | 89,155 | 17.1 |
| 1996 | 87,630 | 17.0 |
| Mexican American/Chicano | | |
| 1991 | 23,837 | 18.4 |
| 1992 | 26,163 | 18.4 |
| 1993 | 27,713 | 18.5 |
| 1994 | 29,558 | 18.4 |
| 1995 | 24,431 | 18.6 |
| 1996 | 21,345 | 18.7 |
| Puerto Rican[1]/Cuban/Other Hispanic | | |
| 1991 | 11,135 | 19.3 |
| 1992 | 13,013 | 19.3 |
| 1993 | 13,894 | 19.3 |
| 1994 | 15,119 | 19.3 |
| 1995 | 24,054 | 18.7 |
| 1996 | 25,857 | 18.9 |
| American Indian/Alaskan Native | | |
| 1991 | 9,358 | 18.2 |
| 1992 | 9,784 | 18.1 |
| 1993 | 10,384 | 18.4 |
| 1994 | 11,026 | 18.5 |
| 1995 | 11,361 | 18.6 |
| 1996 | 11,580 | 18.8 |

[1] Excludes students in Puerto Rico, because test is not given there.

SOURCE: American College Testing. 1996. Results, Summary Reports.

**Appendix table 2-20. Selected characteristics of persons who took the SAT: 1996**



| Sex and race/ethnicity | Took SAT | Have a parent with college degree | | Took PSAT | |
|---|---|---|---|---|---|
| | Number | Number | Percent | Number | Percent |
| Total | 1,084,725 | 519,515 | 48 | 765,384 | 71 |
| Women | 580,127 | 267,776 | 46 | 429,309 | 74 |
| Men | 504,598 | 251,739 | 50 | 336,075 | 67 |
| White | 681,053 | 384,478 | 56 | 541,748 | 80 |
| Women | 366,985 | 198,079 | 54 | 300,520 | 82 |
| Men | 314,068 | 186,399 | 59 | 241,228 | 77 |
| Asian and Pacific Islander | 84,319 | 48,239 | 57 | 62,564 | 74 |
| Women | 42,956 | 23,879 | 56 | 33,046 | 77 |
| Men | 41,363 | 24,360 | 59 | 29,518 | 71 |
| Black | 106,573 | 36,185 | 34 | 69,734 | 65 |
| Women | 62,840 | 19,683 | 31 | 43,631 | 69 |
| Men | 43,733 | 16,502 | 38 | 26,103 | 60 |
| Hispanic, total | 81,985 | 26,597 | 32 | 54,359 | 66 |
| Women | 46,131 | 13,794 | 30 | 31,578 | 68 |
| Men | 35,854 | 12,803 | 36 | 22,781 | 64 |
| Puerto Rican[1] | 13,103 | 4,868 | 37 | 8,653 | 66 |
| Women | 7,478 | 2,531 | 34 | 5,044 | 67 |
| Men | 5,625 | 2,337 | 42 | 3,609 | 64 |
| Mexican-American | 36,689 | 8,941 | 24 | 23,928 | 65 |
| Women | 20,532 | 4,596 | 22 | 13,866 | 68 |
| Men | 16,157 | 4,345 | 27 | 10,062 | 62 |
| Other Hispanic | 32,193 | 12,788 | 40 | 21,778 | 68 |
| Women | 18,121 | 6,667 | 37 | 12,668 | 70 |
| Men | 14,072 | 6,121 | 43 | 9,110 | 65 |
| American Indian/Alaskan Native | 8,737 | 3,713 | 42 | 5,772 | 66 |
| Women | 4,673 | 1,878 | 40 | 3,241 | 69 |
| Men | 4,064 | 1,835 | 45 | 2,531 | 62 |
| Other | 28,099 | 15,364 | 55 | 19,862 | 71 |
| Women | 15,563 | 8,042 | 52 | 11,379 | 73 |
| Men | 12,536 | 7,322 | 58 | 8,483 | 68 |
| No response | 93,959 | - | - | - | - |
| Women | 40,979 | - | - | - | - |
| Men | 52,980 | - | - | - | - |

[1] Excludes students in Puerto Rico.

NOTE: - = Not applicable.

SOURCE: The College Board, 1996 unpublished tabulations.

**Appendix table 2-21. Average ACT composite scores, by type of high school program, race/ethnicity, and annual family income: 1996**



| Race/ethnicity and type of program[1] | Annual family income: Less than $18,000 Number | Less than $18,000 ACT score | $18,000-$35,999 Number | $18,000-$35,999 ACT score | $36,000 or more Number | $36,000 or more ACT score |
|---|---|---|---|---|---|---|
| Total[2] | | | | | | |
| Total[3] | 104,195 | 18.5 | 229,613 | 20.1 | 475,456 | 21.9 |
| Core | 52,650 | 19.7 | 128,846 | 21.2 | 306,653 | 22.8 |
| Less than core | 50,010 | 17.4 | 98,734 | 18.6 | 165,497 | 20.1 |
| White | | | | | | |
| Total | 50,187 | 20.1 | 157,413 | 20.9 | 393,479 | 22.1 |
| Core | 25,080 | 21.5 | 88,415 | 22.0 | 254,197 | 23.0 |
| Less than core | 24,727 | 18.8 | 68,054 | 19.4 | 137,138 | 20.4 |
| Asian American/Pacific Islander | | | | | | |
| Total | 4,775 | 18.7 | 7,486 | 20.6 | 13,464 | 23.3 |
| Core | 3,041 | 19.5 | 5,186 | 21.4 | 10,033 | 23.8 |
| Less than core | 1,643 | 17.1 | 2,172 | 18.9 | 3,221 | 21.6 |
| African-American/Black | | | | | | |
| Total | 26,687 | 16.2 | 30,271 | 16.9 | 23,034 | 18.2 |
| Core | 13,563 | 17.0 | 16,615 | 17.7 | 14,172 | 19.0 |
| Less than core | 12,888 | 15.4 | 13,389 | 15.8 | 8,707 | 16.9 |
| American Indian/Alaskan Native | | | | | | |
| Total | 2,535 | 17.3 | 3,993 | 18.5 | 4,117 | 20.1 |
| Core | 1,033 | 18.8 | 1,938 | 19.6 | 2,279 | 21.2 |
| Less fhan core | 1,306 | 16.6 | 1,922 | 17.5 | 1,748 | 18.8 |
| Mexican American/Pacific Islander | | | | | | |
| Total | 5,340 | 17.4 | 7,598 | 18.4 | 7,020 | 20.1 |
| Core | 2,739 | 18.4 | 4,060 | 19.4 | 4,253 | 21.1 |
| Less than core | 2,562 | 16.3 | 3,486 | 17.2 | 2,729 | 18.6 |
| Puerto Rican[4]/Cuban/Other Hispanic | | | | | | |
| Total | 6,277 | 17.2 | 8,342 | 18.5 | 9,160 | 20.6 |
| Core | 3,149 | 18.3 | 4,681 | 19.4 | 5,916 | 21.4 |
| Less than core | 2,943 | 16.1 | 3,512 | 17.2 | 3,102 | 18.9 |

[1] Type of high school program is divided into *Core* and *Less than core* programs. Core programs are defined by ACT as 4 years of English and 3 years each of mathematics, natural sciences, and social sciences.

[2] Excludes persons not included in the racial/ethnic groups below.

[3] Excludes persons not classified by type of program.

[4] This does not include students in Puerto Rico, because test is not given there.

SOURCE: American College Testing. 1996. Results, Summary Reports.

**Appendix table 2-22. Advanced Placement (AP) candidates, by selected subjects and race/ethnicity: 1996**



| Selected science/mathematics AP subject | Total, all candidates | Underrepresented minorities | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Hispanic | | | | |
| | | American Indian/Alaskan Native (2,491) | Black (22,373) | Mexican American (20,318) | Puerto Rican (13,527) | Other Hispanic (18,476) | Total under-represented minorities | Percentage under-represented minorities |
| Biology | 64,651 | 281 | 2,619 | 1,066 | 361 | 1,414 | 5,741 | 9 |
| Chemistry | 37,642 | 151 | 1,286 | 633 | 132 | 634 | 2,836 | 8 |
| Physics B | 18,644 | 61 | 529 | 298 | 74 | 402 | 1,364 | 7 |
| Physics C (mechanics) | 11,072 | 34 | 236 | 161 | 39 | 220 | 690 | 6 |
| Physics C (electronics and magnetism) | 5,662 | 14 | 99 | 55 | 18 | 95 | 281 | 5 |
| Calculus AB | 102,029 | 360 | 3,689 | 2,310 | 400 | 1,985 | 8,744 | 9 |
| Calculus BC | 20,823 | 44 | 353 | 174 | 52 | 326 | 949 | 5 |
| Computer science A | 6,488 | 28 | 283 | 115 | 42 | 167 | 635 | 10 |
| Computer science AB | 4,577 | 22 | 80 | 50 | 18 | 75 | 245 | 5 |
| Psychology | 14,308 | 64 | 538 | 255 | 73 | 415 | 1,345 | 9 |
| Economics-micro | 10,025 | 40 | 241 | 256 | 42 | 204 | 783 | 8 |
| Economics-macro | 13,252 | 45 | 419 | 409 | 68 | 479 | 1,420 | 11 |

NOTE: Numbers in parentheses indicate the total persons in each group who took any AP test in 1996.

SOURCE: The College Board, 1996b. Advanced Placement Program National Summary Reports, p. 3.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-1. Number of earned bachelor's degrees, by field and by race/ethnicity of recipient: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Total, all recipients | | | | | | |
| Total science and engineering | 337,431 | 345,793 | 356,785 | 376,933 | 388,435 | 395,380 | 399,809 |
| Engineering | 66,947 | 64,703 | 62,186 | 61,898 | 62,670 | 62,962 | 63,330 |
| Sciences | 270,484 | 281,090 | 294,599 | 315,035 | 325,765 | 332,418 | 336,479 |
| Natural sciences | 109,350 | 105,234 | 105,595 | 111,108 | 116,742 | 122,792 | 129,447 |
| Physical science [1] | 17,329 | 16,203 | 16,407 | 17,076 | 17,691 | 18,525 | 19,375 |
| Mathematical science | 15,314 | 14,674 | 14,784 | 14,851 | 14,870 | 14,431 | 13,759 |
| Computer science | 30,963 | 27,695 | 25,410 | 24,854 | 24,477 | 24,458 | 24,662 |
| Biological science | 36,949 | 38,040 | 40,351 | 43,835 | 47,877 | 52,213 | 56,804 |
| Agricultural science | 8,795 | 8,622 | 8,643 | 10,492 | 11,827 | 13,165 | 14,847 |
| Social sciences | 161,134 | 175,856 | 189,004 | 203,927 | 209,023 | 209,626 | 207,032 |
| Social science | 112,180 | 121,838 | 130,111 | 139,884 | 141,772 | 139,858 | 134,431 |
| Psychology | 48,954 | 54,018 | 58,893 | 64,043 | 67,251 | 69,768 | 72,601 |
| Non-S&E [2] | 692,740 | 716,358 | 751,212 | 773,139 | 790,843 | 787,761 | 774,627 |
| Grand total | 1,030,171 | 1,062,151 | 1,107,997 | 1,150,072 | 1,179,278 | 1,183,141 | 1,174,436 |
| | U.S. citizens and permanent residents, total [3] | | | | | | |
| Total science and engineering | 325,108 | 333,475 | 344,061 | 364,695 | 374,633 | 381,451 | 385,055 |
| Engineering | 61,875 | 59,786 | 57,604 | 57,675 | 58,165 | 58,422 | 58,520 |
| Sciences | 263,233 | 273,689 | 286,457 | 307,020 | 316,468 | 323,029 | 326,535 |
| Natural sciences | 104,928 | 100,908 | 101,039 | 106,739 | 111,656 | 117,843 | 124,297 |
| Physical science [1] | 16,724 | 15,608 | 15,799 | 16,469 | 16,927 | 17,812 | 18,652 |
| Mathematical science | 14,771 | 14,150 | 14,206 | 14,259 | 14,318 | 13,869 | 13,166 |
| Computer science | 28,828 | 25,629 | 23,373 | 22,880 | 22,273 | 22,185 | 22,367 |
| Biological science | 36,076 | 37,173 | 39,288 | 42,842 | 46,660 | 51,058 | 55,523 |
| Agricultural science | 8,529 | 8,348 | 8,373 | 10,289 | 11,478 | 12,919 | 14,589 |
| Social sciences | 158,305 | 172,781 | 185,418 | 200,281 | 204,812 | 205,186 | 202,238 |
| Social science | 109,862 | 119,288 | 127,216 | 136,902 | 138,391 | 136,273 | 130,579 |
| Psychology | 48,443 | 53,493 | 58,202 | 63,379 | 66,421 | 68,913 | 71,659 |
| Non-S&E [2] | 678,606 | 702,123 | 734,279 | 756,830 | 772,274 | 767,463 | 752,369 |
| Grand total | 1,003,714 | 1,035,598 | 1,078,340 | 1,121,525 | 1,146,907 | 1,148,914 | 1,137,424 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-1. Number of earned bachelor's degrees, by field and by race/ethnicity of recipient: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | White, non-Hispanics | | | | | | |
| Total science and engineering | 266,862 | 270,225 | 278,190 | 292,614 | 297,171 | 297,616 | 294,773 |
| Engineering | 50,081 | 47,494 | 45,162 | 45,026 | 44,853 | 44,687 | 43,726 |
| Sciences | 216,781 | 222,731 | 233,028 | 247,588 | 252,318 | 252,929 | 251,047 |
| Natural sciences | 84,578 | 80,210 | 80,111 | 84,133 | 87,401 | 91,196 | 94,575 |
| Physical science [1] | 14,238 | 13,055 | 13,145 | 13,678 | 13,941 | 14,616 | 14,952 |
| Mathematical science | 12,287 | 11,765 | 11,649 | 11,723 | 11,669 | 11,089 | 10,343 |
| Computer science | 21,711 | 18,918 | 17,349 | 16,844 | 16,155 | 15,816 | 15,532 |
| Biological science | 28,404 | 28,814 | 30,264 | 32,506 | 35,080 | 37,942 | 40,628 |
| Agricultural science | 7,938 | 7,658 | 7,704 | 9,382 | 10,556 | 11,733 | 13,120 |
| Social sciences | 132,203 | 142,521 | 152,917 | 163,455 | 164,917 | 161,733 | 156,472 |
| Social science | 91,697 | 98,385 | 104,783 | 111,389 | 111,154 | 106,863 | 100,558 |
| Psychology | 40,506 | 44,136 | 48,134 | 52,066 | 53,763 | 54,870 | 55,914 |
| Non-S&E [2] | 573,464 | 586,461 | 614,173 | 628,839 | 634,432 | 620,508 | 598,012 |
| Grand total | 840,326 | 856,686 | 892,363 | 921,453 | 931,603 | 918,124 | 892,785 |
| | Asians | | | | | | |
| Total science and engineering | 19,138 | 19,437 | 20,552 | 22,635 | 24,504 | 26,420 | 29,128 |
| Engineering | 6,075 | 6,012 | 6,220 | 6,265 | 6,407 | 6,516 | 6,785 |
| Sciences | 13,063 | 13,425 | 14,332 | 16,370 | 18,097 | 19,904 | 22,343 |
| Natural sciences | 7,260 | 7,326 | 7,595 | 8,496 | 9,524 | 10,401 | 12,007 |
| Physical science [1] | 922 | 937 | 983 | 1,001 | 1,098 | 1,096 | 1,347 |
| Mathematical science | 1,019 | 874 | 915 | 857 | 915 | 926 | 965 |
| Computer science | 2,268 | 2,144 | 2,010 | 2,082 | 2,245 | 2,247 | 2,365 |
| Biological science | 2,907 | 3,245 | 3,559 | 4,402 | 5,103 | 5,959 | 7,043 |
| Agricultural science | 144 | 126 | 128 | 154 | 163 | 173 | 287 |
| Social sciences | 5,803 | 6,099 | 6,737 | 7,874 | 8,573 | 9,503 | 10,336 |
| Social science | 4,228 | 4,469 | 4,852 | 5,724 | 6,035 | 6,726 | 7,005 |
| Psychology | 1,575 | 1,630 | 1,885 | 2,150 | 2,538 | 2,777 | 3,331 |
| Non-S&E [2] | 18,435 | 18,590 | 21,173 | 23,981 | 26,083 | 28,255 | 30,167 |
| Grand total | 37,573 | 38,027 | 41,725 | 46,616 | 50,587 | 54,675 | 59,295 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-1. Number of earned bachelor's degrees, by field and by race/ethnicity of recipient: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Underrepresented minorities, total | | | | | | |
| Total science and engineering | 31,950 | 33,419 | 36,682 | 41,383 | 44,682 | 48,822 | 51,844 |
| Engineering | 4,805 | 4,729 | 4,953 | 5,277 | 5,714 | 6,020 | 6,717 |
| Sciences | 27,145 | 28,690 | 31,729 | 36,106 | 38,968 | 42,802 | 45,127 |
| Natural sciences | 10,830 | 10,530 | 10,960 | 11,722 | 12,510 | 13,782 | 14,815 |
| Physical science [1] | 1,322 | 1,245 | 1,355 | 1,425 | 1,528 | 1,737 | 1,932 |
| Mathematical science | 1,218 | 1,178 | 1,334 | 1,432 | 1,490 | 1,594 | 1,589 |
| Computer science | 3,742 | 3,416 | 3,292 | 3,342 | 3,390 | 3,611 | 3,915 |
| Biological science | 4,151 | 4,243 | 4,551 | 5,043 | 5,602 | 6,127 | 6,606 |
| Agricultural science | 397 | 448 | 428 | 480 | 500 | 713 | 773 |
| Social sciences | 16,315 | 18,160 | 20,769 | 24,384 | 26,458 | 29,020 | 30,312 |
| Social science | 11,212 | 12,394 | 14,100 | 16,647 | 17,918 | 19,400 | 19,621 |
| Psychology | 5,103 | 5,766 | 6,669 | 7,737 | 8,540 | 9,620 | 10,691 |
| Non-S&E [2] | 70,215 | 73,958 | 81,840 | 88,065 | 95,404 | 102,241 | 106,588 |
| Grand total | 102,165 | 107,377 | 118,522 | 129,448 | 140,086 | 151,063 | 158,432 |
| | Black, non-Hispanics | | | | | | |
| Total science and engineering | 17,385 | 18,230 | 19,987 | 22,431 | 24,421 | 26,289 | 27,528 |
| Engineering | 2,067 | 2,072 | 2,229 | 2,362 | 2,577 | 2,659 | 2,845 |
| Sciences | 15,318 | 16,158 | 17,758 | 20,069 | 21,844 | 23,630 | 24,683 |
| Natural sciences | 6,005 | 5,782 | 5,834 | 6,401 | 6,972 | 7,559 | 8,021 |
| Physical science [1] | 697 | 650 | 753 | 816 | 836 | 921 | 1,034 |
| Mathematical science | 792 | 720 | 811 | 904 | 965 | 992 | 995 |
| Computer science | 2,457 | 2,247 | 1,997 | 2,090 | 2,213 | 2,398 | 2,498 |
| Biological science | 1,916 | 1,994 | 2,111 | 2,385 | 2,739 | 2,980 | 3,231 |
| Agricultural science | 143 | 171 | 162 | 206 | 219 | 268 | 263 |
| Social sciences | 9,313 | 10,376 | 11,924 | 13,668 | 14,872 | 16,071 | 16,662 |
| Social science | 6,570 | 7,226 | 8,236 | 9,489 | 10,254 | 10,835 | 10,921 |
| Psychology | 2,743 | 3,150 | 3,688 | 4,179 | 4,618 | 5,236 | 5,741 |
| Non-S&E [2] | 39,452 | 41,071 | 45,022 | 48,880 | 52,246 | 56,027 | 57,759 |
| Grand total | 56,837 | 59,301 | 65,009 | 71,311 | 76,667 | 82,316 | 85,287 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-1. Number of earned bachelor's degrees, by field and by race/ethnicity of recipient: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Hispanics | | | | | | |
| Total science and engineering | 13,327 | 13,918 | 15,351 | 17,391 | 18,442 | 20,529 | 22,190 |
| Engineering | 2,561 | 2,511 | 2,566 | 2,733 | 2,961 | 3,143 | 3,651 |
| Sciences | 10,766 | 11,407 | 12,785 | 14,658 | 15,481 | 17,386 | 18,539 |
| Natural sciences | 4,417 | 4,357 | 4,705 | 4,892 | 5,034 | 5,648 | 6,119 |
| Physical science [1] | 563 | 522 | 533 | 546 | 599 | 733 | 800 |
| Mathematical science | 373 | 413 | 480 | 482 | 470 | 543 | 536 |
| Computer science | 1,195 | 1,085 | 1,215 | 1,173 | 1,096 | 1,135 | 1,307 |
| Biological science | 2,090 | 2,119 | 2,264 | 2,477 | 2,652 | 2,901 | 3,090 |
| Agricultural science | 196 | 218 | 213 | 214 | 217 | 336 | 386 |
| Social sciences | 6,349 | 7,050 | 8,080 | 9,766 | 10,447 | 11,738 | 12,420 |
| Social science | 4,197 | 4,645 | 5,334 | 6,519 | 6,860 | 7,748 | 7,877 |
| Psychology | 2,152 | 2,405 | 2,746 | 3,247 | 3,587 | 3,990 | 4,543 |
| Non-S&E [2] | 28,034 | 29,946 | 33,676 | 35,616 | 39,403 | 42,154 | 44,501 |
| Grand total | 41,361 | 43,864 | 49,027 | 53,007 | 57,845 | 62,683 | 66,691 |
| | American Indians or Alaskan Natives | | | | | | |
| Total science and engineering | 1,238 | 1,271 | 1,344 | 1,561 | 1,819 | 2,004 | 2,126 |
| Engineering | 177 | 146 | 158 | 182 | 176 | 218 | 221 |
| Sciences | 1,061 | 1,125 | 1,186 | 1,379 | 1,643 | 1,786 | 1,905 |
| Natural sciences | 408 | 391 | 421 | 429 | 504 | 575 | 675 |
| Physical science [1] | 62 | 73 | 69 | 63 | 93 | 83 | 98 |
| Mathematical science | 53 | 45 | 43 | 46 | 55 | 59 | 58 |
| Computer science | 90 | 84 | 80 | 79 | 81 | 78 | 110 |
| Biological science | 145 | 130 | 176 | 181 | 211 | 246 | 285 |
| Agricultural science | 58 | 59 | 53 | 60 | 64 | 109 | 124 |
| Social sciences | 653 | 734 | 765 | 950 | 1,139 | 1,211 | 1,230 |
| Social science | 445 | 523 | 530 | 639 | 804 | 817 | 823 |
| Psychology | 208 | 211 | 235 | 311 | 335 | 394 | 407 |
| Non-S&E [2] | 2,729 | 2,941 | 3,142 | 3,569 | 3,755 | 4,060 | 4,328 |
| Grand total | 3,967 | 4,212 | 4,486 | 5,130 | 5,574 | 6,064 | 6,454 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-1. Number of earned bachelor's degrees, by field and by race/ethnicity of recipient: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | U.S. citizens and permanent residents, unknown race/ethnicity | | | | | | |
| Total science and engineering | 7,158 | 10,394 | 8,637 | 8,063 | 8,276 | 8,593 | 9,310 |
| Engineering | 914 | 1,551 | 1,269 | 1,107 | 1,191 | 1,199 | 1,292 |
| Sciences | 6,244 | 8,843 | 7,368 | 6,956 | 7,085 | 7,394 | 8,018 |
| Natural sciences | 2,260 | 2,842 | 2,373 | 2,388 | 2,221 | 2,464 | 2,900 |
| Physical science [1] | 242 | 371 | 316 | 365 | 360 | 363 | 421 |
| Mathematical science | 247 | 333 | 308 | 247 | 244 | 260 | 269 |
| Computer science | 1,107 | 1,151 | 722 | 612 | 483 | 511 | 555 |
| Biological science | 614 | 871 | 914 | 891 | 875 | 1,030 | 1,246 |
| Agricultural science | 50 | 116 | 113 | 273 | 259 | 300 | 409 |
| Social sciences | 3,984 | 6,001 | 4,995 | 4,568 | 4,864 | 4,930 | 5,118 |
| Social science | 2,725 | 4,040 | 3,481 | 3,142 | 3,284 | 3,284 | 3,395 |
| Psychology | 1,259 | 1,961 | 1,514 | 1,426 | 1,580 | 1,646 | 1,723 |
| Non-S&E [2] | 16,492 | 23,114 | 17,093 | 15,945 | 16,355 | 16,459 | 17,602 |
| Grand total | 23,650 | 33,508 | 25,730 | 24,008 | 24,631 | 25,052 | 26,912 |
| | Nonresident aliens [4] | | | | | | |
| Total science and engineering | 12,323 | 12,318 | 12,724 | 12,238 | 13,802 | 13,929 | 14,754 |
| Engineering | 5,072 | 4,917 | 4,582 | 4,223 | 4,505 | 4,540 | 4,810 |
| Sciences | 7,251 | 7,401 | 8,142 | 8,015 | 9,297 | 9,389 | 9,944 |
| Natural sciences | 4,422 | 4,326 | 4,556 | 4,369 | 5,086 | 4,949 | 5,150 |
| Physical science [1] | 605 | 595 | 608 | 607 | 764 | 713 | 723 |
| Mathematical science | 543 | 524 | 578 | 592 | 552 | 562 | 593 |
| Computer science | 2,135 | 2,066 | 2,037 | 1,974 | 2,204 | 2,273 | 2,295 |
| Biological science | 873 | 867 | 1,063 | 993 | 1,217 | 1,155 | 1,281 |
| Agricultural science | 266 | 274 | 270 | 203 | 349 | 246 | 258 |
| Social sciences | 2,829 | 3,075 | 3,586 | 3,646 | 4,211 | 4,440 | 4,794 |
| Social science | 2,318 | 2,550 | 2,895 | 2,982 | 3,381 | 3,585 | 3,852 |
| Psychology | 511 | 525 | 691 | 664 | 830 | 855 | 942 |
| Non-S&E [2] | 14,134 | 14,235 | 16,933 | 16,309 | 18,569 | 20,298 | 22,258 |
| Grand total | 26,457 | 26,553 | 29,657 | 28,547 | 32,371 | 34,227 | 37,012 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.
[2] Non-S&E refers to non-science and non-engineering.
[3] 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).
[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 on broad fields of study only until 1994; therefore, these trend data could not be adjusted to the exact field taxonomies used by NSF.

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1989-1995.

**Appendix table 3-2. Bachelor's degrees awarded to women, by major field group: 1966-1995**



| Year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmospheric, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricul-tural | Psychol-ogy | Social sciences | |
| 1966 | 222,971 | 45,634 | 146 | 2,172 | 161 | 6,702 | 7,465 | 6,928 | 22,060 | 177,337 |
| 1967 | 238,133 | 50,787 | 184 | 2,205 | 197 | 7,334 | 7,948 | 7,778 | 25,141 | 187,346 |
| 1968 | 277,116 | 61,397 | 216 | 2,435 | 234 | 8,841 | 8,966 | 10,130 | 30,575 | 215,719 |
| 1969 | 321,138 | 72,917 | 312 | 2,661 | 291 | 10,348 | 10,090 | 12,700 | 36,515 | 248,221 |
| 1970 | 344,465 | 79,702 | 337 | 2,626 | 343 | 10,516 | 10,700 | 14,717 | 40,463 | 264,763 |
| 1971 | 367,687 | 85,039 | 361 | 2,631 | 383 | 9,818 | 11,016 | 17,037 | 43,793 | 282,648 |
| 1972 | 390,479 | 90,037 | 492 | 2,653 | 495 | 9,784 | 11,777 | 20,154 | 44,682 | 300,442 |
| 1973 | 408,738 | 95,995 | 576 | 2,589 | 532 | 9,985 | 13,779 | 22,986 | 45,548 | 312,743 |
| 1974 | 423,469 | 102,578 | 698 | 2,767 | 768 | 9,719 | 16,732 | 26,407 | 45,487 | 320,891 |
| 1975 | 423,239 | 102,814 | 845 | 3,011 | 827 | 8,656 | 19,384 | 27,103 | 42,988 | 320,425 |
| 1976 | 425,894 | 103,921 | 1,317 | 3,217 | 922 | 7,678 | 21,836 | 27,376 | 41,575 | 321,973 |
| 1977 | 429,107 | 104,993 | 2,044 | 3,377 | 1,174 | 7,488 | 23,250 | 27,102 | 40,558 | 324,114 |
| 1978 | 439,135 | 107,667 | 3,482 | 3,690 | 1,294 | 7,110 | 24,363 | 26,540 | 41,188 | 331,468 |
| 1979 | 449,946 | 109,915 | 4,881 | 3,899 | 1,387 | 7,421 | 24,787 | 26,363 | 41,177 | 340,031 |
| 1980 | 462,501 | 113,480 | 5,952 | 4,185 | 1,462 | 8,247 | 25,011 | 26,923 | 41,700 | 349,021 |
| 1981 | 472,541 | 115,815 | 7,063 | 4,309 | 1,666 | 9,734 | 24,657 | 26,917 | 41,469 | 356,726 |
| 1982 | 486,500 | 121,399 | 8,275 | 4,526 | 1,807 | 12,173 | 24,313 | 27,783 | 42,522 | 365,101 |
| 1983 | 497,284 | 123,191 | 9,652 | 4,611 | 1,848 | 14,542 | 24,279 | 27,597 | 40,662 | 374,093 |
| 1984 | 499,595 | 125,134 | 10,729 | 4,656 | 1,934 | 18,053 | 23,243 | 27,426 | 39,093 | 374,461 |
| 1985 | 504,217 | 128,871 | 11,246 | 4,836 | 1,861 | 21,525 | 23,140 | 27,422 | 38,841 | 375,346 |
| 1986 | 510,061 | 130,662 | 11,138 | 4,696 | 1,354 | 22,806 | 22,953 | 28,246 | 39,469 | 379,399 |
| 1987 | 518,529 | 131,545 | 11,404 | 4,672 | 1,060 | 21,571 | 22,403 | 29,796 | 40,639 | 386,984 |
| 1988 | 524,797 | 130,933 | 10,779 | 4,582 | 847 | 18,765 | 22,375 | 31,794 | 41,791 | 393,864 |
| 1989 | 542,605 | 133,483 | 10,188 | 4,371 | 801 | 16,595 | 21,679 | 34,663 | 45,186 | 409,122 |
| 1990 | 566,284 | 140,012 | 9,973 | 4,319 | 775 | 15,185 | 22,401 | 38,619 | 48,740 | 426,272 |
| 1991 | 599,045 | 148,347 | 9,665 | 4,425 | 782 | 14,494 | 23,776 | 42,738 | 52,467 | 450,698 |
| 1992 | 624,677 | 159,486 | 9,636 | 4,586 | 1,024 | 14,196 | 26,720 | 46,903 | 56,421 | 465,191 |
| 1993 | 641,742 | 165,720 | 9,981 | 4,764 | 1,050 | 13,950 | 29,182 | 49,222 | 57,571 | 476,022 |
| 1994 | 646,080 | 170,977 | 10,403 | 5,067 | 1,203 | 13,788 | 31,921 | 51,019 | 57,576 | 475,103 |
| 1995 | 643,290 | 175,931 | 10,950 | 5,292 | 1,524 | 13,554 | 35,555 | 52,963 | 56,093 | 467,359 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-2. Bachelor's degrees awarded to women, by major field group: 1966-1995**

[Percentage distribution of bachelor's degrees awarded to women]



| Year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmospheric, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricul-tural | Psychol-ogy | Social sciences | |
| 1966 | 100.0 | 20.5 | 0.1 | 1.0 | 0.1 | 3.0 | 3.3 | 3.1 | 9.9 | 79.5 |
| 1967 | 100.0 | 21.3 | 0.1 | 0.9 | 0.1 | 3.1 | 3.3 | 3.3 | 10.6 | 78.7 |
| 1968 | 100.0 | 22.2 | 0.1 | 0.9 | 0.1 | 3.2 | 3.2 | 3.7 | 11.0 | 77.8 |
| 1969 | 100.0 | 22.7 | 0.1 | 0.8 | 0.1 | 3.2 | 3.1 | 4.0 | 11.4 | 77.3 |
| 1970 | 100.0 | 23.1 | 0.1 | 0.8 | 0.1 | 3.1 | 3.1 | 4.3 | 11.7 | 76.9 |
| 1971 | 100.0 | 23.1 | 0.1 | 0.7 | 0.1 | 2.7 | 3.0 | 4.6 | 11.9 | 76.9 |
| 1972 | 100.0 | 23.1 | 0.1 | 0.7 | 0.1 | 2.5 | 3.0 | 5.2 | 11.4 | 76.9 |
| 1973 | 100.0 | 23.5 | 0.1 | 0.6 | 0.1 | 2.4 | 3.4 | 5.6 | 11.1 | 76.5 |
| 1974 | 100.0 | 24.2 | 0.2 | 0.7 | 0.2 | 2.3 | 4.0 | 6.2 | 10.7 | 75.8 |
| 1975 | 100.0 | 24.3 | 0.2 | 0.7 | 0.2 | 2.0 | 4.6 | 6.4 | 10.2 | 75.7 |
| 1976 | 100.0 | 24.4 | 0.3 | 0.8 | 0.2 | 1.8 | 5.1 | 6.4 | 9.8 | 75.6 |
| 1977 | 100.0 | 24.5 | 0.5 | 0.8 | 0.3 | 1.7 | 5.4 | 6.3 | 9.5 | 75.5 |
| 1978 | 100.0 | 24.5 | 0.8 | 0.8 | 0.3 | 1.6 | 5.5 | 6.0 | 9.4 | 75.5 |
| 1979 | 100.0 | 24.4 | 1.1 | 0.9 | 0.3 | 1.6 | 5.5 | 5.9 | 9.2 | 75.6 |
| 1980 | 100.0 | 24.5 | 1.3 | 0.9 | 0.3 | 1.8 | 5.4 | 5.8 | 9.0 | 75.5 |
| 1981 | 100.0 | 24.5 | 1.5 | 0.9 | 0.4 | 2.1 | 5.2 | 5.7 | 8.8 | 75.5 |
| 1982 | 100.0 | 25.0 | 1.7 | 0.9 | 0.4 | 2.5 | 5.0 | 5.7 | 8.7 | 75.0 |
| 1983 | 100.0 | 24.8 | 1.9 | 0.9 | 0.4 | 2.9 | 4.9 | 5.5 | 8.2 | 75.2 |
| 1984 | 100.0 | 25.0 | 2.1 | 0.9 | 0.4 | 3.6 | 4.7 | 5.5 | 7.8 | 75.0 |
| 1985 | 100.0 | 25.6 | 2.2 | 1.0 | 0.4 | 4.3 | 4.6 | 5.4 | 7.7 | 74.4 |
| 1986 | 100.0 | 25.6 | 2.2 | 0.9 | 0.3 | 4.5 | 4.5 | 5.5 | 7.7 | 74.4 |
| 1987 | 100.0 | 25.4 | 2.2 | 0.9 | 0.2 | 4.2 | 4.3 | 5.7 | 7.8 | 74.6 |
| 1988 | 100.0 | 24.9 | 2.1 | 0.9 | 0.2 | 3.6 | 4.3 | 6.1 | 8.0 | 75.1 |
| 1989 | 100.0 | 24.6 | 1.9 | 0.8 | 0.1 | 3.1 | 4.0 | 6.4 | 8.3 | 75.4 |
| 1990 | 100.0 | 24.7 | 1.8 | 0.8 | 0.1 | 2.7 | 4.0 | 6.8 | 8.6 | 75.3 |
| 1991 | 100.0 | 24.8 | 1.6 | 0.7 | 0.1 | 2.4 | 4.0 | 7.1 | 8.8 | 75.2 |
| 1992 | 100.0 | 25.5 | 1.5 | 0.7 | 0.2 | 2.3 | 4.3 | 7.5 | 9.0 | 74.5 |
| 1993 | 100.0 | 25.8 | 1.6 | 0.7 | 0.2 | 2.2 | 4.5 | 7.7 | 9.0 | 74.2 |
| 1994 | 100.0 | 26.5 | 1.6 | 0.8 | 0.2 | 2.1 | 4.9 | 7.9 | 8.9 | 73.5 |
| 1995 | 100.0 | 27.3 | 1.7 | 0.8 | 0.2 | 2.1 | 5.5 | 8.2 | 8.7 | 72.7 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-2. Bachelor's degrees awarded to women, by major field group: 1966-1995**

[Women as a percentage of all bachelor's recipients]



| Year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmospheric, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricul-tural | Psychol-ogy | Social sciences | |
| 1966 | 42.6 | 24.8 | 0.4 | 14.0 | 9.4 | 33.2 | 25.0 | 40.8 | 34.3 | 52.2 |
| 1967 | 42.3 | 25.4 | 0.5 | 13.9 | 10.2 | 34.1 | 24.5 | 40.0 | 34.7 | 51.7 |
| 1968 | 43.5 | 27.1 | 0.6 | 14.3 | 10.0 | 36.7 | 24.8 | 42.3 | 35.8 | 52.6 |
| 1969 | 43.8 | 27.8 | 0.8 | 14.3 | 10.0 | 36.6 | 24.4 | 43.1 | 36.5 | 52.6 |
| 1970 | 43.2 | 28.0 | 0.8 | 14.5 | 10.2 | 36.1 | 24.1 | 43.6 | 36.6 | 51.5 |
| 1971 | 43.5 | 28.9 | 0.8 | 14.7 | 10.8 | 36.0 | 24.1 | 44.7 | 37.6 | 51.2 |
| 1972 | 43.7 | 29.4 | 1.1 | 15.8 | 12.2 | 35.9 | 24.4 | 46.4 | 37.0 | 51.1 |
| 1973 | 43.9 | 29.9 | 1.2 | 15.8 | 12.2 | 36.3 | 25.2 | 47.8 | 37.0 | 51.3 |
| 1974 | 44.4 | 31.4 | 1.6 | 16.8 | 15.9 | 36.6 | 27.0 | 50.5 | 37.6 | 51.1 |
| 1975 | 45.4 | 32.8 | 2.1 | 18.8 | 17.0 | 37.0 | 29.2 | 52.7 | 38.5 | 51.8 |
| 1976 | 45.6 | 33.6 | 3.4 | 19.5 | 18.3 | 35.3 | 31.2 | 54.4 | 38.8 | 51.5 |
| 1977 | 46.2 | 34.6 | 4.9 | 19.9 | 20.8 | 36.1 | 32.9 | 56.7 | 40.3 | 51.9 |
| 1978 | 47.2 | 35.5 | 7.4 | 21.5 | 21.6 | 35.7 | 35.2 | 58.9 | 41.6 | 52.9 |
| 1979 | 48.3 | 36.3 | 9.1 | 22.6 | 22.8 | 35.9 | 37.1 | 61.3 | 42.9 | 54.1 |
| 1980 | 49.2 | 37.2 | 10.1 | 24.0 | 23.8 | 36.4 | 39.1 | 63.3 | 44.8 | 54.9 |
| 1981 | 49.9 | 37.8 | 11.1 | 24.7 | 24.9 | 36.9 | 41.1 | 65.1 | 45.4 | 55.7 |
| 1982 | 50.5 | 38.5 | 12.3 | 26.2 | 25.6 | 37.9 | 42.3 | 66.9 | 46.2 | 56.3 |
| 1983 | 50.7 | 38.8 | 13.3 | 28.5 | 25.3 | 38.9 | 43.8 | 67.6 | 46.3 | 56.4 |
| 1984 | 50.7 | 38.6 | 14.1 | 29.4 | 24.4 | 39.3 | 44.4 | 67.9 | 45.6 | 56.6 |
| 1985 | 50.9 | 38.8 | 14.5 | 29.7 | 24.6 | 39.5 | 45.1 | 68.2 | 45.8 | 57.0 |
| 1986 | 51.0 | 39.0 | 14.5 | 29.8 | 22.3 | 38.8 | 45.5 | 69.0 | 45.6 | 57.1 |
| 1987 | 51.7 | 39.7 | 15.3 | 30.2 | 22.6 | 38.2 | 46.1 | 69.0 | 45.8 | 57.6 |
| 1988 | 52.2 | 40.6 | 15.4 | 32.1 | 23.8 | 36.9 | 47.7 | 70.1 | 45.8 | 57.6 |
| 1989 | 52.7 | 41.3 | 15.2 | 30.9 | 25.2 | 35.9 | 47.6 | 70.8 | 46.2 | 57.8 |
| 1990 | 53.3 | 42.5 | 15.4 | 32.2 | 27.9 | 35.8 | 48.2 | 71.5 | 46.3 | 58.1 |
| 1991 | 54.1 | 43.9 | 15.5 | 32.4 | 28.7 | 36.1 | 48.7 | 72.6 | 47.2 | 58.5 |
| 1992 | 54.3 | 44.9 | 15.6 | 33.1 | 32.0 | 35.6 | 49.3 | 73.2 | 47.8 | 58.5 |
| 1993 | 54.4 | 45.3 | 15.9 | 33.6 | 30.0 | 35.4 | 48.9 | 73.2 | 48.2 | 58.5 |
| 1994 | 54.6 | 45.8 | 16.5 | 34.6 | 31.1 | 35.2 | 48.9 | 73.1 | 49.0 | 58.7 |
| 1995 | 54.8 | 46.5 | 17.3 | 35.5 | 34.0 | 35.1 | 49.7 | 73.0 | 49.8 | 58.7 |

NOTE: For the years 1966-1970, the science and engineering total includes degrees granted for "other" science; these degrees are not included in any of the specific categories. These degrees constitute less than 2 percent of the total.

SOURCES: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics: Survey of Degrees and Other Formal Awards Conferred, and Completions Survey.

**Appendix table 3-3. Bachelor's degrees awarded to men, by major field group: 1967-1995**



| Year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmospheric, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricul-tural | Psychol-ogy | Social sciences | |
| 1967 | 324,236 | 149,045 | 36,013 | 13,642 | 1,739 | 14,196 | 24,541 | 11,657 | 47,257 | 175,191 |
| 1968 | 359,747 | 165,200 | 37,464 | 14,602 | 2,105 | 15,243 | 27,175 | 13,791 | 54,820 | 194,547 |
| 1969 | 412,865 | 189,272 | 41,270 | 15,962 | 2,633 | 17,915 | 31,190 | 16,758 | 63,544 | 223,593 |
| 1970 | 453,605 | 204,528 | 44,433 | 15,547 | 3,008 | 18,593 | 33,747 | 19,067 | 70,133 | 249,077 |
| 1971 | 478,423 | 209,318 | 44,887 | 15,317 | 3,179 | 17,488 | 34,712 | 21,117 | 72,618 | 269,105 |
| 1972 | 503,631 | 216,422 | 45,219 | 14,161 | 3,560 | 17,466 | 36,514 | 23,267 | 76,235 | 287,209 |
| 1973 | 521,534 | 225,090 | 46,203 | 13,826 | 3,842 | 17,543 | 40,908 | 25,110 | 77,658 | 296,444 |
| 1974 | 530,907 | 223,652 | 42,550 | 13,686 | 4,055 | 16,851 | 45,174 | 25,849 | 75,487 | 307,255 |
| 1975 | 508,424 | 210,741 | 38,979 | 12,990 | 4,050 | 14,729 | 46,937 | 24,333 | 68,723 | 297,683 |
| 1976 | 508,549 | 205,570 | 37,473 | 13,280 | 4,124 | 14,071 | 48,168 | 22,987 | 65,467 | 302,979 |
| 1977 | 499,121 | 198,805 | 39,313 | 13,560 | 4,479 | 13,241 | 47,339 | 20,692 | 60,181 | 300,316 |
| 1978 | 491,066 | 195,888 | 43,769 | 13,453 | 4,709 | 12,815 | 44,852 | 18,517 | 57,773 | 295,178 |
| 1979 | 481,394 | 193,247 | 48,588 | 13,358 | 4,695 | 13,249 | 41,994 | 16,649 | 54,714 | 288,147 |
| 1980 | 477,750 | 191,215 | 52,858 | 13,285 | 4,693 | 14,439 | 38,931 | 15,590 | 51,419 | 286,535 |
| 1981 | 474,336 | 190,977 | 56,654 | 13,137 | 5,028 | 16,672 | 35,265 | 14,447 | 49,774 | 283,359 |
| 1982 | 477,543 | 193,624 | 59,185 | 12,737 | 5,254 | 19,966 | 33,222 | 13,756 | 49,504 | 283,919 |
| 1983 | 483,395 | 194,380 | 63,018 | 11,586 | 5,450 | 22,802 | 31,132 | 13,228 | 47,164 | 289,015 |
| 1984 | 486,750 | 199,150 | 65,424 | 11,175 | 5,991 | 27,893 | 29,108 | 12,949 | 46,610 | 287,600 |
| 1985 | 486,660 | 203,402 | 66,326 | 11,434 | 5,715 | 32,985 | 28,172 | 12,815 | 45,955 | 283,258 |
| 1986 | 490,143 | 204,743 | 65,682 | 11,088 | 4,722 | 35,920 | 27,488 | 12,691 | 47,152 | 285,400 |
| 1987 | 485,003 | 199,981 | 63,021 | 10,792 | 3,629 | 34,871 | 26,168 | 13,399 | 48,101 | 285,022 |
| 1988 | 481,236 | 191,549 | 59,375 | 9,673 | 2,707 | 32,112 | 24,550 | 13,584 | 49,548 | 289,687 |
| 1989 | 487,566 | 189,338 | 56,759 | 9,777 | 2,380 | 29,682 | 23,852 | 14,291 | 52,597 | 298,228 |
| 1990 | 495,867 | 189,082 | 54,732 | 9,106 | 2,001 | 27,184 | 24,050 | 15,399 | 56,610 | 306,785 |
| 1991 | 508,952 | 189,328 | 52,522 | 9,253 | 1,946 | 25,700 | 25,007 | 16,155 | 58,745 | 319,624 |
| 1992 | 525,395 | 195,779 | 52,305 | 9,289 | 2,177 | 25,693 | 27,473 | 17,130 | 61,712 | 329,616 |
| 1993 | 537,536 | 200,315 | 52,724 | 9,424 | 2,453 | 25,483 | 30,439 | 18,029 | 61,763 | 337,221 |
| 1994 | 537,061 | 202,284 | 52,609 | 9,588 | 2,665 | 25,397 | 33,347 | 18,749 | 59,929 | 334,777 |
| 1995 | 531,146 | 202,217 | 52,421 | 9,605 | 2,954 | 25,066 | 35,915 | 19,638 | 56,618 | 328,929 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-3. Bachelor's degrees awarded to men, by major field group: 1966-1995**

[Percent distribution]



| Year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmospheric, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricul-tural | Psychol-ogy | Social sciences | |
| 1966 | 100.0 | 46.1 | 11.9 | 4.4 | 0.5 | 4.5 | 7.4 | 3.3 | 14.1 | 53.9 |
| 1967 | 100.0 | 46.0 | 11.1 | 4.2 | 0.5 | 4.4 | 7.6 | 3.6 | 14.6 | 54.0 |
| 1968 | 100.0 | 45.9 | 10.4 | 4.1 | 0.6 | 4.2 | 7.6 | 3.8 | 15.2 | 54.1 |
| 1969 | 100.0 | 45.8 | 10.0 | 3.9 | 0.6 | 4.3 | 7.6 | 4.1 | 15.4 | 54.2 |
| 1970 | 100.0 | 45.1 | 9.8 | 3.4 | 0.7 | 4.1 | 7.4 | 4.2 | 15.5 | 54.9 |
| 1971 | 100.0 | 43.8 | 9.4 | 3.2 | 0.7 | 3.7 | 7.3 | 4.4 | 15.2 | 56.2 |
| 1972 | 100.0 | 43.0 | 9.0 | 2.8 | 0.7 | 3.5 | 7.3 | 4.6 | 15.1 | 57.0 |
| 1973 | 100.0 | 43.2 | 8.9 | 2.7 | 0.7 | 3.4 | 7.8 | 4.8 | 14.9 | 56.8 |
| 1974 | 100.0 | 42.1 | 8.0 | 2.6 | 0.8 | 3.2 | 8.5 | 4.9 | 14.2 | 57.9 |
| 1975 | 100.0 | 41.4 | 7.7 | 2.6 | 0.8 | 2.9 | 9.2 | 4.8 | 13.5 | 58.6 |
| 1976 | 100.0 | 40.4 | 7.4 | 2.6 | 0.8 | 2.8 | 9.5 | 4.5 | 12.9 | 59.6 |
| 1977 | 100.0 | 39.8 | 7.9 | 2.7 | 0.9 | 2.7 | 9.5 | 4.1 | 12.1 | 60.2 |
| 1978 | 100.0 | 39.9 | 8.9 | 2.7 | 1.0 | 2.6 | 9.1 | 3.8 | 11.8 | 60.1 |
| 1979 | 100.0 | 40.1 | 10.1 | 2.8 | 1.0 | 2.8 | 8.7 | 3.5 | 11.4 | 59.9 |
| 1980 | 100.0 | 40.0 | 11.1 | 2.8 | 1.0 | 3.0 | 8.1 | 3.3 | 10.8 | 60.0 |
| 1981 | 100.0 | 40.3 | 11.9 | 2.8 | 1.1 | 3.5 | 7.4 | 3.0 | 10.5 | 59.7 |
| 1982 | 100.0 | 40.5 | 12.4 | 2.7 | 1.1 | 4.2 | 7.0 | 2.9 | 10.4 | 59.5 |
| 1983 | 100.0 | 40.2 | 13.0 | 2.4 | 1.1 | 4.7 | 6.4 | 2.7 | 9.8 | 59.8 |
| 1984 | 100.0 | 40.9 | 13.4 | 2.3 | 1.2 | 5.7 | 6.0 | 2.7 | 9.6 | 59.1 |
| 1985 | 100.0 | 41.8 | 13.6 | 2.3 | 1.2 | 6.8 | 5.8 | 2.6 | 9.4 | 58.2 |
| 1986 | 100.0 | 41.8 | 13.4 | 2.3 | 1.0 | 7.3 | 5.6 | 2.6 | 9.6 | 58.2 |
| 1987 | 100.0 | 41.2 | 13.0 | 2.2 | 0.7 | 7.2 | 5.4 | 2.8 | 9.9 | 58.8 |
| 1988 | 100.0 | 39.8 | 12.3 | 2.0 | 0.6 | 6.7 | 5.1 | 2.8 | 10.3 | 60.2 |
| 1989 | 100.0 | 38.8 | 11.6 | 2.0 | 0.5 | 6.1 | 4.9 | 2.9 | 10.8 | 61.2 |
| 1990 | 100.0 | 38.1 | 11.0 | 1.8 | 0.4 | 5.5 | 4.9 | 3.1 | 11.4 | 61.9 |
| 1991 | 100.0 | 37.2 | 10.3 | 1.8 | 0.4 | 5.0 | 4.9 | 3.2 | 11.5 | 62.8 |
| 1992 | 100.0 | 37.3 | 10.0 | 1.8 | 0.4 | 4.9 | 5.2 | 3.3 | 11.7 | 62.7 |
| 1993 | 100.0 | 37.3 | 9.8 | 1.8 | 0.5 | 4.7 | 5.7 | 3.4 | 11.5 | 62.7 |
| 1994 | 100.0 | 37.7 | 9.8 | 1.8 | 0.5 | 4.7 | 6.2 | 3.5 | 11.2 | 62.3 |
| 1995 | 100.0 | 38.1 | 9.9 | 1.8 | 0.6 | 4.7 | 6.8 | 3.7 | 10.7 | 61.9 |

NOTES: For the years 1966-1970 the science and engineering total includes degrees granted for "other" science; these degrees are not included in any of the specific categories. These degrees constitute less than 2 percent of the total. Because of rounding, details may not sum to totals.

SOURCES: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics: Survey of Degrees and Other Formal Awards Conferred, and Completions Survey.

**Appendix table 3-4. Number of earned bachelor's degrees, by field and by race/ethnicity of male recipients: 1989–1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Total, all recipients | | | | | | |
| Total science and engineering | 198,728 | 199,916 | 201,499 | 209,270 | 214,388 | 216,492 | 216,078 |
| Engineering | 56,759 | 54,730 | 52,522 | 52,270 | 52,696 | 52,569 | 52,389 |
| Sciences | 141,969 | 145,186 | 148,977 | 157,000 | 161,692 | 163,923 | 163,689 |
| Natural sciences | 65,875 | 62,518 | 62,091 | 64,678 | 67,855 | 70,956 | 73,593 |
| Physical science [1] | 12,157 | 11,109 | 11,199 | 11,466 | 11,877 | 12,253 | 12,559 |
| Mathematical science | 8,264 | 7,863 | 7,804 | 7,923 | 7,859 | 7,754 | 7,318 |
| Computer science | 21,418 | 19,321 | 17,896 | 17,670 | 17,565 | 17,466 | 17,628 |
| Biological science | 18,295 | 18,631 | 19,715 | 21,107 | 23,111 | 25,314 | 26,956 |
| Agricultural science | 5,741 | 5,594 | 5,477 | 6,512 | 7,443 | 8,169 | 9,132 |
| Social sciences | 76,094 | 82,668 | 86,886 | 92,322 | 93,837 | 92,967 | 90,096 |
| Social science | 61,803 | 67,269 | 70,731 | 75,185 | 75,808 | 74,218 | 70,458 |
| Psychology | 14,291 | 15,399 | 16,155 | 17,137 | 18,029 | 18,749 | 19,638 |
| Non-S&E [2] | 288,838 | 295,951 | 307,453 | 316,125 | 323,148 | 320,569 | 315,068 |
| Grand total | 487,566 | 495,867 | 508,952 | 525,395 | 537,536 | 537,061 | 531,146 |
| | U.S. citizens and permanent residents, total [3] | | | | | | |
| Total science and engineering | 189,685 | 190,980 | 192,516 | 200,929 | 204,994 | 207,030 | 206,144 |
| Engineering | 52,160 | 50,303 | 48,410 | 48,518 | 48,655 | 48,577 | 48,145 |
| Sciences | 137,525 | 140,677 | 144,106 | 152,411 | 156,339 | 158,453 | 157,999 |
| Natural sciences | 62,973 | 59,662 | 59,096 | 61,872 | 64,584 | 67,726 | 70,302 |
| Physical science [1] | 11,751 | 10,694 | 10,788 | 11,049 | 11,352 | 11,786 | 12,086 |
| Mathematical science | 7,917 | 7,539 | 7,430 | 7,565 | 7,514 | 7,390 | 6,960 |
| Computer science | 19,901 | 17,849 | 16,433 | 16,251 | 15,964 | 15,799 | 15,960 |
| Biological science | 17,869 | 18,200 | 19,171 | 20,628 | 22,542 | 24,739 | 26,334 |
| Agricultural science | 5,535 | 5,380 | 5,274 | 6,379 | 7,212 | 8,012 | 8,962 |
| Social sciences | 74,552 | 81,015 | 85,010 | 90,539 | 91,755 | 90,727 | 87,697 |
| Social science | 60,431 | 65,776 | 69,033 | 73,577 | 73,946 | 72,185 | 68,291 |
| Psychology | 14,121 | 15,239 | 15,977 | 16,962 | 17,809 | 18,542 | 19,406 |
| Non-S&E [2] | 280,764 | 287,979 | 298,209 | 307,360 | 313,490 | 310,288 | 303,886 |
| Grand total | 470,449 | 478,959 | 490,725 | 508,289 | 518,484 | 517,318 | 510,030 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-4. Number of earned bachelor's degrees, by field and by race/ethnicity of male recipients: 1989–1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | White, non-Hispanics | | | | | | |
| Total science and engineering | 158,590 | 157,675 | 158,687 | 164,220 | 166,063 | 165,245 | 161,731 |
| Engineering | 42,779 | 40,533 | 38,692 | 38,513 | 38,244 | 37,830 | 36,785 |
| Sciences | 115,811 | 117,142 | 119,995 | 125,707 | 127,819 | 127,415 | 124,946 |
| Natural sciences | 52,132 | 48,848 | 48,304 | 50,126 | 52,048 | 54,115 | 55,197 |
| Physical science [1] | 10,173 | 9,179 | 9,203 | 9,430 | 9,614 | 9,958 | 10,006 |
| Mathematical science | 6,598 | 6,253 | 6,119 | 6,255 | 6,131 | 5,920 | 5,456 |
| Computer science | 15,799 | 13,974 | 12,916 | 12,571 | 12,329 | 12,022 | 11,793 |
| Biological science | 14,377 | 14,488 | 15,174 | 16,030 | 17,293 | 18,882 | 19,790 |
| Agricultural science | 5,185 | 4,954 | 4,892 | 5,840 | 6,681 | 7,333 | 8,152 |
| Social sciences | 63,679 | 68,294 | 71,691 | 75,581 | 75,771 | 73,300 | 69,749 |
| Social science | 51,766 | 55,662 | 58,414 | 61,574 | 61,269 | 58,409 | 54,508 |
| Psychology | 11,913 | 12,632 | 13,277 | 14,007 | 14,502 | 14,891 | 15,241 |
| Non-S&E [2] | 239,962 | 243,349 | 252,058 | 258,297 | 261,177 | 254,966 | 245,424 |
| Grand total | 398,552 | 401,024 | 410,745 | 422,517 | 427,240 | 420,211 | 407,155 |
| | Asians | | | | | | |
| Total science and engineering | 11,578 | 11,528 | 11,942 | 13,198 | 14,132 | 14,967 | 16,039 |
| Engineering | 4,936 | 4,827 | 4,969 | 5,067 | 5,130 | 5,235 | 5,340 |
| Sciences | 6,642 | 6,701 | 6,973 | 8,131 | 9,002 | 9,732 | 10,699 |
| Natural sciences | 4,073 | 4,054 | 4,149 | 4,783 | 5,380 | 5,721 | 6,483 |
| Physical science [1] | 626 | 592 | 606 | 615 | 675 | 648 | 784 |
| Mathematical science | 527 | 491 | 482 | 486 | 502 | 523 | 519 |
| Computer science | 1,420 | 1,335 | 1,268 | 1,373 | 1,492 | 1,476 | 1,583 |
| Biological science | 1,442 | 1,573 | 1,736 | 2,230 | 2,633 | 2,992 | 3,467 |
| Agricultural science | 58 | 63 | 57 | 79 | 78 | 82 | 130 |
| Social sciences | 2,569 | 2,647 | 2,824 | 3,348 | 3,622 | 4,011 | 4,216 |
| Social science | 2,065 | 2,156 | 2,260 | 2,728 | 2,884 | 3,204 | 3,247 |
| Psychology | 504 | 491 | 564 | 620 | 738 | 807 | 969 |
| Non-S&E [2] | 7,625 | 7,569 | 8,831 | 9,992 | 10,687 | 11,453 | 12,309 |
| Grand total | 19,203 | 19,097 | 20,773 | 23,190 | 24,819 | 26,420 | 28,348 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-4. Number of earned bachelor's degrees, by field and by race/ethnicity of male recipients: 1989–1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Underrepresented minorities, total | | | | | | |
| Total science and engineering | 15,672 | 15,954 | 17,027 | 18,890 | 20,160 | 22,001 | 23,235 |
| Engineering | 3,638 | 3,574 | 3,654 | 3,952 | 4,261 | 4,458 | 4,917 |
| Sciences | 12,034 | 12,380 | 13,373 | 14,938 | 15,899 | 17,543 | 18,318 |
| Natural sciences | 5,411 | 5,043 | 5,226 | 5,450 | 5,766 | 6,389 | 6,888 |
| Physical science [1] | 771 | 655 | 755 | 745 | 792 | 931 | 998 |
| Mathematical science | 636 | 614 | 657 | 675 | 744 | 786 | 820 |
| Computer science | 2,013 | 1,797 | 1,758 | 1,864 | 1,802 | 1,939 | 2,190 |
| Biological science | 1,734 | 1,685 | 1,799 | 1,885 | 2,130 | 2,337 | 2,449 |
| Agricultural science | 257 | 292 | 257 | 281 | 298 | 396 | 431 |
| Social sciences | 6,623 | 7,337 | 8,147 | 9,488 | 10,133 | 11,154 | 11,430 |
| Social science | 5,286 | 5,788 | 6,442 | 7,590 | 8,013 | 8,813 | 8,742 |
| Psychology | 1,337 | 1,549 | 1,705 | 1,898 | 2,120 | 2,341 | 2,688 |
| Non-S&E [2] | 25,978 | 27,093 | 29,887 | 31,805 | 34,440 | 36,527 | 38,307 |
| Grand total | 41,650 | 43,047 | 46,914 | 50,695 | 54,600 | 58,528 | 61,542 |
| | Black, non-Hispanics | | | | | | |
| Total science and engineering | 7,685 | 7,830 | 8,448 | 9,375 | 10,099 | 10,806 | 11,127 |
| Engineering | 1,397 | 1,416 | 1,484 | 1,614 | 1,764 | 1,784 | 1,846 |
| Sciences | 6,288 | 6,414 | 6,964 | 7,761 | 8,335 | 9,022 | 9,281 |
| Natural sciences | 2,732 | 2,476 | 2,538 | 2,709 | 2,872 | 3,146 | 3,314 |
| Physical science [1] | 365 | 292 | 391 | 381 | 370 | 464 | 495 |
| Mathematical science | 374 | 342 | 380 | 374 | 444 | 457 | 476 |
| Computer science | 1,205 | 1,074 | 971 | 1,092 | 1,049 | 1,161 | 1,241 |
| Biological science | 700 | 658 | 696 | 749 | 883 | 927 | 981 |
| Agricultural science | 88 | 110 | 100 | 113 | 126 | 137 | 121 |
| Social sciences | 3,556 | 3,938 | 4,426 | 5,052 | 5,463 | 5,876 | 5,967 |
| Social science | 2,911 | 3,144 | 3,547 | 4,070 | 4,364 | 4,644 | 4,565 |
| Psychology | 645 | 794 | 879 | 982 | 1,099 | 1,232 | 1,402 |
| Non-S&E [2] | 14,228 | 14,760 | 15,790 | 17,143 | 18,275 | 19,300 | 19,871 |
| Grand total | 21,913 | 22,590 | 24,238 | 26,518 | 28,374 | 30,106 | 30,998 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-4. Number of earned bachelor's degrees, by field and by race/ethnicity of male recipients: 1989–1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Hispanics | | | | | | |
| Total science and engineering | 7,318 | 7,434 | 7,888 | 8,730 | 9,160 | 10,190 | 11,031 |
| Engineering | 2,100 | 2,035 | 2,039 | 2,187 | 2,355 | 2,495 | 2,895 |
| Sciences | 5,218 | 5,399 | 5,849 | 6,543 | 6,805 | 7,695 | 8,136 |
| Natural sciences | 2,432 | 2,328 | 2,458 | 2,497 | 2,608 | 2,925 | 3,196 |
| Physical science [1] | 362 | 311 | 318 | 326 | 361 | 415 | 437 |
| Mathematical science | 224 | 249 | 259 | 279 | 273 | 300 | 315 |
| Computer science | 750 | 669 | 738 | 724 | 700 | 719 | 876 |
| Biological science | 965 | 955 | 1,019 | 1,043 | 1,144 | 1,298 | 1,340 |
| Agricultural science | 131 | 144 | 124 | 125 | 130 | 193 | 228 |
| Social sciences | 2,786 | 3,071 | 3,391 | 4,046 | 4,197 | 4,770 | 4,940 |
| Social science | 2,153 | 2,384 | 2,634 | 3,220 | 3,269 | 3,774 | 3,774 |
| Psychology | 633 | 687 | 757 | 826 | 928 | 996 | 1,166 |
| Non-S&E [2] | 10,684 | 11,249 | 12,893 | 13,296 | 14,665 | 15,670 | 16,844 |
| Grand total | 18,002 | 18,683 | 20,781 | 22,026 | 23,825 | 25,860 | 27,875 |
| | American Indians or Alaskan Natives | | | | | | |
| Total science and engineering | 669 | 690 | 691 | 785 | 901 | 1,005 | 1,077 |
| Engineering | 141 | 123 | 131 | 151 | 142 | 179 | 176 |
| Sciences | 528 | 567 | 560 | 634 | 759 | 826 | 901 |
| Natural sciences | 247 | 239 | 230 | 244 | 286 | 318 | 378 |
| Physical science [1] | 44 | 52 | 46 | 38 | 61 | 52 | 66 |
| Mathematical science | 38 | 23 | 18 | 22 | 27 | 29 | 29 |
| Computer science | 58 | 54 | 49 | 48 | 53 | 59 | 73 |
| Biological science | 69 | 72 | 84 | 93 | 103 | 112 | 128 |
| Agricultural science | 38 | 38 | 33 | 43 | 42 | 66 | 82 |
| Social sciences | 281 | 328 | 330 | 390 | 473 | 508 | 523 |
| Social science | 222 | 260 | 261 | 300 | 380 | 395 | 403 |
| Psychology | 59 | 68 | 69 | 90 | 93 | 113 | 120 |
| Non-S&E [2] | 1,066 | 1,084 | 1,204 | 1,366 | 1,500 | 1,557 | 1,592 |
| Grand total | 1,735 | 1,774 | 1,895 | 2,151 | 2,401 | 2,562 | 2,669 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-4. Number of earned bachelor's degrees, by field and by race/ethnicity of male recipients: 1989–1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | U.S. citizens and permanent residents, unknown race/ethnicity | | | | | | |
| Total science and engineering | 3,845 | 5,823 | 4,860 | 4,621 | 4,639 | 4,817 | 5,139 |
| Engineering | 807 | 1,369 | 1,095 | 986 | 1,020 | 1,054 | 1,103 |
| Sciences | 3,038 | 4,454 | 3,765 | 3,635 | 3,619 | 3,763 | 4,036 |
| Natural sciences | 1,357 | 1,717 | 1,417 | 1,513 | 1,390 | 1,501 | 1,734 |
| Physical science [1] | 181 | 268 | 224 | 259 | 271 | 249 | 298 |
| Mathematical science | 156 | 181 | 172 | 149 | 137 | 161 | 165 |
| Computer science | 669 | 743 | 491 | 443 | 341 | 362 | 394 |
| Biological science | 316 | 454 | 462 | 483 | 486 | 528 | 628 |
| Agricultural science | 35 | 71 | 68 | 179 | 155 | 201 | 249 |
| Social sciences | 1,681 | 2,737 | 2,348 | 2,122 | 2,229 | 2,262 | 2,302 |
| Social science | 1,314 | 2,170 | 1,917 | 1,685 | 1,780 | 1,759 | 1,794 |
| Psychology | 367 | 567 | 431 | 437 | 449 | 503 | 508 |
| Non-S&E [2] | 7,199 | 9,968 | 7,433 | 7,266 | 7,186 | 7,342 | 7,846 |
| Grand total | 11,044 | 15,791 | 12,293 | 11,887 | 11,825 | 12,159 | 12,985 |
| | Nonresident aliens [4] | | | | | | |
| Total science and engineering | 9,043 | 8,936 | 8,983 | 8,341 | 9,394 | 9,462 | 9,934 |
| Engineering | 4,599 | 4,427 | 4,112 | 3,752 | 4,041 | 3,992 | 4,244 |
| Sciences | 4,444 | 4,509 | 4,871 | 4,589 | 5,353 | 5,470 | 5,690 |
| Natural sciences | 2,902 | 2,856 | 2,995 | 2,806 | 3,271 | 3,230 | 3,291 |
| Physical science [1] | 406 | 415 | 411 | 417 | 525 | 467 | 473 |
| Mathematical science | 347 | 324 | 374 | 358 | 345 | 364 | 358 |
| Computer science | 1,517 | 1,472 | 1,463 | 1,419 | 1,601 | 1,667 | 1,668 |
| Biological science | 426 | 431 | 544 | 479 | 569 | 575 | 622 |
| Agricultural science | 206 | 214 | 203 | 133 | 231 | 157 | 170 |
| Social sciences | 1,542 | 1,653 | 1,876 | 1,783 | 2,082 | 2,240 | 2,399 |
| Social science | 1,372 | 1,493 | 1,698 | 1,608 | 1,862 | 2,033 | 2,167 |
| Psychology | 170 | 160 | 178 | 175 | 220 | 207 | 232 |
| Non-S&E [2] | 8,074 | 7,972 | 9,244 | 8,765 | 9,658 | 10,281 | 11,182 |
| Grand total | 17,117 | 16,908 | 18,227 | 17,106 | 19,052 | 19,743 | 21,116 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

[3] 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).

[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 on broad fields of study only until 1994; therefore, these trend data could not be adjusted to the exact field taxonomies used by NSF.

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1989-95.

**Appendix table 3-5. Number of earned bachelor's degrees, by field and by race/ethnicity of female recipients: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Total, all recipients | | | | | | |
| Total science and engineering | 138,703 | 145,877 | 155,286 | 167,663 | 174,047 | 178,888 | 183,731 |
| Engineering | 10,188 | 9,973 | 9,664 | 9,628 | 9,974 | 10,393 | 10,941 |
| Sciences | 128,515 | 135,904 | 145,622 | 158,035 | 164,073 | 168,495 | 172,790 |
| Natural sciences | 43,475 | 42,716 | 43,504 | 46,430 | 48,887 | 51,836 | 55,854 |
| Physical science [1] | 5,172 | 5,094 | 5,208 | 5,610 | 5,814 | 6,272 | 6,816 |
| Mathematical science | 7,050 | 6,811 | 6,980 | 6,928 | 7,011 | 6,677 | 6,441 |
| Computer science | 9,545 | 8,374 | 7,514 | 7,184 | 6,912 | 6,992 | 7,034 |
| Biological science | 18,654 | 19,409 | 20,636 | 22,728 | 24,766 | 26,899 | 29,848 |
| Agricultural science | 3,054 | 3,028 | 3,166 | 3,980 | 4,384 | 4,996 | 5,715 |
| Social sciences | 85,040 | 93,188 | 102,118 | 111,605 | 115,186 | 116,659 | 116,936 |
| Social science | 50,377 | 54,569 | 59,380 | 64,699 | 65,964 | 65,640 | 63,973 |
| Psychology | 34,663 | 38,619 | 42,738 | 46,906 | 49,222 | 51,019 | 52,963 |
| Non-S&E [2] | 403,902 | 420,407 | 443,759 | 457,014 | 467,695 | 467,192 | 459,559 |
| Grand total | 542,605 | 566,284 | 599,045 | 624,677 | 641,742 | 646,080 | 643,290 |
| | U.S. citizens and permanent residents, total [3] | | | | | | |
| Total science and engineering | 135,423 | 142,495 | 151,545 | 163,766 | 169,639 | 174,421 | 178,911 |
| Engineering | 9,715 | 9,483 | 9,194 | 9,157 | 9,510 | 9,845 | 10,375 |
| Sciences | 125,708 | 133,012 | 142,351 | 154,609 | 160,129 | 164,576 | 168,536 |
| Natural sciences | 41,955 | 41,246 | 41,943 | 44,867 | 47,072 | 50,117 | 53,995 |
| Physical science [1] | 4,973 | 4,914 | 5,011 | 5,420 | 5,575 | 6,026 | 6,566 |
| Mathematical science | 6,854 | 6,611 | 6,776 | 6,694 | 6,804 | 6,479 | 6,206 |
| Computer science | 8,927 | 7,780 | 6,940 | 6,629 | 6,309 | 6,386 | 6,407 |
| Biological science | 18,207 | 18,973 | 20,117 | 22,214 | 24,118 | 26,319 | 29,189 |
| Agricultural science | 2,994 | 2,968 | 3,099 | 3,910 | 4,266 | 4,907 | 5,627 |
| Social sciences | 83,753 | 91,766 | 100,408 | 109,742 | 113,057 | 114,459 | 114,541 |
| Social science | 49,431 | 53,512 | 58,183 | 63,325 | 64,445 | 64,088 | 62,288 |
| Psychology | 34,322 | 38,254 | 42,225 | 46,417 | 48,612 | 50,371 | 52,253 |
| Non-S&E [2] | 397,842 | 414,144 | 436,070 | 449,470 | 458,784 | 457,175 | 448,483 |
| Grand total | 533,265 | 556,639 | 587,615 | 613,236 | 628,423 | 631,596 | 627,394 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-5. Number of earned bachelor's degrees, by field and by race/ethnicity of female recipients: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | White, non-Hispanics | | | | | | |
| Total science and engineering | 108,272 | 112,550 | 119,503 | 128,394 | 131,108 | 132,371 | 133,042 |
| Engineering | 7,302 | 6,961 | 6,470 | 6,513 | 6,609 | 6,857 | 6,941 |
| Sciences | 100,970 | 105,589 | 113,033 | 121,881 | 124,499 | 125,514 | 126,101 |
| Natural sciences | 32,446 | 31,362 | 31,807 | 34,007 | 35,353 | 37,081 | 39,378 |
| Physical science [1] | 4,065 | 3,876 | 3,942 | 4,248 | 4,327 | 4,658 | 4,946 |
| Mathematical science | 5,689 | 5,512 | 5,530 | 5,468 | 5,538 | 5,169 | 4,887 |
| Computer science | 5,912 | 4,944 | 4,433 | 4,273 | 3,826 | 3,794 | 3,739 |
| Biological science | 14,027 | 14,326 | 15,090 | 16,476 | 17,787 | 19,060 | 20,838 |
| Agricultural science | 2,753 | 2,704 | 2,812 | 3,542 | 3,875 | 4,400 | 4,968 |
| Social sciences | 68,524 | 74,227 | 81,226 | 87,874 | 89,146 | 88,433 | 86,723 |
| Social science | 39,931 | 42,723 | 46,369 | 49,815 | 49,885 | 48,454 | 46,050 |
| Psychology | 28,593 | 31,504 | 34,857 | 38,059 | 39,261 | 39,979 | 40,673 |
| Non-S&E [2] | 333,502 | 343,112 | 362,115 | 370,542 | 373,255 | 365,542 | 352,588 |
| Grand total | 441,774 | 455,662 | 481,618 | 498,936 | 504,363 | 497,913 | 485,630 |
| | Asians | | | | | | |
| Total science and engineering | 7,560 | 7,909 | 8,610 | 9,437 | 10,372 | 11,453 | 13,089 |
| Engineering | 1,139 | 1,185 | 1,251 | 1,198 | 1,277 | 1,281 | 1,445 |
| Sciences | 6,421 | 6,724 | 7,359 | 8,239 | 9,095 | 10,172 | 11,644 |
| Natural sciences | 3,187 | 3,272 | 3,446 | 3,713 | 4,144 | 4,680 | 5,524 |
| Physical science [1] | 296 | 345 | 377 | 386 | 423 | 448 | 563 |
| Mathematical science | 492 | 383 | 433 | 371 | 413 | 403 | 446 |
| Computer science | 848 | 809 | 742 | 709 | 753 | 771 | 782 |
| Biological science | 1,465 | 1,672 | 1,823 | 2,172 | 2,470 | 2,967 | 3,576 |
| Agricultural science | 86 | 63 | 71 | 75 | 85 | 91 | 157 |
| Social sciences | 3,234 | 3,452 | 3,913 | 4,526 | 4,951 | 5,492 | 6,120 |
| Social science | 2,163 | 2,313 | 2,592 | 2,996 | 3,151 | 3,522 | 3,758 |
| Psychology | 1,071 | 1,139 | 1,321 | 1,530 | 1,800 | 1,970 | 2,362 |
| Non-S&E [2] | 10,810 | 11,021 | 12,342 | 13,989 | 15,396 | 16,802 | 17,858 |
| Grand total | 18,370 | 18,930 | 20,952 | 23,426 | 25,768 | 28,255 | 30,947 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-5. Number of earned bachelor's degrees, by field and by race/ethnicity of female recipients: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Underrepresented minorities, total | | | | | | |
| Total science and engineering | 16,278 | 17,465 | 19,655 | 22,493 | 24,522 | 26,821 | 28,609 |
| Engineering | 1,167 | 1,155 | 1,299 | 1,325 | 1,453 | 1,562 | 1,800 |
| Sciences | 15,111 | 16,310 | 18,356 | 21,168 | 23,069 | 25,259 | 26,809 |
| Natural sciences | 5,419 | 5,487 | 5,734 | 6,272 | 6,744 | 7,393 | 7,927 |
| Physical science [1] | 551 | 590 | 600 | 680 | 736 | 806 | 934 |
| Mathematical science | 582 | 564 | 677 | 757 | 746 | 808 | 769 |
| Computer science | 1,729 | 1,619 | 1,534 | 1,478 | 1,588 | 1,672 | 1,725 |
| Biological science | 2,417 | 2,558 | 2,752 | 3,158 | 3,472 | 3,790 | 4,157 |
| Agricultural science | 140 | 156 | 171 | 199 | 202 | 317 | 342 |
| Social sciences | 9,692 | 10,823 | 12,622 | 14,896 | 16,325 | 17,866 | 18,882 |
| Social science | 5,926 | 6,606 | 7,658 | 9,057 | 9,905 | 10,587 | 10,879 |
| Psychology | 3,766 | 4,217 | 4,964 | 5,839 | 6,420 | 7,279 | 8,003 |
| Non-S&E [2] | 44,237 | 46,865 | 51,953 | 56,260 | 60,964 | 65,714 | 68,281 |
| Grand total | 60,515 | 64,330 | 71,608 | 78,753 | 85,486 | 92,535 | 96,890 |
| | Black, non-Hispanics | | | | | | |
| Total science and engineering | 9,700 | 10,400 | 11,539 | 13,056 | 14,322 | 15,483 | 16,401 |
| Engineering | 670 | 656 | 745 | 748 | 813 | 875 | 999 |
| Sciences | 9,030 | 9,744 | 10,794 | 12,308 | 13,509 | 14,608 | 15,402 |
| Natural sciences | 3,273 | 3,306 | 3,296 | 3,692 | 4,100 | 4,413 | 4,707 |
| Physical science [1] | 332 | 358 | 362 | 435 | 466 | 457 | 539 |
| Mathematical science | 418 | 378 | 431 | 530 | 521 | 535 | 519 |
| Computer science | 1,252 | 1,173 | 1,026 | 998 | 1,164 | 1,237 | 1,257 |
| Biological science | 1,216 | 1,336 | 1,415 | 1,636 | 1,856 | 2,053 | 2,250 |
| Agricultural science | 55 | 61 | 62 | 93 | 93 | 131 | 142 |
| Social sciences | 5,757 | 6,438 | 7,498 | 8,616 | 9,409 | 10,195 | 10,695 |
| Social science | 3,659 | 4,082 | 4,689 | 5,419 | 5,890 | 6,191 | 6,356 |
| Psychology | 2,098 | 2,356 | 2,809 | 3,197 | 3,519 | 4,004 | 4,339 |
| Non-S&E [2] | 25,224 | 26,311 | 29,232 | 31,737 | 33,971 | 36,727 | 37,888 |
| Grand total | 34,924 | 36,711 | 40,771 | 44,793 | 48,293 | 52,210 | 54,289 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-5. Number of earned bachelor's degrees, by field and by race/ethnicity of female recipients: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | Hispanics | | | | | | |
| Total science and engineering | 6,009 | 6,484 | 7,463 | 8,661 | 9,282 | 10,339 | 11,159 |
| Engineering | 461 | 476 | 527 | 546 | 606 | 648 | 756 |
| Sciences | 5,548 | 6,008 | 6,936 | 8,115 | 8,676 | 9,691 | 10,403 |
| Natural sciences | 1,985 | 2,029 | 2,247 | 2,395 | 2,426 | 2,723 | 2,923 |
| Physical science [1] | 201 | 211 | 215 | 220 | 238 | 318 | 363 |
| Mathematical science | 149 | 164 | 221 | 203 | 197 | 243 | 221 |
| Computer science | 445 | 416 | 477 | 449 | 396 | 416 | 431 |
| Biological science | 1,125 | 1,164 | 1,245 | 1,434 | 1,508 | 1,603 | 1,750 |
| Agricultural science | 65 | 74 | 89 | 89 | 87 | 143 | 158 |
| Social sciences | 3,563 | 3,979 | 4,689 | 5,720 | 6,250 | 6,968 | 7,480 |
| Social science | 2,044 | 2,261 | 2,700 | 3,299 | 3,591 | 3,974 | 4,103 |
| Psychology | 1,519 | 1,718 | 1,989 | 2,421 | 2,659 | 2,994 | 3,377 |
| Non-S&E [2] | 17,350 | 18,697 | 20,783 | 22,320 | 24,738 | 26,484 | 27,657 |
| Grand total | 23,359 | 25,181 | 28,246 | 30,981 | 34,020 | 36,823 | 38,816 |
| | American Indians and Alaskan Natives | | | | | | |
| Total science and engineering | 569 | 581 | 653 | 776 | 918 | 999 | 1,049 |
| Engineering | 36 | 23 | 27 | 31 | 34 | 39 | 45 |
| Sciences | 533 | 558 | 626 | 745 | 884 | 960 | 1,004 |
| Natural sciences | 161 | 152 | 191 | 185 | 218 | 257 | 297 |
| Physical science [1] | 18 | 21 | 23 | 25 | 32 | 31 | 32 |
| Mathematical science | 15 | 22 | 25 | 24 | 28 | 30 | 29 |
| Computer science | 32 | 30 | 31 | 31 | 28 | 19 | 37 |
| Biological science | 76 | 58 | 92 | 88 | 108 | 134 | 157 |
| Agricultural science | 20 | 21 | 20 | 17 | 22 | 43 | 42 |
| Social sciences | 372 | 406 | 435 | 560 | 666 | 703 | 707 |
| Social science | 223 | 263 | 269 | 339 | 424 | 422 | 420 |
| Psychology | 149 | 143 | 166 | 221 | 242 | 281 | 287 |
| Non-S&E [2] | 1,663 | 1,857 | 1,938 | 2,203 | 2,255 | 2,503 | 2,736 |
| Grand total | 2,232 | 2,438 | 2,591 | 2,979 | 3,173 | 3,502 | 3,785 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-5. Number of earned bachelor's degrees, by field and by race/ethnicity of female recipients: 1989-1995**



| Field | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|
| | U.S. citizens and permanent residents, unknown race/ethnicity | | | | | | |
| Total science and engineering | 3,313 | 4,571 | 3,777 | 3,442 | 3,637 | 3,776 | 4,171 |
| Engineering | 107 | 182 | 174 | 121 | 171 | 145 | 189 |
| Sciences | 3,206 | 4,389 | 3,603 | 3,321 | 3,466 | 3,631 | 3,982 |
| Natural sciences | 903 | 1,125 | 956 | 875 | 831 | 963 | 1,166 |
| Physical science [1] | 61 | 103 | 92 | 106 | 89 | 114 | 123 |
| Mathematical science | 91 | 152 | 136 | 98 | 107 | 99 | 104 |
| Computer science | 438 | 408 | 231 | 169 | 142 | 149 | 161 |
| Biological science | 298 | 417 | 452 | 408 | 389 | 502 | 618 |
| Agricultural science | 15 | 45 | 45 | 94 | 104 | 99 | 160 |
| Social sciences | 2,303 | 3,264 | 2,647 | 2,446 | 2,635 | 2,668 | 2,816 |
| Social science | 1,411 | 1,870 | 1,564 | 1,457 | 1,504 | 1,525 | 1,601 |
| Psychology | 892 | 1,394 | 1,083 | 989 | 1,131 | 1,143 | 1,215 |
| Non-S&E [2] | 9,293 | 13,146 | 9,660 | 8,679 | 9,169 | 9,117 | 9,756 |
| Grand total | 12,606 | 17,717 | 13,437 | 12,121 | 12,806 | 12,893 | 13,927 |
| | Nonresident aliens [4] | | | | | | |
| Total science and engineering | 3,280 | 3,382 | 3,741 | 3,897 | 4,408 | 4,467 | 4,820 |
| Engineering | 473 | 490 | 470 | 471 | 464 | 548 | 566 |
| Sciences | 2,807 | 2,892 | 3,271 | 3,426 | 3,944 | 3,919 | 4,254 |
| Natural sciences | 1,520 | 1,470 | 1,561 | 1,563 | 1,815 | 1,719 | 1,859 |
| Physical science [1] | 199 | 180 | 197 | 190 | 239 | 246 | 250 |
| Mathematical science | 196 | 200 | 204 | 234 | 207 | 198 | 235 |
| Computer science | 618 | 594 | 574 | 555 | 603 | 606 | 627 |
| Biological science | 447 | 436 | 519 | 514 | 648 | 580 | 659 |
| Agricultural science | 60 | 60 | 67 | 70 | 118 | 89 | 88 |
| Social sciences | 1,287 | 1,422 | 1,710 | 1,863 | 2,129 | 2,200 | 2,395 |
| Social science | 946 | 1,057 | 1,197 | 1,374 | 1,519 | 1,552 | 1,685 |
| Psychology | 341 | 365 | 513 | 489 | 610 | 648 | 710 |
| Non-S&E [2] | 6,060 | 6,263 | 7,689 | 7,544 | 8,911 | 10,017 | 11,076 |
| Grand total | 9,340 | 9,645 | 11,430 | 11,441 | 13,319 | 14,484 | 15,896 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

[3] 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).

[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 on broad fields of study only until 1994; therefore, these trend data could not be adjusted to the exact field taxonomies used by NSF.

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1989-95.

**Appendix table 3-6. Percentage distribution of persons 18-24 years of age in total population, total undergraduate enrollment, and the index of representation, by race/ethnicity and sex: 1980, 1990-1994[1]**



| Race/ethnicity and sex | 1980 | | | 1990 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation |
| White males | 38.90 | 39.00 | 100.30 | 35.72 | 35.35 | 98.96 | 35.49 | 34.57 | 97.41 |
| Asian males | 0.78 | 1.25 | 159.40 | 1.67 | 2.12 | 127.20 | 1.74 | 2.30 | 132.10 |
| Black males | 6.19 | 4.13 | 66.65 | 6.65 | 3.74 | 56.21 | 6.72 | 3.87 | 57.66 |
| Hispanic males | 3.93 | 2.51 | 63.80 | 6.54 | 3.15 | 48.19 | 6.62 | 3.38 | 51.10 |
| American Indian males | 0.34 | 0.33 | 98.79 | 0.41 | 0.34 | 81.42 | 0.42 | 0.36 | 84.21 |
| White females | 38.41 | 42.62 | 110.94 | 34.69 | 42.99 | 123.93 | 34.41 | 42.36 | 123.07 |
| Asian females | 0.77 | 1.17 | 152.11 | 1.57 | 2.04 | 129.95 | 1.66 | 2.27 | 136.70 |
| Black females | 6.67 | 5.70 | 85.44 | 6.90 | 5.82 | 84.35 | 6.94 | 6.09 | 87.69 |
| Hispanic females | 3.65 | 2.84 | 77.59 | 5.46 | 3.98 | 72.96 | 5.58 | 4.30 | 76.97 |
| American Indian females | 0.33 | 0.42 | 126.31 | 0.40 | 0.47 | 119.09 | 0.40 | 0.50 | 124.16 |

| Race/ethnicity and sex | 1992 | | | 1993 | | | 1994 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation | Percent of 18-24 years population | Percent of undergraduate enrollment | Index of representation |
| White males | 35.21 | 33.74 | 95.83 | 35.03 | 33.30 | 95.07 | 34.80 | 32.59 | 93.64 |
| Asian males | 1.84 | 2.48 | 134.67 | 1.92 | 2.61 | 135.60 | 1.98 | 2.76 | 139.36 |
| Black males | 6.79 | 3.99 | 58.77 | 6.83 | 4.10 | 59.96 | 6.91 | 4.14 | 59.99 |
| Hispanic males | 6.68 | 3.65 | 54.59 | 6.70 | 3.82 | 57.05 | 6.75 | 4.04 | 59.90 |
| American Indian males | 0.44 | 0.37 | 85.98 | 0.44 | 0.39 | 87.79 | 0.45 | 0.40 | 90.03 |
| White females | 34.12 | 41.76 | 122.37 | 33.90 | 41.21 | 121.58 | 33.62 | 40.73 | 121.14 |
| Asian females | 1.78 | 2.51 | 141.15 | 1.87 | 2.66 | 142.33 | 1.95 | 2.86 | 146.54 |
| Black females | 7.00 | 6.33 | 90.31 | 7.03 | 6.49 | 92.26 | 7.11 | 6.72 | 94.52 |
| Hispanic females | 5.72 | 4.66 | 81.39 | 5.85 | 4.89 | 83.57 | 6.00 | 5.19 | 86.43 |
| American Indian females | 0.42 | 0.52 | 124.22 | 0.42 | 0.54 | 126.20 | 0.43 | 0.57 | 131.52 |

[1]The numbers of cases for the percent distributions are presented in appendix table 3-7. Nonresident aliens were not included in these calculations. The numbers displayed may not be exact due to rounding error.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

**Appendix table 3-7. Number of persons 18-24 years of age in total population and total undergraduate enrollment, by race/ethnicity and sex: 1980, 1990-1994[1]**



| Race/ethnicity and sex | 1980 | | 1990 | | 1991 | |
|---|---|---|---|---|---|---|
| | 18-24 years population | Undergraduate enrollment | 18-24 years population | Undergraduate enrollment | 18-24 years population | Undergraduate enrollment |
| Total | 30,103,000 | 10,392,825 | 26,831,000 | 11,784,320 | 26,384,000 | 12,360,130 |
| White males | 11,715,000 | 4,057,626 | 9,585,000 | 4,165,862 | 9,364,000 | 4,273,310 |
| Asian males | 236,000 | 129,876 | 448,000 | 250,287 | 460,000 | 284,673 |
| Black males | 1,864,000 | 428,913 | 1,783,000 | 440,209 | 1,772,000 | 478,648 |
| Hispanic males | 1,184,000 | 260,800 | 1,754,000 | 371,232 | 1,747,000 | 418,243 |
| American Indian males | 102,000 | 34,790 | 111,000 | 39,692 | 112,000 | 44,186 |
| White females | 11,564,000 | 4,429,148 | 9,308,000 | 5,066,228 | 9,080,000 | 5,235,217 |
| Asian females | 232,000 | 121,837 | 422,000 | 240,847 | 438,000 | 280,493 |
| Black females | 2,007,000 | 592,008 | 1,850,000 | 685,382 | 1,832,000 | 752,604 |
| Hispanic females | 1,100,000 | 294,657 | 1,464,000 | 469,138 | 1,473,000 | 531,103 |
| American Indian females | 99,000 | 43,170 | 106,000 | 55,443 | 106,000 | 61,653 |

| Race/ethnicity and sex | 1992 | | 1993 | | 1994 | |
|---|---|---|---|---|---|---|
| | 18-24 years population | Undergraduate enrollment | 18-24 years population | Undergraduate enrollment | 18-24 years population | Undergraduate enrollment |
| Total | 25,942,000 | 12,435,117 | 25,653,000 | 12,213,674 | 25,260,000 | 12,146,792 |
| White males | 9,134,000 | 4,195,726 | 8,986,000 | 4,067,289 | 8,791,000 | 3,958,270 |
| Asian males | 478,000 | 308,564 | 493,000 | 318,289 | 501,000 | 335,737 |
| Black males | 1,761,000 | 496,123 | 1,752,000 | 500,194 | 1,745,000 | 503,381 |
| Hispanic males | 1,733,000 | 453,488 | 1,720,000 | 467,155 | 1,704,000 | 490,827 |
| American Indian males | 113,000 | 46,572 | 113,000 | 47,233 | 113,000 | 48,920 |
| White females | 8,852,000 | 5,192,500 | 8,696,000 | 5,033,796 | 8,493,000 | 4,947,344 |
| Asian females | 461,000 | 311,899 | 479,000 | 324,604 | 493,000 | 347,394 |
| Black females | 1,817,000 | 786,609 | 1,804,000 | 792,427 | 1,795,000 | 815,881 |
| Hispanic females | 1,485,000 | 579,329 | 1,501,000 | 597,193 | 1,516,000 | 630,102 |
| American Indian females | 108,000 | 64,307 | 109,000 | 65,494 | 109,000 | 68,936 |

[1]Distributions of U.S. Bureau of the Census' estimate of the 18-24 years of age population of the United States are presented in appendix table 3-8.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

**Appendix table 3-8. U.S. population estimates of persons 18-24, by race/ethnicity, sex, and age: 1980, 1990-1994**
[Numbers in thousands]



| | 1980 | | | 1990 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|
| Race/ethnicity and sex | Total | 18-19 | 20-24 | Total | 18-19 | 20-24 | Total | 18-19 | 20-24 |
| Total | 30,103 | 8,718 | 21,385 | 26,831 | 7,699 | 19,132 | 26,384 | 6,950 | 19,434 |
| White males | 11,715 | 3,379 | 8,336 | 9,585 | 2,741 | 6,844 | 9,364 | 2,533 | 6,831 |
| Asian males | 236 | 66 | 170 | 448 | 128 | 320 | 460 | 123 | 337 |
| Black males | 1,864 | 578 | 1,286 | 1,783 | 554 | 1,229 | 1,772 | 532 | 1,240 |
| Hispanic males | 1,184 | 344 | 840 | 1,754 | 479 | 1,275 | 1,747 | 459 | 1,288 |
| American Indian males | 102 | 32 | 70 | 111 | 34 | 77 | 112 | 33 | 79 |
| White females | 11,564 | 3,311 | 8,253 | 9,308 | 2,645 | 6,663 | 9,080 | 2,428 | 6,652 |
| Asian females | 232 | 61 | 171 | 422 | 121 | 301 | 438 | 118 | 320 |
| Black females | 2,007 | 598 | 1,409 | 1,850 | 555 | 1,295 | 1,832 | 530 | 1,302 |
| Hispanic females | 1,100 | 319 | 781 | 1,464 | 410 | 1,054 | 1,473 | 163 | 1,310 |
| American Indian females | 99 | 30 | 69 | 106 | 32 | 74 | 106 | 31 | 75 |

| | 1992 | | | 1993 | | | 1994 | | |
|---|---|---|---|---|---|---|---|---|---|
| Race/ethnicity and sex | Total | 18-19 | 20-24 | Total | 18-19 | 20-24 | Total | 18-19 | 20-24 |
| Total | 25,942 | 6,868 | 19,074 | 25,653 | 6,868 | 18,785 | 25,260 | 6,907 | 18,353 |
| White males | 9,134 | 2,395 | 6,739 | 8,986 | 2,402 | 6,584 | 8,791 | 2,410 | 6,381 |
| Asian males | 478 | 123 | 355 | 493 | 128 | 365 | 501 | 131 | 370 |
| Black males | 1,761 | 508 | 1,253 | 1,752 | 502 | 1,250 | 1,745 | 503 | 1,242 |
| Hispanic males | 1,733 | 445 | 1,288 | 1,720 | 439 | 1,281 | 1,704 | 447 | 1,257 |
| American Indian males | 113 | 31 | 82 | 113 | 31 | 82 | 113 | 31 | 82 |
| White females | 8,852 | 2,301 | 6,551 | 8,696 | 2,299 | 6,397 | 8,493 | 2,302 | 6,191 |
| Asian females | 461 | 119 | 342 | 479 | 122 | 357 | 493 | 126 | 367 |
| Black females | 1,817 | 509 | 1,308 | 1,804 | 502 | 1,302 | 1,795 | 503 | 1,292 |
| Hispanic females | 1,485 | 406 | 1,079 | 1,501 | 412 | 1,089 | 1,516 | 423 | 1,093 |
| American Indian females | 108 | 31 | 77 | 109 | 31 | 78 | 109 | 31 | 78 |

SOURCES: U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 601, Projections of the Population of the United States: 2050, U.S. Government Printing Office, Washington, D.C., 1975. U.S. Bureau of the Census, Current Population Reports, P25-1095, U.S. Population Estimates, by 1975 to Age, Sex, Race, and Hispanic Origin: 1980 to 1991. U.S. Government Printing Office, Washington, D.C., 1993. U.S. Bureau of the Census, Current Population Reports, P25-1092, Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1992 to 2050, U.S. Government Printing Office, Washington, D.C., 1992.

**Appendix table 3-9. Total undergraduate enrollment at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Total undergraduate enrollment: | | | | | | | |
| Total, all races and ethnicities | 9,536,927 | 10,603,579 | 12,011,657 | 12,595,335 | 12,693,778 | 12,482,813 | 12,417,701 |
| Non-resident aliens | 144,535 | 210,753 | 227,337 | 235,205 | 258,661 | 269,139 | 270,909 |
| White, non-Hispanic | 7,759,913 | 8,486,774 | 9,232,090 | 9,508,527 | 9,388,226 | 9,101,085 | 8,905,614 |
| Asian or Pacific Islander | 172,633 | 251,713 | 491,134 | 565,166 | 620,463 | 642,893 | 683,131 |
| Underrepresented minorities | 1,459,846 | 1,654,339 | 2,061,096 | 2,286,437 | 2,426,428 | 2,469,696 | 2,558,047 |
| Black, non-Hispanic | 946,476 | 1,020,921 | 1,125,591 | 1,231,252 | 1,282,732 | 1,292,621 | 1,319,262 |
| American Indian or Alaskan Native | 69,955 | 77,961 | 95,135 | 105,839 | 110,879 | 112,727 | 117,856 |
| Hispanic | 443,415 | 555,457 | 840,370 | 949,346 | 1,032,817 | 1,064,348 | 1,120,929 |
| Men, all races and ethnicities | 4,951,997 | 5,052,234 | 5,396,557 | 5,632,690 | 5,644,113 | 5,547,126 | 5,484,342 |
| Non-resident aliens | 97,198 | 140,229 | 129,275 | 133,630 | 143,640 | 146,966 | 147,207 |
| White, non-Hispanic | 4,063,605 | 4,057,626 | 4,165,862 | 4,273,310 | 4,195,726 | 4,067,289 | 3,958,270 |
| Asian or Pacific Islander | 92,787 | 129,876 | 250,287 | 284,673 | 308,564 | 318,289 | 335,737 |
| Underrepresented minorities | 698,407 | 724,503 | 851,133 | 941,077 | 996,183 | 1,014,582 | 1,043,128 |
| Black, non-Hispanic | 432,042 | 428,913 | 440,209 | 478,648 | 496,123 | 500,194 | 503,381 |
| American Indian or Alaskan Native | 34,894 | 34,790 | 39,692 | 44,186 | 46,572 | 47,233 | 48,920 |
| Hispanic | 231,472 | 260,800 | 371,232 | 418,243 | 453,488 | 467,155 | 490,827 |
| Women, all races and ethnicities | 4,584,930 | 5,551,345 | 6,615,100 | 6,962,645 | 7,049,665 | 6,935,687 | 6,933,359 |
| Non-resident aliens | 47,338 | 70,525 | 98,062 | 101,575 | 115,021 | 122,173 | 123,702 |
| White, non-Hispanic | 3,696,308 | 4,429,148 | 5,066,228 | 5,235,217 | 5,192,500 | 5,033,796 | 4,947,344 |
| Asian or Pacific Islander | 79,846 | 121,837 | 240,847 | 280,493 | 311,899 | 324,604 | 347,394 |
| Underrepresented minorities | 761,439 | 929,835 | 1,209,963 | 1,345,360 | 1,430,245 | 1,455,114 | 1,514,919 |
| Black, non-Hispanic | 514,434 | 592,008 | 685,382 | 752,604 | 786,609 | 792,427 | 815,881 |
| American Indian or Alaskan Native | 35,062 | 43,170 | 55,443 | 61,653 | 64,307 | 65,494 | 68,936 |
| Hispanic | 211,943 | 294,657 | 469,138 | 531,103 | 579,329 | 597,193 | 630,102 |
| Percentage distibution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.5% | 2.0% | 1.9% | 1.9% | 2.0% | 2.2% | 2.2% |
| White, non-Hispanic | 81.4% | 80.0% | 76.9% | 75.5% | 74.0% | 72.9% | 71.7% |
| Asian or Pacific Islander | 1.8% | 2.4% | 4.1% | 4.5% | 4.9% | 5.2% | 5.5% |
| Underrepresented minorities | 15.3% | 15.6% | 17.2% | 18.2% | 19.1% | 19.8% | 20.6% |
| Black, non-Hispanic | 9.9% | 9.6% | 9.4% | 9.8% | 10.1% | 10.4% | 10.6% |
| American Indian or Alaskan Native | 0.7% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% | 0.9% |
| Hispanic | 4.6% | 5.2% | 7.0% | 7.5% | 8.1% | 8.5% | 9.0% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 2.0% | 2.8% | 2.4% | 2.4% | 2.5% | 2.6% | 2.7% |
| White, non-Hispanic | 82.1% | 80.3% | 77.2% | 75.9% | 74.3% | 73.3% | 72.2% |
| Asian or Pacific Islander | 1.9% | 2.6% | 4.6% | 5.1% | 5.5% | 5.7% | 6.1% |
| Underrepresented minorities | 14.1% | 14.3% | 15.8% | 16.7% | 17.6% | 18.3% | 19.0% |
| Black, non-Hispanic | 8.7% | 8.5% | 8.2% | 8.5% | 8.8% | 9.0% | 9.2% |
| American Indian or Alaskan Native | 0.7% | 0.7% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% |
| Hispanic | 4.7% | 5.2% | 6.9% | 7.4% | 8.0% | 8.4% | 8.9% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-9. Total undergraduate enrollment at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.0% | 1.3% | 1.5% | 1.5% | 1.6% | 1.8% | 1.8% |
| White, non-Hispanic | 80.6% | 79.8% | 76.6% | 75.2% | 73.7% | 72.6% | 71.4% |
| Asian or Pacific Islander | 1.7% | 2.2% | 3.6% | 4.0% | 4.4% | 4.7% | 5.0% |
| Underrepresented minorities | 16.6% | 16.7% | 18.3% | 19.3% | 20.3% | 21.0% | 21.8% |
| Black, non-Hispanic | 11.2% | 10.7% | 10.4% | 10.8% | 11.2% | 11.4% | 11.8% |
| American Indian or Alaskan Native | 0.8% | 0.8% | 0.8% | 0.9% | 0.9% | 0.9% | 1.0% |
| Hispanic | 4.6% | 5.3% | 7.1% | 7.6% | 8.2% | 8.6% | 9.1% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum 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: 1998*

**Appendix table 3-10. Proportion of 4-year college dominant students participating in key core science and mathematics courses, by race/ethnicity and sex: 1982-1993 cohort**



| | White | Black | Hispanic | Asian | Women | Men |
|---|---|---|---|---|---|---|
| General pre-college mathematics | 6.3% | 17.6% | 8.0% | - | 7.9% | 6.7% |
| Pre-college algebra | 11.8 | 18.7 | 21.4 | - | 13.4 | 12.0 |
| Pre-college algebra | 26.1 | 26.1 | 21.5 | 16.5 | 24.9 | 26.7 |
| Pre-calculus | 21.7 | 22.1 | 15.5 | 48.7 | 17.9 | 26.5 |
| Finite/discrete mathematics | 9.7 | 6.2 | 4.8 | 13.9 | 8.5 | 10.1 |
| Statistics | 26.9 | 20.5 | 20.9 | 28.5 | 24.7 | 27.4 |
| Calculus | 32.2 | 18.5 | 26.3 | 63.3 | 23 | 40.3 |
| Introductory computer science | 20.8 | 13 | 12.5 | 14.2 | 17.3 | 21.9 |
| Computer programming | 21.9 | 18.2 | 21.6 | 33.7 | 16.7 | 27.1 |
| Computer organization and architecture | 4.4 | 5.2 | 7.2 | 5.8 | 3 | 6.3 |
| Data processing | 7.1 | 7.1 | 8.1 | 0 | 6.8 | 7.3 |
| Systems organization and analysis | 6 | 5.3 | 5.7 | 10.5 | 4.3 | 7.7 |
| General biology | 32.3 | 41.4 | 29 | 35.7 | 38.6 | 27.1 |
| Microbiology | 7 | 6.2 | 5.3 | 9.7 | 9.9 | 3.7 |
| Ecology | 6.6 | 3.7 | 8.2 | 9 | 7 | 5.8 |
| Genetics | 6.1 | 4.2 | - | 12.9 | 5.8 | 6.2 |
| Anatomy and physiology | 10.1 | 8.9 | 15.1 | 8.5 | 14.4 | 5.6 |
| Physiology | 7.6 | 8.3 | 5.5 | 14.3 | 10.1 | 5.1 |
| Biochemistry | 4.8 | 3.8 | 4.5 | 15.9 | 5.5 | 4.4 |
| General physical science | 6.8 | 17.1 | 5.9 | - | 8.1 | 7.3 |
| Astronomy | 13.4 | 6.6 | 13.3 | 10.8 | 10 | 15.5 |
| General geology | 1.4 | 6.1 | 6.9 | - | 8.9 | 12.4 |
| General chemistry | 34.3 | 22.2 | 30.5 | 59.5 | 29.9 | 37.5 |
| Organic chemistry | 9.5 | 7.3 | 5.6 | 24.8 | 9.6 | 9.6 |
| Introductory physics | 22.7 | 15.7 | 16.1 | 48.5 | 15.1 | 30.3 |

NOTE: Universe: Students who earned 30 or more credits from 4-year colleges and 10 or fewer credits from 2-year colleges. Weighted N=969,228. - = Too few observations in the sample to produce a reliable estimate.

SOURCE: National Center for Education Statistics High School and Beyond/Sophomore Cohort, 1982-1993 Cohort.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-11. Proportion of community college dominant students participating in key core science, mathematics, and technology courses, by gender: 1982-1993 cohort**



| | Women | Men |
|---|---|---|
| General pre-college mathematics | 13.6% | 9.6% |
| Arithmetic, pre-algebra | 6.4 | 6.8 |
| Pre-college algebra | 26.4 | 30.7 |
| College algebra | 13.5 | 20.1 |
| Pre-calculus | 4.6 | 8.3 |
| Technical mathematics | 6 | 19.4 |
| Business mathematics: pre-college | 18.1 | 12.4 |
| Introductory computer science | 10.4 | 18.1 |
| Computer programming | 13.8 | 16.9 |
| Data processing | 20.1 | 12.5 |
| Electronics technology | - | 17.7 |
| Computer technology | - | 10.9 |
| General biology | 15.8 | 13.9 |
| Microbiology | 11.1 | - |
| Anatomy and physiology | 20.3 | 2.6 |
| Human development | 6.9 | - |
| Astronomy | 4.6 | 5 |
| General chemistry | 10.8 | 11.2 |
| Introductory physics | - | 10.2 |

NOTE: Universe: Students who earned 30 or more credits from 4-year colleges and 10 or fewer credits from 2-year colleges. - = Too few observations in the sample to produce a reliable estimate.

SOURCE: National Center for Education Statistics, High School and Beyond/Sophomore Cohort, 1982-1993 Cohort

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-12. Total enrollment at 2-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Total enrollment | | | | | | | |
| Total, all races and ethnicities | 3,719,873 | 4,381,779 | 5,126,629 | 5,572,644 | 5,641,541 | 5,479,815 | 5,422,242 |
| Non-resident aliens | 40,440 | 62,363 | 74,831 | 73,665 | 90,557 | 91,595 | 92,092 |
| White, non-Hispanic | 2,945,192 | 3,439,968 | 3,862,573 | 4,125,453 | 4,057,223 | 3,879,659 | 3,760,725 |
| Asian or Pacific Islander | 78,038 | 123,876 | 215,506 | 258,244 | 292,505 | 298,636 | 316,094 |
| Underrepresented minorities | 656,202 | 755,572 | 973,719 | 1,115,282 | 1,201,256 | 1,209,925 | 1,253,331 |
| Black, non-Hispanic | 407,375 | 452,325 | 501,766 | 566,040 | 589,641 | 585,835 | 600,743 |
| American Indian or Alaskan Native | 38,606 | 44,759 | 51,677 | 59,230 | 60,339 | 60,476 | 62,188 |
| Hispanic | 210,221 | 258,488 | 420,276 | 490,012 | 551,276 | 563,614 | 590,400 |
| Men, all races and ethnicities | 1,897,687 | 1,985,211 | 2,187,395 | 2,371,462 | 2,380,155 | 2,312,351 | 2,279,995 |
| Non-resident aliens | 24,788 | 38,529 | 37,058 | 38,135 | 45,657 | 45,191 | 45,319 |
| White, non-Hispanic | 1,507,456 | 1,549,876 | 1,642,810 | 1,750,720 | 1,705,468 | 1,631,398 | 1,577,034 |
| Asian or Pacific Islander | 42,006 | 62,939 | 108,274 | 128,816 | 143,283 | 145,879 | 153,680 |
| Underrepresented minorities | 323,437 | 333,867 | 399,253 | 453,791 | 485,747 | 489,883 | 503,962 |
| Black, non-Hispanic | 190,816 | 190,199 | 191,072 | 213,086 | 218,216 | 217,273 | 220,630 |
| American Indian or Alaskan Native | 19,177 | 19,652 | 21,236 | 24,410 | 24,768 | 24,850 | 25,144 |
| Hispanic | 113,443 | 124,016 | 186,945 | 216,295 | 242,763 | 247,760 | 258,188 |
| Women, all races and ethnicities | 1,822,186 | 2,396,568 | 2,939,234 | 3,201,182 | 3,261,386 | 3,167,464 | 3,142,247 |
| Non-resident aliens | 15,652 | 23,834 | 37,773 | 35,530 | 44,900 | 46,404 | 46,773 |
| White, non-Hispanic | 1,437,736 | 1,890,093 | 2,219,763 | 2,374,733 | 2,351,755 | 2,248,261 | 2,183,691 |
| Asian or Pacific Islander | 36,032 | 60,937 | 107,232 | 129,428 | 149,222 | 152,757 | 162,414 |
| Underrepresented minorities | 332,766 | 421,704 | 574,466 | 661,491 | 715,509 | 720,042 | 749,369 |
| Black, non-Hispanic | 216,559 | 262,126 | 310,694 | 352,954 | 371,425 | 368,562 | 380,113 |
| American Indian or Alaskan Native | 19,429 | 25,106 | 30,441 | 34,820 | 35,571 | 35,626 | 37,044 |
| Hispanic | 96,778 | 134,472 | 233,331 | 273,717 | 308,513 | 315,854 | 332,212 |
| Percentage distribution | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.1% | 1.4% | 1.5% | 1.3% | 1.6% | 1.7% | 1.7% |
| White, non-Hispanic | 79.2% | 78.5% | 75.3% | 74.0% | 71.9% | 70.8% | 69.4% |
| Asian or Pacific Islander | 2.1% | 2.8% | 4.2% | 4.6% | 5.2% | 5.4% | 5.8% |
| Underrepresented minorities | 17.6% | 17.2% | 19.0% | 20.0% | 21.3% | 22.1% | 23.1% |
| Black, non-Hispanic | 11.0% | 10.3% | 9.8% | 10.2% | 10.5% | 10.7% | 11.1% |
| American Indian or Alaskan Native | 1.0% | 1.0% | 1.0% | 1.1% | 1.1% | 1.1% | 1.1% |
| Hispanic | 5.7% | 5.9% | 8.2% | 8.8% | 9.8% | 10.3% | 10.9% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.3% | 1.9% | 1.7% | 1.6% | 1.9% | 2.0% | 2.0% |
| White, non-Hispanic | 79.4% | 78.1% | 75.1% | 73.8% | 71.7% | 70.6% | 69.2% |
| Asian or Pacific Islander | 2.2% | 3.2% | 4.9% | 5.4% | 6.0% | 6.3% | 6.7% |
| Underrepresented minorities | 17.0% | 16.8% | 18.3% | 19.1% | 20.4% | 21.2% | 22.1% |
| Black, non-Hispanic | 10.1% | 9.6% | 8.7% | 9.0% | 9.2% | 9.4% | 9.7% |
| American Indian or Alaskan Native | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.1% | 1.1% |
| Hispanic | 6.0% | 6.2% | 8.5% | 9.1% | 10.2% | 10.7% | 11.3% |

See expanatory information and SOURCES at end of table.

**Appendix table 3-12. Total enrollment at 2-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 0.9% | 1.0% | 1.3% | 1.1% | 1.4% | 1.5% | 1.5% |
| White, non-Hispanic | 78.9% | 78.9% | 75.5% | 74.2% | 72.1% | 71.0% | 69.5% |
| Asian or Pacific Islander | 2.0% | 2.5% | 3.6% | 4.0% | 4.6% | 4.8% | 5.2% |
| Underrepresented minorities | 18.3% | 17.6% | 19.5% | 20.7% | 21.9% | 22.7% | 23.8% |
| Black, non-Hispanic | 11.9% | 10.9% | 10.6% | 11.0% | 11.4% | 11.6% | 12.1% |
| American Indian or Alaskan Native | 1.1% | 1.0% | 1.0% | 1.1% | 1.1% | 1.1% | 1.2% |
| Hispanic | 5.3% | 5.6% | 7.9% | 8.6% | 9.5% | 10.0% | 10.6% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum 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: 1998*

**Appendix table 3-13. Full-time enrollment at 2-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Full-time enrollment: | | | | | | | |
| Total, all races and ethnicities | 1,578,879 | 1,673,285 | 1,854,914 | 2,051,499 | 2,052,345 | 2,018,843 | 2,003,156 |
| Non-resident aliens | 23,455 | 38,130 | 39,170 | 39,622 | 45,552 | 48,065 | 49,780 |
| White, non-Hispanic | 1,203,160 | 1,256,837 | 1,365,469 | 1,479,114 | 1,449,485 | 1,399,190 | 1,355,666 |
| Asian or Pacific Islander | 32,907 | 45,678 | 75,777 | 92,123 | 102,247 | 108,109 | 116,879 |
| Underrepresented minorities | 319,358 | 332,640 | 374,498 | 440,640 | 455,061 | 463,479 | 480,831 |
| Black, non-Hispanic | 208,009 | 213,043 | 201,362 | 233,333 | 232,604 | 233,932 | 239,240 |
| American Indian or Alaskan Native | 17,330 | 17,040 | 19,987 | 24,165 | 24,987 | 25,337 | 26,239 |
| Hispanic | 94,018 | 102,557 | 153,149 | 183,142 | 197,470 | 204,210 | 215,352 |
| Men, all races and ethnicities | 860,049 | 842,831 | 869,326 | 952,894 | 939,615 | 919,688 | 901,363 |
| Non-resident aliens | 15,919 | 26,360 | 20,476 | 21,372 | 23,747 | 24,417 | 25,524 |
| White, non-Hispanic | 665,656 | 641,136 | 650,420 | 699,036 | 674,998 | 649,203 | 622,180 |
| Asian or Pacific Islander | 19,029 | 25,092 | 40,625 | 48,455 | 52,714 | 55,237 | 59,568 |
| Underrepresented minorities | 159,446 | 150,243 | 157,805 | 184,031 | 188,156 | 190,831 | 194,091 |
| Black, non-Hispanic | 98,356 | 92,731 | 81,692 | 93,523 | 90,536 | 90,959 | 90,322 |
| American Indian or Alaskan Native | 8,984 | 7,994 | 8,800 | 10,475 | 10,725 | 10,964 | 11,020 |
| Hispanic | 52,106 | 49,519 | 67,313 | 80,033 | 86,895 | 88,908 | 92,749 |
| Women, all races and ethnicities | 718,830 | 830,454 | 985,588 | 1,098,605 | 1,112,730 | 1,099,155 | 1,101,793 |
| Non-resident aliens | 7,536 | 11,770 | 18,694 | 18,250 | 21,805 | 23,648 | 24,256 |
| White, non-Hispanic | 537,504 | 615,701 | 715,049 | 780,078 | 774,487 | 749,987 | 733,486 |
| Asian or Pacific Islander | 13,878 | 20,586 | 35,152 | 43,668 | 49,533 | 52,872 | 57,311 |
| Underrepresented minorities | 159,912 | 182,397 | 216,693 | 256,609 | 266,905 | 272,648 | 286,740 |
| Black, non-Hispanic | 109,653 | 120,313 | 119,670 | 139,810 | 142,068 | 142,973 | 148,918 |
| American Indian or Alaskan Native | 8,346 | 9,046 | 11,187 | 13,690 | 14,262 | 14,373 | 15,219 |
| Hispanic | 41,912 | 53,038 | 85,836 | 103,109 | 110,575 | 115,302 | 122,603 |
| Percentage distribution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.5% | 2.3% | 2.1% | 1.9% | 2.2% | 2.4% | 2.5% |
| White, non-Hispanic | 76.2% | 75.1% | 73.6% | 72.1% | 70.6% | 69.3% | 67.7% |
| Asian or Pacific Islander | 2.1% | 2.7% | 4.1% | 4.5% | 5.0% | 5.4% | 5.8% |
| Underrepresented minorities | 20.2% | 19.9% | 20.2% | 21.5% | 22.2% | 23.0% | 24.0% |
| Black, non-Hispanic | 13.2% | 12.7% | 10.9% | 11.4% | 11.3% | 11.6% | 11.9% |
| American Indian or Alaskan Native | 1.1% | 1.0% | 1.1% | 1.2% | 1.2% | 1.3% | 1.3% |
| Hispanic | 6.0% | 6.1% | 8.3% | 8.9% | 9.6% | 10.1% | 10.8% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.9% | 3.1% | 2.4% | 2.2% | 2.5% | 2.7% | 2.8% |
| White, non-Hispanic | 77.4% | 76.1% | 74.8% | 73.4% | 71.8% | 70.6% | 69.0% |
| Asian or Pacific Islander | 2.2% | 3.0% | 4.7% | 5.1% | 5.6% | 6.0% | 6.6% |
| Underrepresented minorities | 18.5% | 17.8% | 18.2% | 19.3% | 20.0% | 20.7% | 21.5% |
| Black, non-Hispanic | 11.4% | 11.0% | 9.4% | 9.8% | 9.6% | 9.9% | 10.0% |
| American Indian or Alaskan Native | 1.0% | 0.9% | 1.0% | 1.1% | 1.1% | 1.2% | 1.2% |
| Hispanic | 6.1% | 5.9% | 7.7% | 8.4% | 9.2% | 9.7% | 10.3% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-13. Full-time enrollment at 2-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.0% | 1.4% | 1.9% | 1.7% | 2.0% | 2.2% | 2.2% |
| White, non-Hispanic | 74.8% | 74.1% | 72.6% | 71.0% | 69.6% | 68.2% | 66.6% |
| Asian or Pacific Islander | 1.9% | 2.5% | 3.6% | 4.0% | 4.5% | 4.8% | 5.2% |
| Underrepresented minorities | 22.2% | 22.0% | 22.0% | 23.4% | 24.0% | 24.8% | 26.0% |
| Black, non-Hispanic | 15.3% | 14.5% | 12.1% | 12.7% | 12.8% | 13.0% | 13.5% |
| American Indian or Alaskan Native | 1.2% | 1.1% | 1.1% | 1.2% | 1.3% | 1.3% | 1.4% |
| Hispanic | 5.8% | 6.4% | 8.7% | 9.4% | 9.9% | 10.5% | 11.1% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum 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: 1998*

**Appendix table 3-14. Percentage distribution of persons 18-24 years of age in total population, total student enrollment in 2-year institutions, and the index of representation, by race/ethnicity and sex: 1980, 1990-1994[1]**



| Race/ethnicity and sex | 1980 | | | 1990 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention |
| White males | 38.92 | 35.88 | 92.20 | 35.72 | 32.52 | 91.03 | 35.49 | 31.84 | 89.70 |
| Asian males | 0.78 | 1.46 | 185.86 | 1.67 | 2.14 | 128.36 | 1.74 | 2.34 | 134.36 |
| Black males | 6.19 | 4.40 | 71.11 | 6.65 | 3.78 | 56.92 | 6.72 | 3.88 | 57.70 |
| Hispanic males | 3.93 | 2.87 | 73.00 | 6.54 | 3.70 | 56.61 | 6.62 | 3.93 | 59.40 |
| American Indian males | 0.34 | 0.45 | 134.27 | 0.41 | 0.42 | 101.61 | 0.42 | 0.44 | 104.57 |
| White females | 38.41 | 43.76 | 113.91 | 34.69 | 43.94 | 126.66 | 34.41 | 43.18 | 125.48 |
| Asian females | 0.77 | 1.41 | 183.05 | 1.57 | 2.12 | 134.96 | 1.66 | 2.35 | 141.78 |
| Black females | 6.67 | 6.07 | 91.02 | 6.90 | 6.15 | 89.20 | 6.94 | 6.42 | 92.44 |
| Hispanic females | 3.65 | 3.11 | 85.20 | 5.46 | 4.62 | 84.65 | 5.58 | 4.98 | 89.16 |
| American Indian females | 0.33 | 0.58 | 176.74 | 0.40 | 0.60 | 152.53 | 0.40 | 0.63 | 157.61 |

| Race/ethnicity and sex | 1992 | | | 1993 | | | 1994 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 2-year college enrollment | Index of represention |
| White males | 35.21 | 30.72 | 87.26 | 35.03 | 30.28 | 86.43 | 34.80 | 29.59 | 85.02 |
| Asian males | 1.84 | 2.58 | 140.09 | 1.92 | 2.71 | 140.88 | 1.98 | 2.88 | 145.37 |
| Black males | 6.79 | 3.93 | 57.91 | 6.83 | 4.03 | 59.04 | 6.91 | 4.14 | 59.92 |
| Hispanic males | 6.68 | 4.37 | 65.47 | 6.70 | 4.60 | 68.58 | 6.75 | 4.84 | 71.81 |
| American Indian males | 0.44 | 0.45 | 102.43 | 0.44 | 0.46 | 104.70 | 0.45 | 0.47 | 105.45 |
| White females | 34.12 | 42.37 | 124.16 | 33.90 | 41.73 | 123.09 | 33.62 | 40.97 | 121.85 |
| Asian females | 1.78 | 2.69 | 151.27 | 1.87 | 2.84 | 151.83 | 1.95 | 3.05 | 156.12 |
| Black females | 7.00 | 6.69 | 95.53 | 7.03 | 6.84 | 97.27 | 7.11 | 7.13 | 100.36 |
| Hispanic females | 5.72 | 5.56 | 97.09 | 5.85 | 5.86 | 100.18 | 6.00 | 6.23 | 103.85 |
| American Indian females | 0.42 | 0.64 | 153.92 | 0.42 | 0.66 | 155.61 | 0.43 | 0.69 | 161.06 |

[1]The number of cases for the percent distributions are presented in appendix table 3-15. Nonresident aliens were not included in these calculations. The numbers displayed may not be exact due to rounding error.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-15. Number of persons 18-24 years of age in total population and total 2-year college enrollment, by race/ethnicity[1] and sex: 1980, 1990-1994**



| Race/ethnicity and sex | 1980 | | 1990 | | 1991 | |
|---|---|---|---|---|---|---|
| | 18-24 years population | Total 2-year college enrollment | 18-24 years population | Total 2-year college enrollment | 18-24 years population | Total 2-year college enrollment |
| Total | 30,103,000 | 4,319,416 | 26,831,000 | 5,051,798 | 26,384,000 | 5,498,979 |
| White males | 11,715,000 | 1,549,876 | 9,585,000 | 1,642,810 | 9,364,000 | 1,750,720 |
| Asian males | 236,000 | 62,939 | 448,000 | 108,274 | 460,000 | 128,816 |
| Black males | 1,864,000 | 190,199 | 1,783,000 | 191,072 | 1,772,000 | 213,086 |
| Hispanic males | 1,184,000 | 124,016 | 1,754,000 | 186,945 | 1,747,000 | 216,295 |
| American Indian males | 102,000 | 19,652 | 111,000 | 21,236 | 112,000 | 24,410 |
| White females | 11,564,000 | 1,890,093 | 9,308,000 | 2,219,763 | 9,080,000 | 2,374,733 |
| Asian females | 232,000 | 60,937 | 422,000 | 107,232 | 438,000 | 129,428 |
| Black females | 2,007,000 | 262,126 | 1,850,000 | 310,694 | 1,832,000 | 352,954 |
| Hispanic females | 1,100,000 | 134,472 | 1,464,000 | 233,331 | 1,473,000 | 273,717 |
| American Indian females | 99,000 | 25,106 | 106,000 | 30,441 | 106,000 | 34,820 |

| Race/ethnicity and sex | 1992 | | 1993 | | 1994 | |
|---|---|---|---|---|---|---|
| | 18-24 years population | Total 2-year college enrollment | 18-24 years population | Total 2-year college enrollment | 18-24 years population | Total 2-year college enrollment |
| Total | 25,942,000 | 5,550,984 | 25,653,000 | 5,388,220 | 25,260,000 | 5,330,150 |
| White males | 9,134,000 | 1,705,468 | 8,986,000 | 1,631,398 | 8,791,000 | 1,577,034 |
| Asian males | 478,000 | 143,283 | 493,000 | 145,879 | 501,000 | 153,680 |
| Black males | 1,761,000 | 218,216 | 1,752,000 | 217,273 | 1,745,000 | 220,630 |
| Hispanic males | 1,733,000 | 242,763 | 1,720,000 | 247,760 | 1,704,000 | 258,188 |
| American Indian males | 113,000 | 24,768 | 113,000 | 24,850 | 113,000 | 25,144 |
| White females | 8,852,000 | 2,351,755 | 8,696,000 | 2,248,261 | 8,493,000 | 2,183,691 |
| Asian females | 461,000 | 149,222 | 479,000 | 152,757 | 493,000 | 162,414 |
| Black females | 1,817,000 | 371,425 | 1,804,000 | 368,562 | 1,795,000 | 380,113 |
| Hispanic females | 1,485,000 | 308,513 | 1,501,000 | 315,854 | 1,516,000 | 332,212 |
| American Indian females | 108,000 | 35,571 | 109,000 | 35,626 | 109,000 | 37,044 |

[1]Nonresident aliens were not included in these calculations. The numbers displayed may not be exact due to rounding error.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

**Appendix table 3-16. Percentage of undergraduates who reported a disability and among those with disabilities, the type of disability: 1995-1996**



| | Type of disability reported among those reporting a disability | | | | | | |
|---|---|---|---|---|---|---|---|
| | Any disabilities | Visual | Hearing | Speech | Orthopedic | Learning disability | Other |
| Total | 5.5 | 16.3 | 16.3 | 3.0 | 22.9 | 29.2 | 21.2 |
| Age as of 12/31/95 | | | | | | | |
| 18 years or younger | 4.5 | 18.7 | 11.4 | 4.2 | 6.1 | 40.7 | 22.0 |
| 19-23 years | 4.7 | 15.4 | 16.1 | 3.8 | 9.6 | 42.9 | 19.4 |
| 24-29 years | 4.2 | 14.5 | 19.6 | 4.5 | 20.8 | 28.5 | 22.9 |
| 30-39 years | 6.5 | 19.2 | 14.7 | 1.3 | 33.1 | 19.8 | 19.9 |
| 40 years or older | 10.3 | 16.1 | 17.7 | 1.6 | 44.3 | 10.1 | 23.9 |
| Single parent | | | | | | | |
| No | 5.4 | 17.0 | 16.4 | 3.1 | 23.5 | 30.0 | 18.7 |
| Yes | 6.4 | 11.6 | 15.2 | 2.5 | 18.3 | 23.6 | 40.1 |
| Number of dependents | | | | | | | |
| None | 5.1 | 18.0 | 15.7 | 2.8 | 19.9 | 32.8 | 18.9 |
| One or more | 6.8 | 12.4 | 17.6 | 3.5 | 29.9 | 20.8 | 26.5 |
| Average hours worked while enrolled | | | | | | | |
| Did not work | 9.2 | 11.7 | 13.6 | 1.9 | 35.0 | 22.2 | 29.5 |
| 1-15 hours | 4.8 | 17.4 | 10.9 | 2.8 | 17.8 | 37.9 | 20.8 |
| 16-20 hours | 3.6 | 10.7 | 21.0 | 5.3 | 10.1 | 56.6 | 7.6 |
| 21-34 hours | 5.8 | 15.5 | 18.7 | 6.8 | 12.2 | 36.7 | 16.3 |
| 35 or more hours | 4.1 | 25.1 | 17.7 | 1.4 | 21.0 | 20.8 | 18.0 |
| Level of institution | | | | | | | |
| Less-than-2-year | 8.8 | 18.4 | 19.4 | 0.6 | 34.4 | 20.2 | 20.3 |
| 2-year | 5.9 | 17.1 | 16.3 | 2.3 | 24.7 | 28.9 | 21.1 |
| 4-year | 4.7 | 16.0 | 15.3 | 4.6 | 19.2 | 29.7 | 20.7 |
| Institution type | | | | | | | |
| Public | 5.3 | 17.0 | 17.3 | 3.2 | 22.5 | 27.6 | 21.0 |
| Less-than-2-year | 7.4 | 28.0 | 18.9 | 0.0 | 13.4 | 30.5 | 13.0 |
| 2-year | 5.9 | 17.2 | 16.9 | 2.3 | 24.0 | 29.1 | 21.1 |
| 4-year non-doctorate-granting | 5.6 | 13.0 | 20.2 | 5.2 | 28.4 | 22.4 | 17.8 |
| Doctorate-granting | 3.5 | 18.9 | 15.4 | 4.9 | 11.5 | 26.7 | 25.7 |
| Private not-for-profit | 5.6 | 17.6 | 11.1 | 3.7 | 19.2 | 36.0 | 18.9 |
| Less-than-4-year | 8.0 | 24.2 | 16.4 | 2.2 | 33.3 | 12.9 | 20.2 |
| 4-year non-doctorate-granting | 5.9 | 17.6 | 7.1 | 3.2 | 14.3 | 42.4 | 20.6 |
| Doctorate-granting | 4.3 | 14.1 | 19.5 | 5.6 | 25.5 | 29.9 | 13.8 |
| Private for-profit | 7.3 | 13.1 | 15.5 | 0.6 | 38.7 | 23.1 | 23.5 |
| More than one institution | 6.8 | 10.6 | 18.7 | 1.6 | 19.2 | 37.5 | 25.2 |
| Class level | | | | | | | |
| First-year beginning | 5.9 | 15.2 | 12.4 | 3.7 | 17.2 | 38.1 | 21.4 |
| Other first year | 6.6 | 20.9 | 16.3 | 2.7 | 27.7 | 22.1 | 20.1 |
| Second year | 4.6 | 9.8 | 18.4 | 3.4 | 20.6 | 31.3 | 21.3 |
| Third year | 5.1 | 17.9 | 18.0 | 3.6 | 26.0 | 36.7 | 13.9 |
| Fourth or fifth year | 4.4 | 18.0 | 17.8 | 2.4 | 19.7 | 22.6 | 23.3 |
| Unclassified | 5.5 | 7.7 | 20.4 | 0.0 | 24.6 | 27.3 | 37.8 |
| Attendance intensity | | | | | | | |
| Exclusively full-time | 5.7 | 15.1 | 15.5 | 2.3 | 23.2 | 32.0 | 19.4 |
| Mixed full-time and part-time | 4.6 | 17.3 | 16.4 | 2.6 | 19.7 | 29.9 | 25.7 |
| Exclusively part-time | 5.5 | 17.9 | 18.6 | 4.4 | 24.5 | 24.6 | 19.8 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-16. Percentage of undergraduates who reported a disability and among those with disabilities, the type of disability: 1995-1996**



| | Type of disability reported among those reporting a disability | | | | | | |
|---|---|---|---|---|---|---|---|
| | Any disabilities | Visual | Hearing | Speech | Orthopedic | Learning disability | Other |
| Total | 5.5 | 16.3 | 16.3 | 3.0 | 22.9 | 29.2 | 21.2 |
| Attendance status | | | | | | | |
| Full-time, full year | 5.3 | 17.5 | 14.7 | 2.5 | 17.7 | 33.9 | 22.1 |
| Full-time, part year | 6.9 | 10.1 | 15.0 | 1.3 | 34.4 | 25.7 | 18.9 |
| Part-time, full year | 5.5 | 19.4 | 22.5 | 3.1 | 17.5 | 28.5 | 21.7 |
| Part-time, part year | 5.3 | 15.6 | 13.2 | 5.0 | 30.2 | 23.5 | 20.8 |
| Undergraduate program | | | | | | | |
| Certificate | 7.2 | 25.5 | 18.6 | 1.3 | 30.5 | 19.9 | 13.5 |
| Associate's degree | 6.1 | 11.8 | 16.5 | 3.6 | 23.5 | 32.8 | 23.3 |
| Bachelor's degree | 4.6 | 15.8 | 15.3 | 3.2 | 19.3 | 30.0 | 21.9 |
| Nondegree program | 3.8 | low n | low n | low n | low n | low n | low n |
| Gender | | | | | | | |
| Male | 6.3 | 14.7 | 19.8 | 4.2 | 23.0 | 27.1 | 19.9 |
| Female | 4.9 | 18.0 | 12.8 | 1.8 | 22.7 | 31.4 | 22.5 |
| Race/ethnicity | | | | | | | |
| White; non-Hispanic | 6.2 | 15.8 | 17.1 | 1.8 | 22.6 | 31.3 | 20.6 |
| Asian/Pacific Islander | 1.9 | low n | low n | low n | low n | low n | low n |
| Black; non-Hispanic | 3.4 | 11.7 | 11.3 | 1.7 | 31.3 | 18.0 | 34.2 |
| Hispanic | 4.1 | 19.1 | 17.5 | 16.3 | 17.3 | 23.7 | 14.6 |
| American Indian/Alaskan Native | 13.4 | low n | low n | low n | low n | low n | low n |
| Dependency status | | | | | | | |
| Dependent | 4.6 | 16.8 | 13.6 | 4.3 | 9.0 | 44.2 | 19.0 |
| Independent | 6.4 | 16.0 | 18.1 | 2.1 | 32.4 | 19.0 | 22.6 |
| Dependency status | | | | | | | |
| Dependent | 4.6 | 16.8 | 13.6 | 4.3 | 9.0 | 44.2 | 19.0 |
| Independent; No dependents, unmarried | 7.0 | 22.8 | 11.9 | 0.8 | 34.4 | 19.4 | 20.4 |
| Independent; No dependents, married | 4.5 | 11.4 | 36.8 | 0.0 | 36.4 | 11.0 | 14.2 |
| Independent; With dependents | 6.8 | 12.4 | 17.6 | 3.5 | 29.9 | 20.8 | 26.5 |
| Income and dependency status | | | | | | | |
| Dependent; Less than $20,000 | 4.4 | 21.5 | 9.2 | 10.6 | 9.2 | 43.6 | 9.7 |
| Dependent; $20,000-$39,999 | 4.1 | 16.9 | 8.8 | 4.1 | 11.6 | 45.1 | 21.4 |
| Dependent; $40,000-$59,999 | 4.3 | 16.5 | 19.9 | 0.7 | 12.2 | 36.4 | 27.1 |
| Dependent; $60,000-$79,999 | 4.2 | 15.7 | 15.6 | 1.5 | 5.7 | 40.9 | 22.3 |
| Dependent; $80,000-$99,999 | 5.5 | 5.6 | 28.4 | 14.5 | 2.7 | 42.6 | 10.8 |
| Dependent; $100,000 or more | 6.4 | 19.9 | 5.2 | 0.3 | 7.7 | 58.4 | 16.1 |
| Independent; Less than $10,000 | 7.4 | 9.7 | 8.1 | 3.0 | 32.7 | 27.0 | 32.6 |
| Independent; $10,000-$19,999 | 7.7 | 21.1 | 12.4 | 1.5 | 28.6 | 18.0 | 27.1 |
| Independent; $20,000-$29,999 | 6.2 | 17.8 | 30.3 | 4.3 | 31.2 | 15.4 | 12.8 |
| Independent; $30,000-$49,999 | 5.7 | 22.1 | 28.2 | 0.1 | 36.5 | 12.5 | 11.9 |
| Independent; $50,000 or more | 4.4 | 9.5 | 25.9 | 1.0 | 36.1 | 15.4 | 15.8 |
| Marital status | | | | | | | |
| Not married | 5.3 | 17.8 | 13.5 | 3.0 | 17.2 | 34.1 | 22.8 |
| Married | 5.8 | 13.6 | 25.2 | 3.0 | 37.1 | 14.8 | 17.0 |
| Separated | 9.1 | 2.5 | 13.0 | 1.2 | 45.9 | 26.8 | 14.5 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-16. Percentage of undergraduates who reported a disability and among those with disabilities, the type of disability: 1995-1996**



| | Type of disability reported among those reporting a disability | | | | | | |
|---|---|---|---|---|---|---|---|
| | Any disabilities | Visual | Hearing | Speech | Orthopedic | Learning disability | Other |
| Parents' education | | | | | | | |
| Less than high school diploma | 7.1 | 16.1 | 20.9 | 4.1 | 36.8 | 15.9 | 20.4 |
| High school diploma or equivalent | 5.6 | 23.7 | 17.9 | 2.3 | 25.7 | 20.9 | 17.4 |
| Some postsecondary education | 5.8 | 14.3 | 14.6 | 0.4 | 23.0 | 37.5 | 20.9 |
| Bachelor's degree or higher | 5.4 | 13.4 | 17.9 | 3.8 | 12.7 | 41.7 | 19.8 |
| Primary role if working while enrolled | | | | | | | |
| Student working to meet expenses | 4.5 | 17.9 | 15.6 | 1.5 | 12.3 | 45.0 | 15.0 |
| Employee enrolled in school | 4.5 | 26.9 | 24.2 | 3.5 | 23.3 | 19.4 | 8.5 |

SOURCE: National Center for Education Statistics, 1996 National Postsecondary Student Aid Study data analysis system.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-17. Full-time undergraduate enrollment at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Full-time undergraduate enrollment: | | | | | | | |
| Total, all races and ethnicities | 6,115,948 | 6,464,633 | 7,058,865 | 7,346,260 | 7,369,223 | 7,302,852 | 7,287,543 |
| Non-resident aliens | 109,147 | 166,114 | 167,228 | 176,693 | 188,885 | 196,806 | 203,280 |
| White, non-Hispanic | 4,959,703 | 5,133,039 | 5,403,802 | 5,510,013 | 5,437,032 | 5,310,930 | 5,216,002 |
| Asian or Pacific Islander | 106,424 | 144,691 | 298,070 | 339,467 | 367,609 | 387,105 | 416,090 |
| Underrepresented minorities | 940,675 | 1,020,788 | 1,189,765 | 1,320,087 | 1,375,697 | 1,408,011 | 1,452,171 |
| Black, non-Hispanic | 627,230 | 650,728 | 670,892 | 733,802 | 753,189 | 763,883 | 776,887 |
| American Indian or Alaskan Native | 40,227 | 40,471 | 50,769 | 57,339 | 60,942 | 62,710 | 66,169 |
| Hispanic | 273,218 | 329,589 | 468,104 | 528,946 | 561,566 | 581,418 | 609,115 |
| Men, all races and ethnicities | 3,280,896 | 3,268,722 | 3,367,828 | 3,484,304 | 3,473,410 | 3,430,498 | 3,388,062 |
| Non-resident aliens | 77,669 | 116,471 | 99,043 | 103,606 | 108,439 | 111,328 | 114,224 |
| White, non-Hispanic | 2,693,974 | 2,622,125 | 2,609,128 | 2,648,578 | 2,598,252 | 2,531,133 | 2,461,618 |
| Asian or Pacific Islander | 58,801 | 77,250 | 155,377 | 174,480 | 187,040 | 195,676 | 208,493 |
| Underrepresented minorities | 450,452 | 452,876 | 504,280 | 557,640 | 579,679 | 592,361 | 603,727 |
| Black, non-Hispanic | 287,359 | 279,140 | 275,249 | 299,931 | 305,603 | 309,775 | 308,954 |
| American Indian or Alaskan Native | 20,799 | 19,176 | 22,494 | 25,081 | 26,785 | 27,690 | 28,791 |
| Hispanic | 142,295 | 154,560 | 206,537 | 232,628 | 247,291 | 254,896 | 265,982 |
| Women, all races and ethnicities | 2,835,052 | 3,195,911 | 3,691,037 | 3,861,956 | 3,895,813 | 3,872,354 | 3,899,481 |
| Non-resident aliens | 31,478 | 49,644 | 68,185 | 73,087 | 80,446 | 85,478 | 89,056 |
| White, non-Hispanic | 2,265,729 | 2,510,914 | 2,794,674 | 2,861,435 | 2,838,780 | 2,779,797 | 2,754,384 |
| Asian or Pacific Islander | 47,623 | 67,441 | 142,693 | 164,987 | 180,569 | 191,429 | 207,597 |
| Underrepresented minorities | 490,222 | 567,912 | 685,485 | 762,447 | 796,018 | 815,650 | 848,444 |
| Black, non-Hispanic | 339,872 | 371,588 | 395,643 | 433,871 | 447,586 | 454,108 | 467,933 |
| American Indian or Alaskan Native | 19,427 | 21,295 | 28,275 | 32,258 | 34,157 | 35,020 | 37,378 |
| Hispanic | 130,923 | 175,029 | 261,567 | 296,318 | 314,275 | 326,522 | 343,133 |
| Percentage distribution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.8% | 2.6% | 2.4% | 2.4% | 2.6% | 2.7% | 2.8% |
| White, non-Hispanic | 81.1% | 79.4% | 76.6% | 75.0% | 73.8% | 72.7% | 71.6% |
| Asian or Pacific Islander | 1.7% | 2.2% | 4.2% | 4.6% | 5.0% | 5.3% | 5.7% |
| Underrepresented minorities | 15.4% | 15.8% | 16.9% | 18.0% | 18.7% | 19.3% | 19.9% |
| Black, non-Hispanic | 10.3% | 10.1% | 9.5% | 10.0% | 10.2% | 10.5% | 10.7% |
| American Indian or Alaskan Native | 0.7% | 0.6% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% |
| Hispanic | 4.5% | 5.1% | 6.6% | 7.2% | 7.6% | 8.0% | 8.4% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 2.4% | 3.6% | 2.9% | 3.0% | 3.1% | 3.2% | 3.4% |
| White, non-Hispanic | 82.1% | 80.2% | 77.5% | 76.0% | 74.8% | 73.8% | 72.7% |
| Asian or Pacific Islander | 1.8% | 2.4% | 4.6% | 5.0% | 5.4% | 5.7% | 6.2% |
| Underrepresented minorities | 13.7% | 13.9% | 15.0% | 16.0% | 16.7% | 17.3% | 17.8% |
| Black, non-Hispanic | 8.8% | 8.5% | 8.2% | 8.6% | 8.8% | 9.0% | 9.1% |
| American Indian or Alaskan Native | 0.6% | 0.6% | 0.7% | 0.7% | 0.8% | 0.8% | 0.8% |
| Hispanic | 4.3% | 4.7% | 6.1% | 6.7% | 7.1% | 7.4% | 7.9% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-17. Full-time undergraduate enrollment at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.1% | 1.6% | 1.8% | 1.9% | 2.1% | 2.2% | 2.3% |
| White, non-Hispanic | 79.9% | 78.6% | 75.7% | 74.1% | 72.9% | 71.8% | 70.6% |
| Asian or Pacific Islander | 1.7% | 2.1% | 3.9% | 4.3% | 4.6% | 4.9% | 5.3% |
| Underrepresented minorities | 17.3% | 17.8% | 18.6% | 19.7% | 20.4% | 21.1% | 21.8% |
| Black, non-Hispanic | 12.0% | 11.6% | 10.7% | 11.2% | 11.5% | 11.7% | 12.0% |
| American Indian or Alaskan Native | 0.7% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% | 1.0% |
| Hispanic | 4.6% | 5.5% | 7.1% | 7.7% | 8.1% | 8.4% | 8.8% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum 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: 1998*

**Appendix table 3-18. Total enrollment of undergraduate students at 4-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Sex and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Total, all races and ethnicities | 5,817,054 | 6,221,800 | 6,885,028 | 7,022,691 | 7,052,237 | 7,002,998 | 6,995,459 |
| Non-resident aliens | 104,095 | 148,390 | 152,506 | 161,540 | 168,104 | 177,544 | 178,817 |
| White, non-Hispanic | 4,814,720 | 5,046,806 | 5,369,517 | 5,383,074 | 5,331,003 | 5,221,426 | 5,144,889 |
| Asian or Pacific Islander | 94,595 | 127,838 | 275,628 | 306,922 | 327,958 | 344,257 | 367,037 |
| Underrepresented minorities | 803,644 | 898,767 | 1,087,377 | 1,171,155 | 1,225,172 | 1,259,771 | 1,304,716 |
| Black, non-Hispanic | 539,101 | 568,596 | 623,825 | 665,212 | 693,091 | 706,786 | 718,519 |
| American Indian or Alaskan Native | 31,349 | 33,202 | 43,458 | 46,609 | 50,540 | 52,251 | 55,668 |
| Hispanic | 233,194 | 296,969 | 420,094 | 459,334 | 481,541 | 500,734 | 530,529 |
| Men, all races and ethnicities | 3,054,310 | 3,067,023 | 3,209,162 | 3,261,228 | 3,263,958 | 3,234,775 | 3,204,347 |
| Non-resident aliens | 72,410 | 101,700 | 92,217 | 95,495 | 97,983 | 101,775 | 101,888 |
| White, non-Hispanic | 2,556,148 | 2,507,750 | 2,523,052 | 2,522,590 | 2,490,258 | 2,435,891 | 2,381,236 |
| Asian or Pacific Islander | 50,781 | 66,937 | 142,013 | 155,857 | 165,281 | 172,410 | 182,057 |
| Underrepresented minorities | 374,971 | 390,636 | 451,880 | 487,286 | 510,436 | 524,699 | 539,166 |
| Black, non-Hispanic | 241,226 | 238,714 | 249,137 | 265,562 | 277,907 | 282,921 | 282,751 |
| American Indian or Alaskan Native | 15,716 | 15,138 | 18,456 | 19,776 | 21,804 | 22,383 | 23,776 |
| Hispanic | 118,029 | 136,784 | 184,287 | 201,948 | 210,725 | 219,395 | 232,639 |
| Women, all races and ethnicities | 2,762,744 | 3,154,777 | 3,675,866 | 3,761,463 | 3,788,279 | 3,768,223 | 3,791,112 |
| Non-resident aliens | 31,685 | 46,691 | 60,289 | 66,045 | 70,121 | 75,769 | 76,929 |
| White, non-Hispanic | 2,258,572 | 2,539,055 | 2,846,465 | 2,860,484 | 2,840,745 | 2,785,535 | 2,763,653 |
| Asian or Pacific Islander | 43,814 | 60,900 | 133,615 | 151,065 | 162,677 | 171,847 | 184,980 |
| Underrepresented minorities | 428,673 | 508,131 | 635,497 | 683,869 | 714,736 | 735,072 | 765,550 |
| Black, non-Hispanic | 297,875 | 329,882 | 374,688 | 399,650 | 415,184 | 423,865 | 435,768 |
| American Indian or Alaskan Native | 15,633 | 18,064 | 25,002 | 26,833 | 28,736 | 29,868 | 31,892 |
| Hispanic | 115,165 | 160,185 | 235,807 | 257,386 | 270,816 | 281,339 | 297,890 |
| Percentage distribution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.8% | 2.4% | 2.2% | 2.3% | 2.4% | 2.5% | 2.6% |
| White, non-Hispanic | 82.8% | 81.1% | 78.0% | 76.7% | 75.6% | 74.6% | 73.5% |
| Asian or Pacific Islander | 1.6% | 2.1% | 4.0% | 4.4% | 4.7% | 4.9% | 5.2% |
| Underrepresented minorities | 13.8% | 14.4% | 15.8% | 16.7% | 17.4% | 18.0% | 18.7% |
| Black, non-Hispanic | 9.3% | 9.1% | 9.1% | 9.5% | 9.8% | 10.1% | 10.3% |
| American Indian or Alaskan Native | 0.5% | 0.5% | 0.7% | 0.7% | 0.7% | 0.8% | 0.8% |
| Hispanic | 4.0% | 4.8% | 6.1% | 6.5% | 6.8% | 7.2% | 7.6% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 2.4% | 3.3% | 2.9% | 2.9% | 3.0% | 3.1% | 3.2% |
| White, non-Hispanic | 83.7% | 81.8% | 78.6% | 77.4% | 76.3% | 75.3% | 74.3% |
| Asian or Pacific Islander | 1.7% | 2.2% | 4.4% | 4.8% | 5.1% | 5.3% | 5.7% |
| Underrepresented minorities | 12.3% | 12.7% | 14.1% | 14.9% | 15.6% | 16.2% | 16.8% |
| Black, non-Hispanic | 7.9% | 7.8% | 7.8% | 8.1% | 8.5% | 8.7% | 8.8% |
| American Indian or Alaskan Native | 0.5% | 0.5% | 0.6% | 0.7% | 0.7% | 0.7% | 0.8% |
| Hispanic | 3.9% | 4.5% | 5.7% | 6.2% | 6.5% | 6.8% | 7.3% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-18. Total enrollment of undergraduate students at 4-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Sex and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.1% | 1.5% | 1.6% | 1.8% | 1.9% | 2.0% | 2.0% |
| White, non-Hispanic | 81.8% | 80.5% | 77.4% | 76.0% | 75.0% | 73.9% | 72.9% |
| Asian or Pacific Islander | 1.6% | 1.9% | 3.6% | 4.0% | 4.3% | 4.6% | 4.9% |
| Underrepresented minorities | 15.5% | 16.1% | 17.3% | 18.2% | 18.9% | 19.5% | 20.2% |
| Black, non-Hispanic | 10.8% | 10.5% | 10.2% | 10.6% | 11.0% | 11.2% | 11.5% |
| American Indian or Alaskan Native | 0.5% | 0.6% | 0.7% | 0.7% | 0.7% | 0.8% | 0.9% |
| Hispanic | 4.2% | 5.1% | 6.4% | 6.8% | 7.1% | 7.5% | 7.9% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum 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: 1998*

**Appendix table 3-19. Full-time enrollment of undergraduate students at 4-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Full-time undergraduate enrollment: | | | | | | | |
| Total, all races and ethnicities | 4,537,069 | 4,791,348 | 5,203,951 | 5,294,761 | 5,316,878 | 5,284,009 | 5,284,387 |
| Non-resident aliens | 85,692 | 127,984 | 128,058 | 137,071 | 143,333 | 148,741 | 153,500 |
| White, non-Hispanic | 3,756,543 | 3,876,203 | 4,038,333 | 4,030,899 | 3,987,547 | 3,911,740 | 3,860,336 |
| Asian or Pacific Islander | 73,517 | 99,013 | 222,293 | 247,344 | 265,362 | 278,996 | 299,211 |
| Underrepresented minorities | 621,317 | 688,148 | 815,267 | 879,447 | 920,636 | 944,532 | 971,340 |
| Black, non-Hispanic | 419,221 | 437,685 | 469,530 | 500,469 | 520,585 | 529,951 | 537,647 |
| American Indian or Alaskan Native | 22,896 | 23,431 | 30,782 | 33,174 | 35,955 | 37,373 | 39,930 |
| Hispanic | 179,200 | 227,032 | 314,955 | 345,804 | 364,096 | 377,208 | 393,763 |
| Men, all races and ethnicities | 2,420,847 | 2,425,891 | 2,498,502 | 2,531,410 | 2,533,795 | 2,510,810 | 2,486,699 |
| Non-resident aliens | 61,750 | 90,111 | 78,567 | 82,234 | 84,692 | 86,911 | 88,700 |
| White, non-Hispanic | 2,028,318 | 1,980,989 | 1,958,708 | 1,949,542 | 1,923,254 | 1,881,930 | 1,839,438 |
| Asian or Pacific Islander | 39,772 | 52,158 | 114,752 | 126,025 | 134,326 | 140,439 | 148,925 |
| Underrepresented minorities | 291,007 | 302,633 | 346,475 | 373,609 | 391,523 | 401,530 | 409,636 |
| Black, non-Hispanic | 189,003 | 186,410 | 193,557 | 206,408 | 215,067 | 218,816 | 218,632 |
| American Indian or Alaskan Native | 11,816 | 11,183 | 13,694 | 14,606 | 16,060 | 16,726 | 17,771 |
| Hispanic | 90,188 | 105,041 | 139,224 | 152,595 | 160,396 | 165,988 | 173,233 |
| Women, all races and ethnicities | 2,116,222 | 2,365,457 | 2,705,449 | 2,763,351 | 2,783,083 | 2,773,199 | 2,797,688 |
| Non-resident aliens | 23,942 | 37,874 | 49,491 | 54,837 | 58,641 | 61,830 | 64,800 |
| White, non-Hispanic | 1,728,225 | 1,895,213 | 2,079,625 | 2,081,357 | 2,064,293 | 2,029,810 | 2,020,898 |
| Asian or Pacific Islander | 33,745 | 46,855 | 107,541 | 121,319 | 131,036 | 138,557 | 150,286 |
| Underrepresented minorities | 330,310 | 385,515 | 468,792 | 505,838 | 529,113 | 543,002 | 561,704 |
| Black, non-Hispanic | 230,218 | 251,275 | 275,973 | 294,061 | 305,518 | 311,135 | 319,015 |
| American Indian or Alaskan Native | 11,081 | 12,248 | 17,088 | 18,568 | 19,895 | 20,647 | 22,159 |
| Hispanic | 89,012 | 121,991 | 175,731 | 193,209 | 203,700 | 211,220 | 220,530 |
| Percentage distribution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.9% | 2.7% | 2.5% | 2.6% | 2.7% | 2.8% | 2.9% |
| White, non-Hispanic | 82.8% | 80.9% | 77.6% | 76.1% | 75.0% | 74.0% | 73.1% |
| Asian or Pacific Islander | 1.6% | 2.1% | 4.3% | 4.7% | 5.0% | 5.3% | 5.7% |
| Underrepresented minorities | 13.7% | 14.4% | 15.7% | 16.6% | 17.3% | 17.9% | 18.4% |
| Black, non-Hispanic | 9.2% | 9.1% | 9.0% | 9.5% | 9.8% | 10.0% | 10.2% |
| American Indian or Alaskan Native | 0.5% | 0.5% | 0.6% | 0.6% | 0.7% | 0.7% | 0.8% |
| Hispanic | 3.9% | 4.7% | 6.1% | 6.5% | 6.8% | 7.1% | 7.5% |
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 2.6% | 3.7% | 3.1% | 3.2% | 3.3% | 3.5% | 3.6% |
| White, non-Hispanic | 83.8% | 81.7% | 78.4% | 77.0% | 75.9% | 75.0% | 74.0% |
| Asian or Pacific Islander | 1.6% | 2.2% | 4.6% | 5.0% | 5.3% | 5.6% | 6.0% |
| Underrepresented minorities | 12.0% | 12.5% | 13.9% | 14.8% | 15.5% | 16.0% | 16.5% |
| Black, non-Hispanic | 7.8% | 7.7% | 7.7% | 8.2% | 8.5% | 8.7% | 8.8% |
| American Indian or Alaskan Native | 0.5% | 0.5% | 0.5% | 0.6% | 0.6% | 0.7% | 0.7% |
| Hispanic | 3.7% | 4.3% | 5.6% | 6.0% | 6.3% | 6.6% | 7.0% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-19. Full-time enrollment of undergraduate students at 4-year institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.1% | 1.6% | 1.8% | 2.0% | 2.1% | 2.2% | 2.3% |
| White, non-Hispanic | 81.7% | 80.1% | 76.9% | 75.3% | 74.2% | 73.2% | 72.2% |
| Asian or Pacific Islander | 1.6% | 2.0% | 4.0% | 4.4% | 4.7% | 5.0% | 5.4% |
| Underrepresented minorities | 15.6% | 16.3% | 17.3% | 18.3% | 19.0% | 19.6% | 20.1% |
| Black, non-Hispanic | 10.9% | 10.6% | 10.2% | 10.6% | 11.0% | 11.2% | 11.4% |
| American Indian or Alaskan Native | 0.5% | 0.5% | 0.6% | 0.7% | 0.7% | 0.7% | 0.8% |
| Hispanic | 4.2% | 5.2% | 6.5% | 7.0% | 7.3% | 7.6% | 7.9% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum to totals.

SOURCES: U.S. Department of Education/NCES. Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS.

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**Appendix table 3-20. Percentage distribution of persons 18-24 years of age in total population, total enrollment of undergraduate students at 4-year institutions, and the index of representation, by race/ethnicity and sex: 1980, 1990-1994[1]**



| Race/ethnicity and sex | 1980 | | | 1990 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention |
| White males | 38.92 | 41.29 | 106.10 | 35.72 | 37.48 | 104.90 | 35.49 | 36.77 | 103.59 |
| Asian males | 0.78 | 1.10 | 140.58 | 1.67 | 2.11 | 126.33 | 1.74 | 2.27 | 130.29 |
| Black males | 6.19 | 3.93 | 63.48 | 6.65 | 3.70 | 55.69 | 6.72 | 3.87 | 57.63 |
| Hispanic males | 3.93 | 2.25 | 57.26 | 6.54 | 2.74 | 41.87 | 6.62 | 2.94 | 44.45 |
| American Indian males | 0.34 | 0.25 | 73.56 | 0.41 | 0.27 | 66.26 | 0.42 | 0.29 | 67.90 |
| White females | 38.41 | 41.81 | 108.83 | 34.69 | 42.28 | 121.87 | 34.41 | 41.69 | 121.14 |
| Asian females | 0.77 | 1.00 | 130.11 | 1.57 | 1.98 | 126.18 | 1.66 | 2.20 | 132.63 |
| Black females | 6.67 | 5.43 | 81.47 | 6.90 | 5.57 | 80.72 | 6.94 | 5.82 | 83.89 |
| Hispanic females | 3.65 | 2.64 | 72.18 | 5.46 | 3.50 | 64.19 | 5.58 | 3.75 | 67.19 |
| American Indian females | 0.33 | 0.30 | 90.44 | 0.40 | 0.37 | 94.00 | 0.40 | 0.39 | 97.34 |

| Race/ethnicity and sex | 1992 | | | 1993 | | | 1994 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention | Percent of 18-24 years population | Percent of 4-year college enrollment | Index of represention |
| White males | 35.21 | 36.17 | 102.74 | 35.03 | 35.69 | 101.88 | 34.80 | 34.93 | 100.38 |
| Asian males | 1.84 | 2.40 | 130.30 | 1.92 | 2.53 | 131.44 | 1.98 | 2.67 | 134.66 |
| Black males | 6.79 | 4.04 | 59.47 | 6.83 | 4.15 | 60.69 | 6.91 | 4.15 | 60.04 |
| Hispanic males | 6.68 | 3.06 | 45.82 | 6.70 | 3.21 | 47.94 | 6.75 | 3.41 | 50.59 |
| American Indian males | 0.44 | 0.32 | 72.71 | 0.44 | 0.33 | 74.45 | 0.45 | 0.35 | 77.97 |
| White females | 34.12 | 41.27 | 120.93 | 33.90 | 40.81 | 120.39 | 33.62 | 40.54 | 120.58 |
| Asian females | 1.78 | 2.36 | 132.98 | 1.87 | 2.52 | 134.84 | 1.95 | 2.71 | 139.04 |
| Black females | 7.00 | 6.03 | 86.11 | 7.03 | 6.21 | 88.31 | 7.11 | 6.39 | 89.96 |
| Hispanic females | 5.72 | 3.93 | 68.72 | 5.85 | 4.12 | 70.45 | 6.00 | 4.37 | 72.81 |
| American Indian females | 0.42 | 0.42 | 100.27 | 0.42 | 0.44 | 102.99 | 0.43 | 0.47 | 108.42 |

[1]The number of cases for the percent distributions are presented in appendix table 3-21. Nonresident aliens were not included in these calculations. The numbers displayed may not be exact due to rounding error.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

**Appendix table 3-21. Number of persons 18-24 years of age in total population and total 4-year college enrollment, by race/ethnicity and sex: 1980, 1990-1994**



| Race/ethnicity and sex | 1980 | | 1990 | | 1991 | |
|---|---|---|---|---|---|---|
| | 18-24 year old population | Total 4-year college enrollment | 18-24 year old population | Total 4-year college enrollment | 18-24 year old population | Total 4-year college enrollment |
| Total | 30,103,000 | 6,073,409 | 26,831,000 | 6,732,522 | 26,384,000 | 6,861,151 |
| White males | 11,715,000 | 2,507,750 | 9,585,000 | 2,523,052 | 9,364,000 | 2,522,590 |
| Asian males | 236,000 | 66,937 | 448,000 | 142,013 | 460,000 | 155,857 |
| Black males | 1,864,000 | 238,714 | 1,783,000 | 249,137 | 1,772,000 | 265,562 |
| Hispanic males | 1,184,000 | 136,784 | 1,754,000 | 184,287 | 1,747,000 | 201,948 |
| American Indian males | 102,000 | 15,138 | 111,000 | 18,456 | 112,000 | 19,776 |
| White females | 11,564,000 | 2,539,055 | 9,308,000 | 2,846,465 | 9,080,000 | 2,860,484 |
| Asian females | 232,000 | 60,900 | 422,000 | 133,615 | 438,000 | 151,065 |
| Black females | 2,007,000 | 329,882 | 1,850,000 | 374,688 | 1,832,000 | 399,650 |
| Hispanic females | 1,100,000 | 160,185 | 1,464,000 | 235,807 | 1,473,000 | 257,386 |
| American Indian females | 99,000 | 18,064 | 106,000 | 25,002 | 106,000 | 26,833 |

| Race/ethnicity and sex | 1992 | | 1993 | | 1994 | |
|---|---|---|---|---|---|---|
| | 18-24 year old population | Total 4-year college enrollment | 18-24 year old population | Total 4-year college enrollment | 18-24 year old population | Total 4-year college enrollment |
| Total | 25,942,000 | 6,884,133 | 25,653,000 | 6,825,454 | 25,260,000 | 6,816,642 |
| White males | 9,134,000 | 2,490,258 | 8,986,000 | 2,435,891 | 8,791,000 | 2,381,236 |
| Asian males | 478,000 | 165,281 | 493,000 | 172,410 | 501,000 | 182,057 |
| Black males | 1,761,000 | 277,907 | 1,752,000 | 282,921 | 1,745,000 | 282,751 |
| Hispanic males | 1,733,000 | 210,725 | 1,720,000 | 219,395 | 1,704,000 | 232,639 |
| American Indian males | 113,000 | 21,804 | 113,000 | 22,383 | 113,000 | 23,776 |
| White females | 8,852,000 | 2,840,745 | 8,696,000 | 2,785,535 | 8,493,000 | 2,763,653 |
| Asian females | 461,000 | 162,677 | 479,000 | 171,847 | 493,000 | 184,980 |
| Black females | 1,817,000 | 415,184 | 1,804,000 | 423,865 | 1,795,000 | 435,768 |
| Hispanic females | 1,485,000 | 270,816 | 1,501,000 | 281,339 | 1,516,000 | 297,890 |
| American Indian females | 108,000 | 28,736 | 109,000 | 29,868 | 109,000 | 31,892 |

NOTE: These data do not include nonresident aliens; and U.S. citizens and permanent residents for whom their race/ethnicity is unknown.

SOURCES: U.S. Department of Education/NCES Opening Fall Enrollment Survey and U.S. Bureau of the Census, Current Population Reports, tabulations by National Science Foundation/SRS.

**Appendix table 3-22. Percentage distribution of full-time, first-time, first-year students attending 4-year colleges in 1990, percentage distribution of earned bachelor's degrees in 1994, and the index of representation, by race/ethnicity, sex, and field of degree[1]**



| Race/ethnicity and sex | Number of full-time, first-time, first-year 1990 4-year college enrollment | Percent of full-time, first-time, first-year 1990 4-year college enrollment | Total degrees | | Engineering | | Physical sciences | |
|---|---|---|---|---|---|---|---|---|
| | | | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 385,984 | 36.8 | 37.4 | 101.47 | 66.1 | 179.41 | 57.1 | 154.87 |
| Asian males | 24,904 | 2.4 | 2.4 | 98.88 | 9.1 | 384.79 | 3.7 | 156.20 |
| Black males | 48,485 | 4.6 | 2.7 | 57.87 | 3.1 | 67.35 | 2.7 | 57.45 |
| Hispanic males | 31,614 | 3.0 | 2.3 | 76.24 | 4.4 | 144.46 | 2.4 | 78.80 |
| American Indian males | 3,024 | 0.3 | 0.2 | 78.96 | 0.3 | 108.35 | 0.3 | 103.23 |
| White females | 418,445 | 39.9 | 44.3 | 110.90 | 12.0 | 30.00 | 26.7 | 66.82 |
| Asian females | 24,860 | 2.4 | 2.5 | 105.93 | 2.2 | 94.32 | 2.6 | 108.18 |
| Black females | 67,517 | 6.4 | 4.6 | 72.07 | 1.5 | 23.72 | 2.6 | 40.63 |
| Hispanic females | 39,134 | 3.7 | 3.3 | 87.70 | 1.1 | 30.31 | 1.8 | 48.78 |
| American Indian females | 3,503 | 0.3 | 0.3 | 93.18 | 0.1 | 20.38 | 0.2 | 53.12 |

| Race/ethnicity and sex | Mathematical science | | Computer science | | Biological science | | Agricultural science | |
|---|---|---|---|---|---|---|---|---|
| | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 43.5 | 118.05 | 55.5 | 150.53 | 37.7 | 102.43 | 58.1 | 157.70 |
| Asian males | 3.8 | 161.64 | 6.8 | 286.43 | 6.0 | 251.55 | 0.6 | 27.33 |
| Black males | 3.4 | 72.55 | 5.4 | 115.73 | 1.9 | 40.03 | 1.1 | 23.45 |
| Hispanic males | 2.2 | 73.04 | 3.3 | 109.91 | 2.6 | 85.97 | 1.5 | 50.68 |
| American Indian males | 0.2 | 73.81 | 0.3 | 94.29 | 0.2 | 77.55 | 0.5 | 181.17 |
| White females | 38.0 | 95.08 | 17.5 | 43.82 | 38.1 | 95.37 | 34.9 | 87.28 |
| Asian females | 3.0 | 124.77 | 3.6 | 149.88 | 5.9 | 249.89 | 0.7 | 30.38 |
| Black females | 3.9 | 60.99 | 5.7 | 88.54 | 4.1 | 63.67 | 1.0 | 16.11 |
| Hispanic females | 1.8 | 47.79 | 1.9 | 51.37 | 3.2 | 85.76 | 1.1 | 30.33 |
| American Indian females | 0.2 | 65.92 | 0.1 | 26.21 | 0.3 | 80.09 | 0.3 | 101.89 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-22. Percentage distribution of full-time, first-time, first-year students attending 4-year colleges in 1990, percentage distribution of earned bachelor's degrees, distribution of earned bachelor's degrees in 1994, and the index of representation, by race/ethnicity, sex, and field of degree[1]**



| Race/ethnicity and sex | Social sciences | | Psychology | | Non-science and engineering | |
|---|---|---|---|---|---|---|
| | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 43.9 | 119.19 | 22.1 | 60.08 | 34.0 | 92.13 |
| Asian males | 2.4 | 101.33 | 1.2 | 50.46 | 1.5 | 64.14 |
| Black males | 3.5 | 75.44 | 1.8 | 39.57 | 2.6 | 55.52 |
| Hispanic males | 2.8 | 94.03 | 1.5 | 49.06 | 2.1 | 69.13 |
| American Indian males | 0.3 | 102.88 | 0.2 | 58.19 | 0.2 | 71.81 |
| White females | 36.4 | 91.20 | 59.4 | 148.78 | 48.7 | 121.84 |
| Asian females | 2.6 | 111.59 | 2.9 | 123.40 | 2.2 | 94.27 |
| Black females | 4.7 | 72.22 | 6.0 | 92.35 | 4.9 | 75.87 |
| Hispanic females | 3.0 | 79.98 | 4.5 | 119.13 | 3.5 | 94.39 |
| American Indian females | 0.3 | 94.89 | 0.4 | 124.91 | 0.3 | 99.66 |

[1]The numbers of cases for the percent distributions of earned bachelor's degrees are presented in text table 3-6.

NOTE: These data do not include nonresident aliens; and U.S. citizens and permanent residents for whom their race/ethnicity is unknown.

SOURCE: U.S. Department of Education/National Center for Education Statistics, Opening Fall Enrollments Survey and Completions Survey, tabulations by National Science Foundation/SRS.

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**Appendix table 3-23. Percentage distribution of full-time, first-time, first-year students attending 4-year colleges in 1991, percentage distribution of earned bachelor's degrees in 1995, and the index of representation, by race/ethnicity, sex, and field of degree[1]**



| Race/ethnicity and sex | Number of full-time first-time first-year 1991 4-year college enrollment | Percent of full-time first-time first-year 1991 4-year college enrollment | Total degrees | | Engineering | | Physical sciences | |
|---|---|---|---|---|---|---|---|---|
| | | | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 371,494 | 35.9 | 36.7 | 102.04 | 64.3 | 178.90 | 54.9 | 152.75 |
| Asian males | 25,873 | 2.5 | 2.6 | 102.01 | 9.3 | 372.89 | 4.3 | 171.85 |
| Black males | 50,317 | 4.9 | 2.8 | 57.36 | 3.2 | 66.28 | 2.7 | 55.79 |
| Hispanic males | 34,283 | 3.3 | 2.5 | 75.70 | 5.1 | 152.56 | 2.4 | 72.29 |
| American Indian males | 3,024 | 0.3 | 0.2 | 82.17 | 0.3 | 105.15 | 0.4 | 123.78 |
| White females | 406,538 | 39.3 | 43.7 | 111.22 | 12.1 | 30.85 | 27.1 | 69.00 |
| Asian females | 27,228 | 2.6 | 2.8 | 105.82 | 2.5 | 95.88 | 3.1 | 117.27 |
| Black females | 68,697 | 6.6 | 4.9 | 73.58 | 1.7 | 26.27 | 3.0 | 44.50 |
| Hispanic females | 42,756 | 4.1 | 3.5 | 84.52 | 1.3 | 31.95 | 2.0 | 48.15 |
| American Indian females | 3,721 | 0.4 | 0.3 | 94.71 | 0.1 | 21.85 | 0.2 | 48.77 |

| Race/ethnicity and sex | Mathematical science | | Computer science | | Biological science | | Agricultural science | |
|---|---|---|---|---|---|---|---|---|
| | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 42.3 | 117.74 | 54.1 | 150.48 | 36.5 | 101.48 | 57.5 | 160.00 |
| Asian males | 4.0 | 160.81 | 7.3 | 290.02 | 6.4 | 255.26 | 0.9 | 36.64 |
| Black males | 3.7 | 75.84 | 5.7 | 116.91 | 1.8 | 37.14 | 0.9 | 17.53 |
| Hispanic males | 2.4 | 73.66 | 4.0 | 121.12 | 2.5 | 74.46 | 1.6 | 48.49 |
| American Indian males | 0.2 | 76.88 | 0.3 | 114.43 | 0.2 | 80.63 | 0.6 | 197.72 |
| White females | 37.9 | 96.37 | 17.1 | 43.60 | 38.4 | 97.64 | 35.0 | 89.10 |
| Asian females | 3.5 | 131.32 | 3.6 | 136.14 | 6.6 | 250.18 | 1.1 | 42.04 |
| Black females | 4.0 | 60.57 | 5.8 | 86.73 | 4.1 | 62.39 | 1.0 | 15.07 |
| Hispanic females | 1.7 | 41.44 | 2.0 | 47.78 | 3.2 | 77.97 | 1.1 | 26.94 |
| American Indian females | 0.2 | 62.48 | 0.2 | 47.13 | 0.3 | 80.37 | 0.3 | 82.30 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-23. Percentage distribution of full-time, first-time, first-year students attending 4-year colleges in 1991, percentage distribution of earned bachelor's degrees in 1995, and the index of representation, by race/ethnicity, sex, and field of degree[1]**



| | Social sciences | | Psychology | | Non-science and engineering | |
|---|---|---|---|---|---|---|
| Race/ethnicity and sex | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation | Percent distribution of earned bachelor's degrees | Index of representation |
| White males | 42.9 | 119.28 | 21.8 | 60.65 | 33.4 | 92.96 |
| Asian males | 2.6 | 102.02 | 1.4 | 55.37 | 1.7 | 66.94 |
| Black males | 3.6 | 73.75 | 2.0 | 41.19 | 2.7 | 55.57 |
| Hispanic males | 3.0 | 89.49 | 1.7 | 50.28 | 2.3 | 69.14 |
| American Indian males | 0.3 | 108.34 | 0.2 | 58.67 | 0.2 | 74.08 |
| White females | 36.2 | 92.08 | 58.2 | 147.91 | 48.0 | 122.04 |
| Asian females | 3.0 | 112.20 | 3.4 | 128.25 | 2.4 | 92.29 |
| Black females | 5.0 | 75.22 | 6.2 | 93.38 | 5.2 | 77.61 |
| Hispanic females | 3.2 | 78.01 | 4.8 | 116.77 | 3.8 | 91.02 |
| American Indian females | 0.3 | 91.76 | 0.4 | 114.03 | 0.4 | 103.47 |

[1]The numbers of cases for the percent distributions of earned bachelor's degrees are presented in text table 3-6.

NOTE: These data do not include nonresident aliens; and U.S. citizens and permanent residents for whom their race/ethnicity is unknown.

SOURCE: U.S. Department of Education/National Center for Education Statistics, Opening Fall Enrollments Survey and Completions Survey, tabulations by National Science Foundation/SRS.

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**Appendix table 3-24. Full-time enrollment of first-time, first-year students at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Total, all races and ethnicities | 1,081,893 | 1,132,943 | 1,068,432 | 1,055,682 | 1,064,886 | 1,077,987 | 1,076,502 |
| Non-resident aliens | 17,504 | 21,319 | 20,962 | 21,751 | 22,289 | 21,925 | 22,002 |
| White, non-Hispanic | 889,861 | 911,879 | 804,429 | 778,032 | 779,514 | 781,057 | 778,784 |
| Asian or Pacific Islander | 15,550 | 21,181 | 49,764 | 53,101 | 54,885 | 57,406 | 61,772 |
| Underrepresented minorities | 158,977 | 178,564 | 193,277 | 202,798 | 208,198 | 217,599 | 213,944 |
| Black, non-Hispanic | 108,591 | 113,244 | 116,002 | 119,014 | 120,226 | 122,474 | 122,249 |
| Hispanic | 45,223 | 59,841 | 70,748 | 77,039 | 80,858 | 87,598 | 83,427 |
| American Indian or Alaskan Native | 5,162 | 5,479 | 6,527 | 6,745 | 7,114 | 7,527 | 8,268 |
| Men, all races and ethnicities | 547,612 | 554,275 | 506,357 | 497,751 | 500,801 | 505,457 | 498,778 |
| Non-resident aliens | 12,015 | 14,021 | 12,346 | 12,760 | 12,814 | 12,389 | 12,506 |
| White, non-Hispanic | 455,667 | 452,321 | 385,984 | 371,494 | 370,379 | 370,980 | 365,219 |
| Asian or Pacific Islander | 8,081 | 10,849 | 24,904 | 25,873 | 26,950 | 28,186 | 29,679 |
| Underrepresented minorities | 71,850 | 77,084 | 83,123 | 87,624 | 90,658 | 93,902 | 91,374 |
| Black, non-Hispanic | 47,683 | 48,093 | 48,485 | 50,317 | 51,189 | 51,789 | 50,895 |
| Hispanic | 21,767 | 26,393 | 31,614 | 34,283 | 36,157 | 38,664 | 36,701 |
| American Indian or Alaskan Native | 2,399 | 2,598 | 3,024 | 3,024 | 3,312 | 3,449 | 3,778 |
| Women, all races and ethnicities | 534,281 | 578,668 | 562,075 | 557,931 | 564,085 | 572,530 | 577,724 |
| Non-resident aliens | 5,490 | 7,298 | 8,616 | 8,991 | 9,475 | 9,536 | 9,496 |
| White, non-Hispanic | 434,194 | 459,558 | 418,445 | 406,538 | 409,135 | 410,077 | 413,565 |
| Asian or Pacific Islander | 7,470 | 10,332 | 24,860 | 27,228 | 27,935 | 29,220 | 32,093 |
| Underrepresented minorities | 87,127 | 101,480 | 110,154 | 115,174 | 117,540 | 123,697 | 122,570 |
| Black, non-Hispanic | 60,908 | 65,150 | 67,517 | 68,697 | 69,037 | 70,685 | 71,354 |
| Hispanic | 23,456 | 33,449 | 39,134 | 42,756 | 44,701 | 48,934 | 46,726 |
| American Indian or Alaskan Native | 2,763 | 2,881 | 3,503 | 3,721 | 3,802 | 4,078 | 4,490 |
| Percentage distribution: | | | | | | | |
| Total, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.6% | 1.9% | 2.0% | 2.1% | 2.1% | 2.0% | 2.0% |
| White, non-Hispanic | 82.3% | 80.5% | 75.3% | 73.7% | 73.2% | 72.5% | 72.3% |
| Asian or Pacific Islander | 1.4% | 1.9% | 4.7% | 5.0% | 5.2% | 5.3% | 5.7% |
| Underrepresented minorities | 14.7% | 15.8% | 18.1% | 19.2% | 19.6% | 20.2% | 19.9% |
| Black, non-Hispanic | 10.0% | 10.0% | 10.9% | 11.3% | 11.3% | 11.4% | 11.4% |
| Hispanic | 4.2% | 5.3% | 6.6% | 7.3% | 7.6% | 8.1% | 7.7% |
| American Indian or Alaskan Native | 4.8% | 4.8% | 5.6% | 5.7% | 5.9% | 6.1% | 6.8% |

See explanatory information and SOURCES at end of table.

**Appendix table 3-24. Full-time enrollment of first-time, first-year students at all institutions, by sex and race/ethnicity: Fall 1976-1994, selected years**



| Enrollment status, sex, and race/ethnicity | 1976 | 1980 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| Men, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 2.2% | 2.5% | 2.4% | 2.6% | 2.6% | 2.5% | 2.5% |
| White, non-Hispanic | 83.2% | 81.6% | 76.2% | 74.6% | 74.0% | 73.4% | 73.2% |
| Asian or Pacific Islander | 1.5% | 2.0% | 4.9% | 5.2% | 5.4% | 5.6% | 6.0% |
| Underrepresented minorities | 13.1% | 13.9% | 16.4% | 17.6% | 18.1% | 18.6% | 18.3% |
| Black, non-Hispanic | 8.7% | 8.7% | 9.6% | 10.1% | 10.2% | 10.2% | 10.2% |
| Hispanic | 4.0% | 4.8% | 6.2% | 6.9% | 7.2% | 7.6% | 7.4% |
| American Indian or Alaskan Native | 5.0% | 5.4% | 6.2% | 6.0% | 6.5% | 6.7% | 7.4% |
| Women, all races and ethnicities | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Non-resident aliens | 1.0% | 1.3% | 1.5% | 1.6% | 1.7% | 1.7% | 1.6% |
| White, non-Hispanic | 81.3% | 79.4% | 74.4% | 72.9% | 72.5% | 71.6% | 71.6% |
| Asian or Pacific Islander | 1.4% | 1.8% | 4.4% | 4.9% | 5.0% | 5.1% | 5.6% |
| Underrepresented minorities | 16.3% | 17.5% | 19.6% | 20.6% | 20.8% | 21.6% | 21.2% |
| Black, non-Hispanic | 11.4% | 11.3% | 12.0% | 12.3% | 12.2% | 12.3% | 12.4% |
| Hispanic | 4.4% | 5.8% | 7.0% | 7.7% | 7.9% | 8.5% | 8.1% |
| American Indian or Alaskan Native | 4.5% | 4.4% | 5.2% | 5.4% | 5.5% | 5.8% | 6.3% |

NOTE: Other/unknown races and ethnicities have been distributed proportionately across groups. Because of rounding, details may not sum to totals.

SOURCES: U.S. Department of Education/NCES. Opening Fall Enrollment Survey; tabulations by National Science Foundation/SRS.

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**Appendix table 3-25. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to blacks, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all black recipients | | | | | | |
| Total science and engineering | 17,230 | 17,385 | 18,230 | 19,987 | 22,431 | 24,421 | 26,289 |
| Engineering | 2,315 | 2,067 | 2,072 | 2,229 | 2,362 | 2,577 | 2,659 |
| Sciences | 14,915 | 15,318 | 16,158 | 17,758 | 20,069 | 21,844 | 23,630 |
| Natural sciences | 6,524 | 6,005 | 5,782 | 5,834 | 6,401 | 6,972 | 7,559 |
| Physical science [1] | 823 | 697 | 650 | 753 | 816 | 836 | 921 |
| Mathematical science | 834 | 792 | 720 | 811 | 904 | 965 | 992 |
| Computer science | 2,820 | 2,457 | 2,247 | 1,997 | 2,090 | 2,213 | 2,398 |
| Biological science | 1,890 | 1,916 | 1,994 | 2,111 | 2,385 | 2,739 | 2,980 |
| Agricultural science | 157 | 143 | 171 | 162 | 206 | 219 | 268 |
| Social sciences | 8,391 | 9,313 | 10,376 | 11,924 | 13,668 | 14,872 | 16,071 |
| Social science | 5,940 | 6,570 | 7,226 | 8,236 | 9,489 | 10,254 | 10,835 |
| Psychology | 2,451 | 2,743 | 3,150 | 3,688 | 4,179 | 4,618 | 5,236 |
| Non-S&E [2] | 37,873 | 39,452 | 41,071 | 45,022 | 48,880 | 52,246 | 56,027 |
| Grand total | 55,103 | 56,837 | 59,301 | 65,009 | 71,311 | 76,667 | 82,316 |
| | Total, all black recipients from HBCUs | | | | | | |
| Total science and engineering | 5,229 | 5,054 | 5,190 | 5,679 | 6,363 | 7,368 | 7,804 |
| Engineering | 557 | 474 | 524 | 589 | 594 | 700 | 690 |
| Sciences | 4,672 | 4,580 | 4,666 | 5,090 | 5,769 | 6,668 | 7,114 |
| Natural sciences | 2,750 | 2,513 | 2,353 | 2,363 | 2,599 | 3,021 | 3,105 |
| Physical science [1] | 346 | 320 | 296 | 358 | 376 | 390 | 421 |
| Mathematical science | 425 | 381 | 307 | 369 | 420 | 463 | 449 |
| Computer science | 1,187 | 1,048 | 899 | 748 | 780 | 904 | 904 |
| Biological science | 714 | 693 | 764 | 792 | 906 | 1,155 | 1,197 |
| Agricultural science | 78 | 71 | 87 | 96 | 117 | 109 | 134 |
| Social sciences | 1,922 | 2,067 | 2,313 | 2,727 | 3,170 | 3,647 | 4,009 |
| Social science | 1,457 | 1,517 | 1,651 | 1,886 | 2,201 | 2,507 | 2,701 |
| Psychology | 465 | 550 | 662 | 841 | 969 | 1,140 | 1,308 |
| Non-S&E [2] | 11,360 | 10,871 | 11,155 | 12,284 | 13,346 | 14,481 | 15,622 |
| Grand total | 16,589 | 15,925 | 16,345 | 17,963 | 19,709 | 21,849 | 23,426 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-25. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to blacks, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from HBCUs | | | | | | |
| Total science and engineering | 30.3 | 29.1 | 28.5 | 28.4 | 28.4 | 30.2 | 29.7 |
| Engineering | 24.1 | 22.9 | 25.3 | 26.4 | 25.1 | 27.2 | 25.9 |
| Sciences | 31.3 | 29.9 | 28.9 | 28.7 | 28.7 | 30.5 | 30.1 |
| Natural sciences | 42.2 | 41.8 | 40.7 | 40.5 | 40.6 | 43.3 | 41.1 |
| Physical science [1] | 42.0 | 45.9 | 45.5 | 47.5 | 46.1 | 46.7 | 45.7 |
| Mathematical science | 51.0 | 48.1 | 42.6 | 45.5 | 46.5 | 48.0 | 45.3 |
| Computer science | 42.1 | 42.7 | 40.0 | 37.5 | 37.3 | 40.8 | 37.7 |
| Biological science | 37.8 | 36.2 | 38.3 | 37.5 | 38.0 | 42.2 | 40.2 |
| Agricultural science | 49.7 | 49.7 | 50.9 | 59.3 | 56.8 | 49.8 | 50.0 |
| Social sciences | 22.9 | 22.2 | 22.3 | 22.9 | 23.2 | 24.5 | 24.9 |
| Social science | 24.5 | 23.1 | 22.8 | 22.9 | 23.2 | 24.4 | 24.9 |
| Psychology | 19.0 | 20.1 | 21.0 | 22.8 | 23.2 | 24.7 | 25.0 |
| Non-S&E [2] | 30.0 | 27.6 | 27.2 | 27.3 | 27.3 | 27.7 | 27.9 |
| Grand total | 30.1 | 28.0 | 27.6 | 27.6 | 27.6 | 28.5 | 28.5 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

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**Appendix table 3-26. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to black men, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all recipients | | | | | | |
| Total science and engineering | 7,886 | 7,685 | 7,830 | 8,448 | 9,375 | 10,099 | 10,806 |
| Engineering | 1,606 | 1,397 | 1,416 | 1,484 | 1,614 | 1,764 | 1,784 |
| Sciences | 6,280 | 6,288 | 6,414 | 6,964 | 7,761 | 8,335 | 9,022 |
| Natural sciences | 2,939 | 2,732 | 2,476 | 2,538 | 2,709 | 2,872 | 3,146 |
| Physical science [1] | 433 | 365 | 292 | 391 | 381 | 370 | 464 |
| Mathematical science | 399 | 374 | 342 | 380 | 374 | 444 | 457 |
| Computer science | 1,284 | 1,205 | 1,074 | 971 | 1,092 | 1,049 | 1,161 |
| Biological science | 723 | 700 | 658 | 696 | 749 | 883 | 927 |
| Agricultural science | 100 | 88 | 110 | 100 | 113 | 126 | 137 |
| Social sciences | 3,341 | 3,556 | 3,938 | 4,426 | 5,052 | 5,463 | 5,876 |
| Social science | 2,680 | 2,911 | 3,144 | 3,547 | 4,070 | 4,364 | 4,644 |
| Psychology | 661 | 645 | 794 | 879 | 982 | 1,099 | 1,232 |
| Non-S&E [2] | 14,056 | 14,228 | 14,760 | 15,790 | 17,143 | 18,275 | 19,300 |
| Grand total | 21,942 | 21,913 | 22,590 | 24,238 | 26,518 | 28,374 | 30,106 |
| | Total, all black recipients from HBCUs | | | | | | |
| Total science and engineering | 2,337 | 2,112 | 2,086 | 2,211 | 2,450 | 2,761 | 2,940 |
| Engineering | 371 | 308 | 331 | 359 | 380 | 430 | 425 |
| Sciences | 1,966 | 1,804 | 1,755 | 1,852 | 2,070 | 2,331 | 2,515 |
| Natural sciences | 1,193 | 1,056 | 935 | 951 | 972 | 1,089 | 1,162 |
| Physical science [1] | 156 | 160 | 127 | 163 | 145 | 150 | 197 |
| Mathematical science | 213 | 179 | 134 | 164 | 150 | 196 | 181 |
| Computer science | 502 | 460 | 377 | 333 | 364 | 361 | 381 |
| Biological science | 264 | 206 | 231 | 231 | 238 | 317 | 334 |
| Agricultural science | 58 | 51 | 66 | 60 | 75 | 65 | 69 |
| Social sciences | 773 | 748 | 820 | 901 | 1,098 | 1,242 | 1,353 |
| Social science | 661 | 621 | 657 | 720 | 868 | 989 | 1,060 |
| Psychology | 112 | 127 | 163 | 181 | 230 | 253 | 293 |
| Non-S&E [2] | 4,239 | 3,870 | 3,980 | 4,219 | 4,637 | 5,106 | 5,517 |
| Grand total | 6,576 | 5,982 | 6,066 | 6,430 | 7,087 | 7,867 | 8,457 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-26. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to black men, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from HBCUs | | | | | | |
| Total science and engineering | 29.6 | 27.5 | 26.6 | 26.2 | 26.1 | 27.3 | 27.2 |
| Engineering | 23.1 | 22.0 | 23.4 | 24.2 | 23.5 | 24.4 | 23.8 |
| Sciences | 31.3 | 28.7 | 27.4 | 26.6 | 26.7 | 28.0 | 27.9 |
| Natural sciences | 40.6 | 38.7 | 37.8 | 37.5 | 35.9 | 37.9 | 36.9 |
| Physical science [1] | 36.0 | 43.8 | 43.5 | 41.7 | 38.1 | 40.5 | 42.5 |
| Mathematical science | 53.4 | 47.9 | 39.2 | 43.2 | 40.1 | 44.1 | 39.6 |
| Computer science | 39.1 | 38.2 | 35.1 | 34.3 | 33.3 | 34.4 | 32.8 |
| Biological science | 36.5 | 29.4 | 35.1 | 33.2 | 31.8 | 35.9 | 36.0 |
| Agricultural science | 58.0 | 58.0 | 60.0 | 60.0 | 66.4 | 51.6 | 50.4 |
| Social sciences | 23.1 | 21.0 | 20.8 | 20.4 | 21.7 | 22.7 | 23.0 |
| Social science | 24.7 | 21.3 | 20.9 | 20.3 | 21.3 | 22.7 | 22.8 |
| Psychology | 16.9 | 19.7 | 20.5 | 20.6 | 23.4 | 23.0 | 23.8 |
| Non-S&E [2] | 30.2 | 27.2 | 27.0 | 26.7 | 27.0 | 27.9 | 28.6 |
| Grand total | 30.0 | 27.3 | 26.9 | 26.5 | 26.7 | 27.7 | 28.1 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

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**Appendix table 3-27. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to black women, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all black recipients | | | | | | |
| Total science and engineering | 9,344 | 9,700 | 10,400 | 11,539 | 13,056 | 14,322 | 15,483 |
| Engineering | 709 | 670 | 656 | 745 | 748 | 813 | 875 |
| Sciences | 8,635 | 9,030 | 9,744 | 10,794 | 12,308 | 13,509 | 14,608 |
| Natural sciences | 3,585 | 3,273 | 3,306 | 3,296 | 3,692 | 4,100 | 4,413 |
| Physical science [1] | 390 | 332 | 358 | 362 | 435 | 466 | 457 |
| Mathematical science | 435 | 418 | 378 | 431 | 530 | 521 | 535 |
| Computer science | 1,536 | 1,252 | 1,173 | 1,026 | 998 | 1,164 | 1,237 |
| Biological science | 1,167 | 1,216 | 1,336 | 1,415 | 1,636 | 1,856 | 2,053 |
| Agricultural science | 57 | 55 | 61 | 62 | 93 | 93 | 131 |
| Social sciences | 5,050 | 5,757 | 6,438 | 7,498 | 8,616 | 9,409 | 10,195 |
| Social science | 3,260 | 3,659 | 4,082 | 4,689 | 5,419 | 5,890 | 6,191 |
| Psychology | 1,790 | 2,098 | 2,356 | 2,809 | 3,197 | 3,519 | 4,004 |
| Non-S&E [2] | 23,817 | 25,224 | 26,311 | 29,232 | 31,737 | 33,971 | 36,727 |
| Grand total | 33,161 | 34,924 | 36,711 | 40,771 | 44,793 | 48,293 | 52,210 |
| | Total, all black recipients from HBCUs | | | | | | |
| Total science and engineering | 2,892 | 2,942 | 3,104 | 3,468 | 3,913 | 4,607 | 4,864 |
| Engineering | 186 | 166 | 193 | 230 | 214 | 270 | 265 |
| Sciences | 2,706 | 2,776 | 2,911 | 3,238 | 3,699 | 4,337 | 4,599 |
| Natural sciences | 1,557 | 1,457 | 1,418 | 1,412 | 1,627 | 1,932 | 1,943 |
| Physical science [1] | 190 | 160 | 169 | 195 | 231 | 240 | 224 |
| Mathematical science | 212 | 202 | 173 | 205 | 270 | 267 | 268 |
| Computer science | 685 | 588 | 522 | 415 | 416 | 543 | 523 |
| Biological science | 450 | 487 | 533 | 561 | 668 | 838 | 863 |
| Agricultural science | 20 | 20 | 21 | 36 | 42 | 44 | 65 |
| Social sciences | 1,149 | 1,319 | 1,493 | 1,826 | 2,072 | 2,405 | 2,656 |
| Social science | 796 | 896 | 994 | 1,166 | 1,333 | 1,518 | 1,641 |
| Psychology | 353 | 423 | 499 | 660 | 739 | 887 | 1,015 |
| Non-S&E [2] | 7,121 | 7,001 | 7,175 | 8,065 | 8,709 | 9,375 | 10,105 |
| Grand total | 10,013 | 9,943 | 10,279 | 11,533 | 12,622 | 13,982 | 14,969 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-27. Earned bachelor's degrees conferred by all schools and by historically black colleges and universities (HBCUs) to black women, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from HBCUs | | | | | | |
| Total science and engineering | 31.0 | 30.3 | 29.8 | 30.1 | 30.0 | 32.2 | 31.4 |
| Engineering | 26.2 | 24.8 | 29.4 | 30.9 | 28.6 | 33.2 | 30.3 |
| Sciences | 31.3 | 30.7 | 29.9 | 30.0 | 30.1 | 32.1 | 31.5 |
| Natural sciences | 43.4 | 44.5 | 42.9 | 42.8 | 44.1 | 47.1 | 44.0 |
| Physical science [1] | 48.7 | 48.2 | 47.2 | 53.9 | 53.1 | 51.5 | 49.0 |
| Mathematical science | 48.7 | 48.3 | 45.8 | 47.6 | 50.9 | 51.2 | 50.1 |
| Computer science | 44.6 | 47.0 | 44.5 | 40.4 | 41.7 | 46.6 | 42.3 |
| Biological science | 38.6 | 40.0 | 39.9 | 39.6 | 40.8 | 45.2 | 42.0 |
| Agricultural science | 35.1 | 36.4 | 34.4 | 58.1 | 45.2 | 47.3 | 49.6 |
| Social sciences | 22.8 | 22.9 | 23.2 | 24.4 | 24.0 | 25.6 | 26.1 |
| Social science | 24.4 | 24.5 | 24.4 | 24.9 | 24.6 | 25.8 | 26.5 |
| Psychology | 19.7 | 20.2 | 21.2 | 23.5 | 23.1 | 25.2 | 25.3 |
| Non-S&E [2] | 29.9 | 27.8 | 27.3 | 27.6 | 27.4 | 27.6 | 27.5 |
| Grand total | 30.2 | 28.5 | 28.0 | 28.3 | 28.2 | 29.0 | 28.7 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-28. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanics, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all Hispanic recipients | | | | | | |
| Total science and engineering | 12,419 | 13,327 | 13,918 | 15,351 | 17,391 | 18,442 | 20,529 |
| Engineering | 2,554 | 2,561 | 2,511 | 2,566 | 2,733 | 2,961 | 3,143 |
| Sciences | 9,865 | 10,766 | 11,407 | 12,785 | 14,658 | 15,481 | 17,386 |
| Natural sciences | 4,660 | 4,417 | 4,357 | 4,705 | 4,892 | 5,034 | 5,648 |
| Physical science [1] | 585 | 563 | 522 | 533 | 546 | 599 | 733 |
| Mathematical science | 321 | 373 | 413 | 480 | 482 | 470 | 543 |
| Computer science | 1,375 | 1,195 | 1,085 | 1,215 | 1,173 | 1,096 | 1,135 |
| Biological science | 2,146 | 2,090 | 2,119 | 2,264 | 2,477 | 2,652 | 2,901 |
| Agricultural science | 233 | 196 | 218 | 213 | 214 | 217 | 336 |
| Social sciences | 5,205 | 6,349 | 7,050 | 8,080 | 9,766 | 10,447 | 11,738 |
| Social science | 3,503 | 4,197 | 4,645 | 5,334 | 6,519 | 6,860 | 7,748 |
| Psychology | 1,702 | 2,152 | 2,405 | 2,746 | 3,247 | 3,587 | 3,990 |
| Non-S&E [2] | 25,777 | 28,034 | 29,946 | 33,676 | 35,616 | 39,403 | 42,154 |
| Grand total | 38,196 | 41,361 | 43,864 | 49,027 | 53,007 | 57,845 | 62,683 |
| | Total, all Hispanic recipients from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 3,065 | 3,056 | 2,983 | 2,952 | 3,007 | 3,001 | 3,205 |
| Engineering | 584 | 651 | 626 | 554 | 686 | 697 | 742 |
| Sciences | 2,481 | 2,405 | 2,357 | 2,398 | 2,321 | 2,304 | 2,463 |
| Natural sciences | 1,556 | 1,479 | 1,447 | 1,446 | 1,339 | 1,300 | 1,374 |
| Physical science [1] | 173 | 184 | 184 | 154 | 172 | 172 | 227 |
| Mathematical science | 58 | 69 | 69 | 108 | 34 | 41 | 27 |
| Computer science | 337 | 326 | 261 | 327 | 296 | 254 | 258 |
| Biological science | 916 | 858 | 862 | 797 | 837 | 833 | 808 |
| Agricultural science | 72 | 42 | 71 | 60 | 0 | 0 | 54 |
| Social sciences | 925 | 926 | 910 | 952 | 982 | 1,004 | 1,089 |
| Social science | 576 | 501 | 495 | 523 | 496 | 508 | 590 |
| Psychology | 349 | 425 | 415 | 429 | 486 | 496 | 499 |
| Non-S&E [2] | 8,871 | 9,146 | 9,192 | 9,558 | 9,748 | 10,358 | 10,249 |
| Grand total | 11,936 | 12,202 | 12,175 | 12,510 | 12,755 | 13,359 | 13,454 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-28. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanics, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 24.7 | 22.9 | 21.4 | 19.2 | 17.3 | 16.3 | 15.6 |
| Engineering | 22.9 | 25.4 | 24.9 | 21.6 | 25.1 | 23.5 | 23.6 |
| Sciences | 25.1 | 22.3 | 20.7 | 18.8 | 15.8 | 14.9 | 14.2 |
| Natural sciences | 33.4 | 33.5 | 33.2 | 30.7 | 27.4 | 25.8 | 24.3 |
| Physical science [1] | 29.6 | 32.7 | 35.2 | 28.9 | 31.5 | 28.7 | 31.0 |
| Mathematical science | 18.1 | 18.5 | 16.7 | 22.5 | 7.1 | 8.7 | 5.0 |
| Computer science | 24.5 | 27.3 | 24.1 | 26.9 | 25.2 | 23.2 | 22.7 |
| Biological science | 42.7 | 41.1 | 40.7 | 35.2 | 33.8 | 31.4 | 27.9 |
| Agricultural science | 30.9 | 21.4 | 32.6 | 28.2 | 0.0 | 0.0 | 16.1 |
| Social sciences | 17.8 | 14.6 | 12.9 | 11.8 | 10.1 | 9.6 | 9.3 |
| Social science | 16.4 | 11.9 | 10.7 | 9.8 | 7.6 | 7.4 | 7.6 |
| Psychology | 20.5 | 19.7 | 17.3 | 15.6 | 15.0 | 13.8 | 12.5 |
| Non-S&E [2] | 34.4 | 32.6 | 30.7 | 28.4 | 27.4 | 26.3 | 24.3 |
| Grand total | 31.2 | 29.5 | 27.8 | 25.5 | 24.1 | 23.1 | 21.5 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

**Appendix table 3-29. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanic men, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all Hispanic recipients | | | | | | |
| Total science and engineering | 6,974 | 7,318 | 7,434 | 7,888 | 8,730 | 9,160 | 10,190 |
| Engineering | 2,100 | 2,100 | 2,035 | 2,039 | 2,187 | 2,355 | 2,495 |
| Sciences | 4,874 | 5,218 | 5,399 | 5,849 | 6,543 | 6,805 | 7,695 |
| Natural sciences | 2,516 | 2,432 | 2,328 | 2,458 | 2,497 | 2,608 | 2,925 |
| Physical science [1] | 377 | 362 | 311 | 318 | 326 | 361 | 415 |
| Mathematical science | 196 | 224 | 249 | 259 | 279 | 273 | 300 |
| Computer science | 766 | 750 | 669 | 738 | 724 | 700 | 719 |
| Biological science | 1,018 | 965 | 955 | 1,019 | 1,043 | 1,144 | 1,298 |
| Agricultural science | 159 | 131 | 144 | 124 | 125 | 130 | 193 |
| Social sciences | 2,358 | 2,786 | 3,071 | 3,391 | 4,046 | 4,197 | 4,770 |
| Social science | 1,845 | 2,153 | 2,384 | 2,634 | 3,220 | 3,269 | 3,774 |
| Psychology | 513 | 633 | 687 | 757 | 826 | 928 | 996 |
| Non-S&E [2] | 9,664 | 10,684 | 11,249 | 12,893 | 13,296 | 14,665 | 15,670 |
| Grand total | 16,638 | 18,002 | 18,683 | 20,781 | 22,026 | 23,825 | 25,860 |
| | Hispanic recipients from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 1,524 | 1,559 | 1,462 | 1,365 | 1,362 | 1,339 | 1,426 |
| Engineering | 453 | 525 | 481 | 398 | 498 | 511 | 534 |
| Sciences | 1,071 | 1,034 | 981 | 967 | 864 | 828 | 892 |
| Natural sciences | 730 | 671 | 626 | 612 | 520 | 496 | 540 |
| Physical science [1] | 98 | 91 | 90 | 70 | 78 | 70 | 86 |
| Mathematical science | 30 | 39 | 47 | 50 | 20 | 24 | 15 |
| Computer science | 172 | 197 | 143 | 170 | 159 | 147 | 149 |
| Biological science | 377 | 322 | 302 | 293 | 263 | 255 | 258 |
| Agricultural science | 53 | 22 | 44 | 29 | 0 | 0 | 32 |
| Social sciences | 341 | 363 | 355 | 355 | 344 | 332 | 352 |
| Social science | 272 | 257 | 252 | 245 | 243 | 211 | 248 |
| Psychology | 69 | 106 | 103 | 110 | 101 | 121 | 104 |
| Non-S&E [2] | 2,578 | 2,814 | 2,804 | 3,204 | 2,890 | 3,030 | 3,087 |
| Grand total | 4,102 | 4,373 | 4,266 | 4,569 | 4,252 | 4,369 | 4,513 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-29. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanic men, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 21.9 | 21.3 | 19.7 | 17.3 | 15.6 | 14.6 | 14.0 |
| Engineering | 21.6 | 25.0 | 23.6 | 19.5 | 22.8 | 21.7 | 21.4 |
| Sciences | 22.0 | 19.8 | 18.2 | 16.5 | 13.2 | 12.2 | 11.6 |
| Natural sciences | 29.0 | 27.6 | 26.9 | 24.9 | 20.8 | 19.0 | 18.5 |
| Physical science [1] | 26.0 | 25.1 | 28.9 | 22.0 | 23.9 | 19.4 | 20.7 |
| Mathematical science | 15.3 | 17.4 | 18.9 | 19.3 | 7.2 | 8.8 | 5.0 |
| Computer science | 22.5 | 26.3 | 21.4 | 23.0 | 22.0 | 21.0 | 20.7 |
| Biological science | 37.0 | 33.4 | 31.6 | 28.8 | 25.2 | 22.3 | 19.9 |
| Agricultural science | 33.3 | 16.8 | 30.6 | 23.4 | 0.0 | 0.0 | 16.6 |
| Social sciences | 14.5 | 13.0 | 11.6 | 10.5 | 8.5 | 7.9 | 7.4 |
| Social science | 14.7 | 11.9 | 10.6 | 9.3 | 7.5 | 6.5 | 6.6 |
| Psychology | 13.5 | 16.7 | 15.0 | 14.5 | 12.2 | 13.0 | 10.4 |
| Non-S&E [2] | 26.7 | 26.3 | 24.9 | 24.9 | 21.7 | 20.7 | 19.7 |
| Grand total | 24.7 | 24.3 | 22.8 | 22.0 | 19.3 | 18.3 | 17.5 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 3-30. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanic women, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Total, all Hispanic recipients | | | | | | |
| Total science and engineering | 5,445 | 6,009 | 6,484 | 7,463 | 8,661 | 9,282 | 10,339 |
| Engineering | 454 | 461 | 476 | 527 | 546 | 606 | 648 |
| Sciences | 4,991 | 5,548 | 6,008 | 6,936 | 8,115 | 8,676 | 9,691 |
| Natural sciences | 2,144 | 1,985 | 2,029 | 2,247 | 2,395 | 2,426 | 2,723 |
| Physical science [1] | 208 | 201 | 211 | 215 | 220 | 238 | 318 |
| Mathematical science | 125 | 149 | 164 | 221 | 203 | 197 | 243 |
| Computer science | 609 | 445 | 416 | 477 | 449 | 396 | 416 |
| Biological science | 1,128 | 1,125 | 1,164 | 1,245 | 1,434 | 1,508 | 1,603 |
| Agricultural science | 74 | 65 | 74 | 89 | 89 | 87 | 143 |
| Social sciences | 2,847 | 3,563 | 3,979 | 4,689 | 5,720 | 6,250 | 6,968 |
| Social science | 1,658 | 2,044 | 2,261 | 2,700 | 3,299 | 3,591 | 3,974 |
| Psychology | 1,189 | 1,519 | 1,718 | 1,989 | 2,421 | 2,659 | 2,994 |
| Non-S&E [2] | 16,113 | 17,350 | 18,697 | 20,783 | 22,320 | 24,738 | 26,484 |
| Grand total | 21,558 | 23,359 | 25,181 | 28,246 | 30,981 | 34,020 | 36,823 |
| | Hispanic recipients from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 1,541 | 1,497 | 1,521 | 1,587 | 1,645 | 1,662 | 1,779 |
| Engineering | 131 | 126 | 145 | 156 | 188 | 186 | 208 |
| Sciences | 1,410 | 1,371 | 1,376 | 1,431 | 1,457 | 1,476 | 1,571 |
| Natural sciences | 826 | 808 | 821 | 834 | 819 | 804 | 834 |
| Physical science [1] | 75 | 93 | 94 | 84 | 94 | 102 | 141 |
| Mathematical science | 28 | 30 | 22 | 58 | 14 | 17 | 12 |
| Computer science | 165 | 129 | 118 | 157 | 137 | 107 | 109 |
| Biological science | 539 | 536 | 560 | 504 | 574 | 578 | 550 |
| Agricultural science | 19 | 20 | 27 | 31 | 0 | 0 | 22 |
| Social sciences | 584 | 563 | 555 | 597 | 638 | 672 | 737 |
| Social science | 304 | 244 | 243 | 278 | 253 | 297 | 342 |
| Psychology | 280 | 319 | 312 | 319 | 385 | 375 | 395 |
| Non-S&E [2] | 6,293 | 6,332 | 6,388 | 6,354 | 6,858 | 7,328 | 7,162 |
| Grand total | 7,834 | 7,829 | 7,909 | 7,941 | 8,503 | 8,990 | 8,941 |

See explanatory information and SOURCES at end of table.

**Appendix table 3-30. Earned bachelor's degrees conferred by all schools and by institutions in Puerto Rico to Hispanic women, by field: 1987-1994, selected years**



| Field | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|
| | Percentage from institutions in Puerto Rico | | | | | | |
| Total science and engineering | 28.3 | 24.9 | 23.5 | 21.3 | 19.0 | 17.9 | 17.2 |
| Engineering | 28.9 | 27.3 | 30.5 | 29.6 | 34.4 | 30.7 | 32.1 |
| Sciences | 28.3 | 24.7 | 22.9 | 20.6 | 18.0 | 17.0 | 16.2 |
| Natural sciences | 38.5 | 40.7 | 40.5 | 37.1 | 34.2 | 33.1 | 30.6 |
| Physical science [1] | 36.1 | 46.3 | 44.5 | 39.1 | 42.7 | 42.9 | 44.3 |
| Mathematical science | 22.4 | 20.1 | 13.4 | 26.2 | 6.9 | 8.6 | 4.9 |
| Computer science | 27.1 | 29.0 | 28.4 | 32.9 | 30.5 | 27.0 | 26.2 |
| Biological science | 47.8 | 47.6 | 48.1 | 40.5 | 40.0 | 38.3 | 34.3 |
| Agricultural science | 25.7 | 30.8 | 36.5 | 34.8 | 0.0 | 0.0 | 15.4 |
| Social sciences | 20.5 | 15.8 | 13.9 | 12.7 | 11.2 | 10.8 | 10.6 |
| Social science | 18.3 | 11.9 | 10.7 | 10.3 | 7.7 | 8.3 | 8.6 |
| Psychology | 23.5 | 21.0 | 18.2 | 16.0 | 15.9 | 14.1 | 13.2 |
| Non-S&E [2] | 39.1 | 36.5 | 34.2 | 30.6 | 30.7 | 29.6 | 27.0 |
| Grand total | 36.3 | 33.5 | 31.4 | 28.1 | 27.4 | 26.4 | 24.3 |

[1] In this table, "Physical science" includes earth, atmospheric, and ocean sciences, as well as physics, astronomy, and chemistry.

[2] Non-S&E refers to non-science and non-engineering.

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. 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).

SOURCE: Tabulations by National Science Foundation/SRS; data from National Center for Education Statistics IPEDS Completions Surveys, 1987-1994.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

## Appendix table 4-1. Graduate student enrollment in science and engineering, by field: 1985-1995



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 358,126 | 368,119 | 373,355 | 375,287 | 382,769 | 397,159 | 412,708 | 430,797 | 436,233 | 431,758 | 423,922 | 18.37 | -2.82 |
| Total sciences | 262,135 | 266,245 | 269,402 | 272,458 | 278,726 | 289,534 | 299,132 | 312,762 | 319,352 | 318,698 | 316,393 | 20.70 | -0.93 |
| Physical sciences | 30,981 | 32,246 | 32,727 | 32,962 | 33,616 | 34,075 | 34,710 | 35,348 | 35,318 | 34,449 | 33,470 | 8.03 | -5.23 |
| Astronomy | 671 | 689 | 719 | 731 | 789 | 810 | 829 | 869 | 880 | 973 | 912 | 35.92 | 3.64 |
| Chemistry | 18,305 | 18,744 | 18,827 | 18,579 | 18,828 | 19,118 | 19,407 | 19,929 | 20,131 | 19,797 | 19,645 | 7.32 | -2.41 |
| Physics | 11,672 | 12,437 | 12,807 | 13,308 | 13,657 | 13,813 | 14,081 | 14,122 | 13,841 | 13,162 | 12,427 | 6.47 | -10.22 |
| Other physical sciences | 333 | 376 | 374 | 344 | 342 | 334 | 393 | 428 | 466 | 517 | 486 | 45.95 | 4.29 |
| Earth, atmospheric, and ocean sciences | 15,420 | 15,066 | 14,371 | 13,867 | 13,643 | 13,984 | 14,480 | 15,347 | 15,805 | 16,042 | 15,802 | 2.48 | -0.02 |
| Atmospheric sciences | 964 | 961 | 952 | 940 | 912 | 929 | 968 | 1,089 | 1,112 | 1,109 | 1,072 | 11.20 | -3.60 |
| Earth sciences | 10,294 | 9,819 | 8,998 | 8,463 | 8,052 | 7,692 | 7,567 | 7,744 | 7,785 | 7,741 | 7,602 | -26.15 | -2.35 |
| Oceanography | 2,081 | 2,128 | 2,127 | 2,033 | 2,207 | 2,333 | 2,386 | 2,530 | 2,611 | 2,853 | 2,703 | 29.89 | 3.52 |
| Other geosciences | 2,081 | 2,158 | 2,294 | 2,431 | 2,472 | 3,030 | 3,559 | 3,984 | 4,297 | 4,339 | 4,425 | 112.64 | 2.98 |
| Mathematics and statistics | 17,563 | 17,949 | 18,508 | 19,077 | 19,247 | 19,774 | 19,952 | 20,355 | 20,000 | 19,579 | 18,509 | 5.39 | -7.46 |
| Computer science | 29,769 | 31,349 | 32,051 | 32,227 | 32,482 | 34,257 | 34,610 | 36,320 | 36,298 | 34,278 | 33,509 | 12.56 | -7.68 |
| Agricultural sciences | 11,561 | 11,458 | 11,118 | 11,135 | 11,190 | 11,316 | 11,506 | 11,827 | 11,914 | 12,199 | 12,426 | 7.48 | 4.30 |
| Biological sciences | 46,112 | 46,765 | 46,747 | 47,565 | 48,852 | 49,989 | 51,778 | 54,177 | 56,452 | 58,143 | 58,753 | 27.41 | 4.08 |
| Psychology | 40,721 | 41,241 | 42,612 | 43,963 | 45,528 | 48,168 | 51,343 | 53,599 | 54,680 | 54,726 | 54,243 | 33.21 | -0.80 |
| Social sciences | 70,008 | 70,171 | 71,268 | 71,662 | 74,168 | 77,971 | 80,753 | 85,789 | 88,885 | 89,282 | 89,681 | 28.10 | 0.90 |
| Economics | 14,698 | 14,351 | 14,201 | 14,295 | 14,415 | 14,599 | 15,071 | 15,774 | 15,629 | 15,267 | 15,111 | 2.81 | -3.31 |
| Political science and public administration | 26,621 | 27,091 | 27,429 | 27,723 | 29,194 | 30,582 | 31,707 | 33,797 | 35,151 | 34,383 | 34,374 | 29.12 | -2.21 |
| Sociology | 7,620 | 7,553 | 7,968 | 8,077 | 8,393 | 8,965 | 9,292 | 9,990 | 10,360 | 10,485 | 10,516 | 38.01 | 1.51 |
| Anthropology | 5,631 | 5,805 | 5,835 | 5,945 | 6,128 | 6,479 | 6,731 | 7,123 | 7,361 | 7,665 | 7,694 | 36.64 | 4.52 |
| Linguistics | 3,055 | 3,109 | 3,282 | 3,243 | 3,286 | 3,404 | 3,425 | 3,277 | 3,321 | 3,279 | 3,194 | 4.55 | -3.82 |
| History of science | 272 | 266 | 294 | 288 | 304 | 331 | 337 | 360 | 369 | 387 | 401 | 47.43 | 8.67 |
| Other social sciences | 12,111 | 11,996 | 12,259 | 12,091 | 12,448 | 13,611 | 14,190 | 15,468 | 16,694 | 17,816 | 18,391 | 51.85 | 10.17 |
| Engineering | 95,991 | 101,874 | 103,953 | 102,829 | 104,043 | 107,625 | 113,576 | 118,035 | 116,881 | 113,060 | 107,529 | 12.02 | -8.00 |
| Aerospace engineering | 2,538 | 2,804 | 3,015 | 3,223 | 3,524 | 3,934 | 4,120 | 4,036 | 3,940 | 3,715 | 3,343 | 31.72 | -15.15 |
| Chemical engineering | 7,150 | 7,012 | 7,111 | 6,618 | 6,460 | 6,735 | 7,127 | 7,397 | 7,516 | 7,608 | 7,432 | 3.94 | -1.12 |
| Civil engineering | 14,902 | 14,976 | 14,682 | 14,811 | 14,909 | 15,542 | 17,398 | 19,572 | 19,583 | 19,925 | 19,218 | 28.96 | -1.86 |
| Electrical engineering | 28,203 | 29,969 | 31,399 | 32,035 | 33,257 | 33,722 | 35,182 | 36,460 | 35,337 | 33,052 | 31,060 | 10.13 | -12.10 |
| Mechanical engineering | 14,157 | 15,713 | 16,366 | 16,151 | 16,265 | 16,879 | 17,730 | 18,637 | 18,477 | 17,761 | 16,360 | 15.56 | -11.46 |
| Materials engineering | 3,943 | 4,208 | 4,366 | 4,337 | 4,594 | 4,941 | 5,160 | 5,512 | 5,363 | 5,191 | 4,920 | 24.78 | -8.26 |
| Industrial engineering | 10,499 | 11,529 | 12,220 | 11,393 | 11,094 | 11,248 | 12,676 | 13,525 | 13,596 | 13,696 | 13,182 | 25.55 | -3.05 |
| Other engineering | 14,599 | 15,663 | 14,794 | 14,261 | 13,940 | 14,624 | 14,183 | 12,896 | 13,069 | 12,112 | 12,014 | -17.71 | -8.07 |

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

## Appendix table 4-2. Female graduate student enrollment in science and engineering, by field: 1985-1995



| Academic Discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1995 | Percent proportion 1985 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 110,662 | 114,423 | 117,197 | 121,276 | 125,908 | 133,752 | 140,855 | 150,332 | 156,757 | 159,338 | 160,864 | 45.4 | 2.6 | 100.0 | 100 |
| Total sciences | 99,582 | 102,058 | 104,234 | 108,152 | 112,308 | 119,080 | 125,140 | 133,099 | 139,065 | 141,284 | 142,712 | 43.3 | 2.6 | 88.7 | 90.0 |
| Physical sciences | 6,507 | 6,862 | 7,114 | 7,497 | 7,801 | 8,068 | 8,564 | 8,844 | 9,202 | 9,159 | 9,111 | 40.0 | -1.0 | 5.7 | 5.9 |
| Astronomy | 108 | 121 | 118 | 140 | 140 | 165 | 172 | 186 | 198 | 223 | 223 | 106.5 | 12.6 | 0.1 | 0.1 |
| Chemistry | 4,789 | 5,026 | 5,178 | 5,467 | 5,670 | 5,868 | 6,262 | 6,562 | 6,852 | 6,841 | 6,856 | 43.2 | 0.1 | 4.3 | 4.3 |
| Physics | 1,497 | 1,576 | 1,673 | 1,751 | 1,868 | 1,913 | 1,980 | 1,943 | 1,976 | 1,908 | 1,835 | 22.6 | -7.1 | 1.1 | 1.4 |
| Other physical sciences | 113 | 139 | 145 | 139 | 123 | 122 | 150 | 153 | 176 | 187 | 197 | 74.3 | 11.9 | 0.1 | 0.1 |
| Earth, atmospheric, and ocean sciences | 3,927 | 3,947 | 3,779 | 3,805 | 3,858 | 4,119 | 4,455 | 4,858 | 5,060 | 5,353 | 5,479 | 39.5 | 8.3 | 3.4 | 3.5 |
| Atmospheric sciences | 157 | 179 | 168 | 163 | 178 | 185 | 190 | 241 | 225 | 242 | 237 | 51.0 | 5.3 | 0.1 | 0.1 |
| Earth sciences | 2,484 | 2,356 | 2,164 | 2,095 | 1,963 | 1,922 | 2,008 | 2,077 | 2,110 | 2,235 | 2,302 | -7.3 | 9.1 | 1.4 | 2.2 |
| Oceanography | 610 | 667 | 634 | 645 | 725 | 781 | 846 | 959 | 1,004 | 1,107 | 1,099 | 80.2 | 9.5 | 0.7 | 0.6 |
| Other geosciences | 676 | 745 | 813 | 902 | 992 | 1,231 | 1,411 | 1,581 | 1,721 | 1,769 | 1,841 | 172.3 | 7.0 | 1.1 | 0.6 |
| Mathematics and statistics | 5,354 | 5,479 | 5,596 | 5,776 | 5,985 | 6,199 | 6,298 | 6,549 | 6,638 | 6,535 | 6,261 | 16.9 | -5.7 | 3.9 | 4.8 |
| Computer science | 7,561 | 7,852 | 8,015 | 8,194 | 7,988 | 8,199 | 8,270 | 8,467 | 8,472 | 8,152 | 8,175 | 8.1 | -3.5 | 5.1 | 6.8 |
| Agricultural sciences | 2,991 | 2,953 | 2,952 | 3,097 | 3,145 | 3,335 | 3,567 | 3,768 | 4,088 | 4,288 | 4,451 | 48.8 | 8.9 | 2.8 | 2.7 |
| Biological sciences | 19,904 | 20,471 | 20,433 | 21,261 | 22,234 | 23,042 | 24,135 | 25,475 | 27,053 | 28,155 | 28,819 | 44.8 | 6.5 | 17.9 | 18.0 |
| Psychology | 25,124 | 25,864 | 26,929 | 28,461 | 29,855 | 32,346 | 34,787 | 36,904 | 38,068 | 38,240 | 38,142 | 51.8 | 0.2 | 23.7 | 22.7 |
| Social sciences | 28,214 | 28,630 | 29,416 | 30,061 | 31,442 | 33,772 | 35,064 | 38,234 | 40,484 | 41,402 | 42,274 | 49.8 | 4.4 | 26.3 | 25.5 |
| Economics | 3,564 | 3,509 | 3,518 | 3,645 | 3,824 | 3,973 | 4,195 | 4,514 | 4,606 | 4,549 | 4,680 | 31.3 | 1.6 | 2.9 | 3.2 |
| Political science and public administration | 10,345 | 10,677 | 10,866 | 11,393 | 12,170 | 13,157 | 13,736 | 14,971 | 15,784 | 15,605 | 15,979 | 54.5 | 1.2 | 9.9 | 9.3 |
| Sociology | 4,037 | 4,099 | 4,352 | 4,387 | 4,565 | 4,960 | 5,101 | 5,684 | 6,080 | 6,331 | 6,341 | 57.1 | 4.3 | 3.9 | 3.6 |
| Anthropology | 3,121 | 3,345 | 3,353 | 3,446 | 3,580 | 3,791 | 3,953 | 4,247 | 4,392 | 4,593 | 4,556 | 46.0 | 3.7 | 2.8 | 2.8 |
| Linguistics | 1,857 | 1,857 | 1,977 | 1,947 | 1,952 | 2,006 | 1,913 | 1,996 | 2,020 | 2,066 | 2,000 | 7.7 | -1.0 | 1.2 | 1.7 |
| History of science | 92 | 97 | 96 | 104 | 112 | 118 | 132 | 130 | 142 | 140 | 139 | 51.1 | -2.1 | 0.1 | 0.1 |
| Other social sciences | 5,198 | 5,046 | 5,254 | 5,139 | 5,239 | 5,767 | 6,034 | 6,692 | 7,460 | 8,118 | 8,579 | 65.0 | 15.0 | 5.3 | 4.7 |
| Engineering | 11,080 | 12,365 | 12,963 | 13,124 | 13,600 | 14,672 | 15,715 | 17,233 | 17,692 | 18,054 | 18,152 | 63.8 | 2.6 | 11.3 | 10.0 |
| Aerospace engineering | 163 | 200 | 224 | 227 | 243 | 289 | 327 | 348 | 357 | 358 | 351 | 115.3 | -1.7 | 0.2 | 0.1 |
| Chemical engineering | 1,004 | 1,039 | 1,154 | 1,075 | 1,029 | 1,146 | 1,257 | 1,394 | 1,499 | 1,526 | 1,558 | 55.2 | 3.9 | 1.0 | 0.9 |
| Civil engineering | 2,147 | 2,147 | 2,103 | 2,294 | 2,435 | 2,689 | 3,102 | 3,654 | 3,858 | 4,211 | 4,232 | 97.1 | 9.7 | 2.6 | 1.9 |
| Electrical engineering | 2,435 | 2,908 | 3,098 | 3,278 | 3,515 | 3,715 | 3,871 | 4,293 | 4,322 | 4,104 | 4,202 | 72.6 | -2.8 | 2.6 | 2.2 |
| Mechanical engineering | 1,011 | 1,159 | 1,296 | 1,402 | 1,398 | 1,442 | 1,511 | 1,698 | 1,774 | 1,823 | 1,670 | 65.2 | -5.9 | 1.0 | 0.9 |
| Materials engineering | 603 | 675 | 729 | 756 | 810 | 893 | 987 | 1,069 | 1,027 | 1,069 | 1,059 | 75.6 | 3.1 | 0.7 | 0.5 |
| Industrial engineering | 1,780 | 2,095 | 2,244 | 2,093 | 2,110 | 2,137 | 2,355 | 2,655 | 2,593 | 2,800 | 2,795 | 57.0 | 7.8 | 1.7 | 1.6 |
| Other engineering | 1,937 | 2,142 | 2,115 | 1,999 | 2,060 | 2,361 | 2,305 | 2,122 | 2,262 | 2,163 | 2,285 | 18.0 | 1.0 | 1.4 | 1.8 |

NOTE: Because of rounding, details may not add to totals.

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

## Appendix table 4-3. Male graduate student enrollment in science and engineering, by field: 1985-1995



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1995 | Percent proportion 1985 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 247,464 | 253,696 | 256,158 | 254,011 | 256,861 | 263,407 | 271,853 | 280,465 | 279,476 | 272,420 | 263,058 | 6.3 | -5.9 | 100.0 | 100.0 |
| Total sciences | 162,553 | 164,187 | 165,168 | 164,306 | 166,418 | 170,454 | 173,992 | 179,663 | 180,287 | 177,414 | 173,681 | 6.8 | -3.7 | 66.0 | 65.7 |
| Physical sciences | 24,474 | 25,384 | 25,613 | 25,465 | 25,815 | 26,007 | 26,146 | 26,504 | 26,116 | 25,290 | 24,359 | -0.5 | -6.7 | 9.3 | 9.9 |
| Astronomy | 563 | 568 | 601 | 591 | 649 | 645 | 657 | 683 | 682 | 750 | 689 | 22.4 | 1.0 | 0.3 | 0.2 |
| Chemistry | 13,516 | 13,718 | 13,649 | 13,112 | 13,158 | 13,250 | 13,145 | 13,367 | 13,279 | 12,956 | 12,789 | -5.4 | -3.7 | 4.9 | 5.5 |
| Physics | 10,175 | 10,861 | 11,134 | 11,557 | 11,789 | 11,900 | 12,101 | 12,179 | 11,865 | 11,254 | 10,592 | 4.1 | -10.7 | 4.0 | 4.1 |
| Other physical sciences | 220 | 237 | 229 | 205 | 219 | 212 | 243 | 275 | 290 | 330 | 289 | 31.4 | -0.3 | 0.1 | 0.1 |
| Earth, atmospheric, and ocean sciences | 11,493 | 11,119 | 10,592 | 10,062 | 9,785 | 9,865 | 10,025 | 10,489 | 10,745 | 10,689 | 10,323 | -10.2 | -3.9 | 3.9 | 4.6 |
| Atmospheric sciences | 807 | 782 | 784 | 777 | 734 | 744 | 778 | 848 | 887 | 867 | 835 | 3.5 | -5.9 | 0.3 | 0.3 |
| Earth sciences | 7,810 | 7,463 | 6,834 | 6,368 | 6,089 | 5,770 | 5,559 | 5,667 | 5,675 | 5,506 | 5,300 | -32.1 | -6.6 | 2.0 | 3.2 |
| Oceanography | 1,471 | 1,461 | 1,493 | 1,388 | 1,482 | 1,552 | 1,540 | 1,571 | 1,607 | 1,746 | 1,604 | 9.0 | -0.2 | 0.6 | 0.6 |
| Other geosciences | 1,405 | 1,413 | 1,481 | 1,529 | 1,480 | 1,799 | 2,148 | 2,403 | 2,576 | 2,570 | 2,584 | 83.9 | 0.3 | 1.0 | 0.6 |
| Mathematics and statistics | 12,209 | 12,470 | 12,912 | 13,301 | 13,262 | 13,575 | 13,654 | 13,806 | 13,362 | 13,044 | 12,248 | 0.3 | -8.3 | 4.7 | 4.9 |
| Computer science | 22,208 | 23,497 | 24,036 | 24,033 | 24,494 | 26,058 | 26,340 | 27,853 | 27,826 | 26,126 | 25,334 | 14.1 | -9.0 | 9.6 | 9.0 |
| Agricultural sciences | 8,570 | 8,505 | 8,166 | 8,038 | 8,045 | 7,981 | 7,939 | 8,059 | 7,826 | 7,911 | 7,975 | -6.9 | 1.9 | 3.0 | 3.5 |
| Biological sciences | 26,208 | 26,294 | 26,314 | 26,304 | 26,618 | 26,947 | 27,643 | 28,702 | 29,399 | 29,988 | 29,934 | 14.2 | 1.8 | 11.4 | 10.6 |
| Psychology | 15,597 | 15,377 | 15,683 | 15,502 | 15,673 | 15,822 | 16,556 | 16,695 | 16,612 | 16,486 | 16,101 | 3.2 | -3.1 | 6.1 | 6.3 |
| Social sciences | 41,794 | 41,541 | 41,852 | 41,601 | 42,726 | 44,199 | 45,689 | 47,555 | 48,401 | 47,880 | 47,407 | 13.4 | -2.1 | 18.0 | 16.9 |
| Economics | 11,134 | 10,842 | 10,683 | 10,650 | 10,591 | 10,626 | 10,876 | 11,260 | 11,023 | 10,718 | 10,431 | -6.3 | -5.4 | 4.0 | 4.5 |
| Political science and public administration | 16,276 | 16,414 | 16,563 | 16,330 | 17,024 | 17,425 | 17,971 | 18,826 | 19,367 | 18,778 | 18,395 | 13.0 | -5.0 | 7.0 | 6.6 |
| Sociology | 3,583 | 3,454 | 3,616 | 3,690 | 3,828 | 4,005 | 4,191 | 4,306 | 4,280 | 4,154 | 4,175 | 16.5 | -2.5 | 1.6 | 1.4 |
| Anthropology | 2,510 | 2,460 | 2,482 | 2,499 | 2,548 | 2,688 | 2,778 | 2,876 | 2,969 | 3,072 | 3,138 | 25.0 | 5.7 | 1.2 | 1.0 |
| Linguistics | 1,198 | 1,252 | 1,305 | 1,296 | 1,334 | 1,398 | 1,512 | 1,281 | 1,301 | 1,213 | 1,194 | -0.3 | -8.2 | 0.5 | 0.5 |
| History of science | 180 | 169 | 198 | 184 | 192 | 213 | 205 | 230 | 227 | 247 | 262 | 45.6 | 15.4 | 0.1 | 0.1 |
| Other social sciences | 6,913 | 6,950 | 7,005 | 6,952 | 7,209 | 7,844 | 8,156 | 8,776 | 9,234 | 9,698 | 9,812 | 41.9 | 6.3 | 3.7 | 2.8 |
| Engineering | 84,911 | 89,509 | 90,990 | 89,705 | 90,443 | 92,953 | 97,861 | 100,802 | 99,189 | 95,006 | 89,377 | 5.3 | -9.9 | 34.0 | 34.3 |
| Aerospace engineering | 2,375 | 2,604 | 2,791 | 2,996 | 3,281 | 3,645 | 3,793 | 3,688 | 3,583 | 3,357 | 2,992 | 26.0 | -16.5 | 1.1 | 1.0 |
| Chemical engineering | 6,146 | 5,973 | 5,957 | 5,543 | 5,431 | 5,589 | 5,870 | 6,003 | 6,017 | 6,082 | 5,874 | -4.4 | -2.4 | 2.2 | 2.5 |
| Civil engineering | 12,755 | 12,829 | 12,579 | 12,517 | 12,474 | 12,853 | 14,296 | 15,918 | 15,725 | 15,714 | 14,986 | 17.5 | -4.7 | 5.7 | 5.2 |
| Electrical engineering | 25,768 | 27,061 | 28,301 | 28,757 | 29,742 | 30,007 | 31,311 | 32,167 | 31,015 | 28,948 | 26,858 | 4.2 | -13.4 | 10.2 | 10.4 |
| Mechanical engineering | 13,146 | 14,554 | 15,070 | 14,749 | 14,867 | 15,437 | 16,219 | 16,939 | 16,703 | 15,938 | 14,690 | 11.7 | -12.1 | 5.6 | 5.3 |
| Materials engineering | 3,340 | 3,533 | 3,637 | 3,581 | 3,784 | 4,048 | 4,173 | 4,443 | 4,336 | 4,122 | 3,861 | 15.6 | -11.0 | 1.5 | 1.3 |
| Industrial engineering | 8,719 | 9,434 | 9,976 | 9,300 | 8,984 | 9,111 | 10,321 | 10,870 | 11,003 | 10,896 | 10,387 | 19.1 | -5.6 | 3.9 | 3.5 |
| Other engineering | 12,662 | 13,521 | 12,679 | 12,262 | 11,880 | 12,263 | 11,878 | 10,774 | 10,807 | 9,949 | 9,729 | -23.2 | -10.0 | 3.7 | 5.1 |

NOTE: Because of rounding, details may not add to totals.

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

**Appendix table 4-4. Full-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 234,056 | 242,841 | 247,219 | 250,667 | 256,928 | 265,423 | 277,183 | 290,654 | 294,227 | 293,324 | 288,016 | 23.1 | -2.1 | 100.0 | 100.0 |
| Total sciences | 178,160 | 182,675 | 185,287 | 187,660 | 192,553 | 199,446 | 206,149 | 216,228 | 220,400 | 221,756 | 220,154 | 23.6 | -0.1 | 76.1 | 76.4 |
| Physical sciences | 26,669 | 27,762 | 28,412 | 28,574 | 29,207 | 29,485 | 30,117 | 30,673 | 30,611 | 30,043 | 28,892 | 8.3 | -5.6 | 11.4 | 10.0 |
| Earth, atmospheric, and ocean sciences | 11,334 | 11,249 | 10,435 | 10,192 | 10,021 | 10,244 | 10,373 | 10,986 | 11,367 | 11,470 | 11,290 | -0.4 | -0.7 | 4.8 | 3.9 |
| Mathematics and statistics | 11,816 | 12,388 | 13,043 | 13,512 | 13,681 | 13,865 | 14,256 | 14,679 | 14,530 | 14,226 | 13,422 | 13.6 | -7.6 | 5.0 | 4.7 |
| Computer science | 13,861 | 15,020 | 15,336 | 15,133 | 15,606 | 16,689 | 16,516 | 17,506 | 17,399 | 16,712 | 16,564 | 19.5 | -4.8 | 5.9 | 5.8 |
| Agricultural sciences | 9,250 | 9,341 | 9,094 | 9,122 | 9,070 | 9,100 | 9,289 | 9,452 | 9,468 | 9,492 | 9,630 | 4.1 | 1.7 | 4.0 | 3.3 |
| Biological sciences | 37,001 | 37,810 | 38,235 | 39,209 | 40,348 | 40,945 | 42,700 | 44,389 | 46,481 | 48,017 | 48,283 | 30.5 | 3.9 | 15.8 | 16.8 |
| Psychology | 25,335 | 26,255 | 27,256 | 28,118 | 29,348 | 30,619 | 32,258 | 34,277 | 34,894 | 35,434 | 35,762 | 41.2 | 2.5 | 10.8 | 12.4 |
| Social sciences | 42,894 | 42,850 | 43,476 | 43,800 | 45,272 | 48,499 | 50,640 | 54,266 | 55,650 | 56,362 | 56,311 | 31.3 | 1.2 | 18.3 | 19.6 |
| Engineering | 55,896 | 60,166 | 61,932 | 63,007 | 64,375 | 65,977 | 71,034 | 74,426 | 73,827 | 71,568 | 67,862 | 21.4 | -8.1 | 23.9 | 23.6 |
| Aerospace engineering | 1,994 | 2,154 | 2,372 | 2,533 | 2,772 | 3,010 | 3,325 | 3,306 | 3,262 | 3,000 | 2,693 | 35.1 | -17.4 | 0.9 | 0.9 |
| Chemical engineering | 5,546 | 5,594 | 5,674 | 5,359 | 5,282 | 5,443 | 5,788 | 5,946 | 6,041 | 6,105 | 5,962 | 7.5 | -1.3 | 2.4 | 2.1 |
| Civil engineering | 9,749 | 9,971 | 9,628 | 9,946 | 9,964 | 10,128 | 11,328 | 12,454 | 12,458 | 12,641 | 12,248 | 25.6 | -1.7 | 4.2 | 4.3 |
| Electrical engineering | 14,799 | 16,290 | 17,101 | 17,706 | 18,466 | 18,675 | 19,904 | 20,996 | 20,400 | 19,414 | 18,303 | 23.7 | -10.3 | 6.3 | 6.4 |
| Mechanical engineering | 8,875 | 9,789 | 10,230 | 10,416 | 10,492 | 10,867 | 11,687 | 12,383 | 12,395 | 11,875 | 11,119 | 25.3 | -10.3 | 1.5 | 3.9 |
| Materials engineering | 3,093 | 3,370 | 3,436 | 3,466 | 3,720 | 3,930 | 4,058 | 4,274 | 4,249 | 4,108 | 3,880 | 25.4 | -8.7 | 3.8 | 1.3 |
| Industrial engineering | 3,456 | 3,807 | 4,156 | 4,295 | 4,658 | 4,770 | 5,598 | 6,081 | 5,902 | 5,910 | 5,328 | 54.2 | -9.7 | 1.3 | 1.8 |
| Other engineering | 8,384 | 9,191 | 9,335 | 9,286 | 9,021 | 9,154 | 9,346 | 8,986 | 9,120 | 8,515 | 8,329 | -0.7 | -8.7 | 3.6 | 2.9 |

NOTE: Because of rounding, details may not add to totals.

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: 1998*

**Appendix table 4-5. Female full-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 69,817 | 72,960 | 75,070 | 78,319 | 81,810 | 86,715 | 92,085 | 98,799 | 103,255 | 106,485 | 107,805 | 54.4 | 4.4 | 100.0 |
| Total sciences | 63,536 | 65,990 | 67,787 | 70,700 | 73,674 | 78,017 | 82,402 | 88,135 | 92,056 | 94,908 | 96,267 | 51.5 | 4.6 | 89.3 |
| Physical sciences | 5,428 | 5,740 | 6,028 | 6,366 | 6,660 | 6,821 | 7,272 | 7,500 | 7,723 | 7,766 | 7,660 | 41.1 | -0.8 | 7.1 |
| Earth, atmospheric, and ocean sciences | 2,834 | 2,913 | 2,676 | 2,748 | 2,753 | 2,927 | 3,176 | 3,398 | 3,552 | 3,794 | 3,901 | 37.6 | 9.8 | 3.6 |
| Mathematics and statistics | 3,202 | 3,404 | 3,562 | 3,718 | 3,935 | 4,044 | 4,221 | 4,429 | 4,434 | 4,416 | 4,203 | 31.3 | -5.2 | 3.9 |
| Computer science | 3,055 | 3,317 | 3,331 | 3,338 | 3,251 | 3,471 | 3,481 | 3,559 | 3,594 | 3,559 | 3,665 | 20.0 | 2.0 | 3.4 |
| Agricultural sciences | 2,397 | 2,386 | 2,378 | 2,482 | 2,513 | 2,646 | 2,865 | 2,998 | 3,187 | 3,326 | 3,456 | 44.2 | 8.4 | 3.2 |
| Biological sciences | 15,203 | 15,817 | 16,136 | 16,805 | 17,612 | 18,156 | 19,202 | 20,159 | 21,561 | 22,524 | 22,999 | 51.3 | 6.7 | 21.3 |
| Psychology | 15,103 | 15,992 | 16,834 | 17,919 | 18,881 | 19,977 | 21,301 | 23,061 | 23,665 | 24,247 | 24,646 | 63.2 | 4.1 | 22.9 |
| Social sciences | 16,314 | 16,421 | 16,842 | 17,324 | 18,069 | 19,975 | 20,884 | 23,031 | 24,340 | 25,276 | 25,737 | 57.8 | 5.7 | 23.9 |
| Engineering | 6,281 | 6,970 | 7,283 | 7,619 | 8,136 | 8,698 | 9,683 | 10,664 | 11,199 | 11,577 | 11,538 | 83.7 | 3.0 | 10.7 |
| Aerospace engineering | 126 | 148 | 167 | 168 | 180 | 199 | 254 | 263 | 291 | 278 | 276 | 119.0 | -5.2 | 0.3 |
| Chemical engineering | 754 | 788 | 874 | 792 | 796 | 896 | 985 | 1,097 | 1,166 | 1,193 | 1,220 | 61.8 | 4.6 | 1.1 |
| Civil engineering | 1,492 | 1,487 | 1,398 | 1,565 | 1,649 | 1,781 | 2,019 | 2,328 | 2,524 | 2,786 | 2,817 | 88.8 | 11.6 | 2.6 |
| Electrical engineering | 1,208 | 1,467 | 1,549 | 1,682 | 1,822 | 1,956 | 2,165 | 2,426 | 2,444 | 2,391 | 2,468 | 104.3 | 1.0 | 2.3 |
| Mechanical engineering | 559 | 627 | 732 | 835 | 855 | 848 | 942 | 1,086 | 1,185 | 1,217 | 1,131 | 102.3 | -4.6 | 1.0 |
| Materials engineering | 439 | 521 | 569 | 579 | 639 | 692 | 742 | 807 | 802 | 840 | 816 | 85.9 | 1.7 | 0.8 |
| Industrial engineering | 635 | 734 | 734 | 736 | 907 | 908 | 1,042 | 1,175 | 1,173 | 1,298 | 1,170 | 84.3 | -0.3 | 1.1 |
| Other engineering | 1,068 | 1,198 | 1,260 | 1,262 | 1,288 | 1,418 | 1,534 | 1,482 | 1,614 | 1,574 | 1,640 | 53.6 | 1.6 | 1.5 |

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

**Appendix table 4-6. Male full-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 164,239 | 169,881 | 172,149 | 172,348 | 175,118 | 178,708 | 185,098 | 191,855 | 190,972 | 186,839 | 180,211 | 9.7 | -5.6 | 100.0 |
| Total sciences | 114,624 | 116,685 | 117,500 | 116,960 | 118,879 | 121,429 | 123,747 | 128,093 | 128,344 | 126,848 | 123,887 | 8.1 | -3.5 | 68.7 |
| Physical sciences | 21,241 | 22,022 | 22,384 | 22,208 | 22,547 | 22,664 | 22,845 | 23,173 | 22,888 | 22,277 | 21,232 | 0.0 | -7.2 | 11.8 |
| Earth, atmospheric, and ocean sciences | 8,500 | 8,336 | 7,759 | 7,444 | 7,268 | 7,317 | 7,197 | 7,588 | 7,815 | 7,676 | 7,389 | -13.1 | -5.5 | 4.1 |
| Mathematics and statistics | 8,614 | 8,984 | 9,481 | 9,794 | 9,746 | 9,821 | 10,035 | 10,250 | 10,096 | 9,810 | 9,219 | 7.0 | -8.7 | 5.1 |
| Computer science | 10,806 | 11,703 | 12,005 | 11,795 | 12,355 | 13,218 | 13,035 | 13,947 | 13,805 | 13,153 | 12,899 | 19.4 | -6.6 | 7.2 |
| Agricultural sciences | 6,853 | 6,955 | 6,716 | 6,640 | 6,557 | 6,454 | 6,424 | 6,454 | 6,281 | 6,166 | 6,174 | -9.9 | -1.7 | 3.4 |
| Biological sciences | 21,798 | 21,993 | 22,099 | 22,404 | 22,736 | 22,789 | 23,498 | 24,230 | 24,920 | 25,493 | 25,284 | 16.0 | 1.5 | 14.0 |
| Psychology | 10,232 | 10,263 | 10,422 | 10,199 | 10,467 | 10,642 | 10,957 | 11,216 | 11,229 | 11,187 | 11,116 | 8.6 | -1.0 | 6.2 |
| Social sciences | 26,580 | 26,429 | 26,634 | 26,476 | 27,203 | 28,524 | 29,756 | 31,235 | 31,310 | 31,086 | 30,574 | 15.0 | -2.4 | 17.0 |
| Engineering | 49,615 | 53,196 | 54,649 | 55,388 | 56,239 | 57,279 | 61,351 | 63,762 | 62,628 | 59,991 | 56,324 | 13.5 | -10.1 | 31.3 |
| Aerospace engineering | 1,868 | 2,006 | 2,205 | 2,365 | 2,592 | 2,811 | 3,071 | 3,043 | 2,971 | 2,722 | 2,417 | 29.4 | -18.6 | 1.3 |
| Chemical engineering | 4,792 | 4,806 | 4,800 | 4,567 | 4,486 | 4,547 | 4,803 | 4,849 | 4,875 | 4,912 | 4,742 | -1.0 | -2.7 | 2.6 |
| Civil engineering | 8,257 | 8,484 | 8,230 | 8,381 | 8,315 | 8,347 | 9,309 | 10,126 | 9,934 | 9,855 | 9,431 | 14.2 | -5.1 | 5.2 |
| Electrical engineering | 13,591 | 14,823 | 15,552 | 16,024 | 16,644 | 16,719 | 17,739 | 18,570 | 17,956 | 17,023 | 15,835 | 16.5 | -11.8 | 8.8 |
| Mechanical engineering | 8,316 | 9,162 | 9,498 | 9,581 | 9,637 | 10,019 | 10,745 | 11,297 | 11,210 | 10,658 | 9,988 | 20.1 | -10.9 | 5.5 |
| Materials engineering | 2,654 | 2,849 | 2,867 | 2,887 | 3,081 | 3,238 | 3,316 | 3,467 | 3,447 | 3,268 | 3,064 | 15.4 | -11.1 | 1.7 |
| Industrial engineering | 2,821 | 3,073 | 3,422 | 3,559 | 3,751 | 3,861 | 4,556 | 4,906 | 4,729 | 4,612 | 4,158 | 47.4 | -12.1 | 2.3 |
| Other engineering | 7,316 | 7,993 | 8,075 | 8,024 | 7,733 | 7,736 | 7,812 | 7,504 | 7,506 | 6,941 | 6,689 | -8.6 | -10.9 | 3.7 |

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: 1998*

**Appendix table 4-7. Part-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 124,070 | 125,278 | 126,136 | 124,620 | 125,841 | 131,736 | 135,525 | 140,143 | 142,006 | 138,434 | 135,906 | 9.5 | -4.3 | 100.0 | 100.0 |
| Total sciences | 83,975 | 83,570 | 84,115 | 84,798 | 86,173 | 90,088 | 92,983 | 96,534 | 98,952 | 96,942 | 96,239 | 14.6 | -2.7 | 67.7 | 70.8 |
| Physical sciences | 4,312 | 4,484 | 4,315 | 4,388 | 4,409 | 4,590 | 4,593 | 4,675 | 4,707 | 4,406 | 4,578 | 6.2 | -2.7 | 3.5 | 3.4 |
| Earth, atmospheric, and ocean sciences | 4,086 | 3,817 | 3,936 | 3,675 | 3,622 | 3,740 | 4,107 | 4,361 | 4,438 | 4,572 | 4,512 | 10.4 | 1.7 | 3.3 | 3.3 |
| Mathematics and statistics | 5,747 | 5,561 | 5,465 | 5,565 | 5,566 | 5,909 | 5,696 | 5,676 | 5,470 | 5,353 | 5,087 | -11.5 | -7.0 | 4.6 | 3.7 |
| Computer science | 15,908 | 16,329 | 16,715 | 17,094 | 16,876 | 17,568 | 18,094 | 18,814 | 18,899 | 17,566 | 16,945 | 6.5 | -10.3 | 12.8 | 12.5 |
| Agricultural sciences | 2,311 | 2,117 | 2,024 | 2,013 | 2,120 | 2,216 | 2,217 | 2,375 | 2,446 | 2,707 | 2,796 | 21.0 | 14.3 | 1.9 | 2.1 |
| Biological sciences | 9,111 | 8,955 | 8,512 | 8,356 | 8,504 | 9,044 | 9,078 | 9,788 | 9,971 | 10,126 | 10,470 | 14.9 | 5.0 | 7.3 | 7.7 |
| Psychology | 15,386 | 14,986 | 15,356 | 15,845 | 16,180 | 17,549 | 19,085 | 19,322 | 19,786 | 19,292 | 18,481 | 20.1 | -6.6 | 12.4 | 13.6 |
| Social sciences | 27,114 | 27,321 | 27,792 | 27,862 | 28,896 | 29,472 | 30,113 | 31,523 | 33,235 | 32,920 | 33,370 | 23.1 | 0.4 | 21.9 | 24.6 |
| Engineering | 40,095 | 41,708 | 42,021 | 39,822 | 39,668 | 41,648 | 42,542 | 43,609 | 43,054 | 41,492 | 39,667 | -1.1 | -7.9 | 32.3 | 29.2 |
| Aerospace engineering | 544 | 650 | 643 | 690 | 752 | 924 | 795 | 730 | 678 | 715 | 650 | 19.5 | -4.1 | 0.4 | 0.5 |
| Chemical engineering | 1,604 | 1,418 | 1,437 | 1,259 | 1,178 | 1,292 | 1,339 | 1,451 | 1,475 | 1,503 | 1,470 | -8.4 | -0.3 | 1.3 | 1.1 |
| Civil engineering | 5,153 | 5,005 | 5,054 | 4,885 | 4,945 | 5,414 | 6,070 | 7,118 | 7,125 | 7,284 | 6,970 | 35.3 | -2.2 | 4.2 | 5.1 |
| Electrical engineering | 13,404 | 13,679 | 14,298 | 14,329 | 14,791 | 15,047 | 15,278 | 15,464 | 14,937 | 13,638 | 12,757 | -4.8 | -14.6 | 10.8 | 9.4 |
| Mechanical engineering | 5,282 | 5,924 | 6,136 | 5,735 | 5,773 | 6,012 | 6,043 | 6,254 | 6,082 | 5,886 | 5,241 | -0.8 | -13.8 | 4.3 | 3.9 |
| Materials engineering | 850 | 838 | 930 | 871 | 874 | 1,011 | 1,102 | 1,238 | 1,114 | 1,083 | 1,040 | 22.4 | -6.6 | 0.7 | 0.8 |
| Industrial engineering | 7,043 | 7,722 | 8,064 | 7,098 | 6,436 | 6,478 | 7,078 | 7,444 | 7,694 | 7,786 | 7,854 | 11.5 | 2.1 | 5.7 | 5.8 |
| Other engineering | 6,215 | 6,472 | 5,459 | 4,975 | 4,919 | 5,470 | 4,837 | 3,910 | 3,949 | 3,597 | 3,685 | -40.7 | -6.7 | 5.0 | 2.7 |

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

**Appendix table 4-8. Female part-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 40,845 | 41,463 | 42,127 | 42,957 | 44,098 | 47,037 | 48,770 | 51,533 | 53,502 | 52,853 | 53,059 | 29.9 | -0.8 | 100.0 | 100.0 |
| Total sciences | 36,046 | 36,068 | 36,447 | 37,452 | 38,634 | 41,063 | 42,738 | 44,964 | 47,009 | 46,376 | 46,445 | 28.8 | -1.2 | 88.3 | 87.5 |
| Physical sciences | 1,079 | 1,122 | 1,086 | 1,131 | 1,141 | 1,247 | 1,292 | 1,344 | 1,479 | 1,393 | 1,451 | 34.5 | -1.9 | 2.6 | 2.7 |
| Earth, atmospheric, and ocean sciences | 1,093 | 1,034 | 1,103 | 1,057 | 1,105 | 1,192 | 1,279 | 1,460 | 1,508 | 1,559 | 1,578 | 44.4 | 4.6 | 2.7 | 3.0 |
| Mathematics and statistics | 2,152 | 2,075 | 2,034 | 2,058 | 2,050 | 2,155 | 2,077 | 2,120 | 2,204 | 2,119 | 2,058 | -4.4 | -6.6 | 5.3 | 3.9 |
| Computer science | 4,506 | 4,535 | 4,684 | 4,856 | 4,737 | 4,728 | 4,789 | 4,908 | 4,878 | 4,593 | 4,510 | 0.1 | -7.5 | 11.0 | 8.5 |
| Agricultural sciences | 594 | 567 | 574 | 615 | 632 | 689 | 702 | 770 | 901 | 962 | 995 | 67.5 | 10.4 | 1.5 | 1.9 |
| Biological sciences | 4,701 | 4,654 | 4,297 | 4,456 | 4,622 | 4,886 | 4,933 | 5,316 | 5,492 | 5,631 | 5,820 | 23.8 | 6.0 | 11.5 | 11.0 |
| Psychology | 10,021 | 9,872 | 10,095 | 10,542 | 10,974 | 12,369 | 13,486 | 13,843 | 14,403 | 13,993 | 13,496 | 34.7 | -6.3 | 24.5 | 25.4 |
| Social sciences | 11,900 | 12,209 | 12,574 | 12,737 | 13,373 | 13,797 | 14,180 | 15,203 | 16,144 | 16,126 | 16,537 | 39.0 | 2.4 | 29.1 | 31.2 |
| Engineering | 4,799 | 5,395 | 5,680 | 5,505 | 5,464 | 5,974 | 6,032 | 6,569 | 6,493 | 6,477 | 6,614 | 37.8 | 1.9 | 11.7 | 12.5 |
| Aerospace engineering | 37 | 52 | 57 | 59 | 63 | 90 | 73 | 85 | 66 | 80 | 75 | 102.7 | 13.6 | 0.1 | 0.1 |
| Chemical engineering | 250 | 251 | 280 | 283 | 233 | 250 | 272 | 297 | 333 | 333 | 338 | 35.2 | 1.5 | 0.6 | 0.6 |
| Civil engineering | 655 | 660 | 705 | 729 | 786 | 908 | 1,083 | 1,326 | 1,334 | 1,425 | 1,415 | 116.0 | 6.1 | 1.6 | 2.7 |
| Electrical engineering | 1,227 | 1,441 | 1,549 | 1,596 | 1,693 | 1,759 | 1,706 | 1,867 | 1,878 | 1,713 | 1,734 | 41.3 | -7.7 | 3.0 | 3.3 |
| Mechanical engineering | 452 | 532 | 564 | 567 | 543 | 594 | 569 | 612 | 589 | 606 | 539 | 19.2 | -8.5 | 1.1 | 1.0 |
| Materials engineering | 164 | 154 | 160 | 177 | 171 | 201 | 245 | 262 | 225 | 229 | 243 | 48.2 | 8.0 | 0.4 | 0.5 |
| Industrial engineering | 1,145 | 1,361 | 1,510 | 1,357 | 1,203 | 1,229 | 1,313 | 1,480 | 1,420 | 1,502 | 1,625 | 41.9 | 14.4 | 2.8 | 3.1 |
| Other engineering | 869 | 944 | 855 | 737 | 772 | 943 | 771 | 640 | 648 | 589 | 645 | -25.8 | -0.5 | 2.1 | 1.2 |

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

**Appendix table 4-9. Male part-time graduate student enrollment in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 83,225 | 83,815 | 84,009 | 81,663 | 81,743 | 84,699 | 86,755 | 88,610 | 88,504 | 85,581 | 82,847 | -0.5 | -6.4 | 100.0 | 100.0 |
| Total sciences | 47,929 | 47,502 | 47,668 | 47,346 | 47,539 | 49,025 | 50,245 | 51,570 | 51,943 | 50,566 | 49,794 | 3.9 | -4.1 | 57.6 | 60.1 |
| Physical sciences | 3,233 | 3,362 | 3,229 | 3,257 | 3,268 | 3,343 | 3,301 | 3,331 | 3,228 | 3,013 | 3,127 | -3.3 | -3.1 | 3.9 | 3.8 |
| Earth, atmospheric, and ocean sciences | 2,993 | 2,783 | 2,833 | 2,618 | 2,517 | 2,548 | 2,828 | 2,901 | 2,930 | 3,013 | 2,934 | -2.0 | 0.1 | 3.6 | 3.5 |
| Mathematics and statistics | 3,595 | 3,486 | 3,431 | 3,507 | 3,516 | 3,754 | 3,619 | 3,556 | 3,266 | 3,234 | 3,029 | -15.7 | -7.3 | 4.3 | 3.7 |
| Computer science | 11,402 | 11,794 | 12,031 | 12,238 | 12,139 | 12,840 | 13,305 | 13,906 | 14,021 | 12,973 | 12,435 | 9.1 | -11.3 | 13.7 | 15.0 |
| Agricultural sciences | 1,717 | 1,550 | 1,450 | 1,398 | 1,488 | 1,527 | 1,515 | 1,605 | 1,545 | 1,745 | 1,801 | 4.9 | 16.6 | 2.1 | 2.2 |
| Biological sciences | 4,410 | 4,301 | 4,215 | 3,900 | 3,882 | 4,158 | 4,145 | 4,472 | 4,479 | 4,495 | 4,650 | 5.4 | 3.8 | 5.3 | 5.6 |
| Psychology | 5,365 | 5,114 | 5,261 | 5,303 | 5,206 | 5,180 | 5,599 | 5,479 | 5,383 | 5,299 | 4,985 | -7.1 | -7.4 | 6.4 | 6.0 |
| Social sciences | 15,214 | 15,112 | 15,218 | 15,125 | 15,523 | 15,675 | 15,933 | 16,320 | 17,091 | 16,794 | 16,833 | 10.6 | -1.5 | 18.3 | 20.3 |
| Engineering | 35,296 | 36,313 | 36,341 | 34,317 | 34,204 | 35,674 | 36,510 | 37,040 | 36,561 | 35,015 | 33,053 | -6.4 | -9.6 | 42.4 | 39.9 |
| Aerospace engineering | 507 | 598 | 586 | 631 | 689 | 834 | 722 | 645 | 612 | 635 | 575 | 13.4 | -6.0 | 0.6 | 0.7 |
| Chemical engineering | 1,354 | 1,167 | 1,157 | 976 | 945 | 1,042 | 1,067 | 1,154 | 1,142 | 1,170 | 1,132 | -16.4 | -0.9 | 1.6 | 1.4 |
| Civil engineering | 4,498 | 4,345 | 4,349 | 4,136 | 4,159 | 4,506 | 4,987 | 5,792 | 5,791 | 5,859 | 5,555 | 23.5 | -4.1 | 5.4 | 6.7 |
| Electrical engineering | 12,177 | 12,238 | 12,749 | 12,733 | 13,098 | 13,288 | 13,572 | 13,597 | 13,059 | 11,925 | 11,023 | -9.5 | -15.6 | 14.6 | 13.3 |
| Mechanical engineering | 4,830 | 5,392 | 5,572 | 5,168 | 5,230 | 5,418 | 5,474 | 5,642 | 5,493 | 5,280 | 4,702 | -2.7 | -14.4 | 5.8 | 5.7 |
| Materials engineering | 686 | 684 | 770 | 694 | 703 | 810 | 857 | 976 | 889 | 854 | 797 | 16.2 | -10.3 | 0.8 | 1.0 |
| Industrial engineering | 5,898 | 6,361 | 6,554 | 5,741 | 5,233 | 5,249 | 5,765 | 5,964 | 6,274 | 6,284 | 6,229 | 5.6 | -0.7 | 7.1 | 7.5 |
| Other engineering | 5,346 | 5,528 | 4,604 | 4,238 | 4,147 | 4,527 | 4,066 | 3,270 | 3,301 | 3,008 | 3,040 | -43.1 | -7.9 | 6.4 | 3.7 |

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

**Appendix table 4-10. Full-time graduate students in science, engineering, and health in all institutions, by sex, source of major support, and field: 1995**



| Source of major support | Total, all surveyed fields | Sciences | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sciences, total | Physical sciences | Earth, atmos-pheric, and ocean sciences | Mathe-matical sciences | Computer sciences | Agri-cultural sciences | Bio-logical sciences | Psychol-ogy | Social sciences |
| | Total | | | | | | | | | |
| Total, all sources | 330,235 | 220,154 | 28,892 | 11,290 | 13,422 | 16,564 | 9,630 | 48,283 | 35,762 | 56,311 |
| Federal, total | 67,469 | 43,145 | 10,353 | 3,489 | 1,291 | 3,175 | 2,048 | 16,593 | 2,576 | 3,620 |
| Dept. of Defense | 9,421 | 4,232 | 1,197 | 421 | 322 | 1,443 | 32 | 357 | 175 | 285 |
| Dept. of HHS, total | 22,753 | 16,151 | 2,041 | 34 | 87 | 111 | 27 | 12,048 | 1,324 | 479 |
| NIH | 18,115 | 14,894 | 1,861 | 31 | 63 | 93 | 21 | 11,390 | 1,109 | 326 |
| Other HHS | 4,638 | 1,257 | 180 | 3 | 24 | 18 | 6 | 658 | 215 | 153 |
| NSF | 13,665 | 8,955 | 3,583 | 1,387 | 474 | 1,051 | 88 | 1,406 | 288 | 678 |
| USDA | 3,244 | 2,847 | 38 | 65 | 13 | 13 | 1,192 | 1,083 | 16 | 427 |
| All other Federal | 18,386 | 10,960 | 3,494 | 1,582 | 395 | 557 | 709 | 1,699 | 773 | 1,751 |
| Institutional support | 129,903 | 96,989 | 14,858 | 4,445 | 9,169 | 5,492 | 3,882 | 20,805 | 13,091 | 25,247 |
| Other outside support, total | 26,114 | 14,924 | 2,079 | 991 | 478 | 1,309 | 1,489 | 3,923 | 1,144 | 3,511 |
| All other U.S. | 20,564 | 11,549 | 1,792 | 756 | 291 | 1,065 | 1,090 | 3,317 | 1,101 | 2,137 |
| Foreign | 5,550 | 3,375 | 287 | 235 | 187 | 244 | 399 | 606 | 43 | 1,374 |
| Self-support | 106,749 | 65,096 | 1,602 | 2,365 | 2,484 | 6,588 | 2,211 | 6,962 | 18,951 | 23,933 |
| | Men | | | | | | | | | |
| Total, all sources | 191,695 | 123,887 | 21,232 | 7,389 | 9,219 | 12,899 | 6,174 | 25,284 | 11,116 | 30,574 |
| Federal, total | 42,860 | 26,880 | 7,842 | 2,377 | 975 | 2,629 | 1,312 | 8,887 | 890 | 1,968 |
| Dept. of Defense | 7,799 | 3,354 | 992 | 318 | 280 | 1,238 | 24 | 195 | 83 | 224 |
| Dept. of HHS, total | 10,803 | 8,567 | 1,328 | 23 | 67 | 86 | 18 | 6,417 | 445 | 183 |
| NIH | 9,601 | 7,937 | 1,196 | 21 | 50 | 76 | 15 | 6,088 | 379 | 112 |
| Other HHS | 1,202 | 630 | 132 | 2 | 17 | 10 | 3 | 329 | 66 | 71 |
| NSF | 9,958 | 6,174 | 2,770 | 928 | 331 | 858 | 54 | 751 | 114 | 368 |
| USDA | 2,019 | 1,703 | 31 | 44 | 10 | 10 | 754 | 591 | 5 | 258 |
| All other Federal | 12,281 | 7,082 | 2,721 | 1,064 | 287 | 437 | 462 | 933 | 243 | 935 |
| Institutional support | 78,667 | 56,013 | 10,709 | 2,822 | 6,347 | 4,314 | 2,498 | 11,034 | 4,518 | 13,771 |
| Other outside support, total | 17,942 | 9,373 | 1,539 | 708 | 340 | 1,028 | 1,048 | 2,161 | 388 | 2,161 |
| All other U.S. | 13,783 | 6,906 | 1,305 | 515 | 198 | 825 | 725 | 1,784 | 374 | 1,180 |
| Foreign | 4,159 | 2,467 | 234 | 193 | 142 | 203 | 323 | 377 | 14 | 981 |
| Self-support | 52,226 | 31,621 | 1,142 | 1,482 | 1,557 | 4,928 | 1,316 | 3,202 | 5,320 | 12,674 |
| | Women | | | | | | | | | |
| Total, all sources | 138,540 | 96,267 | 7,660 | 3,901 | 4,203 | 3,665 | 3,456 | 22,999 | 24,646 | 25,737 |
| Federal, total | 24,609 | 16,265 | 2,511 | 1,112 | 316 | 546 | 736 | 7,706 | 1,686 | 1,652 |
| Dept. of Defense | 1,622 | 878 | 205 | 103 | 42 | 205 | 8 | 162 | 92 | 61 |
| Dept. of HHS, total | 11,950 | 7,584 | 713 | 11 | 20 | 25 | 9 | 5,631 | 879 | 296 |
| NIH | 8,514 | 6,957 | 665 | 10 | 13 | 17 | 6 | 5,302 | 730 | 214 |
| Other HHS | 3,436 | 627 | 48 | 1 | 7 | 8 | 3 | 329 | 149 | 82 |
| NSF | 3,707 | 2,781 | 813 | 459 | 143 | 193 | 34 | 655 | 174 | 310 |
| USDA | 1,225 | 1,144 | 7 | 21 | 3 | 3 | 438 | 492 | 11 | 169 |
| All other Federal | 6,105 | 3,878 | 773 | 518 | 108 | 120 | 247 | 766 | 530 | 816 |
| Institutional support | 51,236 | 40,976 | 4,149 | 1,623 | 2,822 | 1,178 | 1,384 | 9,771 | 8,573 | 11,476 |
| Other outside support, total | 8,172 | 5,551 | 540 | 283 | 138 | 281 | 441 | 1,762 | 756 | 1,350 |
| All other U.S. | 6,781 | 4,643 | 487 | 241 | 93 | 240 | 365 | 1,533 | 727 | 957 |
| Foreign | 1,391 | 908 | 53 | 42 | 45 | 41 | 76 | 229 | 29 | 393 |
| Self-support | 54,523 | 33,475 | 460 | 883 | 927 | 1,660 | 895 | 3,760 | 13,631 | 11,259 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-10. Full-time graduate students in science, engineering, and health in all institutions, by sex, source of major support, and field: 1995**



| Source of major support | Total engineering | | | | | | | | | Health fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | Engineering, total | Aerospace engineering | Chemical engineering | Civil engineering | Electrical engineering | Industrial engineering | Mechanical engineering | Metallurgical and materials engineering | Other engineering | |
| | Total | | | | | | | | | |
| Total, all sources | 67,862 | 2,693 | 5,962 | 12,248 | 18,303 | 5,328 | 11,119 | 3,880 | 8,329 | 42,219 |
| Federal, total | 16,323 | 1,109 | 1,754 | 1,970 | 4,085 | 648 | 2,773 | 1,544 | 2,440 | 8,001 |
| Dept. of Defense | 4,807 | 535 | 164 | 290 | 1,706 | 188 | 821 | 468 | 635 | 382 |
| Dept. of HHS, total | 918 | 5 | 163 | 41 | 113 | 54 | 93 | 25 | 424 | 5,684 |
| NIH | 768 | 1 | 136 | 31 | 84 | 27 | 82 | 11 | 396 | 2,453 |
| Other HHS | 150 | 4 | 27 | 10 | 29 | 27 | 11 | 14 | 28 | 3,231 |
| NSF | 4,611 | 121 | 761 | 530 | 1,353 | 175 | 742 | 495 | 434 | 99 |
| USDA | 342 | 2 | 66 | 53 | 34 | 0 | 4 | 3 | 180 | 55 |
| All other Federal | 5,645 | 446 | 600 | 1,056 | 879 | 231 | 1,113 | 553 | 767 | 1,781 |
| Institutional support | 23,844 | 817 | 2,262 | 4,861 | 6,234 | 1,858 | 3,896 | 1,177 | 2,739 | 9,070 |
| Other outside support, total | 9,121 | 234 | 1,105 | 1,180 | 2,552 | 498 | 1,606 | 708 | 1,238 | 2,069 |
| All other U.S. | 7,477 | 178 | 967 | 892 | 2,134 | 420 | 1,352 | 592 | 942 | 1,538 |
| Foreign | 1,644 | 56 | 138 | 288 | 418 | 78 | 254 | 116 | 296 | 531 |
| Self-support | 18,574 | 533 | 841 | 4,237 | 5,432 | 2,324 | 2,844 | 451 | 1,912 | 23,079 |
| | Men | | | | | | | | | |
| Total, all sources | 56,324 | 2,417 | 4,742 | 9,431 | 15,835 | 4,158 | 9,988 | 3,064 | 6,689 | 11,484 |
| Federal, total | 13,697 | 995 | 1,406 | 1,517 | 3,578 | 511 | 2,476 | 1,248 | 1,966 | 2,283 |
| Dept. of Defense | 4,250 | 500 | 140 | 232 | 1,528 | 157 | 758 | 387 | 548 | 195 |
| Dept. of HHS, total | 692 | 5 | 125 | 26 | 95 | 31 | 80 | 22 | 308 | 1,544 |
| NIH | 575 | 1 | 100 | 17 | 72 | 19 | 71 | 11 | 284 | 1,089 |
| Other HHS | 117 | 4 | 25 | 9 | 23 | 12 | 9 | 11 | 24 | 455 |
| NSF | 3,734 | 96 | 594 | 399 | 1,149 | 139 | 646 | 387 | 324 | 50 |
| USDA | 280 | 1 | 54 | 44 | 30 | 0 | 3 | 1 | 147 | 36 |
| All other Federal | 4,741 | 393 | 493 | 816 | 776 | 184 | 989 | 451 | 639 | 458 |
| Institutional support | 19,627 | 707 | 1,802 | 3,706 | 5,421 | 1,420 | 3,455 | 909 | 2,207 | 3,027 |
| Other outside support, total | 7,747 | 219 | 867 | 948 | 2,263 | 420 | 1,467 | 563 | 1,000 | 822 |
| All other U.S. | 6,278 | 163 | 764 | 693 | 1,873 | 345 | 1,226 | 469 | 745 | 599 |
| Foreign | 1,469 | 56 | 103 | 255 | 390 | 75 | 241 | 94 | 255 | 223 |
| Self-support | 15,253 | 496 | 667 | 3,260 | 4,573 | 1,807 | 2,590 | 344 | 1,516 | 5,352 |
| | Women | | | | | | | | | |
| Total, all sources | 11,538 | 276 | 1,220 | 2,817 | 2,468 | 1,170 | 1,131 | 816 | 1,640 | 30,735 |
| Federal, total | 2,626 | 114 | 348 | 453 | 507 | 137 | 297 | 296 | 474 | 5,718 |
| Dept. of Defense | 557 | 35 | 24 | 58 | 178 | 31 | 63 | 81 | 87 | 187 |
| Dept. of HHS, total | 226 | 0 | 38 | 15 | 18 | 23 | 13 | 3 | 116 | 4,140 |
| NIH | 193 | 0 | 36 | 14 | 12 | 8 | 11 | 0 | 112 | 1,364 |
| Other HHS | 33 | 0 | 2 | 1 | 6 | 15 | 2 | 3 | 4 | 2,776 |
| NSF | 877 | 25 | 167 | 131 | 204 | 36 | 96 | 108 | 110 | 49 |
| USDA | 62 | 1 | 12 | 9 | 4 | 0 | 1 | 2 | 33 | 19 |
| All other Federal | 904 | 53 | 107 | 240 | 103 | 47 | 124 | 102 | 128 | 1,323 |
| Institutional support | 4,217 | 110 | 460 | 1,155 | 813 | 438 | 441 | 268 | 532 | 6,043 |
| Other outside support, total | 1,374 | 15 | 238 | 232 | 289 | 78 | 139 | 145 | 238 | 1,247 |
| All other U.S. | 1,199 | 15 | 203 | 199 | 261 | 75 | 126 | 123 | 197 | 939 |
| Foreign | 175 | 0 | 35 | 33 | 28 | 3 | 13 | 22 | 41 | 308 |
| Self-support | 3,321 | 37 | 174 | 977 | 859 | 517 | 254 | 107 | 396 | 17,727 |

NOTE: Because of rounding, details may not add to totals.

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

**Appendix table 4-11. Female graduate science and engineering student enrollment, by institutional rank: 1985-1995**



| | Academic Institution | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | University of Minnesota, all campuses | 1,496 | 1,562 | 1,545 | 1,613 | 1,748 | 1,711 | 1,791 | 1,871 | 1,996 | 1,893 | 1,880 |
| 2 | University of Wisconsin-Madison | 1,263 | 1,327 | 1,359 | 1,415 | 1,475 | 1,565 | 1,639 | 1,720 | 1,777 | 1,711 | 1,671 |
| 3 | George Washington University | 818 | 1,155 | 1,479 | 1,388 | 1,373 | 1,440 | 1,468 | 1,610 | 1,633 | 1,672 | 1,662 |
| 4 | Rutgers the State University of NJ, all campuses | 1,298 | 1,347 | 1,309 | 1,319 | 1,408 | 1,437 | 1,465 | 1,544 | 1,527 | 1,518 | 1,523 |
| 5 | University of California-Berkeley | 1,283 | 1,318 | 1,327 | 1,295 | 1,293 | 1,398 | 1,377 | 1,409 | 1,447 | 1,456 | 1,498 |
| 6 | University of Michigan, all campuses | 1,014 | 1,035 | 1,114 | 1,168 | 1,179 | 1,247 | 1,251 | 1,395 | 1,522 | 1,524 | 1,462 |
| 7 | University of Colorado, all campuses | 847 | 899 | 959 | 907 | 982 | 1,124 | 1,220 | 1,344 | 1,476 | 1,391 | 1,459 |
| 8 | Indiana University, all campuses | 587 | 643 | 702 | 705 | 912 | 1,252 | 1,331 | 1,419 | 1,472 | 1,440 | 1,423 |
| 9 | University of Washington | 1,003 | 1,058 | 1,085 | 1,143 | 1,188 | 1,284 | 1,320 | 1,346 | 1,340 | 1,376 | 1,411 |
| 10 | University of Illinois at Urbana-Champaign | 945 | 1,015 | 1,147 | 1,171 | 1,199 | 1,178 | 1,202 | 1,335 | 1,379 | 1,363 | 1,403 |
| 11 | University of Maryland at College Park | 1,070 | 1,059 | 1,071 | 1,109 | 1,155 | 1,197 | 1,173 | 1,248 | 1,292 | 1,354 | 1,386 |
| 12 | Ohio State University, all campuses | 1,000 | 1,067 | 1,149 | 1,164 | 1,160 | 1,132 | 1,330 | 1,325 | 1,390 | 1,340 | 1,363 |
| 13 | Pennsylvania State University, all campuses | 923 | 1,027 | 1,002 | 1,124 | 1,144 | 1,168 | 1,207 | 1,218 | 1,255 | 1,284 | 1,321 |
| 14 | Cornell University, all campuses | 883 | 969 | 982 | 1,010 | 1,034 | 1,051 | 1,097 | 1,308 | 1,298 | 1,317 | 1,320 |
| 15 | New York University | 1,374 | 1,290 | 1,241 | 1,094 | 1,151 | 1,125 | 1,242 | 1,216 | 1,322 | 1,300 | 1,312 |
| 16 | Texas A&M University, all campuses | 900 | 939 | 1,024 | 1,102 | 1,202 | 1,305 | 1,286 | 1,391 | 1,369 | 1,347 | 1,310 |
| 17 | Harvard University | 897 | 915 | 791 | 892 | 854 | 946 | 1,025 | 1,225 | 1,269 | 1,297 | 1,299 |
| 18 | University of California-Los Angeles | 838 | 837 | 856 | 875 | 916 | 924 | 1,027 | 1,074 | 1,188 | 1,332 | 1,263 |
| 19 | University of Southern California | 1,668 | 1,729 | 1,675 | 1,616 | 1,500 | 1,228 | 1,238 | 1,368 | 1,369 | 1,262 | 1,259 |
| 20 | Teachers College, Columbia University | 910 | 891 | 936 | 1,067 | 1,026 | 968 | 1,029 | 1,063 | 1,131 | 1,145 | 1,177 |
| 21 | University of Massachusetts Central Office | 703 | 745 | 694 | 913 | 890 | 959 | 975 | 996 | 1,070 | 1,108 | 1,149 |
| 22 | American University | 690 | 635 | 648 | 620 | 690 | 765 | 846 | 1,052 | 1,186 | 1,230 | 1,143 |
| 23 | George Mason University | 362 | 361 | 499 | 638 | 681 | 752 | 759 | 801 | 896 | 922 | 1,142 |
| 24 | Nova Southeastern University | 306 | 139 | 644 | 707 | 663 | 673 | 762 | 845 | 954 | 1,127 | 1,124 |
| 25 | Stanford University | 717 | 707 | 762 | 865 | 919 | 892 | 949 | 1,020 | 1,039 | 1,046 | 1,119 |
| 26 | University of Texas at Austin | 1,045 | 1,081 | 900 | 898 | 931 | 923 | 1,047 | 1,104 | 1,156 | 1,148 | 1,101 |
| 27 | North Carolina State University at Raleigh | 664 | 728 | 719 | 799 | 826 | 809 | 837 | 921 | 920 | 1,045 | 1,086 |
| 28 | Michigan State University | 755 | 815 | 753 | 767 | 863 | 854 | 900 | 958 | 1,064 | 1,070 | 1,077 |
| 29 | Antioch University, all campuses | 0 | 0 | 0 | 843 | 758 | 846 | 1,108 | 1,139 | 1,105 | 1,171 | 1,070 |
| 30 | University of Pittsburgh, all campuses | 708 | 672 | 697 | 713 | 740 | 845 | 883 | 1,109 | 1,130 | 1,146 | 1,068 |
| 31 | Purdue University, all campuses | 833 | 803 | 762 | 889 | 896 | 896 | 894 | 970 | 1,051 | 1,091 | 1,066 |
| 32 | Louisiana State University, all campuses | 633 | 638 | 634 | 625 | 605 | 664 | 732 | 809 | 891 | 1,027 | 1,048 |
| 33 | University of Kansas, all campuses | 573 | 568 | 555 | 564 | 627 | 665 | 715 | 710 | 758 | 1,075 | 1,047 |
| 34 | Boston University | 594 | 659 | 667 | 665 | 656 | 798 | 805 | 859 | 979 | 1,032 | 1,035 |
| 35 | Virginia Polytechnic Institute and State University | 798 | 788 | 790 | 683 | 808 | 850 | 852 | 876 | 927 | 935 | 1,035 |
| 36 | University of North Carolina at Chapel Hill | 742 | 731 | 767 | 832 | 913 | 943 | 913 | 979 | 1,031 | 1,046 | 1,023 |
| 37 | University of Florida | 721 | 725 | 740 | 797 | 757 | 804 | 830 | 890 | 975 | 992 | 1,020 |
| 38 | Arizona State University Main | 529 | 505 | 565 | 672 | 690 | 792 | 844 | 989 | 983 | 983 | 1,019 |
| 39 | Massachusetts Institute of Technology | 769 | 774 | 761 | 807 | 867 | 956 | 972 | 977 | 1,013 | 983 | 1,007 |
| 40 | University of Arizona | 879 | 935 | 839 | 871 | 880 | 857 | 881 | 901 | 939 | 942 | 997 |
| 41 | University of California-Davis | 823 | 899 | 819 | 852 | 861 | 922 | 853 | 860 | 912 | 922 | 951 |
| 42 | SUNY at Buffalo, all campuses | 653 | 685 | 828 | 825 | 785 | 841 | 916 | 934 | 964 | 910 | 885 |
| 43 | Iowa State University | 693 | 697 | 746 | 796 | 793 | 828 | 821 | 838 | 898 | 913 | 880 |
| 44 | Wayne State University | 526 | 586 | 519 | 552 | 702 | 766 | 756 | 792 | 769 | 860 | 854 |
| 45 | Georgia Institute of Technology, all campuses | 420 | 457 | 486 | 508 | 515 | 601 | 702 | 745 | 790 | 833 | 828 |
| 46 | State University of New York at Albany | 430 | 417 | 420 | 430 | 459 | 505 | 534 | 843 | 892 | 852 | 828 |
| 47 | University of Connecticut, all campuses | 570 | 590 | 634 | 621 | 636 | 694 | 749 | 803 | 809 | 795 | 826 |
| 48 | University of Pennsylvania | 775 | 755 | 747 | 759 | 817 | 790 | 797 | 785 | 804 | 780 | 802 |
| 49 | University of Illinois at Chicago | 635 | 673 | 673 | 638 | 714 | 760 | 807 | 838 | 809 | 797 | 799 |
| 50 | University of Chicago | 417 | 510 | 509 | 545 | 598 | 644 | 656 | 755 | 770 | 802 | 782 |

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

**Appendix table 4-12. Graduate science and engineering student enrollment in Historically Black Colleges and Universities, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 3,404 | 3,290 | 3,042 | 3,319 | 3,285 | 3,490 | 3,527 | 3,734 | 3,975 | 4,526 | 4,489 | 31.9 | 12.9 | 100.0 | 100.0 |
| Total sciences | 3,062 | 2,916 | 2,707 | 2,939 | 2,902 | 3,096 | 3,115 | 3,251 | 3,497 | 3,941 | 3,902 | 27.4 | 11.6 | 90.0 | 86.9 |
| Total physical sciences | 320 | 299 | 300 | 328 | 336 | 322 | 332 | 363 | 397 | 437 | 453 | 41.6 | 14.1 | 9.4 | 10.1 |
| Chemistry | 228 | 196 | 197 | 204 | 233 | 203 | 206 | 211 | 237 | 270 | 271 | 18.9 | 14.3 | 6.7 | 6.0 |
| Physics | 72 | 84 | 100 | 112 | 94 | 112 | 120 | 146 | 145 | 153 | 170 | 136.1 | 17.2 | 2.1 | 3.8 |
| Other physical sciences | 20 | 19 | 3 | 12 | 9 | 7 | 6 | 6 | 15 | 14 | 12 | -40.0 | -20.0 | 0.6 | 0.3 |
| Earth, atmospheric, and ocean sciences | 34 | 19 | 16 | 36 | 27 | 48 | 60 | 80 | 92 | 75 | 82 | 141.2 | -10.9 | 1.0 | 1.8 |
| Earth sciences | 17 | 19 | 16 | 13 | 2 | 6 | 3 | 5 | 4 | 2 | 2 | -88.2 | -50.0 | 0.5 | 0.0 |
| Oceanography | 0 | 0 | 0 | 23 | 25 | 37 | 41 | 41 | 37 | 36 | 35 | 100.0 | -5.4 | 0.0 | 0.8 |
| Other geosciences | 17 | 0 | 0 | 0 | 0 | 5 | 16 | 34 | 51 | 37 | 45 | 164.7 | -11.8 | 0.5 | 1.0 |
| Mathematics and statistics | 240 | 265 | 259 | 252 | 255 | 179 | 187 | 192 | 249 | 233 | 208 | -13.3 | -16.5 | 7.1 | 4.6 |
| Computer science | 304 | 279 | 229 | 277 | 290 | 404 | 429 | 437 | 425 | 450 | 415 | 36.5 | -2.4 | 8.9 | 9.2 |
| Agricultural sciences | 66 | 55 | 52 | 64 | 66 | 131 | 122 | 133 | 115 | 155 | 185 | 180.3 | 60.9 | 1.9 | 4.1 |
| Biological sciences | 479 | 447 | 409 | 414 | 447 | 460 | 468 | 500 | 641 | 652 | 715 | 49.3 | 11.5 | 14.1 | 15.9 |
| Psychology | 404 | 419 | 374 | 443 | 440 | 448 | 447 | 506 | 550 | 699 | 580 | 43.6 | 5.5 | 11.9 | 12.9 |
| Social sciences | 1,215 | 1,133 | 1,068 | 1,125 | 1,041 | 1,104 | 1,070 | 1,040 | 1,028 | 1,240 | 1,264 | 4.0 | 23.0 | 35.7 | 28.2 |
| Economics | 224 | 206 | 169 | 180 | 148 | 125 | 102 | 138 | 125 | 120 | 101 | -54.9 | -19.2 | 6.6 | 2.2 |
| Political science and public administration | 345 | 389 | 367 | 399 | 335 | 376 | 407 | 454 | 447 | 611 | 673 | 95.1 | 50.6 | 10.1 | 15.0 |
| Sociology | 306 | 239 | 257 | 243 | 238 | 272 | 238 | 262 | 271 | 324 | 326 | 6.5 | 20.3 | 9.0 | 7.3 |
| Linguistics | 129 | 129 | 144 | 136 | 137 | 134 | 142 | 0 | 0 | 0 | 0 | -100.0 | 0.0 | 3.8 | 0.0 |
| Other social sciences | 211 | 170 | 131 | 167 | 183 | 197 | 181 | 186 | 185 | 185 | 164 | -22.3 | -11.4 | 6.2 | 3.7 |
| Engineering | 342 | 374 | 335 | 380 | 383 | 394 | 412 | 483 | 478 | 585 | 587 | 71.6 | 22.8 | 10.0 | 13.1 |
| Chemical engineering | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 28 | 28 | 27 | 33 | 100.0 | 17.9 | 0.0 | 0.7 |
| Civil engineering | 46 | 47 | 52 | 57 | 72 | 60 | 75 | 87 | 101 | 97 | 104 | 126.1 | 3.0 | 1.4 | 2.3 |
| Electrical engineering | 121 | 61 | 129 | 111 | 129 | 132 | 132 | 164 | 157 | 190 | 155 | 28.1 | -1.3 | 3.6 | 3.5 |
| Mechanical engineering | 81 | 63 | 65 | 102 | 72 | 100 | 94 | 106 | 99 | 113 | 121 | 49.4 | 22.2 | 2.4 | 2.7 |
| Industrial engineering | 20 | 0 | 10 | 26 | 26 | 28 | 34 | 40 | 39 | 64 | 55 | 175.0 | 41.0 | 0.6 | 1.2 |
| Other engineering | 74 | 203 | 79 | 84 | 84 | 74 | 61 | 58 | 54 | 94 | 119 | 60.8 | 120.4 | 2.2 | 2.7 |

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

**Appendix table 4-13. Female graduate science and engineering students attending Historically Black Colleges and Universities, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 1,316 | 1,273 | 1,114 | 1,277 | 1,344 | 1,505 | 1,546 | 1,585 | 1,839 | 2,173 | 2,206 | 67.6 | 20.0 | 100.0 | 100.0 |
| Total sciences | 1,279 | 1,214 | 1,061 | 1,216 | 1,285 | 1,418 | 1,461 | 1,484 | 1,739 | 2,045 | 2,060 | 61.1 | 18.5 | 97.2 | 93.4 |
| Total physical sciences | 113 | 85 | 84 | 93 | 105 | 106 | 109 | 119 | 155 | 165 | 171 | 51.3 | 10.3 | 8.6 | 7.8 |
| Chemistry | 93 | 60 | 69 | 69 | 84 | 81 | 80 | 85 | 113 | 130 | 123 | 32.3 | 8.8 | 7.1 | 5.6 |
| Physics | 8 | 13 | 14 | 18 | 14 | 20 | 24 | 29 | 33 | 29 | 42 | 425.0 | 27.3 | 0.6 | 1.9 |
| Other physical sciences | 12 | 12 | 1 | 6 | 7 | 5 | 5 | 5 | 9 | 6 | 6 | -50.0 | -33.3 | 0.9 | 0.3 |
| Earth, atmospheric, and ocean sciences | 7 | 9 | 5 | 17 | 12 | 22 | 25 | 33 | 39 | 41 | 47 | 571.4 | 20.5 | 0.5 | 2.1 |
| Earth sciences | 5 | 9 | 5 | 4 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | -60.0 | 0.0 | 0.4 | 0.1 |
| Oceanography | 0 | 0 | 0 | 13 | 12 | 17 | 18 | 19 | 16 | 18 | 21 | 100.0 | 31.3 | 0.0 | 1.0 |
| Other geosciences | 2 | 0 | 0 | 0 | 0 | 3 | 5 | 12 | 21 | 21 | 24 | 1,100.0 | 14.3 | 0.2 | 1.1 |
| Mathematics and statistics | 100 | 105 | 81 | 84 | 92 | 70 | 70 | 71 | 122 | 116 | 84 | -16.0 | -31.1 | 7.6 | 3.8 |
| Computer science | 84 | 83 | 58 | 96 | 107 | 154 | 150 | 149 | 152 | 153 | 176 | 109.5 | 15.8 | 6.4 | 8.0 |
| Agricultural sciences | 15 | 9 | 8 | 8 | 9 | 27 | 31 | 33 | 60 | 81 | 93 | 520.0 | 55.0 | 1.1 | 4.2 |
| Biological sciences | 257 | 222 | 200 | 201 | 240 | 240 | 237 | 263 | 335 | 361 | 414 | 61.1 | 23.6 | 19.5 | 18.8 |
| Psychology | 227 | 252 | 225 | 284 | 294 | 291 | 318 | 328 | 367 | 491 | 398 | 75.3 | 8.4 | 17.2 | 18.0 |
| Social Sciences | 476 | 449 | 400 | 433 | 426 | 508 | 521 | 488 | 509 | 637 | 677 | 42.2 | 33.0 | 36.2 | 30.7 |
| Economics | 38 | 37 | 33 | 32 | 32 | 29 | 34 | 43 | 33 | 30 | 32 | -15.8 | -3.0 | 2.9 | 1.5 |
| Political science and public administration | 136 | 139 | 117 | 135 | 107 | 155 | 194 | 219 | 224 | 322 | 374 | 175.0 | 67.0 | 10.3 | 17.0 |
| Sociology | 146 | 135 | 137 | 125 | 134 | 158 | 114 | 130 | 153 | 188 | 185 | 26.7 | 20.9 | 11.1 | 8.4 |
| Linguistics | 86 | 86 | 69 | 66 | 83 | 81 | 86 | 0 | 0 | 0 | 0 | -100.0 | 0.0 | 6.5 | 0.0 |
| Other social sciences | 70 | 52 | 44 | 75 | 70 | 85 | 93 | 96 | 99 | 97 | 86 | 22.9 | -13.1 | 5.3 | 3.9 |
| Total engineering | 37 | 59 | 53 | 61 | 59 | 87 | 85 | 101 | 100 | 128 | 146 | 294.6 | 46.0 | 2.8 | 6.6 |
| Chemical engineering | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 10 | 10 | 10 | 13 | 100.0 | 30.0 | 0.0 | 0.6 |
| Civil engineering | 9 | 20 | 22 | 27 | 17 | 12 | 13 | 15 | 15 | 20 | 25 | 177.8 | 66.7 | 0.7 | 1.1 |
| Electrical engineering | 12 | 11 | 17 | 12 | 16 | 39 | 28 | 31 | 31 | 32 | 35 | 191.7 | 12.9 | 0.9 | 1.6 |
| Mechanical engineering | 7 | 3 | 6 | 9 | 6 | 11 | 14 | 9 | 11 | 19 | 21 | 200.0 | 90.9 | 0.5 | 1.0 |
| Industrial engineering | 7 | 0 | 2 | 5 | 9 | 15 | 14 | 24 | 17 | 23 | 23 | 228.6 | 35.3 | 0.5 | 1.0 |
| Other engineering | 2 | 25 | 6 | 8 | 11 | 10 | 10 | 12 | 16 | 24 | 29 | 1,350.0 | 81.3 | 0.2 | 1.3 |

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

**Appendix table 4-14. U.S. citizen and permanent resident graduate students in science and engineering, by field for all races and ethnicities: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 281,314 | 284,144 | 284,565 | 281,672 | 284,686 | 294,339 | 304,073 | 321,281 | 330,447 | 329,391 | 325,135 | 15.6 | -1.6 | 100.0 | 100.0 |
| Total sciences | 214,145 | 214,215 | 213,989 | 214,069 | 217,340 | 224,913 | 231,840 | 244,686 | 252,833 | 253,326 | 253,093 | 18.2 | 0.1 | 76.1 | 77.8 |
| Total physical sciences | 22,040 | 22,218 | 22,099 | 21,890 | 21,843 | 21,609 | 21,985 | 22,543 | 23,066 | 22,742 | 22,028 | -0.1 | -4.5 | 7.8 | 6.8 |
| Astronomy | 517 | 526 | 537 | 565 | 625 | 618 | 612 | 644 | 663 | 711 | 680 | 31.5 | 2.6 | 0.2 | 0.2 |
| Chemistry | 13,934 | 13,902 | 13,528 | 12,920 | 12,721 | 12,475 | 12,509 | 13,022 | 13,456 | 13,385 | 13,181 | -5.4 | -2.0 | 5.0 | 4.1 |
| Physics | 7,278 | 7,447 | 7,692 | 8,107 | 8,188 | 8,221 | 8,511 | 8,495 | 8,557 | 8,217 | 7,764 | 6.7 | -9.3 | 2.6 | 2.4 |
| Other physical sciences | 311 | 343 | 342 | 298 | 309 | 295 | 353 | 382 | 390 | 429 | 403 | 29.6 | 3.3 | 0.1 | 0.1 |
| Total earth sciences | 13,554 | 12,996 | 12,181 | 11,459 | 11,068 | 11,309 | 11,583 | 12,343 | 12,795 | 12,776 | 12,866 | -5.1 | 0.6 | 4.8 | 4.0 |
| Atmospheric science | 755 | 748 | 713 | 693 | 663 | 648 | 658 | 765 | 815 | 844 | 806 | 6.8 | -1.1 | 0.3 | 0.2 |
| Earth sciences | 9,268 | 8,695 | 7,785 | 7,147 | 6,648 | 6,211 | 6,032 | 6,076 | 6,113 | 5,991 | 6,059 | -34.6 | -0.9 | 3.3 | 1.9 |
| Oceanography | 1,736 | 1,704 | 1,723 | 1,568 | 1,644 | 1,776 | 1,777 | 1,937 | 2,022 | 2,132 | 2,082 | 19.9 | 3.0 | 0.6 | 0.6 |
| Other geosciences | 1,795 | 1,849 | 1,960 | 2,051 | 2,113 | 2,674 | 3,116 | 3,565 | 3,845 | 3,809 | 3,919 | 118.3 | 1.9 | 0.6 | 1.2 |
| Mathematics and statistics | 12,218 | 12,139 | 12,379 | 12,652 | 12,564 | 13,210 | 13,318 | 13,878 | 13,866 | 13,496 | 12,688 | 3.8 | -8.5 | 4.3 | 3.9 |
| Computer science | 22,272 | 23,291 | 23,274 | 23,243 | 22,788 | 23,351 | 22,988 | 24,165 | 24,344 | 23,200 | 22,796 | 2.4 | -6.4 | 7.9 | 7.0 |
| Agricultural sciences | 8,905 | 8,665 | 8,204 | 8,206 | 8,251 | 8,133 | 8,298 | 8,649 | 8,778 | 9,060 | 9,304 | 4.5 | 6.0 | 3.2 | 2.9 |
| Biological sciences | 39,245 | 38,967 | 38,069 | 37,876 | 38,080 | 38,470 | 39,282 | 41,358 | 43,525 | 45,274 | 46,455 | 18.4 | 6.7 | 14.0 | 14.3 |
| Psychology | 39,229 | 39,739 | 41,073 | 42,316 | 43,897 | 46,350 | 49,355 | 51,638 | 52,771 | 52,363 | 52,126 | 32.9 | -1.2 | 13.9 | 16.0 |
| Social sciences | 56,682 | 56,200 | 56,710 | 56,427 | 58,849 | 62,481 | 65,031 | 70,112 | 73,688 | 74,415 | 74,830 | 32.0 | 1.5 | 20.1 | 23.0 |
| Economics | 9,234 | 8,879 | 8,493 | 8,207 | 8,182 | 8,252 | 8,589 | 9,040 | 9,204 | 8,949 | 8,617 | -6.7 | -6.4 | 3.3 | 2.7 |
| Political science and public administration | 23,446 | 23,455 | 23,712 | 24,003 | 25,648 | 27,095 | 28,099 | 30,259 | 31,614 | 30,965 | 30,983 | 32.1 | -2.0 | 8.3 | 9.5 |
| Sociology | 6,044 | 5,970 | 6,267 | 6,266 | 6,589 | 7,145 | 7,570 | 8,339 | 8,809 | 9,055 | 9,212 | 52.4 | 4.6 | 2.1 | 2.8 |
| Anthropology | 5,090 | 5,173 | 5,173 | 5,215 | 5,365 | 5,688 | 5,907 | 6,309 | 6,561 | 6,878 | 6,994 | 37.4 | 6.6 | 1.8 | 2.2 |
| Linguisics | 1,983 | 2,016 | 2,179 | 2,102 | 2,109 | 2,167 | 2,166 | 2,180 | 2,260 | 2,267 | 2,197 | 10.8 | -2.8 | 0.7 | 0.7 |
| History of science | 217 | 224 | 251 | 242 | 264 | 287 | 286 | 300 | 314 | 331 | 350 | 61.3 | 11.5 | 0.1 | 0.1 |
| Other social sciences | 10,668 | 10,483 | 10,635 | 10,392 | 10,692 | 11,847 | 12,414 | 13,685 | 14,926 | 15,970 | 16,477 | 54.5 | 10.4 | 3.8 | 5.1 |
| Total engineering | 67,169 | 69,929 | 70,576 | 67,603 | 67,346 | 69,426 | 72,233 | 76,595 | 77,614 | 76,065 | 72,042 | 7.3 | -7.2 | 23.9 | 22.2 |
| Aeronautical engineering | 1,729 | 1,932 | 2,144 | 2,113 | 2,431 | 2,703 | 2,892 | 2,854 | 2,739 | 2,476 | 2,157 | 24.8 | -21.2 | 0.6 | 0.7 |
| Chemical engineering | 4,729 | 4,640 | 4,625 | 4,071 | 3,662 | 3,791 | 3,939 | 4,122 | 4,348 | 4,595 | 4,482 | -5.2 | 3.1 | 1.7 | 1.4 |
| Civil engineering | 9,515 | 9,286 | 9,095 | 9,000 | 9,074 | 9,628 | 10,854 | 12,734 | 13,299 | 13,991 | 13,618 | 43.1 | 2.4 | 3.4 | 4.2 |
| Electrical engineering | 19,760 | 20,425 | 21,282 | 21,670 | 22,109 | 22,127 | 22,366 | 23,627 | 22,897 | 21,644 | 19,752 | 0.0 | -13.7 | 7.0 | 6.1 |
| Mechanical engineering | 9,370 | 10,329 | 10,855 | 10,131 | 10,450 | 10,799 | 11,056 | 11,875 | 12,199 | 11,923 | 10,918 | 16.5 | -10.5 | 3.3 | 3.4 |
| Materials engineering | 2,574 | 2,600 | 2,673 | 2,557 | 2,653 | 2,826 | 2,992 | 3,301 | 3,201 | 3,225 | 2,987 | 16.0 | -6.7 | 0.9 | 0.9 |
| Industrial engineering | 8,552 | 9,364 | 9,607 | 8,710 | 8,176 | 8,129 | 8,902 | 9,682 | 10,153 | 10,120 | 9,865 | 15.4 | -2.8 | 3.0 | 3.0 |
| Other engineering | 10,940 | 11,353 | 10,295 | 9,351 | 8,791 | 9,423 | 9,232 | 8,400 | 8,778 | 8,091 | 8,263 | -24.5 | -5.9 | 3.9 | 2.5 |

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

**Appendix table 4-15. Black graduate students in science and engineering, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 10,453 | 10,460 | 10,426 | 11,191 | 11,775 | 12,774 | 13,691 | 15,449 | 17,147 | 17,665 | 18,366 | 75.7 | 7.1 |
| Total sciences | 9,066 | 9,008 | 9,010 | 9,691 | 10,159 | 10,988 | 11,666 | 13,075 | 14,588 | 14,882 | 15,494 | 70.9 | 6.2 |
| Total physical sciences | 535 | 524 | 536 | 569 | 633 | 654 | 699 | 807 | 843 | 856 | 894 | 67.1 | 6.0 |
| Astronomy | 6 | 5 | 6 | 6 | 6 | 8 | 11 | 10 | 12 | 8 | 11 | 83.3 | -8.3 |
| Chemistry | 381 | 356 | 374 | 372 | 440 | 452 | 477 | 566 | 594 | 596 | 621 | 63.0 | 4.5 |
| Physics | 121 | 125 | 136 | 171 | 173 | 177 | 189 | 211 | 211 | 242 | 248 | 105.0 | 17.5 |
| Other physical sciences | 27 | 38 | 20 | 20 | 14 | 17 | 22 | 20 | 26 | 10 | 14 | -48.1 | -46.2 |
| Total earth sciences | 127 | 98 | 93 | 107 | 95 | 123 | 141 | 202 | 227 | 203 | 220 | 73.2 | -3.1 |
| Atmospheric science | 7 | 5 | 2 | 7 | 7 | 9 | 6 | 13 | 13 | 12 | 18 | 157.1 | 38.5 |
| Earth sciences | 70 | 46 | 49 | 50 | 43 | 51 | 55 | 73 | 67 | 57 | 67 | -4.3 | 0.0 |
| Oceanography | 18 | 18 | 14 | 19 | 21 | 21 | 24 | 28 | 29 | 40 | 34 | 88.9 | 17.2 |
| Other geosciences | 32 | 29 | 28 | 31 | 24 | 42 | 56 | 88 | 118 | 94 | 101 | 215.6 | -14.4 |
| Mathematics and statistics | 409 | 449 | 441 | 422 | 463 | 511 | 524 | 579 | 710 | 672 | 690 | 68.7 | -2.8 |
| Computer science | 622 | 702 | 769 | 839 | 848 | 985 | 1,093 | 1,108 | 1,193 | 1,216 | 1,189 | 91.2 | -0.3 |
| Agricultural sciences | 137 | 120 | 133 | 143 | 153 | 158 | 145 | 209 | 235 | 239 | 293 | 113.9 | 24.7 |
| Biological sciences | 1,183 | 1,103 | 1,055 | 1,153 | 1,212 | 1,249 | 1,317 | 1,493 | 1,737 | 1,709 | 1,879 | 58.8 | 8.2 |
| Psychology | 1,790 | 1,786 | 1,794 | 1,945 | 2,061 | 2,226 | 2,455 | 2,762 | 3,288 | 3,545 | 3,422 | 91.2 | 4.1 |
| Social sciences | 4,263 | 4,226 | 4,189 | 4,513 | 4,694 | 5,082 | 5,292 | 5,915 | 6,355 | 6,442 | 6,907 | 62.0 | 8.7 |
| Economics | 392 | 392 | 379 | 368 | 359 | 368 | 365 | 453 | 482 | 447 | 466 | 18.9 | -3.3 |
| Political science and public administration | 2,143 | 2,245 | 2,133 | 2,365 | 2,500 | 2,715 | 2,831 | 3,193 | 3,258 | 3,234 | 3,559 | 66.1 | 9.2 |
| Sociology | 580 | 514 | 557 | 587 | 598 | 693 | 752 | 869 | 985 | 1,057 | 1,095 | 88.8 | 11.2 |
| Anthropology | 95 | 95 | 101 | 106 | 116 | 128 | 132 | 174 | 176 | 209 | 215 | 126.3 | 22.2 |
| Linguisics | 119 | 123 | 142 | 146 | 151 | 143 | 145 | 46 | 63 | 59 | 51 | -57.1 | -19.0 |
| History of science | 2 | 4 | 5 | 3 | 3 | 5 | 5 | 6 | 4 | 7 | 8 | 300.0 | 100.0 |
| Other social sciences | 932 | 853 | 872 | 938 | 967 | 1,030 | 1,062 | 1,174 | 1,387 | 1,429 | 1,513 | 62.3 | 9.1 |
| Total engineering | 1,387 | 1,452 | 1,416 | 1,500 | 1,616 | 1,786 | 2,025 | 2,374 | 2,559 | 2,783 | 2,872 | 107.1 | 12.2 |
| Aeronautical engineering | 24 | 25 | 25 | 24 | 27 | 38 | 44 | 47 | 56 | 61 | 51 | 112.5 | -8.9 |
| Chemical engineering | 71 | 85 | 87 | 84 | 79 | 84 | 119 | 144 | 159 | 157 | 174 | 145.1 | 9.4 |
| Civil engineering | 182 | 172 | 160 | 189 | 244 | 232 | 279 | 343 | 393 | 423 | 474 | 160.4 | 20.6 |
| Electrical engineering | 455 | 390 | 422 | 514 | 564 | 612 | 669 | 771 | 863 | 861 | 831 | 82.6 | -3.7 |
| Mechanical engineering | 161 | 161 | 187 | 200 | 200 | 247 | 246 | 320 | 336 | 398 | 403 | 150.3 | 19.9 |
| Materials engineering | 33 | 32 | 23 | 26 | 36 | 55 | 55 | 61 | 72 | 88 | 86 | 160.6 | 19.4 |
| Industrial engineering | 233 | 270 | 270 | 267 | 253 | 294 | 384 | 444 | 440 | 507 | 525 | 125.3 | 19.3 |
| Other engineering | 228 | 317 | 242 | 196 | 213 | 224 | 229 | 244 | 240 | 288 | 328 | 43.9 | 36.7 |

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

**Appendix table 4-16. American Indian or Alaskan Native graduate students in science and engineering, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 737 | 743 | 782 | 918 | 860 | 1,054 | 1,120 | 1,244 | 1,312 | 1,383 | 1,524 | 106.8 | 16.2 |
| Total sciences | 615 | 613 | 659 | 775 | 738 | 902 | 935 | 1,067 | 1,101 | 1,141 | 1,293 | 110.2 | 17.4 |
| Total physical sciences | 35 | 48 | 46 | 52 | 44 | 63 | 62 | 67 | 81 | 67 | 78 | 122.9 | -3.7 |
| Astronomy | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 4 | 3 | 3 | 3 | 200.0 | 0.0 |
| Chemistry | 25 | 33 | 29 | 30 | 25 | 44 | 43 | 37 | 54 | 46 | 45 | 80.0 | -16.7 |
| Physics | 9 | 13 | 16 | 20 | 19 | 16 | 15 | 26 | 22 | 16 | 30 | 233.3 | 36.4 |
| Other physical sciences | 0 | 1 | 0 | 2 | 0 | 1 | 2 | 0 | 2 | 2 | 0 | 0.0 | -100.0 |
| Total earth sciences | 23 | 19 | 18 | 27 | 26 | 30 | 29 | 35 | 46 | 49 | 53 | 130.4 | 15.2 |
| Atmospheric science | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 4 | N/A | 100.0 |
| Earth sciences | 17 | 14 | 16 | 24 | 19 | 22 | 20 | 25 | 27 | 29 | 27 | 58.8 | 0.0 |
| Oceanography | 2 | 2 | 1 | 0 | 0 | 1 | 3 | 4 | 3 | 6 | 8 | 300.0 | 166.7 |
| Other geosciences | 4 | 2 | 1 | 3 | 7 | 7 | 6 | 6 | 14 | 11 | 14 | 250.0 | 0.0 |
| Mathematics and statistics | 22 | 31 | 48 | 32 | 34 | 20 | 20 | 27 | 32 | 36 | 70 | 218.2 | 118.8 |
| Computer science | 57 | 21 | 28 | 39 | 40 | 44 | 42 | 72 | 68 | 43 | 55 | -3.5 | -19.1 |
| Agricultural sciences | 22 | 24 | 29 | 33 | 25 | 20 | 31 | 39 | 34 | 37 | 58 | 163.6 | 70.6 |
| Biological sciences | 88 | 105 | 90 | 104 | 85 | 142 | 129 | 141 | 157 | 183 | 214 | 143.2 | 36.3 |
| Psychology | 135 | 134 | 152 | 177 | 180 | 235 | 252 | 291 | 290 | 317 | 331 | 145.2 | 14.1 |
| Social sciences | 233 | 231 | 248 | 311 | 304 | 348 | 370 | 395 | 393 | 409 | 434 | 86.3 | 10.4 |
| Economics | 17 | 28 | 19 | 85 | 70 | 68 | 57 | 35 | 23 | 24 | 26 | 52.9 | 13.0 |
| Political science and public administration | 108 | 89 | 98 | 96 | 91 | 100 | 114 | 126 | 141 | 145 | 137 | 26.9 | -2.8 |
| Sociology | 34 | 29 | 38 | 30 | 37 | 50 | 55 | 64 | 62 | 62 | 58 | 70.6 | -6.5 |
| Anthropology | 21 | 27 | 36 | 45 | 53 | 66 | 68 | 74 | 79 | 89 | 103 | 390.5 | 30.4 |
| Linguisics | 8 | 9 | 13 | 6 | 10 | 8 | 7 | 3 | 3 | 7 | 9 | 12.5 | 200.0 |
| History of science | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | N/A | N/A |
| Other social sciences | 45 | 49 | 44 | 49 | 43 | 55 | 69 | 92 | 85 | 81 | 100 | 122.2 | 17.6 |
| Total engineering | 122 | 130 | 123 | 143 | 122 | 152 | 185 | 177 | 211 | 242 | 231 | 89.3 | 9.5 |
| Aeronautical engineering | 2 | 8 | 5 | 3 | 5 | 6 | 5 | 6 | 8 | 6 | 8 | 300.0 | 0.0 |
| Chemical engineering | 8 | 5 | 26 | 24 | 10 | 5 | 22 | 15 | 14 | 18 | 21 | 162.5 | 50.0 |
| Civil engineering | 16 | 28 | 9 | 22 | 22 | 37 | 34 | 31 | 43 | 38 | 42 | 162.5 | -2.3 |
| Electrical engineering | 30 | 43 | 18 | 39 | 37 | 49 | 39 | 38 | 45 | 53 | 52 | 73.3 | 15.6 |
| Mechanical engineering | 25 | 15 | 23 | 12 | 13 | 15 | 21 | 24 | 30 | 54 | 44 | 76.0 | 46.7 |
| Materials engineering | 6 | 3 | 2 | 4 | 5 | 2 | 1 | 4 | 4 | 6 | 8 | 33.3 | 100.0 |
| Industrial engineering | 11 | 10 | 24 | 14 | 15 | 23 | 39 | 42 | 36 | 23 | 23 | 109.1 | -36.1 |
| Other engineering | 24 | 18 | 16 | 25 | 15 | 15 | 24 | 17 | 31 | 44 | 33 | 37.5 | 6.5 |

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

**Appendix table 4-17. Hispanic graduate students in science and engineering, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 8,614 | 8,658 | 8,823 | 9,098 | 9,436 | 10,159 | 11,045 | 12,248 | 13,386 | 13,284 | 14,089 | 63.6 | 5.3 |
| Total sciences | 7,133 | 7,056 | 7,093 | 7,379 | 7,729 | 8,273 | 8,921 | 9,785 | 10,692 | 10,427 | 11,258 | 57.8 | 5.3 |
| Total physical sciences | 599 | 629 | 591 | 624 | 680 | 642 | 649 | 680 | 747 | 675 | 732 | 22.2 | -2.0 |
| Astronomy | 7 | 7 | 8 | 6 | 13 | 7 | 11 | 11 | 13 | 16 | 16 | 128.6 | 23.1 |
| Chemistry | 438 | 463 | 419 | 438 | 464 | 426 | 398 | 428 | 472 | 442 | 486 | 11.0 | 3.0 |
| Physics | 151 | 153 | 159 | 178 | 195 | 203 | 233 | 229 | 252 | 211 | 219 | 45.0 | -13.1 |
| Other physical sciences | 3 | 6 | 5 | 2 | 8 | 6 | 7 | 12 | 10 | 6 | 11 | 266.7 | 10.0 |
| Total earth sciences | 238 | 237 | 227 | 210 | 209 | 241 | 250 | 308 | 371 | 344 | 369 | 55.0 | -0.5 |
| Atmospheric science | 11 | 13 | 10 | 9 | 8 | 9 | 24 | 11 | 15 | 14 | 10 | -9.1 | -33.3 |
| Earth sciences | 105 | 98 | 99 | 112 | 110 | 130 | 116 | 141 | 160 | 140 | 154 | 46.7 | -3.8 |
| Oceanography | 98 | 101 | 90 | 68 | 68 | 61 | 59 | 65 | 102 | 88 | 97 | -1.0 | -4.9 |
| Other geosciences | 24 | 25 | 28 | 21 | 23 | 41 | 51 | 91 | 94 | 102 | 108 | 350.0 | 14.9 |
| Mathematics and statistics | 262 | 270 | 266 | 328 | 305 | 351 | 349 | 376 | 415 | 369 | 400 | 52.7 | -3.6 |
| Computer science | 488 | 453 | 551 | 516 | 542 | 565 | 631 | 706 | 699 | 637 | 660 | 35.2 | -5.6 |
| Agricultural sciences | 321 | 302 | 221 | 278 | 297 | 272 | 279 | 279 | 308 | 263 | 289 | -10.0 | -6.2 |
| Biological sciences | 935 | 950 | 1,032 | 1,116 | 1,200 | 1,220 | 1,374 | 1,459 | 1,649 | 1,651 | 1,810 | 93.6 | 9.8 |
| Psychology | 1,611 | 1,707 | 1,665 | 1,722 | 1,751 | 2,160 | 2,365 | 2,373 | 2,564 | 2,488 | 2,777 | 72.4 | 8.3 |
| Social sciences | 2,679 | 2,508 | 2,540 | 2,585 | 2,745 | 2,822 | 3,024 | 3,604 | 3,939 | 4,000 | 4,221 | 57.6 | 7.2 |
| Economics | 315 | 309 | 292 | 321 | 305 | 279 | 336 | 382 | 391 | 404 | 420 | 33.3 | 7.4 |
| Political science and public administration | 1,445 | 1,405 | 1,254 | 1,330 | 1,390 | 1,361 | 1,453 | 1,776 | 1,902 | 1,789 | 1,926 | 33.3 | 1.3 |
| Sociology | 231 | 187 | 249 | 245 | 276 | 316 | 353 | 408 | 485 | 494 | 532 | 130.3 | 9.7 |
| Anthropology | 151 | 136 | 152 | 150 | 162 | 173 | 207 | 222 | 248 | 295 | 343 | 127.2 | 38.3 |
| Linguisics | 68 | 68 | 93 | 113 | 128 | 136 | 132 | 168 | 165 | 158 | 138 | 102.9 | -16.4 |
| History of science | 2 | 1 | 3 | 5 | 3 | 4 | 4 | 3 | 3 | 5 | 4 | 100.0 | 33.3 |
| Other social sciences | 467 | 402 | 497 | 421 | 481 | 553 | 539 | 645 | 745 | 855 | 858 | 83.7 | 15.2 |
| Total engineering | 1,481 | 1,602 | 1,730 | 1,719 | 1,707 | 1,886 | 2,124 | 2,463 | 2,694 | 2,857 | 2,831 | 91.2 | 5.1 |
| Aeronautical engineering | 33 | 24 | 37 | 45 | 49 | 51 | 54 | 72 | 70 | 75 | 65 | 97.0 | -7.1 |
| Chemical engineering | 107 | 116 | 117 | 135 | 111 | 143 | 159 | 176 | 180 | 171 | 202 | 88.8 | 12.2 |
| Civil engineering | 251 | 252 | 263 | 263 | 275 | 302 | 383 | 478 | 550 | 549 | 590 | 135.1 | 7.3 |
| Electrical engineering | 443 | 464 | 521 | 528 | 558 | 576 | 661 | 748 | 841 | 853 | 794 | 79.2 | -5.6 |
| Mechanical engineering | 181 | 243 | 282 | 217 | 214 | 282 | 338 | 394 | 382 | 451 | 420 | 132.0 | 9.9 |
| Materials engineering | 37 | 44 | 48 | 48 | 53 | 71 | 56 | 73 | 76 | 122 | 102 | 175.7 | 34.2 |
| Industrial engineering | 253 | 275 | 281 | 280 | 241 | 231 | 253 | 297 | 332 | 375 | 392 | 54.9 | 18.1 |
| Other engineering | 176 | 184 | 181 | 203 | 206 | 230 | 220 | 225 | 263 | 261 | 266 | 51.1 | 1.1 |

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

**Appendix table 4-18. Asian or Pacific Islander graduate students in science and engineering, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 12,003 | 12,775 | 14,565 | 15,188 | 15,693 | 17,156 | 18,139 | 21,762 | 24,149 | 26,457 | 26,015 | 116.7 | 7.7 |
| Total sciences | 7,198 | 7,661 | 8,716 | 9,278 | 9,682 | 10,469 | 11,023 | 13,270 | 15,150 | 16,656 | 16,897 | 134.7 | 11.5 |
| Total physical sciences | 937 | 910 | 1,047 | 1,253 | 1,175 | 1,200 | 1,429 | 1,615 | 1,973 | 1,925 | 1,797 | 91.8 | -8.9 |
| Astronomy | 6 | 12 | 14 | 37 | 36 | 38 | 30 | 25 | 24 | 35 | 30 | 400.0 | 25.0 |
| Chemistry | 660 | 631 | 715 | 720 | 680 | 653 | 820 | 923 | 1,186 | 1,174 | 1,121 | 69.8 | -5.5 |
| Physics | 265 | 259 | 304 | 481 | 452 | 501 | 557 | 640 | 732 | 683 | 629 | 137.4 | -14.1 |
| Other physical sciences | 6 | 8 | 14 | 15 | 7 | 8 | 22 | 27 | 31 | 33 | 17 | 183.3 | -45.2 |
| Total earth sciences | 194 | 153 | 179 | 209 | 207 | 258 | 267 | 383 | 469 | 454 | 423 | 118.0 | -9.8 |
| Atmospheric science | 25 | 27 | 37 | 47 | 45 | 26 | 28 | 51 | 55 | 66 | 69 | 176.0 | 25.5 |
| Earth sciences | 110 | 67 | 69 | 82 | 96 | 116 | 137 | 162 | 217 | 180 | 151 | 37.3 | -30.4 |
| Oceanography | 27 | 32 | 43 | 48 | 30 | 43 | 36 | 70 | 66 | 74 | 83 | 207.4 | 25.8 |
| Other geosciences | 32 | 27 | 30 | 32 | 36 | 73 | 66 | 100 | 131 | 134 | 120 | 275.0 | -8.4 |
| Mathematics and statistics | 623 | 706 | 769 | 756 | 703 | 822 | 866 | 963 | 1,020 | 1,199 | 1,124 | 80.4 | 10.2 |
| Computer science | 1,868 | 2,064 | 2,466 | 2,682 | 2,727 | 2,888 | 2,858 | 3,400 | 3,572 | 4,103 | 4,103 | 119.6 | 14.9 |
| Agricultural sciences | 138 | 135 | 169 | 217 | 236 | 242 | 225 | 215 | 264 | 276 | 273 | 97.8 | 3.4 |
| Biological sciences | 1,446 | 1,564 | 1,650 | 1,799 | 1,986 | 2,228 | 2,346 | 2,822 | 3,456 | 3,913 | 4,247 | 193.7 | 22.9 |
| Psychology | 559 | 619 | 727 | 747 | 817 | 962 | 1,040 | 1,284 | 1,476 | 1,586 | 1,596 | 185.5 | 8.1 |
| Social sciences | 1,433 | 1,510 | 1,709 | 1,615 | 1,831 | 1,869 | 1,992 | 2,588 | 2,920 | 3,200 | 3,334 | 132.7 | 14.2 |
| Economics | 314 | 390 | 414 | 361 | 427 | 445 | 424 | 563 | 639 | 666 | 643 | 104.8 | 0.6 |
| Political science and public administration | 676 | 595 | 651 | 595 | 710 | 714 | 810 | 960 | 1,086 | 1,091 | 1,227 | 81.5 | 13.0 |
| Sociology | 155 | 149 | 191 | 194 | 212 | 216 | 220 | 271 | 343 | 428 | 433 | 179.4 | 26.2 |
| Anthropology | 53 | 69 | 98 | 107 | 109 | 114 | 117 | 172 | 172 | 192 | 208 | 292.5 | 20.9 |
| Linguisics | 45 | 53 | 109 | 108 | 83 | 84 | 91 | 141 | 139 | 186 | 179 | 297.8 | 28.8 |
| History of science | 3 | 3 | 10 | 12 | 15 | 5 | 7 | 8 | 12 | 9 | 14 | 366.7 | 16.7 |
| Other social sciences | 187 | 251 | 236 | 238 | 275 | 291 | 323 | 473 | 529 | 628 | 630 | 236.9 | 19.1 |
| Total engineering | 4,805 | 5,114 | 5,849 | 5,910 | 6,011 | 6,687 | 7,116 | 8,492 | 8,999 | 9,801 | 9,118 | 89.8 | 1.3 |
| Aeronautical engineering | 84 | 101 | 109 | 125 | 143 | 152 | 196 | 181 | 224 | 223 | 177 | 110.7 | -21.0 |
| Chemical engineering | 277 | 287 | 348 | 302 | 235 | 316 | 399 | 379 | 461 | 521 | 461 | 66.4 | 0.0 |
| Civil engineering | 436 | 444 | 582 | 601 | 597 | 760 | 837 | 1,043 | 1,167 | 1,374 | 1,360 | 211.9 | 16.5 |
| Electrical engineering | 1,966 | 2,071 | 2,453 | 2,587 | 2,703 | 3,050 | 3,026 | 3,755 | 3,749 | 4,088 | 3,762 | 91.4 | 0.3 |
| Mechanical engineering | 794 | 811 | 883 | 769 | 824 | 830 | 985 | 1,179 | 1,307 | 1,410 | 1,243 | 56.5 | -4.9 |
| Materials engineering | 219 | 235 | 241 | 250 | 273 | 224 | 260 | 327 | 336 | 346 | 307 | 40.2 | -8.6 |
| Industrial engineering | 326 | 397 | 440 | 467 | 451 | 450 | 586 | 794 | 863 | 855 | 829 | 154.3 | -3.9 |
| Other engineering | 703 | 768 | 793 | 809 | 785 | 905 | 827 | 834 | 892 | 984 | 979 | 39.3 | 9.8 |

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

**Appendix table 4-19. White non-Hispanic graduate students in science and engineering, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 223,682 | 227,547 | 228,809 | 229,037 | 229,694 | 238,492 | 243,608 | 253,516 | 257,009 | 255,976 | 246,776 | 10.3 | -4.0 |
| Total sciences | 173,541 | 174,621 | 175,008 | 176,708 | 178,201 | 185,285 | 188,824 | 196,120 | 199,558 | 199,945 | 194,663 | 12.2 | -2.5 |
| Total physical sciences | 18,324 | 18,553 | 18,087 | 18,282 | 18,318 | 18,433 | 18,402 | 18,527 | 18,582 | 18,422 | 17,506 | -4.5 | -5.8 |
| Astronomy | 472 | 483 | 486 | 509 | 553 | 548 | 544 | 576 | 580 | 624 | 577 | 22.2 | -0.5 |
| Chemistry | 11,378 | 11,351 | 10,763 | 10,597 | 10,498 | 10,523 | 10,414 | 10,592 | 10,687 | 10,656 | 10,323 | -9.3 | -3.4 |
| Physics | 6,227 | 6,459 | 6,561 | 6,925 | 7,003 | 7,110 | 7,164 | 7,063 | 7,005 | 6,771 | 6,250 | 0.4 | -10.8 |
| Other physical sciences | 247 | 260 | 277 | 251 | 264 | 252 | 280 | 296 | 310 | 371 | 356 | 44.1 | 14.8 |
| Total earth sciences | 11,760 | 11,587 | 10,924 | 10,415 | 10,137 | 10,375 | 10,531 | 10,893 | 11,145 | 11,351 | 11,324 | -3.7 | 1.6 |
| Atmospheric science | 708 | 702 | 657 | 623 | 594 | 597 | 589 | 675 | 714 | 733 | 691 | -2.4 | -3.2 |
| Earth sciences | 7,916 | 7,700 | 7,099 | 6,565 | 6,125 | 5,747 | 5,510 | 5,389 | 5,384 | 5,391 | 5,402 | -31.8 | 0.3 |
| Oceanography | 1,507 | 1,501 | 1,425 | 1,380 | 1,468 | 1,580 | 1,550 | 1,653 | 1,701 | 1,868 | 1,811 | 20.2 | 6.5 |
| Other geosciences | 1,629 | 1,684 | 1,743 | 1,847 | 1,950 | 2,451 | 2,882 | 3,176 | 3,346 | 3,359 | 3,420 | 109.9 | 2.2 |
| Mathematics and statistics | 9,787 | 9,528 | 9,650 | 10,133 | 10,064 | 10,605 | 10,457 | 10,851 | 10,572 | 10,486 | 9,630 | -1.6 | -8.9 |
| Computer science | 15,724 | 16,525 | 17,156 | 17,346 | 16,496 | 17,292 | 16,464 | 16,894 | 16,801 | 15,759 | 14,795 | -5.9 | -11.9 |
| Agricultural sciences | 7,881 | 7,785 | 7,435 | 7,315 | 7,294 | 7,251 | 7,481 | 7,679 | 7,731 | 7,972 | 8,013 | 1.7 | 3.6 |
| Biological sciences | 34,002 | 33,779 | 32,643 | 32,725 | 32,361 | 32,677 | 33,058 | 34,229 | 35,094 | 36,389 | 36,489 | 7.3 | 4.0 |
| Psychology | 32,757 | 33,166 | 34,785 | 35,920 | 37,227 | 39,247 | 40,990 | 42,500 | 42,744 | 42,191 | 40,679 | 24.2 | -4.8 |
| Social sciences | 43,306 | 43,698 | 44,328 | 44,572 | 46,304 | 49,405 | 51,441 | 54,547 | 56,889 | 57,375 | 56,227 | 29.8 | -1.2 |
| Economics | 7,166 | 7,092 | 6,674 | 6,501 | 6,527 | 6,565 | 6,832 | 7,099 | 7,173 | 7,036 | 6,682 | -6.8 | -6.8 |
| Political science and public administration | 16,772 | 17,189 | 18,132 | 18,624 | 19,529 | 20,848 | 21,657 | 22,991 | 24,050 | 23,348 | 22,436 | 33.8 | -6.7 |
| Sociology | 4,796 | 4,653 | 4,833 | 4,845 | 5,233 | 5,621 | 5,944 | 6,405 | 6,552 | 6,737 | 6,678 | 39.2 | 1.9 |
| Anthropology | 4,553 | 4,645 | 4,448 | 4,457 | 4,631 | 4,939 | 5,116 | 5,359 | 5,581 | 5,827 | 5,812 | 27.7 | 4.1 |
| Linguisics | 1,672 | 1,595 | 1,720 | 1,683 | 1,670 | 1,728 | 1,697 | 1,747 | 1,770 | 1,770 | 1,688 | 1.0 | -4.6 |
| History of science | 210 | 216 | 223 | 222 | 227 | 271 | 269 | 280 | 294 | 308 | 313 | 49.0 | 6.5 |
| Other social sciences | 8,137 | 8,308 | 8,298 | 8,240 | 8,487 | 9,433 | 9,926 | 10,666 | 11,469 | 12,349 | 12,618 | 55.1 | 10.0 |
| Total engineering | 50,141 | 52,926 | 53,801 | 52,329 | 51,493 | 53,207 | 54,784 | 57,396 | 57,451 | 56,031 | 52,113 | 3.9 | -9.3 |
| Aeronautical engineering | 1,342 | 1,520 | 1,631 | 1,751 | 2,015 | 2,241 | 2,196 | 2,245 | 2,071 | 2,024 | 1,774 | 32.2 | -14.3 |
| Chemical engineering | 3,865 | 3,886 | 3,827 | 3,382 | 3,097 | 3,151 | 3,140 | 3,236 | 3,388 | 3,519 | 3,418 | -11.6 | 0.9 |
| Civil engineering | 7,327 | 7,256 | 7,066 | 7,370 | 7,337 | 7,727 | 8,684 | 10,196 | 10,415 | 11,025 | 10,460 | 42.8 | 0.4 |
| Electrical engineering | 13,461 | 13,992 | 14,922 | 15,404 | 15,818 | 15,662 | 15,571 | 15,996 | 15,661 | 14,336 | 12,751 | -5.3 | -18.6 |
| Mechanical engineering | 7,159 | 7,864 | 7,984 | 7,841 | 7,633 | 8,238 | 8,416 | 9,035 | 9,029 | 8,890 | 8,059 | 12.6 | -10.7 |
| Materials engineering | 2,092 | 2,101 | 2,247 | 2,137 | 2,196 | 2,320 | 2,502 | 2,683 | 2,542 | 2,550 | 2,377 | 13.6 | -6.5 |
| Industrial engineering | 7,031 | 7,433 | 7,907 | 7,130 | 6,537 | 6,407 | 7,016 | 7,375 | 7,448 | 7,503 | 7,084 | 0.8 | -4.9 |
| Other engineering | 7,864 | 8,874 | 8,217 | 7,314 | 6,860 | 7,461 | 7,259 | 6,630 | 6,897 | 6,184 | 6,190 | -21.3 | -10.3 |

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

**Appendix table 4-20. Graduate students in science and engineering of other or unknown races and ethnicities, by field: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 25,825 | 23,961 | 21,160 | 16,240 | 17,228 | 14,704 | 16,470 | 17,062 | 17,444 | 14,626 | 18,365 | -28.9 | 5.3 |
| Total sciences | 16,592 | 15,256 | 13,503 | 10,238 | 10,831 | 8,996 | 10,471 | 11,369 | 11,744 | 10,275 | 13,488 | -18.7 | 14.9 |
| Total physical sciences | 1,610 | 1,554 | 1,792 | 1,110 | 993 | 617 | 744 | 847 | 840 | 797 | 1,021 | -36.6 | 21.5 |
| Astronomy | 25 | 18 | 22 | 7 | 17 | 15 | 14 | 18 | 31 | 25 | 43 | 72.0 | 38.7 |
| Chemistry | 1,052 | 1,068 | 1,228 | 763 | 614 | 377 | 357 | 476 | 463 | 471 | 585 | -44.4 | 26.3 |
| Physics | 505 | 438 | 516 | 332 | 346 | 214 | 353 | 326 | 335 | 294 | 388 | -23.2 | 15.8 |
| Other physical sciences | 28 | 30 | 26 | 8 | 16 | 11 | 20 | 27 | 11 | 7 | 5 | -82.1 | -54.5 |
| Total earth sciences | 1,212 | 902 | 740 | 491 | 394 | 282 | 365 | 522 | 537 | 375 | 477 | -60.6 | -11.2 |
| Atmospheric science | 4 | 0 | 7 | 7 | 9 | 7 | 11 | 15 | 16 | 16 | 14 | 250.0 | -12.5 |
| Earth sciences | 1,050 | 770 | 453 | 314 | 255 | 145 | 194 | 286 | 258 | 194 | 258 | -75.4 | 0.0 |
| Oceanography | 84 | 50 | 150 | 53 | 57 | 70 | 105 | 117 | 121 | 56 | 49 | -41.7 | -59.5 |
| Other geosciences | 74 | 82 | 130 | 117 | 73 | 60 | 55 | 104 | 142 | 109 | 156 | 110.8 | 9.9 |
| Mathematics and statistics | 1,115 | 1,155 | 1,205 | 981 | 995 | 901 | 1,102 | 1,082 | 1,117 | 734 | 774 | -30.6 | -30.7 |
| Computer science | 3,513 | 3,526 | 2,304 | 1,821 | 2,135 | 1,577 | 1,900 | 1,985 | 2,011 | 1,442 | 1,994 | -43.2 | -0.8 |
| Agricultural sciences | 406 | 299 | 217 | 220 | 246 | 190 | 137 | 228 | 206 | 273 | 378 | -6.9 | 83.5 |
| Biological sciences | 1,591 | 1,466 | 1,599 | 979 | 1,236 | 954 | 1,058 | 1,214 | 1,432 | 1,429 | 1,816 | 14.1 | 26.8 |
| Psychology | 2,377 | 2,327 | 1,950 | 1,805 | 1,861 | 1,520 | 2,253 | 2,428 | 2,409 | 2,236 | 3,321 | 39.7 | 37.9 |
| Social sciences | 4,768 | 4,027 | 3,696 | 2,831 | 2,971 | 2,955 | 2,912 | 3,063 | 3,192 | 2,989 | 3,707 | -22.3 | 16.1 |
| Economics | 1,030 | 668 | 715 | 571 | 494 | 527 | 575 | 508 | 496 | 372 | 380 | -63.1 | -23.4 |
| Political science and public administration | 2,302 | 1,932 | 1,444 | 993 | 1,428 | 1,357 | 1,234 | 1,213 | 1,177 | 1,358 | 1,698 | -26.2 | 44.3 |
| Sociology | 248 | 438 | 399 | 365 | 233 | 249 | 246 | 322 | 382 | 277 | 416 | 67.7 | 8.9 |
| Anthropology | 217 | 201 | 338 | 350 | 294 | 268 | 267 | 308 | 305 | 266 | 313 | 44.2 | 2.6 |
| Linguisics | 71 | 168 | 102 | 46 | 67 | 68 | 94 | 75 | 120 | 87 | 132 | 85.9 | 10.0 |
| History of science | 0 | 0 | 10 | 0 | 16 | 1 | 1 | 2 | 1 | 1 | 10 | N/A | 900.0 |
| Other social sciences | 900 | 620 | 688 | 506 | 439 | 485 | 495 | 635 | 711 | 628 | 758 | -15.8 | 6.6 |
| Total engineering | 9,233 | 8,705 | 7,657 | 6,002 | 6,397 | 5,708 | 5,999 | 5,693 | 5,700 | 4,351 | 4,877 | -47.2 | -14.4 |
| Aeronautical engineering | 244 | 254 | 337 | 165 | 192 | 215 | 397 | 303 | 310 | 87 | 82 | -66.4 | -73.5 |
| Chemical engineering | 401 | 261 | 220 | 144 | 130 | 92 | 100 | 172 | 146 | 209 | 206 | -48.6 | 41.1 |
| Civil engineering | 1,303 | 1,134 | 1,015 | 555 | 599 | 570 | 637 | 643 | 731 | 582 | 692 | -46.9 | -5.3 |
| Electrical engineering | 3,405 | 3,465 | 2,946 | 2,598 | 2,429 | 2,178 | 2,400 | 2,319 | 1,738 | 1,453 | 1,562 | -54.1 | -10.1 |
| Mechanical engineering | 1,050 | 1,235 | 1,496 | 1,092 | 1,566 | 1,187 | 1,050 | 923 | 1,115 | 720 | 749 | -28.7 | -32.8 |
| Materials engineering | 187 | 185 | 112 | 92 | 90 | 154 | 118 | 153 | 171 | 113 | 107 | -42.8 | -37.4 |
| Industrial engineering | 698 | 979 | 685 | 552 | 679 | 724 | 624 | 730 | 1,034 | 857 | 1,012 | 45.0 | -2.1 |
| Other engineering | 1,945 | 1,192 | 846 | 804 | 712 | 588 | 673 | 450 | 455 | 330 | 467 | -76.0 | 2.6 |

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

**Appendix table 4-21. Graduate students in science and engineering, by field, sex, and race/ethnicity: 1994 and 1995 (U.S. citizens and permanent residents only)**



| | Year | Total | White | Asian | Black | Hispanic | American Indian | Unknown |
|---|---|---|---|---|---|---|---|---|
| | | | | | Total | | | |
| Total science and engineering | 1994 | 329,391 | 255,976 | 26,457 | 17,665 | 13,284 | 1,383 | 14,626 |
| | 1995 | 325,135 | 246,776 | 26,015 | 18,366 | 14,089 | 1,524 | 18,365 |
| Physical sciences | 1994 | 22,742 | 18,422 | 1,925 | 856 | 675 | 67 | 797 |
| | 1995 | 22,028 | 17,506 | 1,797 | 894 | 732 | 78 | 1,021 |
| Earth, atmospheric, and ocean sciences | 1994 | 12,776 | 11,351 | 454 | 203 | 344 | 49 | 375 |
| | 1995 | 12,866 | 11,324 | 423 | 220 | 369 | 53 | 477 |
| Mathematics | 1994 | 13,496 | 10,486 | 1,199 | 672 | 369 | 36 | 734 |
| | 1995 | 12,688 | 9,630 | 1,124 | 690 | 400 | 70 | 774 |
| Computer sciences | 1994 | 23,200 | 15,759 | 4,103 | 1,216 | 637 | 43 | 1,442 |
| | 1995 | 22,796 | 14,795 | 4,103 | 1,189 | 660 | 55 | 1,994 |
| Agricultural sciences | 1994 | 9,060 | 7,972 | 276 | 239 | 263 | 37 | 273 |
| | 1995 | 9,304 | 8,013 | 273 | 293 | 289 | 58 | 378 |
| Biological sciences | 1994 | 45,274 | 36,389 | 3,913 | 1,709 | 1,651 | 183 | 1,429 |
| | 1995 | 46,455 | 36,489 | 4,247 | 1,879 | 1,810 | 214 | 1,816 |
| Psychology | 1994 | 52,363 | 42,191 | 1,586 | 3,545 | 2,488 | 317 | 2,236 |
| | 1995 | 52,126 | 40,679 | 1,596 | 3,422 | 2,777 | 331 | 3,321 |
| Social sciences | 1994 | 74,415 | 57,375 | 3,200 | 6,442 | 4,000 | 409 | 2,989 |
| | 1995 | 74,830 | 56,227 | 3,334 | 6,907 | 4,221 | 434 | 3,707 |
| Total engineering | 1994 | 76,065 | 56,031 | 9,801 | 2,783 | 2,857 | 242 | 4,351 |
| | 1995 | 72,042 | 52,113 | 9,118 | 2,872 | 2,831 | 231 | 4,877 |
| | | | | | Female | | | |
| Total science and engineering | 1994 | 133,420 | 102,182 | 9,319 | 9,609 | 6,109 | 691 | 5,510 |
| | 1995 | 134,643 | 100,253 | 9,554 | 10,147 | 6,726 | 774 | 7,189 |
| Physical sciences | 1994 | 6,190 | 4,677 | 670 | 359 | 231 | 18 | 235 |
| | 1995 | 6,059 | 4,488 | 623 | 368 | 262 | 19 | 299 |
| Earth, atmospheric, and ocean sciences | 1994 | 4,476 | 3,948 | 157 | 85 | 130 | 23 | 133 |
| | 1995 | 4,694 | 4,090 | 162 | 103 | 143 | 22 | 174 |
| Mathematics | 1994 | 4,850 | 3,669 | 471 | 331 | 133 | 12 | 234 |
| | 1995 | 4,610 | 3,419 | 450 | 306 | 157 | 27 | 251 |
| Computer sciences | 1994 | 5,728 | 3,287 | 1,374 | 510 | 161 | 7 | 389 |
| | 1995 | 5,606 | 3,098 | 1,356 | 526 | 162 | 15 | 449 |
| Agricultural sciences | 1994 | 3,445 | 2,970 | 108 | 121 | 121 | 17 | 108 |
| | 1995 | 3,581 | 3,008 | 124 | 143 | 134 | 29 | 143 |
| Biological sciences | 1994 | 22,581 | 17,917 | 1,921 | 1,038 | 884 | 106 | 715 |
| | 1995 | 23,331 | 18,094 | 2,117 | 1,190 | 967 | 121 | 842 |
| Psychology | 1994 | 36,830 | 29,426 | 1,150 | 2,691 | 1,782 | 220 | 1,561 |
| | 1995 | 36,902 | 28,493 | 1,182 | 2,589 | 2,030 | 237 | 2,371 |
| Social sciences | 1994 | 36,083 | 27,065 | 1,652 | 3,649 | 2,071 | 224 | 1,422 |
| | 1995 | 36,740 | 26,611 | 1,741 | 4,011 | 2,240 | 253 | 1,884 |
| Total engineering | 1994 | 13,237 | 9,223 | 1,816 | 825 | 596 | 64 | 713 |
| | 1995 | 13,120 | 8,952 | 1,799 | 911 | 631 | 51 | 776 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-21. Graduate students in science and engineering, by field, sex, and race/ethnicity: 1994 and 1995 (U.S. citizens and permanent residents only)**



| | Year | Total | White | Asian | Black | Hispanic | American Indian | Unknown |
|---|---|---|---|---|---|---|---|---|
| | Male | | | | | | | |
| Total science and engineering | 1994 | 195,971 | 153,794 | 17,138 | 8,056 | 7,175 | 692 | 9,116 |
| | 1995 | 190,492 | 146,523 | 16,461 | 8,219 | 7,363 | 750 | 11,176 |
| Physical sciences | 1994 | 16,552 | 13,745 | 1,255 | 497 | 444 | 49 | 562 |
| | 1995 | 15,969 | 13,018 | 1,174 | 526 | 470 | 59 | 722 |
| Earth, atmospheric, and ocean sciences | 1994 | 8,300 | 7,403 | 297 | 118 | 214 | 26 | 242 |
| | 1995 | 8,172 | 7,234 | 261 | 117 | 226 | 31 | 303 |
| Mathematics | 1994 | 8,646 | 6,817 | 728 | 341 | 236 | 24 | 500 |
| | 1995 | 8,078 | 6,211 | 674 | 384 | 243 | 43 | 523 |
| Computer sciences | 1994 | 17,472 | 12,472 | 2,729 | 706 | 476 | 36 | 1,053 |
| | 1995 | 17,190 | 11,697 | 2,747 | 663 | 498 | 40 | 1,545 |
| Agricultural sciences | 1994 | 5,615 | 5,002 | 168 | 118 | 142 | 20 | 165 |
| | 1995 | 5,723 | 5,005 | 149 | 150 | 155 | 29 | 235 |
| Biological sciences | 1994 | 22,693 | 18,472 | 1,992 | 671 | 767 | 77 | 714 |
| | 1995 | 23,124 | 18,395 | 2,130 | 689 | 843 | 93 | 974 |
| Psychology | 1994 | 15,533 | 12,765 | 436 | 854 | 706 | 97 | 675 |
| | 1995 | 15,224 | 12,186 | 414 | 833 | 747 | 94 | 950 |
| Social sciences | 1994 | 38,332 | 30,310 | 1,548 | 2,793 | 1,929 | 185 | 1,567 |
| | 1995 | 38,090 | 29,616 | 1,593 | 2,896 | 1,981 | 181 | 1,823 |
| Total engineering | 1994 | 62,828 | 46,808 | 7,985 | 1,958 | 2,261 | 178 | 3,638 |
| | 1995 | 58,922 | 43,161 | 7,319 | 1,961 | 2,200 | 180 | 4,101 |

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: 1998*

**Appendix table 4-22. Graduate students with temporary visas enrolled in science and engineering, by field: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total science and engineering | 76,812 | 83,975 | 88,790 | 93,615 | 98,083 | 102,820 | 108,635 | 109,516 | 105,786 | 102,367 | 98,787 | 28.6 | -6.6 |
| Total sciences | 47,990 | 52,030 | 55,413 | 58,389 | 61,386 | 64,621 | 67,292 | 68,076 | 66,519 | 65,372 | 63,300 | 31.9 | -4.8 |
| Physical sciences | 8,941 | 10,028 | 10,628 | 11,072 | 11,773 | 12,466 | 12,725 | 12,805 | 12,252 | 11,707 | 11,442 | 28.0 | -6.6 |
| Astronomy | 154 | 163 | 182 | 166 | 164 | 192 | 217 | 225 | 217 | 262 | 232 | 50.6 | 6.9 |
| Chemistry | 4,371 | 4,842 | 5,299 | 5,659 | 6,107 | 6,643 | 6,898 | 6,907 | 6,675 | 6,412 | 6,464 | 47.9 | -3.2 |
| Physics | 4,394 | 4,990 | 5,115 | 5,201 | 5,469 | 5,592 | 5,570 | 5,627 | 5,284 | 4,945 | 4,663 | 6.1 | -11.8 |
| Other physical sciences | 22 | 33 | 32 | 46 | 33 | 39 | 40 | 46 | 76 | 88 | 83 | 277.3 | 9.2 |
| Earth, atmospheric, and ocean sciences | 1,866 | 2,070 | 2,190 | 2,408 | 2,575 | 2,675 | 2,897 | 3,004 | 3,010 | 3,266 | 2,936 | 57.3 | -2.5 |
| Atmospheric sciences | 209 | 213 | 239 | 247 | 249 | 281 | 310 | 324 | 297 | 265 | 266 | 27.3 | -10.4 |
| Earth sciences | 1,026 | 1,124 | 1,213 | 1,316 | 1,404 | 1,481 | 1,535 | 1,668 | 1,672 | 1,750 | 1,543 | 50.4 | -7.7 |
| Oceanography | 345 | 424 | 404 | 465 | 563 | 557 | 609 | 593 | 589 | 721 | 621 | 80.0 | 5.4 |
| Other geosciences | 286 | 309 | 334 | 380 | 359 | 356 | 443 | 419 | 452 | 530 | 506 | 76.9 | 11.9 |
| Mathematics and statistics | 5,345 | 5,810 | 6,129 | 6,425 | 6,683 | 6,564 | 6,634 | 6,477 | 6,134 | 6,083 | 5,821 | 8.9 | -5.1 |
| Computer science | 7,497 | 8,058 | 8,777 | 8,984 | 9,694 | 10,906 | 11,622 | 12,155 | 11,954 | 11,078 | 10,713 | 42.9 | -10.4 |
| Biological sciences | 9,523 | 10,591 | 11,592 | 12,618 | 13,711 | 14,702 | 15,704 | 15,997 | 16,063 | 16,008 | 15,420 | 61.9 | -4.0 |
| Agricultural sciences | 2,656 | 2,793 | 2,914 | 2,929 | 2,939 | 3,183 | 3,208 | 3,178 | 3,136 | 3,139 | 3,122 | 17.5 | -0.4 |
| Biological sciences | 6,867 | 7,798 | 8,678 | 9,689 | 10,772 | 11,519 | 12,496 | 12,819 | 12,927 | 12,869 | 12,298 | 79.1 | -4.9 |
| Psychology | 1,492 | 1,502 | 1,539 | 1,647 | 1,631 | 1,818 | 1,988 | 1,961 | 1,909 | 2,363 | 2,117 | 41.9 | 10.9 |
| Social sciences | 13,326 | 13,971 | 14,558 | 15,235 | 15,319 | 15,490 | 15,722 | 15,677 | 15,197 | 14,867 | 14,851 | 11.4 | -2.3 |
| Economics | 5,464 | 5,472 | 5,708 | 6,088 | 6,233 | 6,347 | 6,482 | 6,734 | 6,425 | 6,318 | 6,494 | 18.9 | 1.1 |
| Political science and public administration | 3,175 | 3,636 | 3,717 | 3,720 | 3,546 | 3,487 | 3,608 | 3,538 | 3,537 | 3,418 | 3,391 | 6.8 | -4.1 |
| Sociology | 1,576 | 1,583 | 1,701 | 1,811 | 1,804 | 1,820 | 1,722 | 1,651 | 1,551 | 1,430 | 1,304 | -17.3 | -15.9 |
| Anthropology | 541 | 632 | 662 | 730 | 763 | 791 | 824 | 814 | 800 | 787 | 700 | 29.4 | -12.5 |
| Linguistics | 1,072 | 1,093 | 1,103 | 1,141 | 1,177 | 1,237 | 1,259 | 1,097 | 1,061 | 1,012 | 997 | -7.0 | -6.0 |
| History of science | 55 | 42 | 43 | 46 | 40 | 44 | 51 | 60 | 55 | 56 | 51 | -7.3 | -7.3 |
| Other social sciences | 1,443 | 1,513 | 1,624 | 1,699 | 1,756 | 1,764 | 1,776 | 1,783 | 1,768 | 1,846 | 1,914 | 32.6 | 8.3 |
| Engineering | 28,822 | 31,945 | 33,377 | 35,226 | 36,697 | 38,199 | 41,343 | 41,440 | 39,267 | 36,995 | 35,487 | 23.1 | -9.6 |
| Aerospace engineering | 809 | 872 | 871 | 1,110 | 1,093 | 1,231 | 1,228 | 1,182 | 1,201 | 1,239 | 1,186 | 46.6 | -1.2 |
| Chemical engineering | 2,421 | 2,372 | 2,486 | 2,547 | 2,798 | 2,944 | 3,188 | 3,275 | 3,168 | 3,013 | 2,950 | 21.9 | -6.9 |
| Civil engineering | 5,387 | 5,690 | 5,587 | 5,811 | 5,835 | 5,914 | 6,544 | 6,838 | 6,284 | 5,934 | 5,600 | 4.0 | -10.9 |
| Electrical engineering | 8,443 | 9,544 | 10,117 | 10,365 | 11,148 | 11,595 | 12,816 | 12,833 | 12,440 | 11,408 | 11,308 | 33.9 | -9.1 |
| Mechanical engineering | 4,787 | 5,384 | 5,511 | 6,020 | 5,815 | 6,080 | 6,674 | 6,762 | 6,278 | 5,838 | 5,442 | 13.7 | -13.3 |
| Materials engineering | 1,369 | 1,608 | 1,693 | 1,780 | 1,941 | 2,115 | 2,168 | 2,211 | 2,162 | 1,966 | 1,933 | 41.2 | -10.6 |
| Industrial engineering | 1,947 | 2,165 | 2,613 | 2,683 | 2,918 | 3,119 | 3,774 | 3,843 | 3,443 | 3,576 | 3,317 | 70.4 | -3.7 |
| Other engineering | 3,659 | 4,310 | 4,499 | 4,910 | 5,149 | 5,201 | 4,951 | 4,496 | 4,291 | 4,021 | 3,751 | 2.5 | -12.6 |

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

**Appendix table 4-23. U.S. citizen and permanent resident graduate students in science and engineering, by field and race/ethnicity: 1985-1995**



| Race and ethnicity | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total enrollment | 358,126 | 368,119 | 373,355 | 375,287 | 382,769 | 397,159 | 412,708 | 430,797 | 436,233 | 431,758 | 423,922 | 18.4 | -2.8 | 100.0 | 100.0 |
| Total U.S. citizens | 281,314 | 284,144 | 284,565 | 281,672 | 284,686 | 294,339 | 304,073 | 321,281 | 330,447 | 329,391 | 325,135 | 15.6 | -1.6 | 78.6 | 76.7 |
| Black, non-Hispanic | 10,453 | 10,460 | 10,426 | 11,191 | 11,775 | 12,774 | 13,691 | 15,449 | 17,147 | 17,665 | 18,366 | 75.7 | 7.1 | 2.9 | 4.3 |
| American Indian or Alaskan Native | 737 | 743 | 782 | 918 | 860 | 1,054 | 1,120 | 1,244 | 1,312 | 1,383 | 1,524 | 106.8 | 16.2 | 0.2 | 0.4 |
| Asian or Pacific Islander | 12,003 | 12,775 | 14,565 | 15,188 | 15,693 | 17,156 | 18,139 | 21,762 | 24,149 | 26,457 | 26,015 | 116.7 | 7.7 | 3.4 | 6.1 |
| Hispanic | 8,614 | 8,658 | 8,823 | 9,098 | 9,436 | 10,159 | 11,045 | 12,248 | 13,386 | 13,284 | 14,089 | 63.6 | 5.3 | 2.4 | 3.3 |
| White, non-Hispanic | 223,682 | 227,547 | 228,809 | 229,037 | 229,694 | 238,492 | 243,608 | 253,516 | 257,009 | 255,976 | 246,776 | 10.3 | -4.0 | 62.5 | 58.2 |
| Other/unknown | 25,825 | 23,961 | 21,160 | 16,240 | 17,228 | 14,704 | 16,470 | 17,062 | 17,444 | 14,626 | 18,365 | -28.9 | 5.3 | 7.2 | 4.3 |
| Non U.S. citizens | 76,812 | 83,975 | 88,790 | 93,615 | 98,083 | 102,820 | 108,635 | 109,516 | 105,786 | 102,367 | 98,787 | 28.6 | -6.6 | 21.4 | 23.3 |
| Total full-time enrollment | 234,056 | 242,841 | 247,219 | 250,667 | 256,928 | 265,423 | 277,183 | 290,654 | 294,227 | 293,324 | 288,016 | 23.1 | -2.1 | 65.4 | 67.9 |
| Total U.S. citizens | 168,339 | 170,462 | 171,183 | 170,246 | 173,439 | 177,825 | 185,496 | 197,569 | 204,630 | 206,916 | 204,742 | 21.6 | 0.1 | 47.0 | 48.3 |
| Black, non-Hispanic | 5,580 | 5,564 | 5,608 | 6,060 | 6,594 | 7,029 | 7,692 | 8,908 | 9,910 | 10,357 | 10,672 | 91.3 | 7.7 | 1.6 | 2.5 |
| American Indian or Alaskan Native | 479 | 490 | 519 | 570 | 551 | 655 | 717 | 848 | 899 | 960 | 1,064 | 122.1 | 18.4 | 0.1 | 0.3 |
| Asian or Pacific Islander | 7,255 | 7,896 | 9,062 | 9,470 | 9,820 | 10,611 | 11,270 | 13,326 | 15,225 | 17,111 | 16,805 | 131.6 | 10.4 | 2.0 | 4.0 |
| Hispanic | 5,143 | 5,238 | 5,193 | 5,503 | 5,924 | 6,389 | 6,931 | 7,597 | 8,202 | 8,180 | 9,057 | 76.1 | 10.4 | 1.4 | 2.1 |
| White, non-Hispanic | 138,071 | 141,356 | 140,921 | 140,947 | 142,475 | 146,717 | 150,945 | 158,514 | 161,427 | 162,903 | 158,016 | 14.4 | -2.1 | 38.6 | 37.3 |
| Other/unknown | 11,811 | 9,918 | 9,880 | 7,696 | 8,075 | 6,424 | 7,941 | 8,376 | 8,967 | 7,405 | 9,128 | -22.7 | 1.8 | 3.3 | 2.2 |
| Non U.S. citizens | 65,717 | 72,379 | 76,036 | 80,421 | 83,489 | 87,598 | 91,687 | 93,085 | 89,597 | 86,408 | 83,274 | 26.7 | -7.1 | 18.4 | 19.6 |
| Total part-time enrollment | 124,070 | 125,278 | 126,136 | 124,620 | 125,841 | 131,736 | 135,525 | 140,143 | 142,006 | 138,434 | 135,906 | 9.5 | -4.3 | 34.6 | 32.1 |
| Total U.S. citizens | 112,975 | 113,682 | 113,382 | 111,426 | 111,247 | 116,514 | 118,577 | 123,712 | 125,817 | 122,475 | 120,393 | 6.6 | -4.3 | 31.5 | 28.4 |
| Black, non-Hispanic | 4,873 | 4,896 | 4,818 | 5,131 | 5,181 | 5,745 | 5,999 | 6,541 | 7,237 | 7,308 | 7,694 | 57.9 | 6.3 | 1.4 | 1.8 |
| American Indian or Alaskan Native | 258 | 253 | 263 | 348 | 309 | 399 | 403 | 396 | 413 | 423 | 460 | 78.3 | 11.4 | 0.1 | 0.1 |
| Asian or Pacific Islander | 4,748 | 4,879 | 5,503 | 5,718 | 5,873 | 6,545 | 6,869 | 8,436 | 8,924 | 9,346 | 9,210 | 94.0 | 3.2 | 1.3 | 2.2 |
| Hispanic | 3,471 | 3,420 | 3,630 | 3,595 | 3,512 | 3,770 | 4,114 | 4,651 | 5,184 | 5,104 | 5,032 | 45.0 | -2.9 | 1.0 | 1.2 |
| White, non-Hispanic | 85,611 | 86,191 | 87,888 | 88,090 | 87,219 | 91,775 | 92,663 | 95,002 | 95,582 | 93,073 | 88,760 | 3.7 | -7.1 | 23.9 | 20.9 |
| Other/unknown | 14,014 | 14,043 | 11,280 | 8,544 | 9,153 | 8,280 | 8,529 | 8,686 | 8,477 | 7,221 | 9,237 | -34.1 | 9.0 | 3.9 | 2.2 |
| Non U.S. citizens | 11,095 | 11,596 | 12,754 | 13,194 | 14,594 | 15,222 | 16,948 | 16,431 | 16,189 | 15,959 | 15,513 | 39.8 | -4.2 | 3.1 | 3.7 |

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

**Appendix table 4-24. Graduate students in science and engineering attending Historically Black Colleges and Universities, by field and race/ethnicity: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985-1995 | Percent change 1993-1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All races and ethnicities | | | | | | | | | | | | | | |
| Total science and engineering | 2,225 | 2,100 | 1,877 | 2,198 | 2,295 | 2,526 | 2,615 | 2,778 | 3,181 | 3,810 | 3,834 | 72.3 | 20.5 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 198 | 182 | 191 | 223 | 226 | 226 | 248 | 231 | 286 | 340 | 375 | 89.4 | 31.1 | 8.9 | 9.8 |
| Geosciences | 18 | 10 | 11 | 28 | 21 | 38 | 48 | 70 | 80 | 64 | 73 | 305.6 | -8.8 | 0.8 | 1.9 |
| Mathematical sciences | 320 | 312 | 269 | 322 | 384 | 416 | 436 | 443 | 517 | 522 | 491 | 53.4 | -5.0 | 14.4 | 12.8 |
| Agricultural sciences | 45 | 29 | 18 | 14 | 15 | 49 | 60 | 96 | 105 | 136 | 167 | 271.1 | 59.0 | 2.0 | 4.4 |
| Biological sciences | 345 | 306 | 276 | 301 | 333 | 334 | 339 | 377 | 521 | 570 | 607 | 75.9 | 16.5 | 15.5 | 15.8 |
| Psychology | 389 | 408 | 360 | 425 | 403 | 415 | 409 | 479 | 530 | 694 | 573 | 47.3 | 8.1 | 17.5 | 14.9 |
| Social sciences | 799 | 688 | 642 | 716 | 693 | 811 | 812 | 788 | 821 | 1,063 | 1,089 | 36.3 | 32.6 | 35.9 | 28.4 |
| Engineering | 111 | 165 | 110 | 169 | 220 | 237 | 263 | 294 | 321 | 421 | 459 | 313.5 | 43.0 | 5.0 | 12.0 |
| | Black, non-Hispanic | | | | | | | | | | | | | | |
| Total science and engineering | 1,587 | 1,624 | 1,487 | 1,671 | 1,700 | 1,913 | 1,959 | 2,075 | 2,433 | 2,768 | 2,917 | 83.8 | 19.9 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 166 | 159 | 160 | 165 | 179 | 174 | 190 | 179 | 211 | 231 | 249 | 50.0 | 18.0 | 10.5 | 8.5 |
| Geosciences | 10 | 3 | 10 | 11 | 3 | 14 | 24 | 30 | 42 | 30 | 38 | 280.0 | -9.5 | 0.6 | 1.3 |
| Mathematical sciences | 181 | 216 | 212 | 223 | 230 | 267 | 296 | 311 | 359 | 382 | 349 | 92.8 | -2.8 | 11.4 | 12.0 |
| Agricultural sciences | 21 | 22 | 13 | 11 | 10 | 34 | 37 | 70 | 84 | 102 | 130 | 519.0 | 54.8 | 1.3 | 4.5 |
| Biological sciences | 313 | 272 | 239 | 248 | 273 | 278 | 278 | 306 | 403 | 453 | 492 | 57.2 | 22.1 | 19.7 | 16.9 |
| Psychology | 217 | 232 | 196 | 280 | 276 | 313 | 317 | 352 | 428 | 489 | 428 | 97.2 | 0.0 | 13.7 | 14.7 |
| Social sciences | 600 | 632 | 582 | 627 | 587 | 691 | 674 | 650 | 694 | 828 | 937 | 56.2 | 35.0 | 37.8 | 32.1 |
| Engineering | 79 | 88 | 75 | 106 | 142 | 142 | 143 | 177 | 212 | 253 | 294 | 272.2 | 38.7 | 5.0 | 10.1 |
| | American Indian or Alaskan Native | | | | | | | | | | | | | | |
| Total science and engineering | 2 | 2 | 2 | 1 | 5 | 2 | 2 | 7 | 7 | 5 | 19 | 850.0 | 171.4 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 15 | 1,400.0 | 650.0 | 50.0 | 78.9 |
| Geosciences | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mathematical sciences | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | N/A | N/A | 0.0 | 5.3 |
| Agricultural sciences | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0.0 | -100.0 | 0.0 | 0.0 |
| Biological sciences | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 0.0 | -50.0 | 50.0 | 5.3 |
| Psychology | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Social sciences | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0.0 | -100.0 | 0.0 | 0.0 |
| Engineering | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | N/A | N/A | 0.0 | 10.5 |
| | Asian or Pacific Islander | | | | | | | | | | | | | | |
| Total science and engineering | 95 | 72 | 56 | 87 | 144 | 154 | 185 | 150 | 165 | 186 | 175 | 84.2 | 6.1 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 13 | 4 | 3 | 10 | 21 | 17 | 31 | 10 | 25 | 40 | 31 | 138.5 | 24.0 | 13.7 | 17.7 |
| Geosciences | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 8 | 8 | 5 | 100.0 | -37.5 | 0.0 | 2.9 |
| Mathematical sciences | 55 | 42 | 20 | 37 | 64 | 68 | 59 | 66 | 62 | 48 | 51 | -7.3 | -17.7 | 57.9 | 29.1 |
| Agricultural sciences | 4 | 1 | 0 | 0 | 0 | 5 | 8 | 6 | 4 | 4 | 4 | 0.0 | 0.0 | 4.2 | 2.3 |
| Biological sciences | 7 | 9 | 6 | 10 | 13 | 20 | 20 | 15 | 31 | 40 | 34 | 385.7 | 9.7 | 7.4 | 19.4 |
| Psychology | 0 | 1 | 1 | 4 | 6 | 3 | 8 | 1 | 1 | 2 | 2 | 100.0 | 100.0 | 0.0 | 1.1 |
| Social sciences | 7 | 7 | 15 | 12 | 10 | 10 | 9 | 9 | 9 | 10 | 9 | 28.6 | 0.0 | 7.4 | 5.1 |
| Engineering | 9 | 8 | 11 | 14 | 30 | 31 | 50 | 39 | 25 | 34 | 39 | 333.3 | 56.0 | 9.5 | 22.3 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-24. Graduate students in science and engineering attending Historically Black Colleges and Universities, by field and race/ethnicity: 1985-1995 (U.S. citizens and permanent residents only)**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | Percent change 1985B1995 | Percent change 1993B1995 | Percent proportion 1985 | Percent proportion 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hispanic | | | | | | | | | | | | | | |
| Total science and engineering | 24 | 9 | 12 | 22 | 26 | 19 | 23 | 25 | 40 | 41 | 45 | 87.5 | 12.5 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 10 | 9 | 9 | 350.0 | -10.0 | 8.3 | 20.0 |
| Geosciences | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | -33.3 | 100.0 | 12.5 | 4.4 |
| Mathematical sciences | 6 | 0 | 3 | 2 | 4 | 3 | 2 | 3 | 1 | 7 | 6 | 0.0 | 500.0 | 25.0 | 13.3 |
| Agricultural sciences | 0 | 0 | 1 | 0 | 0 | 1 | 3 | 5 | 4 | 4 | 3 | 100.0 | -25.0 | 0.0 | 6.7 |
| Biological sciences | 5 | 5 | 3 | 5 | 7 | 6 | 8 | 4 | 8 | 9 | 9 | 80.0 | 12.5 | 20.8 | 20.0 |
| Psychology | 3 | 1 | 1 | 5 | 7 | 1 | 1 | 2 | 3 | 3 | 3 | 0.0 | 0.0 | 12.5 | 6.7 |
| Social sciences | 4 | 1 | 1 | 3 | 4 | 5 | 6 | 4 | 3 | 5 | 3 | -25.0 | 0.0 | 16.7 | 6.7 |
| Engineering | 1 | 1 | 2 | 5 | 4 | 3 | 2 | 5 | 10 | 3 | 10 | 900.0 | 0.0 | 4.2 | 22.2 |
| | White, non-Hispanic | | | | | | | | | | | | | | |
| Total science and engineering | 296 | 300 | 262 | 306 | 318 | 353 | 378 | 427 | 429 | 665 | 536 | 81.1 | 24.9 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 11 | 7 | 9 | 11 | 19 | 29 | 21 | 35 | 24 | 43 | 44 | 300.0 | 83.3 | 3.7 | 8.2 |
| Geosciences | 5 | 7 | 1 | 17 | 18 | 22 | 19 | 31 | 25 | 20 | 28 | 460.0 | 12.0 | 1.7 | 5.2 |
| Mathematical sciences | 70 | 46 | 28 | 33 | 46 | 50 | 54 | 35 | 51 | 57 | 70 | 0.0 | 37.3 | 23.6 | 13.1 |
| Agricultural sciences | 2 | 6 | 4 | 3 | 5 | 9 | 12 | 8 | 5 | 15 | 15 | 650.0 | 200.0 | 0.7 | 2.8 |
| Biological sciences | 14 | 14 | 21 | 35 | 33 | 30 | 32 | 38 | 55 | 52 | 48 | 242.9 | -12.7 | 4.7 | 9.0 |
| Psychology | 151 | 169 | 141 | 130 | 97 | 81 | 77 | 118 | 93 | 200 | 139 | -7.9 | 49.5 | 51.0 | 25.9 |
| Social sciences | 21 | 22 | 36 | 40 | 60 | 77 | 105 | 104 | 111 | 178 | 112 | 433.3 | 0.9 | 7.1 | 20.9 |
| Engineering | 22 | 29 | 22 | 37 | 40 | 55 | 58 | 58 | 65 | 100 | 80 | 263.6 | 23.1 | 7.4 | 14.9 |
| | Other/Unknown races and ethnicities | | | | | | | | | | | | | | |
| Total science and engineering | 221 | 93 | 58 | 111 | 102 | 85 | 68 | 94 | 107 | 145 | 142 | -35.7 | 32.7 | 100.0 | 100.0 |
| Sciences | | | | | | | | | | | | | | | |
| Physical sciences | 5 | 10 | 18 | 34 | 6 | 6 | 4 | 5 | 14 | 15 | 27 | 440.0 | 92.9 | 2.3 | 19.0 |
| Geosciences | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 4 | 4 | 5 | 0 | 0.0 | -100.0 | 0.0 | 0.0 |
| Mathematical sciences | 8 | 8 | 6 | 27 | 38 | 28 | 25 | 28 | 44 | 27 | 14 | 75.0 | -68.2 | 3.6 | 9.9 |
| Agricultural sciences | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 6 | 11 | 15 | -16.7 | 150.0 | 8.1 | 10.6 |
| Biological sciences | 5 | 5 | 6 | 3 | 7 | 0 | 1 | 13 | 22 | 15 | 23 | 360.0 | 4.5 | 2.3 | 16.2 |
| Psychology | 18 | 5 | 21 | 6 | 16 | 16 | 6 | 5 | 5 | 0 | 1 | -94.4 | -80.0 | 8.1 | 0.7 |
| Social sciences | 167 | 26 | 7 | 34 | 31 | 27 | 17 | 19 | 3 | 41 | 28 | -83.2 | 833.3 | 75.6 | 19.7 |
| Engineering | 0 | 39 | 0 | 7 | 4 | 6 | 10 | 15 | 9 | 31 | 34 | N/A | 277.8 | 0.0 | 23.9 |

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

**Appendix table 4-25. Graduate enrollment, by disability status and field: 1996**

[Percentage distribution]



| | Total | Social/ behavioral sciences | Life and physical sciences | Engineering/ computer science/math | Humanities | Education | Business/ management | Health | Law | Other | Missing/ undeclared |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percentage | | | | | | | | | | | |
| Total (N=2,464,000) | 100 | 8.3 | 6.7 | 8.8 | 8.7 | 27.8 | 18.1 | 7.7 | 0.4 | 3.1 | 10.3 |
| Students without disabilities (N=2,338,000) | 100 | 8.5 | 6.9 | 8.9 | 8.7 | 28.1 | 18.2 | 7.2 | 0.4 | 3.0 | 10.2 |
| Students with disabilities (N=82,000) | 100 | 6.0 | 2.2 | 3.8 | 5.9 | 24.8 | 15.3 | 25.4 | 0.3 | 4.0 | 12.3 |
| Standard errors | | | | | | | | | | | |
| Total | | 0.86 | 0.97 | 1.00 | 1.29 | 1.64 | 1.57 | 1.04 | 0.13 | 0.57 | 1.12 |
| Students without disabilities | | 0.90 | 0.99 | 1.02 | 1.33 | 1.70 | 1.62 | 0.99 | 0.14 | 0.54 | 1.18 |
| Students with disabilities | | 2.11 | 1.48 | 2.07 | 2.15 | 5.70 | 4.56 | 8.23 | 0.20 | 2.62 | 4.98 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: U.S. Department of Education/NCES. 1995-96 National Postsecondary Student Aid Study. Data analysis system.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-26. Total degrees awarded in all fields, by degree level and sex of recipient: 1966-1995**



| Year | Bachelor's | | | Master's | | | Doctoral | | |
|---|---|---|---|---|---|---|---|---|---|
| | Men | Women | Percent women | Men | Women | Percent women | Men | Women | Percent women |
| 1966 | 301,037 | 222,971 | 42.6 | 93,184 | 47,588 | 33.8 | 15,863 | 2,086 | 11.6 |
| 1967 | 324,236 | 238,133 | 42.3 | 103,179 | 54,713 | 34.7 | 17,961 | 2,442 | 12.0 |
| 1968 | 359,747 | 277,116 | 43.5 | 113,749 | 63,401 | 35.8 | 20,005 | 2,932 | 12.8 |
| 1969 | 412,865 | 321,138 | 43.8 | 121,881 | 72,533 | 37.3 | 22,355 | 3,388 | 13.2 |
| 1970 | 453,605 | 344,465 | 43.2 | 126,146 | 83,241 | 39.8 | 25,527 | 3,971 | 13.5 |
| 1971 | 478,423 | 367,687 | 43.5 | 138,590 | 92,896 | 40.1 | 27,271 | 4,596 | 14.4 |
| 1972 | 503,631 | 390,479 | 43.7 | 150,085 | 102,689 | 40.6 | 27,754 | 5,287 | 16.0 |
| 1973 | 521,534 | 408,738 | 43.9 | 155,000 | 109,525 | 41.4 | 27,670 | 6,085 | 18.0 |
| 1974 | 530,907 | 423,469 | 44.4 | 158,344 | 119,915 | 43.1 | 26,594 | 6,453 | 19.5 |
| 1975 | 508,424 | 423,239 | 45.4 | 162,115 | 131,536 | 44.8 | 25,751 | 7,201 | 21.9 |
| 1976 | 508,549 | 425,894 | 45.6 | 167,745 | 145,256 | 46.4 | 25,262 | 7,684 | 23.3 |
| 1977 | 499,121 | 429,107 | 46.2 | 168,210 | 150,031 | 47.1 | 23,858 | 7,858 | 24.8 |
| 1978 | 491,066 | 439,135 | 47.2 | 161,708 | 151,108 | 48.3 | 22,553 | 8,322 | 27.0 |
| 1979 | 481,394 | 449,946 | 48.3 | 153,772 | 148,303 | 49.1 | 22,302 | 8,937 | 28.6 |
| 1980 | 477,750 | 462,501 | 49.2 | 151,159 | 147,936 | 49.5 | 21,612 | 9,408 | 30.3 |
| 1981 | 474,336 | 472,541 | 49.9 | 147,431 | 149,367 | 50.3 | 21,464 | 9,892 | 31.5 |
| 1982 | 477,543 | 486,500 | 50.5 | 145,941 | 150,639 | 50.8 | 21,018 | 10,093 | 32.4 |
| 1983 | 483,395 | 497,284 | 50.7 | 145,114 | 145,817 | 50.1 | 20,748 | 10,533 | 33.7 |
| 1984 | 486,750 | 499,595 | 50.7 | 143,998 | 141,464 | 49.6 | 20,638 | 10,699 | 34.1 |
| 1985 | 486,660 | 504,217 | 50.9 | 143,716 | 143,497 | 50.0 | 20,553 | 10,744 | 34.3 |
| 1986 | 490,143 | 510,061 | 51.0 | 143,932 | 145,897 | 50.3 | 20,595 | 11,307 | 35.4 |
| 1987 | 485,003 | 518,529 | 51.7 | 141,655 | 148,877 | 51.2 | 20,938 | 11,432 | 35.3 |
| 1988 | 481,236 | 524,797 | 52.2 | 145,403 | 154,688 | 51.5 | 21,682 | 11,819 | 35.3 |
| 1989 | 487,566 | 542,605 | 52.7 | 149,399 | 161,651 | 52.0 | 21,813 | 12,513 | 36.5 |
| 1990 | 495,867 | 566,284 | 53.3 | 154,025 | 170,922 | 52.6 | 22,962 | 13,105 | 36.3 |
| 1991 | 508,952 | 599,045 | 54.1 | 156,895 | 181,603 | 53.6 | 23,652 | 13,870 | 37.0 |
| 1992 | 525,395 | 624,677 | 54.3 | 162,299 | 191,908 | 54.2 | 24,436 | 14,420 | 37.1 |
| 1993 | 537,536 | 641,742 | 54.4 | 169,753 | 201,220 | 54.2 | 24,658 | 15,113 | 38.0 |
| 1994 | 537,061 | 646,080 | 54.6 | 176,762 | 212,246 | 54.6 | 25,211 | 15,806 | 38.5 |
| 1995 | 531,146 | 643,290 | 54.8 | 179,198 | 220,230 | 55.1 | 25,277 | 16,333 | 39.3 |

SOURCES: Tabulations by National Science Foundation/SRS; data from Department of Education/National Center for Education Statistics Survey Center for Education Statistics Survey of Degrees and Other Formal Awards Conferred, and Completions Survey; and NSF/SRS, Survey of Earned Doctorates.

**Appendix table 4-27. Science and engineering degrees awarded, by degree level and sex of recipient: 1966-1995**



| Year | Bachelor's | | | Master's | | | Doctoral | | |
|---|---|---|---|---|---|---|---|---|---|
| | Men | Women | Percent women | Men | Women | Percent women | Men | Women | Percent women |
| 1966 | 138,679 | 45,634 | 24.8 | 35,580 | 5,469 | 13.3 | 10,646 | 924 | 8.0 |
| 1967 | 149,045 | 50,787 | 25.4 | 38,682 | 6,306 | 14.0 | 12,013 | 1,096 | 8.4 |
| 1968 | 165,200 | 61,397 | 27.1 | 41,551 | 7,209 | 14.8 | 13,328 | 1,317 | 9.0 |
| 1969 | 189,272 | 72,917 | 27.8 | 44,182 | 8,200 | 15.7 | 14,781 | 1,507 | 9.3 |
| 1970 | 204,528 | 79,702 | 28.0 | 43,973 | 9,722 | 18.1 | 16,404 | 1,648 | 9.1 |
| 1971 | 209,318 | 85,039 | 28.9 | 46,116 | 10,338 | 18.3 | 17,385 | 1,996 | 10.3 |
| 1972 | 216,422 | 90,037 | 29.4 | 48,721 | 11,328 | 18.9 | 17,191 | 2,151 | 11.1 |
| 1973 | 225,090 | 95,995 | 29.9 | 50,233 | 11,813 | 19.0 | 16,853 | 2,520 | 13.0 |
| 1974 | 223,652 | 102,578 | 31.4 | 49,528 | 12,711 | 20.4 | 16,043 | 2,671 | 14.3 |
| 1975 | 210,741 | 102,814 | 32.8 | 49,410 | 13,788 | 21.8 | 15,870 | 2,929 | 15.6 |
| 1976 | 205,570 | 103,921 | 33.6 | 49,992 | 15,015 | 23.1 | 15,375 | 3,097 | 16.8 |
| 1977 | 198,805 | 104,993 | 34.6 | 50,899 | 16,498 | 24.5 | 14,775 | 3,233 | 18.0 |
| 1978 | 195,888 | 107,667 | 35.5 | 50,034 | 17,230 | 25.6 | 14,199 | 3,454 | 19.6 |
| 1979 | 193,247 | 109,915 | 36.3 | 46,614 | 17,612 | 27.4 | 14,128 | 3,744 | 20.9 |
| 1980 | 191,215 | 113,480 | 37.2 | 46,004 | 18,085 | 28.2 | 13,814 | 3,961 | 22.3 |
| 1981 | 190,977 | 115,815 | 37.8 | 45,505 | 18,861 | 29.3 | 14,056 | 4,201 | 23.0 |
| 1982 | 193,624 | 121,399 | 38.5 | 46,557 | 20,011 | 30.1 | 13,925 | 4,350 | 23.8 |
| 1983 | 194,380 | 123,191 | 38.8 | 46,734 | 20,999 | 31.0 | 13,920 | 4,715 | 25.3 |
| 1984 | 199,150 | 125,134 | 38.6 | 47,049 | 21,533 | 31.4 | 13,956 | 4,792 | 25.6 |
| 1985 | 203,402 | 128,871 | 38.8 | 48,247 | 22,331 | 31.6 | 14,044 | 4,891 | 25.8 |
| 1986 | 204,743 | 130,662 | 39.0 | 48,621 | 23,219 | 32.3 | 14,270 | 5,167 | 26.6 |
| 1987 | 199,981 | 131,545 | 39.7 | 48,759 | 23,844 | 32.8 | 14,582 | 5,312 | 26.7 |
| 1988 | 191,549 | 130,933 | 40.6 | 49,820 | 23,835 | 32.4 | 15,271 | 5,662 | 27.0 |
| 1989 | 189,338 | 133,483 | 41.3 | 50,845 | 25,580 | 33.5 | 15,622 | 6,109 | 28.1 |
| 1990 | 189,082 | 140,012 | 42.5 | 51,230 | 26,558 | 34.1 | 16,498 | 6,369 | 27.9 |
| 1991 | 189,328 | 148,347 | 43.9 | 50,441 | 27,927 | 35.6 | 17,088 | 6,931 | 28.9 |
| 1992 | 195,779 | 159,486 | 44.9 | 52,157 | 28,950 | 35.7 | 17,593 | 7,080 | 28.7 |
| 1993 | 200,315 | 165,720 | 45.3 | 55,454 | 30,971 | 35.8 | 17,789 | 7,652 | 30.1 |
| 1994 | 202,284 | 170,977 | 45.8 | 57,970 | 33,441 | 36.6 | 18,283 | 7,919 | 30.2 |
| 1995 | 202,217 | 175,931 | 46.5 | 58,518 | 33,791 | 38.0 | 18,242 | 8,273 | 31.2 |

SOURCES: Tabulations by National Science Foundation/SRS; data from Department of Education/National Center for Education Statistics Survey of Degrees and Other Formal Awards Conferred, and Completions Survey; and NSF/SRS, Survey of Earned Doctorates.

**Appendix table 4-28. Non-science and -engineering degrees awarded, by degree level and sex of recipient: 1966–1995**



| Year | Bachelor's | | | Master's | | | Doctoral | | |
|---|---|---|---|---|---|---|---|---|---|
| | Men | Women | Percent women | Men | Women | Percent women | Men | Women | Percent women |
| 1966 | 162,358 | 177,337 | 52.2 | 57,604 | 42,119 | 42.2 | 5,217 | 1,162 | 18.2 |
| 1967 | 175,191 | 187,346 | 51.7 | 64,497 | 48,407 | 42.9 | 5,948 | 1,346 | 18.5 |
| 1968 | 194,547 | 215,719 | 52.6 | 72,198 | 56,192 | 43.8 | 6,677 | 1,615 | 19.5 |
| 1969 | 223,593 | 248,221 | 52.6 | 77,699 | 64,333 | 45.3 | 7,574 | 1,881 | 19.9 |
| 1970 | 249,077 | 264,763 | 51.5 | 82,173 | 73,519 | 47.2 | 9,123 | 2,323 | 20.3 |
| 1971 | 269,105 | 282,648 | 51.2 | 92,474 | 82,558 | 47.2 | 9,886 | 2,600 | 20.8 |
| 1972 | 287,209 | 300,442 | 51.1 | 101,364 | 91,361 | 47.4 | 10,563 | 3,136 | 22.9 |
| 1973 | 296,444 | 312,743 | 51.3 | 104,767 | 97,712 | 48.3 | 10,817 | 3,565 | 24.8 |
| 1974 | 307,255 | 320,891 | 51.1 | 108,816 | 107,204 | 49.6 | 10,551 | 3,782 | 26.4 |
| 1975 | 297,683 | 320,425 | 51.8 | 112,705 | 117,748 | 51.1 | 9,881 | 4,272 | 30.2 |
| 1976 | 302,979 | 321,973 | 51.5 | 117,753 | 130,241 | 52.5 | 9,887 | 4,587 | 31.7 |
| 1977 | 300,316 | 324,114 | 51.9 | 117,311 | 133,533 | 53.2 | 9,083 | 4,625 | 33.7 |
| 1978 | 295,178 | 331,468 | 52.9 | 111,674 | 133,878 | 54.5 | 8,354 | 4,868 | 36.8 |
| 1979 | 288,147 | 340,031 | 54.1 | 107,158 | 130,691 | 54.9 | 8,174 | 5,193 | 38.8 |
| 1980 | 286,535 | 349,021 | 54.9 | 105,155 | 129,851 | 55.3 | 7,798 | 5,447 | 41.1 |
| 1981 | 283,359 | 356,726 | 55.7 | 101,926 | 130,506 | 56.1 | 7,408 | 5,691 | 43.4 |
| 1982 | 283,919 | 365,101 | 56.3 | 99,384 | 130,628 | 56.8 | 7,093 | 5,743 | 44.7 |
| 1983 | 289,015 | 374,093 | 56.4 | 98,380 | 124,818 | 55.9 | 6,828 | 5,818 | 46.0 |
| 1984 | 287,600 | 374,461 | 56.6 | 96,949 | 119,931 | 55.3 | 6,682 | 5,907 | 46.9 |
| 1985 | 283,258 | 375,346 | 57.0 | 95,469 | 121,166 | 55.9 | 6,509 | 5,853 | 47.3 |
| 1986 | 285,400 | 379,399 | 57.1 | 95,311 | 122,678 | 56.3 | 6,325 | 6,140 | 49.3 |
| 1987 | 285,022 | 386,984 | 57.6 | 92,896 | 125,033 | 57.4 | 6,356 | 6,120 | 49.1 |
| 1988 | 289,687 | 393,864 | 57.6 | 95,583 | 130,853 | 57.8 | 6,411 | 6,157 | 49.0 |
| 1989 | 298,228 | 409,122 | 57.8 | 98,554 | 136,071 | 58.0 | 6,191 | 6,404 | 50.8 |
| 1990 | 306,785 | 426,272 | 58.1 | 102,795 | 144,364 | 58.4 | 6,464 | 6,736 | 51.0 |
| 1991 | 319,624 | 450,698 | 58.5 | 106,454 | 153,676 | 59.1 | 6,564 | 6,939 | 51.4 |
| 1992 | 329,616 | 465,191 | 58.5 | 110,142 | 162,958 | 59.7 | 6,843 | 7,340 | 51.8 |
| 1993 | 337,221 | 476,022 | 58.5 | 114,299 | 170,249 | 59.8 | 6,869 | 7,461 | 52.1 |
| 1994 | 334,777 | 475,103 | 58.7 | 118,792 | 178,805 | 60.1 | 6,928 | 7,887 | 53.2 |
| 1995 | 328,929 | 467,359 | 58.7 | 120,680 | 184,439 | 60.4 | 7,035 | 8,060 | 53.4 |

SOURCES: Tabulations by National Science Foundation/SRS; data from Department of Education/National Center for Education Statistics Survey of Degrees and Other Formal Awards Conferred, and Completions Survey; and NSF/SRS, Survey of Earned Doctorates.

**Appendix table 4-29. Total master's degree recipients, by major field group and sex: 1985-1995**



| Sex and year | All fields | Science and engineering fields | | | | | | | | All other fields |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Engineer-ing | Physical sciences | Earth, atmos, and ocean sciences | Mathe-matical/ computer sciences | Biological/ agricultural sciences | Psychol-ogy | Social sciences | |
| Both sexes: | | | | | | | | | | |
| 1985 | 287,213 | 70,578 | 20,972 | 3,605 | 2,160 | 10,004 | 8,208 | 8,481 | 17,148 | 216,635 |
| 1986 | 289,829 | 71,840 | 21,096 | 3,649 | 2,234 | 11,254 | 8,023 | 8,363 | 17,221 | 217,989 |
| 1987 | 290,532 | 72,603 | 22,070 | 3,574 | 2,051 | 11,808 | 7,775 | 8,165 | 17,160 | 217,929 |
| 1988 | 300,091 | 73,655 | 22,726 | 3,708 | 1,920 | 12,600 | 7,556 | 7,925 | 17,220 | 226,436 |
| 1989 | 311,050 | 76,425 | 23,743 | 3,876 | 1,819 | 12,829 | 7,523 | 8,652 | 17,983 | 234,625 |
| 1990 | 324,947 | 77,788 | 23,995 | 3,805 | 1,596 | 13,327 | 7,527 | 9,308 | 18,230 | 247,159 |
| 1991 | 338,498 | 78,368 | 24,013 | 3,777 | 1,499 | 12,956 | 7,406 | 9,802 | 18,915 | 260,130 |
| 1992 | 354,207 | 81,107 | 25,018 | 3,922 | 1,425 | 13,320 | 7,885 | 9,852 | 19,685 | 273,100 |
| 1993 | 370,973 | 86,425 | 27,664 | 3,965 | 1,397 | 14,100 | 8,112 | 10,412 | 20,775 | 284,548 |
| 1994 | 389,008 | 91,411 | 28,717 | 4,263 | 1,418 | 14,350 | 8,686 | 11,572 | 22,405 | 297,597 |
| 1995 | 399,428 | 94,309 | 28,630 | 4,241 | 1,483 | 14,495 | 9,069 | 13,132 | 23,259 | 305,119 |
| Men: | | | | | | | | | | |
| 1985 | 143,716 | 48,247 | 18,728 | 2,775 | 1,639 | 6,951 | 4,881 | 3,064 | 10,209 | 95,469 |
| 1986 | 143,932 | 48,621 | 18,696 | 2,736 | 1,717 | 7,724 | 4,679 | 2,937 | 10,132 | 95,311 |
| 1987 | 141,655 | 48,759 | 19,300 | 2,684 | 1,531 | 8,011 | 4,437 | 2,838 | 9,958 | 92,896 |
| 1988 | 145,403 | 49,820 | 19,918 | 2,817 | 1,433 | 8,759 | 4,312 | 2,599 | 9,982 | 95,583 |
| 1989 | 149,399 | 50,845 | 20,661 | 2,836 | 1,337 | 8,833 | 4,210 | 2,814 | 10,154 | 98,554 |
| 1990 | 154,025 | 51,230 | 20,726 | 2,754 | 1,218 | 9,176 | 4,080 | 3,025 | 10,251 | 102,795 |
| 1991 | 156,895 | 50,441 | 20,656 | 2,703 | 1,116 | 8,709 | 3,975 | 2,994 | 10,288 | 106,454 |
| 1992 | 162,299 | 52,157 | 21,349 | 2,834 | 1,057 | 9,199 | 4,227 | 2,929 | 10,562 | 110,142 |
| 1993 | 169,753 | 55,454 | 23,570 | 2,794 | 1,006 | 9,773 | 4,381 | 2,928 | 11,002 | 114,299 |
| 1994 | 176,762 | 57,970 | 24,294 | 3,030 | 994 | 10,128 | 4,515 | 3,287 | 11,722 | 118,792 |
| 1995 | 179,198 | 58,518 | 23,998 | 2,958 | 1,032 | 10,130 | 4,740 | 3,735 | 11,925 | 120,680 |
| Women | | | | | | | | | | |
| 1985 | 143,497 | 22,331 | 2,244 | 830 | 521 | 3,053 | 3,327 | 5,417 | 6,939 | 121,166 |
| 1986 | 145,897 | 23,219 | 2,400 | 913 | 517 | 3,530 | 3,344 | 5,426 | 7,089 | 122,678 |
| 1987 | 148,877 | 23,844 | 2,770 | 890 | 520 | 3,797 | 3,338 | 5,327 | 7,202 | 125,033 |
| 1988 | 154,688 | 23,835 | 2,808 | 891 | 487 | 3,841 | 3,244 | 5,326 | 7,238 | 130,853 |
| 1989 | 161,651 | 25,580 | 3,082 | 1,040 | 482 | 3,996 | 3,313 | 5,838 | 7,829 | 136,071 |
| 1990 | 170,922 | 26,558 | 3,269 | 1,051 | 378 | 4,151 | 3,447 | 6,283 | 7,979 | 144,364 |
| 1991 | 181,603 | 27,927 | 3,357 | 1,074 | 383 | 4,247 | 3,431 | 6,808 | 8,627 | 153,676 |
| 1992 | 191,908 | 28,950 | 3,669 | 1,088 | 368 | 4,121 | 3,658 | 6,923 | 9,123 | 162,958 |
| 1993 | 201,220 | 30,971 | 4,094 | 1,171 | 391 | 4,327 | 3,731 | 7,484 | 9,773 | 170,249 |
| 1994 | 212,246 | 33,441 | 4,423 | 1,233 | 424 | 4,222 | 4,171 | 8,285 | 10,683 | 178,805 |
| 1995 | 220,230 | 35,791 | 4,632 | 1,283 | 451 | 4,365 | 4,329 | 9,397 | 11,334 | 184,439 |
| Percent women: | | | | | | | | | | |
| 1985 | 50.0 | 31.6 | 10.7 | 23.0 | 24.1 | 30.5 | 40.5 | 63.9 | 40.5 | 55.9 |
| 1986 | 50.3 | 32.3 | 11.4 | 25.0 | 23.1 | 31.4 | 41.7 | 64.9 | 41.2 | 56.3 |
| 1987 | 51.2 | 32.8 | 12.6 | 24.9 | 25.4 | 32.2 | 42.9 | 65.2 | 42.0 | 57.4 |
| 1988 | 51.5 | 32.4 | 12.4 | 24.0 | 25.4 | 30.5 | 42.9 | 67.2 | 42.0 | 57.8 |
| 1989 | 52.0 | 33.5 | 13.0 | 26.8 | 26.5 | 31.1 | 44.0 | 67.5 | 43.5 | 58.0 |
| 1990 | 52.6 | 34.1 | 13.6 | 27.6 | 23.7 | 31.1 | 45.8 | 67.5 | 43.8 | 58.4 |
| 1991 | 53.6 | 35.6 | 14.0 | 28.4 | 25.6 | 32.8 | 46.3 | 69.5 | 45.6 | 59.1 |
| 1992 | 54.2 | 35.7 | 14.7 | 27.7 | 25.8 | 30.9 | 46.4 | 70.3 | 46.3 | 59.7 |
| 1993 | 54.2 | 35.8 | 14.8 | 29.5 | 28.0 | 30.7 | 46.0 | 71.9 | 47.0 | 59.8 |
| 1994 | 54.6 | 36.6 | 15.4 | 28.9 | 29.9 | 29.4 | 48.0 | 71.6 | 47.7 | 60.1 |
| 1995 | 55.0 | 38.0 | 16.0 | 30.0 | 30.0 | 30.0 | 48.0 | 72.0 | 49.0 | 60.0 |

SOURCES: Tabulations by National Science Foundation/SRS; data from U.S. Department of Education/NCES Survey of Degrees and Other Formal Awards Conferred, and Completions Survey.

**Appendix table 4-30. Total doctorate recipients, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents: 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total, all recipients: [1] | | | | | | | | | | | |
| Total science and engineering | 18,935 | 19,437 | 19,894 | 20,933 | 21,731 | 22,867 | 24,019 | 24,673 | 25,441 | 26,202 | 26,515 |
| Sciences | 15,769 | 16,061 | 16,182 | 16,746 | 17,188 | 17,973 | 18,804 | 19,235 | 19,743 | 20,380 | 20,508 |
| Physical science | 2,934 | 3,120 | 3,238 | 3,350 | 3,261 | 3,524 | 3,625 | 3,780 | 3,699 | 3,977 | 3,840 |
| Earth, atmospheric, and ocean science | 599 | 559 | 602 | 695 | 723 | 738 | 815 | 794 | 771 | 824 | 778 |
| Mathematical science | 688 | 729 | 740 | 749 | 859 | 892 | 1,039 | 1,058 | 1,146 | 1,118 | 1,190 |
| Computer science | 310 | 399 | 450 | 515 | 612 | 705 | 800 | 869 | 880 | 903 | 998 |
| Agricultural science | 1,110 | 997 | 976 | 1,015 | 1,086 | 1,174 | 1,073 | 1,063 | 968 | 1,078 | 1,036 |
| Biological science | 3,793 | 3,807 | 3,839 | 4,112 | 4,115 | 4,327 | 4,646 | 4,798 | 5,091 | 5,200 | 5,370 |
| Psychology | 3,118 | 3,126 | 3,173 | 3,074 | 3,208 | 3,281 | 3,250 | 3,263 | 3,419 | 3,380 | 3,419 |
| Social science | 3,217 | 3,324 | 3,164 | 3,236 | 3,324 | 3,332 | 3,556 | 3,610 | 3,769 | 3,900 | 3,877 |
| Engineering | 3,166 | 3,376 | 3,712 | 4,187 | 4,543 | 4,894 | 5,215 | 5,438 | 5,698 | 5,822 | 6,007 |
| Non-science and -engineering | 12,362 | 12,465 | 12,476 | 12,568 | 12,595 | 13,200 | 13,503 | 14,183 | 14,330 | 14,815 | 15,095 |
| Grand total | 31,297 | 31,902 | 32,370 | 33,501 | 34,326 | 36,067 | 37,522 | 38,856 | 39,771 | 41,017 | 41,610 |
| U.S. citizens and permanent residents, total: | | | | | | | | | | | |
| Total science and engineering | 14,065 | 14,016 | 14,055 | 14,499 | 14,591 | 15,363 | 15,909 | 15,940 | 16,570 | 18,184 | 18,961 |
| Sciences | 12,471 | 12,290 | 12,142 | 12,353 | 12,362 | 13,017 | 13,435 | 13,420 | 13,873 | 15,131 | 15,625 |
| Physical science | 2,187 | 2,166 | 2,242 | 2,258 | 2,131 | 2,341 | 2,299 | 2,356 | 2,330 | 2,789 | 2,840 |
| Earth, atmospheric, and ocean science | 465 | 427 | 435 | 520 | 547 | 535 | 618 | 541 | 504 | 613 | 593 |
| Mathematical science | 418 | 402 | 396 | 386 | 428 | 422 | 518 | 507 | 590 | 657 | 771 |
| Computer science | 213 | 249 | 275 | 326 | 396 | 403 | 451 | 489 | 509 | 543 | 617 |
| Agricultural science | 726 | 626 | 632 | 610 | 651 | 687 | 620 | 573 | 506 | 616 | 598 |
| Biological science | 3,256 | 3,241 | 3,141 | 3,323 | 3,299 | 3,379 | 3,521 | 3,567 | 3,751 | 4,085 | 4,321 |
| Psychology | 2,864 | 2,832 | 2,806 | 2,729 | 2,737 | 2,992 | 3,018 | 2,986 | 3,159 | 3,137 | 3,169 |
| Social science | 2,342 | 2,347 | 2,215 | 2,201 | 2,173 | 2,258 | 2,390 | 2,401 | 2,524 | 2,691 | 2,716 |
| Engineering | 1,594 | 1,726 | 1,913 | 2,146 | 2,229 | 2,346 | 2,474 | 2,520 | 2,697 | 3,053 | 3,336 |
| Non-science and -engineering | 10,629 | 10,503 | 10,507 | 10,414 | 10,435 | 11,240 | 11,509 | 12,016 | 12,105 | 12,693 | 12,949 |
| Grand total | 24,694 | 24,519 | 24,562 | 24,913 | 25,026 | 26,603 | 27,418 | 27,956 | 28,675 | 30,877 | 31,910 |
| White, non-Hispanic | | | | | | | | | | | |
| Total science and engineering | 12,169 | 12,151 | 12,052 | 12,456 | 12,501 | 13,170 | 13,323 | 13,326 | 13,735 | 13,890 | 13,879 |
| Sciences | 10,981 | 10,797 | 10,594 | 10,801 | 10,775 | 11,330 | 11,486 | 11,446 | 11,710 | 11,870 | 11,793 |
| Physical science | 1,906 | 1,875 | 1,956 | 1,948 | 1,828 | 2,008 | 1,968 | 1,973 | 1,911 | 2,025 | 1,921 |
| Earth, atmospheric, and ocean science | 425 | 397 | 394 | 480 | 498 | 494 | 557 | 485 | 455 | 504 | 464 |
| Mathematical science | 350 | 343 | 319 | 332 | 369 | 372 | 419 | 425 | 476 | 479 | 535 |
| Computer science | 177 | 194 | 229 | 265 | 319 | 339 | 355 | 378 | 410 | 401 | 453 |
| Agricultural science | 659 | 557 | 554 | 518 | 570 | 601 | 545 | 493 | 438 | 487 | 473 |
| Biological science | 2,913 | 2,888 | 2,759 | 2,966 | 2,904 | 2,975 | 3,041 | 3,068 | 3,146 | 3,108 | 3,116 |
| Psychology | 2,591 | 2,548 | 2,516 | 2,445 | 2,453 | 2,648 | 2,652 | 2,636 | 2,805 | 2,731 | 2,715 |
| Social science | 1,960 | 1,995 | 1,867 | 1,847 | 1,834 | 1,893 | 1,949 | 1,988 | 2,069 | 2,135 | 2,116 |
| Engineering | 1,188 | 1,354 | 1,458 | 1,655 | 1,726 | 1,840 | 1,837 | 1,880 | 2,025 | 2,020 | 2,086 |
| Non-science and -engineering | 9,137 | 9,085 | 9,070 | 9,005 | 9,069 | 9,709 | 9,856 | 10,273 | 10,292 | 10,695 | 10,729 |
| Grand total | 21,306 | 21,236 | 21,122 | 21,461 | 21,570 | 22,879 | 23,179 | 23,599 | 24,027 | 24,585 | 24,608 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-30. Total doctorate recipients, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents : 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Asian: | | | | | | | | | | | |
| Total science and engineering | 809 | 816 | 925 | 916 | 986 | 1,009 | 1,180 | 1,344 | 1,610 | 2,989 | 3,666 |
| Sciences | 528 | 554 | 598 | 584 | 625 | 650 | 775 | 893 | 1,083 | 2,122 | 2,635 |
| Physical science | 152 | 147 | 143 | 138 | 156 | 164 | 172 | 226 | 265 | 600 | 751 |
| Earth, atmospheric, and ocean science | 19 | 14 | 18 | 14 | 23 | 15 | 17 | 27 | 22 | 89 | 104 |
| Mathematical science | 33 | 28 | 41 | 33 | 24 | 27 | 57 | 52 | 79 | 142 | 208 |
| Computer science | 17 | 37 | 26 | 44 | 52 | 48 | 66 | 86 | 77 | 117 | 138 |
| Agricultural science | 24 | 22 | 38 | 30 | 23 | 32 | 24 | 37 | 29 | 72 | 78 |
| Biological science | 151 | 168 | 170 | 171 | 201 | 200 | 261 | 269 | 370 | 720 | 924 |
| Psychology | 44 | 42 | 48 | 47 | 55 | 53 | 59 | 59 | 73 | 109 | 121 |
| Social science | 88 | 96 | 114 | 107 | 91 | 111 | 119 | 137 | 168 | 273 | 311 |
| Engineering | 281 | 262 | 327 | 332 | 361 | 359 | 405 | 451 | 527 | 867 | 1,031 |
| Non-science and -engineering | 261 | 245 | 243 | 319 | 282 | 297 | 351 | 417 | 402 | 556 | 634 |
| Grand total | 1,070 | 1,061 | 1,168 | 1,235 | 1,268 | 1,306 | 1,531 | 1,761 | 2,012 | 3,545 | 4,300 |
| Black, non-Hispanic: | | | | | | | | | | | |
| Total science and engineering | 374 | 339 | 319 | 361 | 366 | 373 | 459 | 407 | 468 | 496 | 557 |
| Sciences | 340 | 315 | 294 | 330 | 333 | 333 | 404 | 358 | 418 | 442 | 486 |
| Physical science | 27 | 27 | 20 | 34 | 31 | 30 | 31 | 25 | 41 | 46 | 43 |
| Earth, atmospheric, and ocean science | 4 | 0 | 2 | 3 | 4 | 3 | 3 | 6 | 4 | 6 | 3 |
| Mathematical science | 7 | 6 | 11 | 4 | 8 | 4 | 11 | 4 | 8 | 11 | 5 |
| Computer science | 3 | 1 | 2 | 2 | 1 | 1 | 8 | 5 | 6 | 10 | 11 |
| Agricultural science | 16 | 16 | 13 | 20 | 14 | 15 | 17 | 14 | 16 | 22 | 17 |
| Biological science | 53 | 48 | 60 | 48 | 56 | 50 | 60 | 61 | 74 | 75 | 105 |
| Psychology | 105 | 111 | 93 | 105 | 97 | 115 | 130 | 106 | 119 | 124 | 150 |
| Social science | 125 | 106 | 93 | 114 | 122 | 115 | 144 | 137 | 150 | 148 | 152 |
| Engineering | 34 | 24 | 25 | 31 | 33 | 40 | 55 | 49 | 50 | 54 | 71 |
| Non-science and -engineering | 669 | 617 | 591 | 609 | 596 | 676 | 701 | 706 | 809 | 778 | 898 |
| Grand total | 1,043 | 956 | 910 | 970 | 962 | 1,049 | 1,160 | 1,113 | 1,277 | 1,274 | 1,455 |
| American Indian: | | | | | | | | | | | |
| Total science and engineering | 41 | 52 | 53 | 44 | 53 | 43 | 56 | 69 | 43 | 64 | 69 |
| Sciences | 40 | 46 | 46 | 40 | 46 | 39 | 50 | 58 | 41 | 58 | 59 |
| Physical science | 3 | 5 | 7 | 6 | 10 | 3 | 10 | 12 | 5 | 6 | 9 |
| Earth, atmospheric, and ocean science | 1 | 2 | 0 | 2 | 6 | 1 | 3 | 1 | 4 | 1 | 0 |
| Mathematical science | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 2 | 2 |
| Computer science | 0 | 0 | 3 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 0 |
| Agricultural science | 4 | 0 | 2 | 6 | 2 | 4 | 4 | 0 | 1 | 1 | 2 |
| Biological science | 13 | 17 | 11 | 6 | 7 | 4 | 10 | 13 | 7 | 16 | 15 |
| Psychology | 10 | 9 | 16 | 7 | 11 | 19 | 13 | 15 | 15 | 12 | 14 |
| Social science | 9 | 12 | 7 | 10 | 8 | 7 | 9 | 13 | 7 | 19 | 17 |
| Engineering | 1 | 6 | 7 | 4 | 7 | 4 | 6 | 11 | 2 | 6 | 10 |
| Non-science and -engineering | 55 | 47 | 62 | 50 | 41 | 54 | 76 | 80 | 77 | 78 | 79 |
| Grand total | 96 | 99 | 115 | 94 | 94 | 97 | 132 | 149 | 120 | 142 | 148 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-30. Total doctorate recipients, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents : 1985-1995**



| Academic discipline | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hispanic: | | | | | | | | | | | |
| Total science and engineering | 296 | 345 | 357 | 397 | 382 | 468 | 492 | 513 | 542 | 548 | 568 |
| Sciences | 274 | 310 | 323 | 334 | 335 | 414 | 432 | 442 | 476 | 482 | 491 |
| Physical science | 30 | 41 | 56 | 63 | 59 | 72 | 65 | 72 | 79 | 90 | 73 |
| Earth, atmospheric, and ocean science | 6 | 4 | 5 | 7 | 9 | 13 | 16 | 16 | 13 | 8 | 12 |
| Mathematical science | 12 | 12 | 11 | 4 | 11 | 10 | 9 | 12 | 16 | 13 | 15 |
| Computer science | 6 | 7 | 4 | 2 | 4 | 5 | 12 | 8 | 7 | 7 | 6 |
| Agricultural science | 12 | 17 | 15 | 21 | 18 | 23 | 15 | 18 | 20 | 25 | 21 |
| Biological science | 59 | 66 | 62 | 76 | 71 | 89 | 95 | 102 | 114 | 131 | 126 |
| Psychology | 69 | 90 | 95 | 93 | 93 | 109 | 122 | 133 | 131 | 133 | 145 |
| Social science | 80 | 73 | 75 | 68 | 70 | 93 | 98 | 81 | 96 | 75 | 93 |
| Engineering | 22 | 35 | 34 | 63 | 47 | 54 | 60 | 71 | 66 | 66 | 77 |
| Non-science and -engineering | 338 | 334 | 351 | 296 | 312 | 369 | 375 | 396 | 431 | 481 | 487 |
| Grand total | 634 | 679 | 708 | 693 | 694 | 837 | 867 | 909 | 973 | 1,029 | 1,055 |
| U.S. citizens and permanent residents, unknown race/ethnicity | | | | | | | | | | | |
| Total science and engineering | 376 | 313 | 349 | 325 | 303 | 300 | 399 | 281 | 172 | 197 | 222 |
| Sciences | 308 | 268 | 287 | 264 | 248 | 251 | 288 | 223 | 145 | 157 | 161 |
| Physical science | 69 | 71 | 60 | 69 | 47 | 64 | 53 | 48 | 29 | 22 | 43 |
| Earth, atmospheric, and ocean science | 10 | 10 | 16 | 14 | 7 | 9 | 22 | 6 | 6 | 5 | 10 |
| Mathematical science | 16 | 12 | 14 | 11 | 16 | 8 | 22 | 12 | 10 | 10 | 6 |
| Computer science | 10 | 10 | 11 | 12 | 18 | 10 | 9 | 10 | 8 | 7 | 9 |
| Agricultural science | 11 | 14 | 10 | 15 | 24 | 12 | 15 | 11 | 2 | 9 | 7 |
| Biological science | 67 | 54 | 79 | 56 | 60 | 61 | 54 | 54 | 40 | 35 | 35 |
| Psychology | 45 | 32 | 38 | 32 | 28 | 48 | 42 | 37 | 16 | 28 | 24 |
| Social science | 80 | 65 | 59 | 55 | 48 | 39 | 71 | 45 | 34 | 41 | 27 |
| Engineering | 68 | 45 | 62 | 61 | 55 | 49 | 111 | 58 | 27 | 40 | 61 |
| Non-science and -engineering | 169 | 175 | 190 | 135 | 135 | 135 | 150 | 144 | 94 | 105 | 122 |
| Grand total | 545 | 488 | 539 | 460 | 438 | 435 | 549 | 425 | 266 | 302 | 344 |
| Nonresident alien: [2] | | | | | | | | | | | |
| Total science and engineering | 4,047 | 4,160 | 4,468 | 4,936 | 5,391 | 6,571 | 7,642 | 8,092 | 8,113 | 7,521 | 6,992 |
| Sciences | 2,628 | 2,788 | 2,936 | 3,215 | 3,451 | 4,294 | 5,008 | 5,349 | 5,329 | 4,868 | 4,469 |
| Physical science | 624 | 767 | 801 | 870 | 890 | 1,073 | 1,257 | 1,346 | 1,263 | 1,107 | 930 |
| Earth, atmospheric, and ocean science | 115 | 97 | 122 | 132 | 122 | 171 | 185 | 236 | 235 | 197 | 172 |
| Mathematical science | 238 | 272 | 302 | 305 | 346 | 424 | 506 | 511 | 517 | 448 | 382 |
| Computer science | 89 | 123 | 143 | 176 | 178 | 271 | 340 | 365 | 348 | 343 | 365 |
| Agricultural science | 354 | 320 | 289 | 345 | 355 | 440 | 435 | 472 | 447 | 453 | 429 |
| Biological science | 424 | 391 | 492 | 557 | 608 | 853 | 1,059 | 1,159 | 1,246 | 1,058 | 971 |
| Psychology | 81 | 81 | 85 | 84 | 106 | 117 | 133 | 156 | 148 | 151 | 162 |
| Social science | 703 | 737 | 702 | 746 | 846 | 945 | 1,093 | 1,104 | 1,125 | 1,111 | 1,058 |
| Engineering | 1,419 | 1,372 | 1,532 | 1,721 | 1,940 | 2,277 | 2,634 | 2,743 | 2,784 | 2,653 | 2,523 |
| Non-science and -engineering | 1,180 | 1,116 | 1,144 | 1,259 | 1,257 | 1,522 | 1,670 | 1,861 | 1,821 | 1,885 | 1,814 |
| Grand total | 5,227 | 5,276 | 5,612 | 6,195 | 6,648 | 8,093 | 9,312 | 9,953 | 9,934 | 9,406 | 8,806 |

[1] Total includes persons of unknown citizenship.
[2] Nonresident aliens include foreign citizens on temporary visas only.

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

**Appendix table 4-31. Total doctorate recipients, by major field and sex: 1985-1995**



| Year | Total, Science and Engineering | Engineering | Sciences | | | | | | | | NonS&E, total | Grand total, all fields |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total sciences | Physical sciences | Earth, atmospheric, and ocean sciences | Mathematics | Computer science | Biological/ agricultural sciences | Psychology | Social sciences | | |
| Total | | | | | | | | | | | | |
| 1985 | 18,935 | 3,166 | 15,769 | 2,934 | 599 | 688 | 310 | 4,903 | 3,118 | 3,217 | 12,362 | 31,297 |
| 1986 | 19,437 | 3,376 | 16,061 | 3,120 | 559 | 729 | 399 | 4,804 | 3,126 | 3,324 | 12,465 | 31,902 |
| 1987 | 19,894 | 3,712 | 16,182 | 3,238 | 602 | 740 | 450 | 4,815 | 3,173 | 3,164 | 12,476 | 32,370 |
| 1988 | 20,933 | 4,187 | 16,746 | 3,350 | 695 | 749 | 515 | 5,127 | 3,074 | 3,236 | 12,568 | 33,501 |
| 1989 | 21,731 | 4,543 | 17,188 | 3,261 | 723 | 859 | 612 | 5,201 | 3,208 | 3,324 | 12,595 | 34,326 |
| 1990 | 22,867 | 4,894 | 17,973 | 3,524 | 738 | 892 | 705 | 5,501 | 3,281 | 3,332 | 13,200 | 36,067 |
| 1991 | 24,019 | 5,215 | 18,804 | 3,625 | 815 | 1,039 | 800 | 5,719 | 3,250 | 3,556 | 13,503 | 37,522 |
| 1992 | 24,673 | 5,438 | 19,235 | 3,780 | 794 | 1,058 | 869 | 5,861 | 3,263 | 3,610 | 14,183 | 38,856 |
| 1993 | 25,441 | 5,698 | 19,743 | 3,699 | 771 | 1,146 | 880 | 6,059 | 3,419 | 3,769 | 14,330 | 39,771 |
| 1994 | 26,202 | 5,822 | 20,380 | 3,977 | 824 | 1,118 | 903 | 6,278 | 3,380 | 3,900 | 14,815 | 41,017 |
| 1995 | 26,515 | 6,007 | 20,508 | 3,840 | 778 | 1,190 | 998 | 6,406 | 3,419 | 3,877 | 15,095 | 41,610 |
| Women | | | | | | | | | | | | |
| 1985 | 4,891 | 198 | 4,693 | 467 | 108 | 106 | 33 | 1,409 | 1,541 | 1,029 | 5,853 | 10,744 |
| 1986 | 5,167 | 225 | 4,942 | 510 | 95 | 121 | 48 | 1,452 | 1,599 | 1,117 | 6,140 | 11,307 |
| 1987 | 5,312 | 242 | 5,070 | 528 | 112 | 125 | 65 | 1,531 | 1,698 | 1,011 | 6,120 | 11,432 |
| 1988 | 5,662 | 286 | 5,376 | 567 | 135 | 121 | 56 | 1,691 | 1,681 | 1,125 | 6,157 | 11,819 |
| 1989 | 6,109 | 375 | 5,734 | 619 | 148 | 155 | 108 | 1,769 | 1,800 | 1,135 | 6,404 | 12,513 |
| 1990 | 6,369 | 415 | 5,954 | 661 | 141 | 158 | 110 | 1,860 | 1,913 | 1,111 | 6,736 | 13,105 |
| 1991 | 6,931 | 467 | 6,464 | 679 | 179 | 199 | 117 | 1,981 | 1,996 | 1,313 | 6,939 | 13,870 |
| 1992 | 7,080 | 506 | 6,574 | 770 | 188 | 205 | 120 | 2,064 | 1,928 | 1,299 | 7,340 | 14,420 |
| 1993 | 7,652 | 522 | 7,130 | 780 | 160 | 264 | 138 | 2,278 | 2,088 | 1,422 | 7,461 | 15,113 |
| 1994 | 7,919 | 635 | 7,284 | 828 | 183 | 236 | 137 | 2,355 | 2,102 | 1,443 | 7,887 | 15,806 |
| 1995 | 8,273 | 694 | 7,579 | 878 | 170 | 265 | 186 | 2,442 | 2,172 | 1,466 | 8,060 | 16,333 |
| Women as a percent of total | | | | | | | | | | | | |
| 1985 | 25.8 | 6.3 | 29.8 | 15.9 | 18.0 | 15.4 | 10.6 | 28.7 | 49.4 | 32.0 | 47.3 | 34.3 |
| 1986 | 26.6 | 6.7 | 30.8 | 16.3 | 17.0 | 16.6 | 12.0 | 30.2 | 51.2 | 33.6 | 49.3 | 35.4 |
| 1987 | 26.7 | 6.5 | 31.3 | 16.3 | 18.6 | 16.9 | 14.4 | 31.8 | 53.5 | 32.0 | 49.1 | 35.3 |
| 1988 | 27.0 | 6.8 | 32.1 | 16.9 | 19.4 | 16.2 | 10.9 | 33.0 | 54.7 | 34.8 | 49.0 | 35.3 |
| 1989 | 28.1 | 8.3 | 33.4 | 19.0 | 20.5 | 18.0 | 17.6 | 34.0 | 56.1 | 34.1 | 50.8 | 36.5 |
| 1990 | 27.9 | 8.5 | 33.1 | 18.8 | 19.1 | 17.7 | 15.6 | 33.8 | 58.3 | 33.3 | 51.0 | 36.3 |
| 1991 | 28.9 | 9.0 | 34.4 | 18.7 | 22.0 | 19.2 | 14.6 | 34.6 | 61.4 | 36.9 | 51.4 | 37.0 |
| 1992 | 28.7 | 9.3 | 34.2 | 20.4 | 23.7 | 19.4 | 13.8 | 35.2 | 59.1 | 36.0 | 51.8 | 37.1 |
| 1993 | 30.1 | 9.2 | 36.1 | 21.1 | 20.8 | 23.0 | 15.7 | 37.6 | 61.1 | 37.7 | 52.1 | 38.0 |
| 1994 | 30.2 | 10.9 | 35.7 | 20.8 | 22.2 | 21.1 | 15.2 | 37.5 | 62.2 | 37.0 | 53.2 | 38.5 |
| 1995 | 31.2 | 11.6 | 37.0 | 22.9 | 21.9 | 22.3 | 18.6 | 38.1 | 63.5 | 37.8 | 53.4 | 39.3 |

[1] NonS&E doctorates include those whose field of specialization is unknown.

NOTES: Categories differ from those published by other Federal sponsors and the National Research Council because linguistics, history of science, American studies, and archaeology are included in social sciences rather than in humanities.

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates 1995.

**Appendix table 4-32. Total doctorate recipients, by detailed field and sex: 1995**



| Field of study | Total | Men | Women | Percent women |
|---|---|---|---|---|
| Science and engineering, total | 26,515 | 18,242 | 8,273 | 31.2 |
| Engineering, total | 6,007 | 5,313 | 694 | 11.6 |
| Aeronautical/astronautical engineering | 251 | 237 | 14 | 5.6 |
| Chemical engineering | 708 | 599 | 109 | 15.4 |
| Chemical | 602 | 506 | 96 | 15.9 |
| Petroleum | 48 | 47 | 1 | 2.1 |
| Polymer/plastics | 58 | 46 | 12 | 20.7 |
| Civil engineering | 656 | 580 | 76 | 11.6 |
| Civil | 572 | 517 | 55 | 9.6 |
| Environmental health | 84 | 63 | 21 | 25.0 |
| Electrical engineering | 1,731 | 1,558 | 173 | 10.0 |
| Communications | 29 | 24 | 5 | 17.2 |
| Computer | 189 | 171 | 18 | 9.5 |
| Electrical/electronics | 1,513 | 1,363 | 150 | 9.9 |
| Industrial/manufacturing engineering | 283 | 233 | 50 | 17.7 |
| Materials/metallurgical engineering | 588 | 494 | 94 | 16.0 |
| Ceramic sciences | 39 | 34 | 5 | 12.8 |
| Materials science | 476 | 392 | 84 | 17.6 |
| Metallurgical | 73 | 68 | 5 | 6.8 |
| Mechanical engineering | 1,024 | 961 | 63 | 6.2 |
| Mechanical | 916 | 861 | 55 | 6.0 |
| Engineering mechanics | 108 | 100 | 8 | 7.4 |
| Other engineering | 766 | 651 | 115 | 15.0 |
| Agricultural | 73 | 66 | 7 | 9.6 |
| Bioengineering/biomedical | 189 | 141 | 48 | 25.4 |
| Engineering physics | 17 | 16 | 1 | 5.9 |
| Engineering science | 56 | 50 | 6 | 10.7 |
| Mining/mineral | 19 | 19 | 0 | 0.0 |
| Nuclear | 105 | 96 | 9 | 8.6 |
| Ocean | 21 | 18 | 3 | 14.3 |
| Operations research | 48 | 40 | 8 | 16.7 |
| Systems | 47 | 42 | 5 | 10.6 |
| Engineering, general | 60 | 51 | 9 | 15.0 |
| Engineering, other | 131 | 112 | 19 | 14.5 |
| Sciences, total | 20,508 | 12,929 | 7,579 | 37.0 |
| Physical sciences, total | 3,840 | 2,962 | 878 | 22.9 |
| Astronomy | 173 | 143 | 30 | 17.3 |
| Astronomy | 89 | 71 | 18 | 20.2 |
| Astrophysics | 84 | 72 | 12 | 14.3 |
| Chemistry | 2,161 | 1,500 | 661 | 30.6 |
| Analytical | 317 | 208 | 109 | 34.4 |
| Inorganic | 257 | 165 | 92 | 35.8 |
| Medicinal/pharmaceutical | 96 | 64 | 32 | 33.3 |
| Nuclear | 5 | 2 | 3 | 60.0 |
| Organic | 483 | 349 | 134 | 27.7 |
| Physical | 338 | 245 | 93 | 27.5 |
| Polymer | 116 | 88 | 28 | 24.1 |
| Theoretical | 40 | 30 | 10 | 25.0 |
| Chemistry, general | 458 | 323 | 135 | 29.5 |
| Chemistry, other | 51 | 26 | 25 | 49.0 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-32. Total doctorate recipients, by detailed field and sex: 1995**



| Field of study | Total | Men | Women | Percent women |
|---|---|---|---|---|
| Physics | 1,479 | 1,297 | 182 | 12.3 |
| Acoustics | 18 | 15 | 3 | 16.7 |
| Chemical and atomic/molecular | 110 | 95 | 15 | 13.6 |
| Elementary particle | 183 | 176 | 7 | 3.8 |
| Fluids | 18 | 18 | 0 | 0.0 |
| Nuclear | 91 | 79 | 12 | 13.2 |
| Optics | 98 | 85 | 13 | 13.3 |
| Plasma and high temperature | 46 | 41 | 5 | 10.9 |
| Polymer | 23 | 20 | 3 | 13.0 |
| Solid state and low temperature | 371 | 314 | 57 | 15.4 |
| Physics, general | 355 | 314 | 41 | 11.5 |
| Physics, other | 166 | 140 | 26 | 15.7 |
| Other physical sciences | 27 | 22 | 5 | 18.5 |
| Earth, atmospheric, and ocean sciences, total | 778 | 608 | 170 | 21.9 |
| Atmospheric sciences | 130 | 107 | 23 | 17.7 |
| Atmospheric dynamics | 16 | 13 | 3 | 18.8 |
| Atmospheric physics/chemistry | 27 | 19 | 8 | 29.6 |
| Meteorology | 25 | 22 | 3 | 12.0 |
| Atmospheric science/meteorology, general | 44 | 37 | 7 | 15.9 |
| Atmospheric science/meteorology, other | 18 | 16 | 2 | 11.1 |
| Geosciences | 454 | 363 | 91 | 20.0 |
| Geology | 186 | 148 | 38 | 20.4 |
| Geochemistry | 42 | 32 | 10 | 23.8 |
| Geomorphology/glacial geology | 11 | 7 | 4 | 36.4 |
| Geophysics/seismology | 93 | 74 | 19 | 20.4 |
| Hydrology/water resources | 24 | 20 | 4 | 16.7 |
| Mineralogy/petrology | 19 | 15 | 4 | 21.1 |
| Paleontology | 20 | 17 | 3 | 15.0 |
| Stratigraphy/sedimentation | 16 | 15 | 1 | 6.3 |
| Geological and related sciences, general | 21 | 17 | 4 | 19.0 |
| Geological and related sciences, other | 22 | 18 | 4 | 18.2 |
| Oceanography | 114 | 86 | 28 | 24.6 |
| Marine sciences | 31 | 23 | 8 | 25.8 |
| Oceanography | 83 | 63 | 20 | 24.1 |
| Other environmental sciences | 80 | 52 | 28 | 35.0 |
| Mathematical/computer sciences, total | 2,188 | 1,737 | 451 | 20.6 |
| Mathematics, total | 1,190 | 925 | 265 | 22.3 |
| Algebra | 82 | 58 | 24 | 29.3 |
| Analysis/functional analysis | 99 | 81 | 18 | 18.2 |
| Applied mathematics | 211 | 164 | 47 | 22.3 |
| Computing theory | 14 | 12 | 2 | 14.3 |
| Geometry | 45 | 37 | 8 | 17.8 |
| Logic | 35 | 28 | 7 | 20.0 |
| Mathematical statistics | 205 | 151 | 54 | 26.3 |
| Number theory | 35 | 26 | 9 | 25.7 |
| Operations research | 36 | 31 | 5 | 13.9 |
| Topology | 51 | 43 | 8 | 15.7 |
| Mathematics, general | 305 | 241 | 64 | 21.0 |
| Mathematics, other | 72 | 53 | 19 | 26.4 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-32. Total doctorate recipients, by detailed field and sex: 1995**



| Field of study | Total | Men | Women | Percent women |
|---|---|---|---|---|
| Computer sciences, total | 998 | 812 | 186 | 18.6 |
| Computer science | 914 | 754 | 160 | 17.5 |
| Information science/systems | 84 | 58 | 26 | 31.0 |
| Biological/agricultural sciences, total | 6,406 | 3,964 | 2,442 | 38.1 |
| Biological sciences, total | 5,370 | 3,156 | 2,214 | 41.2 |
| Bacteriology | 13 | 7 | 6 | 46.2 |
| Biochemistry | 825 | 483 | 342 | 41.5 |
| Biomedical sciences | 93 | 52 | 41 | 44.1 |
| Biophysics | 154 | 109 | 45 | 29.2 |
| Biotechnology research | 4 | 2 | 2 | 50.0 |
| Plant genetics | 35 | 23 | 12 | 34.3 |
| Plant pathology | 32 | 22 | 10 | 31.3 |
| Plant physiology | 55 | 34 | 21 | 38.2 |
| Botany, other | 102 | 68 | 34 | 33.3 |
| Anatomy | 65 | 39 | 26 | 40.0 |
| Biometrics/biostatistics | 67 | 44 | 23 | 34.3 |
| Cell biology | 236 | 119 | 117 | 49.6 |
| Developmental biology/embryology | 64 | 34 | 30 | 46.9 |
| Ecology | 203 | 139 | 64 | 31.5 |
| Endocrinology | 20 | 14 | 6 | 30.0 |
| Entomology | 121 | 94 | 27 | 22.3 |
| Biological immunology | 191 | 109 | 82 | 42.9 |
| Microbiology | 426 | 238 | 188 | 44.1 |
| Molecular biology | 618 | 352 | 266 | 43.0 |
| Neuroscience | 305 | 186 | 119 | 39.0 |
| Nutritional sciences | 136 | 44 | 92 | 67.6 |
| Parasitology | 14 | 7 | 7 | 50.0 |
| Toxicology | 123 | 75 | 48 | 39.0 |
| Human/animal genetics | 202 | 110 | 92 | 45.5 |
| Human/animal pathology | 109 | 71 | 38 | 34.9 |
| Human/animal pharmacology | 274 | 147 | 127 | 46.4 |
| Human/animal physiology | 262 | 159 | 103 | 39.3 |
| Zoology, other | 145 | 95 | 50 | 34.5 |
| Biological sciences, general | 350 | 201 | 149 | 42.6 |
| Biological sciences, other | 126 | 79 | 47 | 37.3 |
| Agricultural sciences, total | 1,036 | 808 | 228 | 22.0 |
| Agronomy and crop science | 114 | 101 | 13 | 11.4 |
| Animal breeding/genetics | 19 | 18 | 1 | 5.3 |
| Animal nutrition | 50 | 41 | 9 | 18.0 |
| Dairy science | 14 | 11 | 3 | 21.4 |
| Poultry science | 11 | 11 | 0 | 0.0 |
| Animal sciences, other | 85 | 66 | 19 | 22.4 |
| Fisheries science & management | 49 | 40 | 9 | 18.4 |
| Wildlife/range management | 50 | 42 | 8 | 16.0 |
| Food engineering | 7 | 7 | 0 | 0.0 |
| Food sciences, other | 135 | 81 | 54 | 40.0 |
| Forest biology | 24 | 19 | 5 | 20.8 |
| Forest engineering | 4 | 4 | 0 | 0.0 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-32. Total doctorate recipients, by detailed field and sex: 1995**



| Field of study | Total | Men | Women | Percent women |
|---|---|---|---|---|
| Forest management | 20 | 14 | 6 | 30.0 |
| Wood science and pulp/paper technology | 25 | 19 | 6 | 24.0 |
| Conservation/renewable natural resources | 24 | 19 | 5 | 20.8 |
| Forestry and related sciences, other | 72 | 59 | 13 | 18.1 |
| Horticulture science | 67 | 45 | 22 | 32.8 |
| Plant breeding/genetics | 72 | 57 | 15 | 20.8 |
| Plant pathology | 52 | 43 | 9 | 17.3 |
| Plant sciences, other | 30 | 27 | 3 | 10.0 |
| Soil chemistry/microbiology | 27 | 22 | 5 | 18.5 |
| Soil sciences, other | 72 | 54 | 18 | 25.0 |
| Agricultural sciences, general | 6 | 3 | 3 | 50.0 |
| Agricultural sciences, other | 7 | 5 | 2 | 28.6 |
| Psychology, total | 3,419 | 1,247 | 2,172 | 63.5 |
| Clinical | 1,292 | 425 | 867 | 67.1 |
| Cognitive psychology and psycholinguistics | 104 | 52 | 52 | 50.0 |
| Comparative | 4 | 3 | 1 | 25.0 |
| Counseling | 470 | 173 | 297 | 63.2 |
| Developmental and child | 153 | 31 | 122 | 79.7 |
| Educational | 74 | 21 | 53 | 71.6 |
| Experimental | 151 | 68 | 83 | 55.0 |
| Family and marriage counseling | 51 | 16 | 35 | 68.6 |
| Industrial/organizational | 145 | 61 | 84 | 57.9 |
| Physiological/psychobiology | 93 | 58 | 35 | 37.6 |
| Quantitative | 13 | 4 | 9 | 69.2 |
| Personality | 16 | 7 | 9 | 56.3 |
| Psychometrics | 10 | 6 | 4 | 40.0 |
| School | 91 | 29 | 62 | 68.1 |
| Social | 155 | 71 | 84 | 54.2 |
| Psychology, general | 307 | 121 | 186 | 60.6 |
| Psychology, other | 290 | 101 | 189 | 65.2 |
| Social sciences, total[1] | 3,877 | 2,411 | 1,466 | 37.8 |
| Economics | 1,153 | 875 | 278 | 24.1 |
| Agricultural economics | 173 | 131 | 42 | 24.3 |
| Econometrics | 26 | 22 | 4 | 15.4 |
| Economics | 954 | 722 | 232 | 24.3 |
| Political science | 893 | 627 | 266 | 29.8 |
| International relations and affairs | 72 | 51 | 21 | 29.2 |
| Political science/government | 600 | 433 | 167 | 27.8 |
| Public administration | 129 | 86 | 43 | 33.3 |
| Public policy analysis | 92 | 57 | 35 | 38.0 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-32. Total doctorate recipients, by detailed field and sex: 1995**



| Field of study | Total | Men | Women | Percent women |
|---|---|---|---|---|
| Sociology | 554 | 260 | 294 | 53.1 |
| Demography/population studies | 15 | 9 | 6 | 40.0 |
| Sociology | 539 | 251 | 288 | 53.4 |
| Other social sciences | 1,277 | 649 | 628 | 49.2 |
| American studies | 94 | 41 | 53 | 56.4 |
| Anthropology | 375 | 156 | 219 | 58.4 |
| Archaeology | 35 | 17 | 18 | 51.4 |
| Area studies | 27 | 15 | 12 | 44.4 |
| Criminology | 44 | 21 | 23 | 52.3 |
| Geography | 150 | 107 | 43 | 28.7 |
| History/philosophy of science and technology | 41 | 23 | 18 | 43.9 |
| Linguistics | 201 | 99 | 102 | 50.7 |
| Statistics | 48 | 37 | 11 | 22.9 |
| Urban affairs and studies | 103 | 66 | 37 | 35.9 |
| Social sciences, general | 35 | 12 | 23 | 65.7 |
| Social sciences, other | 124 | 55 | 69 | 55.6 |
| NonS&E, total [2] | 15,095 | 7,035 | 8,060 | 53.4 |
| Health | 1,331 | 487 | 844 | 63.4 |
| Humanities [1] | 4,690 | 2,436 | 2,254 | 48.1 |
| Education | 6,546 | 2,514 | 4,032 | 61.6 |
| Professional/other | 2,528 | 1,598 | 930 | 36.8 |
| Grand total, all fields | 41,610 | 25,277 | 16,333 | 39.3 |

[1] Categories differ from those published by other Federal sponsors and the National Research Council because linguistics, history of science, American studies, and archaeology are included in social sciences rather than in humanities.

[2] Non-science and -engineering doctorates include those whose field of specialization is unknown.

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-33. The top 50 institutions granting science and engineering doctorates to women, and women as a percentage of recipients, by institution: 1995**



| Academic institution | Science and engineering | | | Science | | | Engineering | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Women | Percentage women | Total | Women | Percentage women | Total | Women | Percentage women |
| University of California-Berkeley | 608 | 170 | 28.0 | 430 | 144 | 33.5 | 178 | 26 | 14.6 |
| University of California-Los Angeles | 435 | 147 | 33.8 | 350 | 137 | 39.1 | 85 | 10 | 11.8 |
| University of Wisconsin-Madison | 531 | 143 | 26.9 | 420 | 127 | 30.2 | 111 | 16 | 14.4 |
| Cornell University, all campuses | 430 | 142 | 33.0 | 342 | 123 | 36.0 | 88 | 19 | 21.6 |
| University of Michigan at Ann Arbor | 472 | 134 | 28.4 | 294 | 113 | 38.4 | 178 | 21 | 11.8 |
| University of Illinois at Urbana-Champaign | 519 | 123 | 23.7 | 362 | 106 | 29.3 | 157 | 17 | 10.8 |
| University of Minnesota-Twin Cities | 439 | 121 | 27.6 | 326 | 112 | 34.4 | 113 | 9 | 8.0 |
| Ohio State University, main campus | 425 | 114 | 26.8 | 323 | 104 | 32.2 | 102 | 10 | 9.8 |
| Stanford University | 466 | 110 | 23.6 | 259 | 71 | 27.4 | 207 | 39 | 18.8 |
| Pennsylvania State University, main campus | 401 | 109 | 27.2 | 241 | 90 | 37.3 | 160 | 19 | 11.9 |
| Subtotal, first 10 institutions | 4,726 | 1,313 | 27.8 | 3,347 | 1,127 | 33.7 | 1,379 | 186 | 13.5 |
| University of Texas at Austin | 458 | 109 | 23.8 | 284 | 97 | 34.2 | 174 | 12 | 6.9 |
| University of Pennsylvania | 318 | 108 | 34.0 | 265 | 96 | 36.2 | 53 | 12 | 22.6 |
| Harvard University | 297 | 103 | 34.7 | 287 | 101 | 35.2 | 10 | 2 | 20.0 |
| University of Maryland at College Park | 320 | 101 | 31.6 | 216 | 86 | 39.8 | 104 | 15 | 14.4 |
| Northwestern University | 252 | 99 | 39.3 | 177 | 86 | 48.6 | 75 | 13 | 17.3 |
| University of California-Davis | 302 | 98 | 32.5 | 255 | 95 | 37.3 | 47 | 3 | 6.4 |
| Michigan State University | 283 | 97 | 34.3 | 247 | 91 | 36.8 | 36 | 6 | 16.7 |
| University of Southern California | 308 | 94 | 30.5 | 208 | 84 | 40.4 | 100 | 10 | 10.0 |
| Purdue University, main campus | 399 | 91 | 22.8 | 259 | 81 | 31.3 | 140 | 10 | 7.1 |
| University of Washington | 332 | 91 | 27.4 | 252 | 79 | 31.3 | 80 | 12 | 15.0 |
| Subtotal, first 20 institutions | 7,995 | 2,304 | 28.8 | 5,797 | 2,023 | 34.9 | 2,198 | 281 | 12.8 |
| Massachusetts Institute of Technology | 486 | 90 | 18.5 | 250 | 55 | 22.0 | 236 | 35 | 14.8 |
| Columbia University in the City of New York | 281 | 87 | 31.0 | 248 | 79 | 31.9 | 33 | 8 | 24.2 |
| University of North Carolina at Chapel Hill | 227 | 87 | 38.3 | 219 | 84 | 38.4 | 8 | 3 | 37.5 |
| Rutgers the State University of NJ New Brunswick | 260 | 86 | 33.1 | 205 | 81 | 39.5 | 55 | 5 | 9.1 |
| Texas A&M University, main campus | 432 | 85 | 19.7 | 307 | 74 | 24.1 | 125 | 11 | 8.8 |
| University of Colorado at Boulder | 267 | 82 | 30.7 | 177 | 74 | 41.8 | 90 | 8 | 8.9 |
| University of Florida | 289 | 81 | 28.0 | 204 | 78 | 38.2 | 85 | 3 | 3.5 |
| Yale University | 222 | 76 | 34.2 | 203 | 73 | 36.0 | 19 | 3 | 15.8 |
| University of California-San Diego | 227 | 72 | 31.7 | 192 | 68 | 35.4 | 35 | 4 | 11.4 |
| University of Chicago | 241 | 69 | 28.6 | 240 | 68 | 28.3 | 1 | 1 | 100.0 |
| Subtotal, first 30 institutions | 10,927 | 3,119 | 28.5 | 8,042 | 2,757 | 34.3 | 2,885 | 362 | 12.5 |
| CUNY Graduate School and University Center | 193 | 68 | 35.2 | 178 | 65 | 36.5 | 15 | 3 | 20.0 |
| Indiana University at Bloomington | 176 | 65 | 36.9 | 176 | 65 | 36.9 | 0 | 0 | - |
| State University of NY at Stony Brook, all campuses | 188 | 65 | 34.6 | 166 | 62 | 37.3 | 22 | 3 | 13.6 |
| University of Connecticut | 164 | 65 | 39.6 | 139 | 63 | 45.3 | 25 | 2 | 8.0 |
| University of Georgia | 160 | 64 | 40.0 | 160 | 64 | 40.0 | 0 | 0 | - |
| Johns Hopkins University | 185 | 63 | 34.1 | 149 | 55 | 36.9 | 36 | 8 | 22.2 |
| University of Arizona | 273 | 63 | 23.1 | 217 | 61 | 28.1 | 56 | 2 | 3.6 |
| New York University | 159 | 61 | 38.4 | 159 | 61 | 38.4 | 0 | 0 | - |
| North Carolina State University at Raleigh | 250 | 60 | 24.0 | 158 | 49 | 31.0 | 92 | 11 | 12.0 |
| University of Cincinnati, all campuses | 159 | 60 | 37.7 | 106 | 55 | 51.9 | 53 | 5 | 9.4 |
| Subtotal, first 40 institutions | 12,834 | 3,753 | 29.2 | 9,650 | 3,357 | 34.8 | 3,184 | 396 | 12.4 |
| Princeton University | 221 | 57 | 25.8 | 173 | 49 | 28.3 | 48 | 8 | 16.7 |
| Temple University | 115 | 57 | 49.6 | 111 | 57 | 51.4 | 4 | 0 | - |
| University of Virginia, main campus | 185 | 57 | 30.8 | 138 | 51 | 37.0 | 47 | 6 | 12.8 |
| California School Prof Psych at Los Angeles | 71 | 56 | 78.9 | 71 | 56 | 78.9 | 0 | 0 | - |
| State University of NY at Buffalo | 192 | 56 | 29.2 | 134 | 51 | 38.1 | 58 | 5 | 8.6 |
| California School Prof Psych at San Diego | 80 | 55 | 68.8 | 80 | 55 | 68.8 | 0 | 0 | - |
| University of Pittsburgh, main campus | 157 | 55 | 35.0 | 120 | 51 | 42.5 | 37 | 4 | 10.8 |
| Duke University | 177 | 54 | 30.5 | 141 | 48 | 34.0 | 36 | 6 | 16.7 |
| Iowa State University | 260 | 54 | 20.8 | 180 | 44 | 24.4 | 80 | 10 | 12.5 |
| University of Iowa | 173 | 54 | 31.2 | 139 | 52 | 37.4 | 34 | 2 | 5.9 |
| Subtotal, first 50 institutions | 14,465 | 4,308 | 29.8 | 10,937 | 3,871 | 35.4 | 3,528 | 437 | 12.4 |

KEY: - = cannot be calculated.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995

**Appendix table 4-34. Doctorate recipients in science and engineering, by field, primary mechanism of support, and sex: 1995**



| Field and primary mechanism of support | Total | | Women | | Men | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Total, science and engineering | | | | | | |
| All mechanisms | 26,515 | 100.0 | 8,273 | 100.0 | 18,242 | 100.0 |
| Fellowship/Traineeship | 2,350 | 8.9 | 943 | 11.4 | 1,407 | 7.7 |
| Research assistantship | 7,891 | 29.8 | 2,030 | 24.5 | 5,861 | 32.1 |
| Teaching assistantship | 3,652 | 13.8 | 1,096 | 13.2 | 2,556 | 14.0 |
| Other sources, unknown | 12,622 | 47.6 | 4,204 | 50.8 | 8,418 | 46.1 |
| Physical sciences | | | | | | |
| All mechanisms | 3,840 | 100.0 | 878 | 100.0 | 2,962 | 100.0 |
| Fellowship/Traineeship | 203 | 5.3 | 61 | 6.9 | 142 | 4.8 |
| Research assistantship | 1,679 | 43.7 | 372 | 42.4 | 1,307 | 44.1 |
| Teaching assistantship | 661 | 17.2 | 154 | 17.5 | 507 | 17.1 |
| Other sources, unknown | 1,297 | 33.8 | 291 | 33.1 | 1,006 | 34.0 |
| Earth, atmospheric and ocean sciences | | | | | | |
| All mechanisms | 778 | 100.0 | 170 | 100.0 | 608 | 100.0 |
| Fellowship/Traineeship | 39 | 5.0 | 11 | 6.5 | 28 | 4.6 |
| Research assistantship | 314 | 40.4 | 70 | 41.2 | 244 | 40.1 |
| Teaching assistantship | 77 | 9.9 | 16 | 9.4 | 61 | 10.0 |
| Other sources, unknown | 348 | 44.7 | 73 | 42.9 | 275 | 45.2 |
| Mathematical and computer sciences | | | | | | |
| All mechanisms | 2,188 | 100.0 | 451 | 100.0 | 1,737 | 100.0 |
| Fellowship/Traineeship | 120 | 5.5 | 32 | 7.1 | 88 | 5.1 |
| Research assistantship | 449 | 20.5 | 66 | 14.6 | 383 | 22.0 |
| Teaching assistantship | 718 | 32.8 | 154 | 34.1 | 564 | 32.5 |
| Other sources, unknown | 901 | 41.2 | 199 | 44.1 | 702 | 40.4 |
| Agricultural sciences | | | | | | |
| All mechanisms | 1,036 | 100.0 | 228 | 100.0 | 808 | 100.0 |
| Fellowship/Traineeship | 51 | 4.9 | 13 | 5.7 | 38 | 4.7 |
| Research assistantship | 407 | 39.3 | 83 | 36.4 | 324 | 40.1 |
| Teaching assistantship | 33 | 3.2 | 12 | 5.3 | 21 | 2.6 |
| Other sources, unknown | 545 | 52.6 | 120 | 52.6 | 425 | 52.6 |
| Biological sciences | | | | | | |
| All mechanisms | 5,370 | 100.0 | 2,214 | 100.0 | 3,156 | 100.0 |
| Fellowship/Traineeship | 1,001 | 18.6 | 424 | 19.2 | 577 | 18.3 |
| Research assistantship | 1,673 | 31.2 | 714 | 32.2 | 959 | 30.4 |
| Teaching assistantship | 566 | 10.5 | 224 | 10.1 | 342 | 10.8 |
| Other sources, unknown | 2,130 | 39.7 | 852 | 38.5 | 1,278 | 40.5 |
| Psychology | | | | | | |
| All mechanisms | 3,419 | 100.0 | 2,172 | 100.0 | 1,247 | 100.0 |
| Fellowship/Traineeship | 217 | 6.3 | 140 | 6.4 | 77 | 6.2 |
| Research assistantship | 395 | 11.6 | 240 | 11.0 | 155 | 12.4 |
| Teaching assistantship | 368 | 10.8 | 219 | 10.1 | 149 | 11.9 |
| Other sources, unknown | 2,439 | 71.3 | 1,573 | 72.4 | 866 | 69.4 |
| Social sciences | | | | | | |
| All mechanisms | 3,877 | 100.0 | 1,466 | 100.0 | 2,411 | 100.0 |
| Fellowship/Traineeship | 437 | 11.3 | 183 | 12.5 | 254 | 10.5 |
| Research assistantship | 413 | 10.7 | 159 | 10.8 | 254 | 10.5 |
| Teaching assistantship | 781 | 20.1 | 275 | 18.8 | 506 | 21.0 |
| Other sources, unknown | 2,246 | 57.9 | 849 | 57.9 | 1,397 | 57.9 |
| Engineering | | | | | | |
| All mechanisms | 6,007 | 100.0 | 694 | 100.0 | 5,313 | 100.0 |
| Fellowship/Traineeship | 282 | 4.7 | 79 | 11.4 | 203 | 3.8 |
| Research assistantship | 2,561 | 42.6 | 326 | 47.0 | 2,235 | 42.1 |
| Teaching assistantship | 448 | 7.5 | 42 | 6.1 | 406 | 7.6 |
| Other sources, unknown | 2,716 | 45.2 | 247 | 35.6 | 2,469 | 46.5 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995.

**Appendix table 4-35. Top 50 institutions that were baccalaureate origins of 1991-1995 female science and engineering doctorate recipients, ranked according to total science and engineering doctorates to women, by field of doctorate**



| Rank | Academic Institution | Total S&E | Sciences: Total sciences | Physical sciences | Earth, atmospheric, and ocean sciences | Mathematics | Computer sciences | Agricultural/ biological sciences | Psychology | Social Sciences | Total engineering |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total of all academic institutions | 37,855 | 35,031 | 3,935 | 880 | 1,169 | 698 | 11,120 | 10,286 | 6,943 | 2,824 |
| 1 | University of California-Berkeley | 509 | 458 | 39 | 15 | 11 | 6 | 151 | 119 | 117 | 51 |
| 2 | Cornell University, all campuses | 403 | 368 | 37 | 10 | 2 | 6 | 160 | 104 | 49 | 35 |
| 3 | University of Michigan at Ann Arbor | 400 | 355 | 20 | 5 | 6 | 2 | 93 | 147 | 82 | 45 |
| 4 | University of Illinois at Urbana-Champaign | 349 | 307 | 23 | 11 | 5 | 5 | 130 | 82 | 51 | 42 |
| 5 | University of California-Los Angeles | 334 | 321 | 17 | 11 | 2 | 4 | 67 | 168 | 52 | 13 |
| 6 | University of Wisconsin-Madison | 329 | 311 | 16 | 9 | 5 | 4 | 108 | 105 | 64 | 18 |
| 7 | Pennsylvania State University, main campus | 266 | 232 | 15 | 1 | 4 | 2 | 116 | 54 | 40 | 34 |
| 8 | University of California-Davis | 241 | 229 | 11 | 10 | 0 | 2 | 134 | 41 | 31 | 12 |
| 9 | Rutgers the State University of NJ New Brunswick | 234 | 219 | 23 | 6 | 5 | 3 | 90 | 65 | 27 | 15 |
| 10 | Massachusetts Institute of Technology | 231 | 151 | 43 | 4 | 5 | 14 | 64 | 7 | 14 | 80 |
| 11 | University of Maryland at College Park | 230 | 216 | 14 | 3 | 3 | 4 | 75 | 75 | 42 | 14 |
| 12 | Ohio State University, main campus | 226 | 212 | 10 | 9 | 2 | 3 | 67 | 68 | 53 | 14 |
| 13 | Michigan State University | 218 | 205 | 10 | 5 | 0 | 3 | 78 | 69 | 40 | 13 |
| 14 | Brown University | 210 | 199 | 5 | 12 | 3 | 3 | 47 | 88 | 41 | 11 |
| 15 | University of Minnesota-Twin Cities | 210 | 198 | 15 | 4 | 0 | 3 | 73 | 55 | 48 | 12 |
| 16 | University of California-San Diego | 207 | 190 | 13 | 2 | 6 | 0 | 77 | 57 | 35 | 17 |
| 17 | University of Pennsylvania | 206 | 194 | 12 | 1 | 2 | 3 | 52 | 74 | 50 | 12 |
| 18 | Harvard University | 203 | 195 | 21 | 8 | 9 | 8 | 57 | 34 | 58 | 8 |
| 19 | University of Texas at Austin | 201 | 187 | 8 | 6 | 3 | 1 | 43 | 83 | 43 | 14 |
| 20 | Stanford University | 194 | 172 | 9 | 10 | 3 | 2 | 50 | 52 | 46 | 22 |
| 21 | Yale University | 184 | 176 | 13 | 6 | 5 | 3 | 52 | 41 | 56 | 8 |
| 22 | University of Colorado at Boulder | 180 | 164 | 14 | 5 | 6 | 2 | 47 | 53 | 37 | 16 |
| 23 | Duke University | 173 | 159 | 12 | 6 | 1 | 4 | 52 | 61 | 23 | 14 |
| 24 | Indiana University at Bloomington | 169 | 167 | 12 | 4 | 1 | 1 | 45 | 60 | 44 | 2 |
| 25 | Princeton University | 166 | 142 | 17 | 5 | 5 | 4 | 62 | 18 | 31 | 24 |
| 26 | Purdue University, main campus | 164 | 123 | 14 | 3 | 1 | 3 | 57 | 31 | 14 | 41 |
| 27 | University of California-Santa Barbara | 163 | 157 | 9 | 8 | 2 | 6 | 51 | 50 | 31 | 6 |
| 28 | University of Washington | 160 | 146 | 8 | 1 | 2 | 1 | 50 | 44 | 40 | 14 |
| 29 | Texas A&M University, main campus | 159 | 144 | 8 | 11 | 1 | 1 | 79 | 35 | 9 | 15 |
| 30 | University of California-Irvine | 159 | 155 | 16 | 1 | 3 | 3 | 45 | 67 | 20 | 4 |
| 31 | University of Florida | 155 | 147 | 12 | 2 | 2 | 3 | 43 | 54 | 31 | 8 |
| 32 | Smith College | 153 | 153 | 13 | 9 | 7 | 2 | 47 | 39 | 36 | 0 |
| 33 | University of Virginia, main campus | 151 | 133 | 11 | 3 | 1 | 1 | 45 | 53 | 19 | 18 |
| 34 | University of Massachusetts at Amherst | 145 | 135 | 3 | 6 | 3 | 1 | 46 | 41 | 35 | 10 |
| 35 | State University of New York at Buffalo | 138 | 128 | 12 | 4 | 4 | 1 | 30 | 51 | 26 | 10 |
| 36 | University of North Carolina at Chapel Hill | 136 | 130 | 12 | 6 | 3 | 2 | 41 | 48 | 18 | 6 |
| 37 | Virginia Polytechnic Institute and State University | 136 | 105 | 13 | 3 | 2 | 1 | 53 | 25 | 8 | 31 |
| 38 | Wellesley College | 136 | 133 | 10 | 6 | 4 | 2 | 33 | 39 | 39 | 3 |
| 39 | University of Delaware | 135 | 123 | 15 | 6 | 1 | 1 | 53 | 26 | 21 | 12 |
| 40 | University of California-Santa Cruz | 133 | 131 | 5 | 7 | 1 | 2 | 39 | 39 | 38 | 2 |
| 41 | Barnard College | 132 | 131 | 6 | 2 | 1 | 2 | 19 | 57 | 44 | 1 |
| 42 | Boston University | 131 | 125 | 7 | 1 | 2 | 1 | 25 | 62 | 27 | 6 |
| 43 | Iowa State University | 131 | 120 | 12 | 3 | 2 | 3 | 58 | 23 | 19 | 11 |
| 44 | Oberlin College | 131 | 128 | 16 | 5 | 5 | 2 | 26 | 35 | 39 | 3 |
| 45 | State University of New York at Albany | 130 | 130 | 6 | 1 | 1 | 3 | 36 | 56 | 27 | 0 |
| 46 | Mount Holyoke College | 124 | 121 | 13 | 3 | 5 | 1 | 50 | 27 | 22 | 3 |
| 47 | University of Chicago | 124 | 121 | 10 | 6 | 4 | 1 | 34 | 33 | 33 | 3 |
| 48 | University of Rochester | 121 | 107 | 8 | 6 | 0 | 0 | 36 | 46 | 11 | 14 |
| 49 | Bryn Mawr College | 120 | 115 | 15 | 3 | 8 | 1 | 25 | 19 | 44 | 5 |
| 50 | University of Puerto Rico, Rio Piedras campus | 120 | 116 | 22 | 1 | 2 | 1 | 22 | 42 | 26 | 4 |

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates 1995

**Table 4-36. Postgraduation plans of science and engineering doctorate recipients who are U.S. citizens and permanent residents, by sex and detailed field: 1995**



| Field of study | Total | Total with definite plans | In the United States | | | | | Abroad | Location unknown |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total in U.S. | Post-doctoral study | Academic employment | Industry employment | Other | | |
| Science and engineering, both sexes | 18,961 | 11,841 | 11,261 | 4,850 | 2,695 | 2,180 | 1,536 | 554 | 26 |
| Engineering, total | 3,336 | 1,904 | 1,831 | 374 | 312 | 889 | 256 | 68 | 5 |
| Aeronautical/astronautical | 153 | 83 | 82 | 17 | 8 | 29 | 28 | 1 | 0 |
| Chemical | 381 | 242 | 233 | 50 | 25 | 137 | 21 | 9 | 0 |
| Civil | 309 | 173 | 166 | 26 | 57 | 55 | 28 | 6 | 1 |
| Electrical | 971 | 568 | 551 | 75 | 87 | 326 | 63 | 17 | 0 |
| Industrial | 149 | 79 | 71 | 2 | 36 | 26 | 7 | 7 | 1 |
| Materials/metallurgical | 351 | 201 | 191 | 71 | 11 | 84 | 25 | 9 | 1 |
| Mechanical | 558 | 293 | 284 | 51 | 46 | 155 | 32 | 7 | 2 |
| Other engineering | 464 | 265 | 253 | 82 | 42 | 77 | 52 | 12 | 0 |
| Sciences, total | 15,625 | 9,937 | 9,430 | 4,476 | 2,383 | 1,291 | 1,280 | 486 | 21 |
| Physical sciences, total | 2,840 | 1,767 | 1,645 | 1,021 | 166 | 356 | 102 | 113 | 9 |
| Astronomy | 141 | 105 | 93 | 69 | 15 | 4 | 5 | 12 | 0 |
| Chemistry | 1,623 | 1,038 | 994 | 608 | 94 | 244 | 48 | 42 | 2 |
| Physics | 1,059 | 616 | 551 | 338 | 57 | 107 | 49 | 58 | 7 |
| Other physical sciences | 17 | 8 | 7 | 6 | 0 | 1 | 0 | 1 | 0 |
| Earth, atmospheric, and ocean sciences | 593 | 343 | 316 | 138 | 63 | 47 | 68 | 27 | 0 |
| Mathematics | 771 | 446 | 425 | 98 | 221 | 78 | 28 | 20 | 1 |
| Computer sciences | 617 | 393 | 373 | 45 | 143 | 147 | 38 | 19 | 1 |
| Biological sciences | 4,321 | 3,023 | 2,884 | 2,313 | 280 | 143 | 148 | 131 | 8 |
| Agricultural sciences | 598 | 347 | 318 | 104 | 80 | 85 | 49 | 29 | 0 |
| Psychology | 3,169 | 1,932 | 1,906 | 582 | 485 | 294 | 545 | 25 | 1 |
| Social sciences | 2,716 | 1,686 | 1,563 | 175 | 945 | 141 | 302 | 122 | 1 |
| Science and engineering, women | 6,892 | 4,335 | 4,182 | 1,859 | 1,155 | 539 | 629 | 146 | 7 |
| Engineering, total | 518 | 296 | 287 | 64 | 75 | 111 | 37 | 8 | 1 |
| Aeronautical/astronautical | 12 | 5 | 5 | 1 | 0 | 0 | 4 | 0 | 0 |
| Chemical | 88 | 62 | 60 | 12 | 8 | 36 | 4 | 2 | 0 |
| Civil | 52 | 31 | 30 | 5 | 19 | 4 | 2 | 1 | 0 |
| Electrical | 120 | 65 | 63 | 8 | 17 | 31 | 7 | 2 | 0 |
| Industrial | 34 | 16 | 15 | 0 | 11 | 3 | 1 | 1 | 0 |
| Materials/metallurgical | 78 | 43 | 42 | 10 | 2 | 24 | 6 | 1 | 0 |
| Mechanical | 48 | 21 | 20 | 7 | 5 | 5 | 3 | 0 | 1 |
| Other engineering | 86 | 53 | 52 | 21 | 13 | 8 | 10 | 1 | 0 |

See explanatory information and SOURCES at end of table.

**Table 4-36. Postgraduation plans of science and engineering doctorate recipients who are U.S. citizens and permanent residents, by sex and detailed field: 1995**



| Field of study | Total | Total with definite plans | In the United States | | | | | Abroad | Location unknown |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total in U.S. | Post-doctoral study | Academic employment | Industry employment | Other | | |
| Sciences, total | 6,374 | 4,039 | 3,895 | 1,795 | 1,080 | 428 | 592 | 138 | 6 |
| Physical sciences, total | 708 | 438 | 415 | 241 | 71 | 77 | 26 | 21 | 2 |
| Astronomy | 25 | 20 | 18 | 15 | 2 | 1 | 0 | 2 | 0 |
| Chemistry | 537 | 334 | 317 | 184 | 49 | 65 | 19 | 15 | 2 |
| Physics | 143 | 82 | 78 | 41 | 20 | 10 | 7 | 4 | 0 |
| Other physical sciences | 3 | 2 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| Earth, atmospheric, and ocean sciences | 144 | 83 | 79 | 35 | 15 | 10 | 19 | 4 | 0 |
| Mathematics | 183 | 107 | 104 | 15 | 67 | 15 | 7 | 3 | 0 |
| Computer sciences | 143 | 96 | 91 | 11 | 48 | 22 | 10 | 5 | 0 |
| Biological sciences | 1,854 | 1,278 | 1,227 | 1,001 | 114 | 50 | 62 | 47 | 4 |
| Agricultural sciences | 135 | 68 | 65 | 24 | 19 | 9 | 13 | 3 | 0 |
| Psychology | 2,044 | 1,221 | 1,208 | 366 | 314 | 191 | 337 | 13 | 0 |
| Social sciences | 1,163 | 748 | 706 | 102 | 432 | 54 | 118 | 42 | 0 |
| Science and engineering, men | 12,069 | 7,506 | 7,079 | 2,991 | 1,540 | 1,641 | 907 | 408 | 19 |
| Engineering, total | 2,818 | 1,608 | 1,544 | 310 | 237 | 778 | 219 | 60 | 4 |
| Aeronautical/astronautical | 141 | 78 | 77 | 16 | 8 | 29 | 24 | 1 | 0 |
| Chemical | 293 | 180 | 173 | 38 | 17 | 101 | 17 | 7 | 0 |
| Civil | 257 | 142 | 136 | 21 | 38 | 51 | 26 | 5 | 1 |
| Electrical | 851 | 503 | 488 | 67 | 70 | 295 | 56 | 15 | 0 |
| Industrial | 115 | 63 | 56 | 2 | 25 | 23 | 6 | 6 | 1 |
| Materials/metallurgical | 273 | 158 | 149 | 61 | 9 | 60 | 19 | 8 | 1 |
| Mechanical | 510 | 272 | 264 | 44 | 41 | 150 | 29 | 7 | 1 |
| Other engineering | 378 | 212 | 201 | 61 | 29 | 69 | 42 | 11 | 0 |
| Sciences, total | 9,251 | 5,898 | 5,535 | 2,681 | 1,303 | 863 | 688 | 348 | 15 |
| Physical sciences, total | 2,132 | 1,329 | 1,230 | 780 | 95 | 279 | 76 | 92 | 7 |
| Astronomy | 116 | 85 | 75 | 54 | 13 | 3 | 5 | 10 | 0 |
| Chemistry | 1,086 | 704 | 677 | 424 | 45 | 179 | 29 | 27 | 0 |
| Physics | 916 | 534 | 473 | 297 | 37 | 97 | 42 | 54 | 7 |
| Other physical sciences | 14 | 6 | 5 | 5 | 0 | 0 | 0 | 1 | 0 |
| Earth, atmospheric, and ocean sciences | 449 | 260 | 237 | 103 | 48 | 37 | 49 | 23 | 0 |
| Mathematics | 588 | 339 | 321 | 83 | 154 | 63 | 21 | 17 | 1 |
| Computer sciences | 474 | 297 | 282 | 34 | 95 | 125 | 28 | 14 | 1 |
| Biological sciences | 2,467 | 1,745 | 1,657 | 1,312 | 166 | 93 | 86 | 84 | 4 |
| Agricultural sciences | 463 | 279 | 253 | 80 | 61 | 76 | 36 | 26 | 0 |
| Psychology | 1,125 | 711 | 698 | 216 | 171 | 103 | 208 | 12 | 1 |
| Social sciences | 1,553 | 938 | 857 | 73 | 513 | 87 | 184 | 80 | 1 |

SOURCE: National Science Foundation/SRS, Survey of Earned Doctorates 1995.

**Appendix table 4-37. Total master's degrees awarded, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents: 1987-1995, selected years**



| Field and race/ethnicity | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|
| Total, all recipients | | | | | | | | |
| Total science and engineering | 66,774 | 70,333 | 72,228 | 72,828 | 76,184 | 81,415 | 86,080 | 88,431 |
| Sciences | 44,717 | 46,598 | 48,243 | 48,821 | 51,174 | 53,757 | 57,373 | 59,814 |
| Physical science | 5,638 | 5,703 | 5,411 | 5,282 | 5,352 | 5,365 | 5,688 | 5,735 |
| Mathematical science | 3,327 | 3,430 | 3,684 | 3,632 | 4,019 | 4,084 | 4,108 | 4,190 |
| Computer science | 8,481 | 9,399 | 9,643 | 9,324 | 9,530 | 10,167 | 10,421 | 10,332 |
| Biological science | 2,824 | 4,953 | 4,893 | 4,806 | 4,816 | 4,798 | 5,217 | 5,423 |
| Agricultural science | 4,999 | 2,604 | 2,662 | 2,625 | 3,058 | 3,299 | 3,435 | 3,612 |
| Psychology | 8,165 | 8,652 | 9,308 | 9,802 | 10,280 | 11,020 | 12,274 | 14,021 |
| Social sciences | 11,283 | 11,857 | 12,642 | 13,350 | 14,119 | 15,024 | 16,230 | 16,501 |
| Engineering | 22,057 | 23,735 | 23,985 | 24,007 | 25,010 | 27,658 | 28,707 | 28,617 |
| Non-science and -engineering | 223,758 | 240,717 | 252,719 | 265,670 | 278,023 | 289,558 | 302,928 | 310,997 |
| Grand total | 290,532 | 311,050 | 324,947 | 338,498 | 354,207 | 370,973 | 389,008 | 399,428 |
| Total, U.S. citizens and permanent residents: | | | | | | | | |
| Total science and engineering | 53,729 | 55,190 | 55,890 | 55,779 | 58,177 | 61,265 | 65,201 | 67,110 |
| Sciences | 37,453 | 38,202 | 39,144 | 39,292 | 41,066 | 42,726 | 45,851 | 48,189 |
| Physical science | 4,582 | 4,465 | 4,047 | 3,778 | 3,814 | 3,763 | 3,918 | 3,980 |
| Mathematical science | 2,491 | 2,454 | 2,649 | 2,573 | 2,907 | 2,946 | 3,013 | 3,034 |
| Computer science | 6,414 | 6,957 | 7,080 | 6,505 | 6,361 | 6,388 | 6,509 | 6,452 |
| Biological science | 4,490 | 4,317 | 4,164 | 4,057 | 4,021 | 3,949 | 4,284 | 4,543 |
| Agricultural science | 2,257 | 1,974 | 2,023 | 2,022 | 2,356 | 2,605 | 2,727 | 2,948 |
| Psychology | 7,945 | 8,393 | 8,923 | 9,485 | 9,978 | 10,688 | 11,913 | 13,537 |
| Social sciences | 9,274 | 9,642 | 10,258 | 10,872 | 11,629 | 12,387 | 13,487 | 13,695 |
| Engineering | 16,276 | 16,988 | 16,746 | 16,487 | 17,111 | 18,539 | 19,350 | 18,921 |
| Non-science and -engineering | 208,539 | 223,737 | 234,455 | 245,108 | 256,378 | 265,599 | 277,301 | 283,562 |
| Grand total | 262,268 | 278,927 | 290,345 | 300,887 | 314,555 | 326,864 | 342,502 | 350,672 |
| White, non-Hispanic | | | | | | | | |
| Total science and engineering | 43,360 | 43,945 | 44,450 | 44,513 | 45,649 | 47,975 | 50,711 | 51,417 |
| Sciences | 30,523 | 31,113 | 31,591 | 31,878 | 32,897 | 34,055 | 36,242 | 37,596 |
| Physical science | 3,834 | 3,766 | 3,401 | 3,129 | 3,067 | 3,078 | 3,145 | 3,179 |
| Mathematical science | 2,012 | 2,032 | 2,169 | 2,068 | 2,336 | 2,354 | 2,379 | 2,342 |
| Computer science | 4,717 | 4,786 | 4,851 | 4,637 | 4,407 | 4,464 | 4,286 | 4,205 |
| Biological science | 3,745 | 3,679 | 3,501 | 3,353 | 3,251 | 3,144 | 3,453 | 3,589 |
| Agricultural science | 2,044 | 1,817 | 1,820 | 1,818 | 2,075 | 2,282 | 2,261 | 2,474 |
| Psychology | 6,698 | 7,075 | 7,489 | 7,973 | 8,238 | 8,810 | 9,960 | 11,107 |
| Social sciences | 7,473 | 7,958 | 8,360 | 8,900 | 9,523 | 9,923 | 10,758 | 10,700 |
| Engineering | 12,837 | 12,832 | 12,859 | 12,635 | 12,752 | 13,920 | 14,469 | 13,821 |
| Non-science and -engineering | 173,447 | 186,377 | 192,424 | 203,011 | 211,413 | 217,693 | 223,202 | 226,020 |
| Grand total | 216,807 | 230,322 | 236,874 | 247,524 | 257,062 | 265,668 | 273,913 | 277,437 |
| Asian | | | | | | | | |
| Total science and engineering | 3,455 | 4,100 | 4,055 | 4,310 | 4,763 | 4,846 | 5,422 | 5,683 |
| Sciences | 1,805 | 2,108 | 2,192 | 2,302 | 2,540 | 2,586 | 2,979 | 3,111 |
| Physical science | 227 | 278 | 234 | 251 | 295 | 249 | 284 | 288 |
| Mathematical science | 183 | 178 | 184 | 189 | 201 | 197 | 233 | 239 |
| Computer science | 779 | 894 | 941 | 1,014 | 1,105 | 1,106 | 1,228 | 1,239 |
| Biological science | 190 | 223 | 225 | 231 | 264 | 305 | 332 | 417 |
| Agricultural science | 47 | 44 | 45 | 50 | 51 | 61 | 82 | 97 |
| Psychology | 113 | 131 | 159 | 170 | 183 | 191 | 270 | 298 |
| Social sciences | 266 | 360 | 404 | 397 | 441 | 477 | 550 | 533 |
| Engineering | 1,650 | 1,992 | 1,863 | 2,008 | 2,223 | 2,260 | 2,443 | 2,572 |
| Non-science and -engineering | 4,674 | 6,074 | 5,939 | 6,760 | 7,530 | 8,323 | 9,137 | 10,223 |
| Grand total | 8,129 | 10,174 | 9,994 | 11,070 | 12,293 | 13,169 | 14,559 | 15,906 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-37. Total master's degrees awarded, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents: 1987-1995, selected years**



| Field and race/ethnicity | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|
| Black, non-Hispanic | | | | | | | | |
| Total science and engineering | 1,784 | 1,652 | 1,847 | 2,090 | 2,356 | 2,554 | 2,849 | 3,339 |
| Sciences | 1,381 | 1,297 | 1,460 | 1,692 | 1,890 | 1,990 | 2,260 | 2,674 |
| Physical science | 79 | 78 | 87 | 73 | 98 | 105 | 127 | 147 |
| Mathematical science | 73 | 59 | 70 | 100 | 77 | 98 | 109 | 151 |
| Computer science | 207 | 198 | 232 | 283 | 316 | 308 | 365 | 347 |
| Biological science | 167 | 124 | 110 | 137 | 149 | 135 | 142 | 162 |
| Agricultural science | 55 | 36 | 28 | 51 | 59 | 70 | 78 | 74 |
| Psychology | 376 | 395 | 471 | 454 | 531 | 544 | 636 | 863 |
| Social sciences | 424 | 407 | 462 | 594 | 660 | 730 | 803 | 930 |
| Engineering | 403 | 355 | 387 | 398 | 466 | 564 | 589 | 665 |
| Non-science and -engineering | 11,389 | 11,803 | 12,626 | 13,767 | 15,064 | 16,343 | 18,087 | 19,615 |
| Grand total | 13,173 | 13,455 | 14,473 | 15,857 | 17,420 | 18,897 | 20,936 | 22,954 |
| Hispanic | | | | | | | | |
| Total science and engineering | 1,584 | 1,585 | 1,587 | 1,736 | 1,806 | 2,092 | 2,514 | 2,585 |
| Sciences | 1,072 | 1,117 | 1,141 | 1,268 | 1,318 | 1,511 | 1,795 | 1,874 |
| Physical science | 122 | 92 | 98 | 96 | 93 | 114 | 114 | 129 |
| Mathematical science | 60 | 34 | 51 | 85 | 66 | 78 | 75 | 75 |
| Computer science | 123 | 144 | 118 | 128 | 149 | 162 | 169 | 198 |
| Biological science | 126 | 126 | 120 | 136 | 146 | 151 | 138 | 167 |
| Agricultural science | 62 | 48 | 44 | 49 | 49 | 69 | 184 | 96 |
| Psychology | 271 | 360 | 369 | 391 | 419 | 463 | 558 | 656 |
| Social sciences | 308 | 313 | 341 | 383 | 396 | 474 | 557 | 553 |
| Engineering | 512 | 468 | 446 | 468 | 488 | 581 | 719 | 711 |
| Non-science and -engineering | 6,197 | 6,548 | 6,908 | 7,948 | 8,450 | 9,279 | 10,663 | 11,320 |
| Grand total | 7,781 | 8,133 | 8,495 | 9,684 | 10,256 | 11,371 | 13,177 | 13,905 |
| American Indian | | | | | | | | |
| Total science and engineering | 147 | 209 | 181 | 200 | 198 | 253 | 273 | 299 |
| Sciences | 109 | 176 | 146 | 160 | 156 | 203 | 213 | 256 |
| Physical science | 9 | 18 | 9 | 13 | 18 | 12 | 16 | 19 |
| Mathematical science | 3 | 6 | 6 | 9 | 4 | 8 | 6 | 11 |
| Computer science | 22 | 39 | 7 | 14 | 15 | 14 | 18 | 16 |
| Biological science | 11 | 17 | 14 | 13 | 12 | 26 | 17 | 20 |
| Agricultural science | 3 | 6 | 8 | 8 | 7 | 8 | 11 | 13 |
| Psychology | 35 | 33 | 37 | 49 | 38 | 57 | 62 | 85 |
| Social sciences | 26 | 57 | 65 | 54 | 62 | 78 | 83 | 92 |
| Engineering | 38 | 33 | 35 | 40 | 42 | 50 | 60 | 43 |
| Non-science and -engineering | 902 | 873 | 869 | 925 | 1,030 | 1,091 | 1,345 | 1,243 |
| Grand total | 1,049 | 1,082 | 1,050 | 1,125 | 1,228 | 1,344 | 1,618 | 1,542 |
| Unknown Race/Ethnicity | | | | | | | | |
| Total science and engineering | 3,399 | 3,699 | 3,770 | 2,930 | 3,405 | 3,545 | 3,432 | 3,787 |
| Sciences | 2,563 | 2,391 | 2,614 | 1,992 | 2,265 | 2,381 | 2,362 | 2,678 |
| Physical science | 311 | 233 | 218 | 216 | 243 | 205 | 232 | 218 |
| Mathematical science | 160 | 145 | 169 | 122 | 223 | 211 | 211 | 216 |
| Computer science | 566 | 896 | 931 | 429 | 369 | 334 | 443 | 447 |
| Biological science | 251 | 148 | 194 | 187 | 199 | 188 | 202 | 188 |
| Agricultural science | 46 | 23 | 78 | 46 | 115 | 115 | 111 | 194 |
| Psychology | 452 | 399 | 398 | 448 | 569 | 623 | 427 | 528 |
| Social sciences | 777 | 547 | 626 | 544 | 547 | 705 | 736 | 887 |
| Engineering | 836 | 1,308 | 1,156 | 938 | 1,140 | 1,164 | 1,070 | 1,109 |
| Non-science and -engineering | 11,930 | 12,062 | 15,689 | 12,697 | 12,891 | 12,870 | 14,867 | 15,141 |
| Grand total | 15,329 | 15,761 | 19,459 | 15,627 | 16,296 | 16,415 | 18,299 | 18,928 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-37. Total master's degrees awarded, by field, citizenship status, and race/ethnicity of U.S. citizens and permanent residents: 1987-1995, selected years**



| Field and race/ethnicity | 1987 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|
| Nonresident aliens | | | | | | | | |
| Total science and engineering | 13,045 | 15,143 | 16,338 | 17,049 | 18,007 | 20,150 | 20,879 | 21,321 |
| Sciences | 7,264 | 8,396 | 9,099 | 9,529 | 10,108 | 11,031 | 11,522 | 11,625 |
| Physical science | 1,056 | 1,238 | 1,364 | 1,504 | 1,538 | 1,602 | 1,770 | 1,755 |
| Mathematical science | 836 | 976 | 1,035 | 1,059 | 1,112 | 1,138 | 1,095 | 1,156 |
| Computer science | 2,067 | 2,442 | 2,563 | 2,819 | 3,169 | 3,779 | 3,912 | 3,880 |
| Biological science | 567 | 636 | 729 | 749 | 795 | 849 | 933 | 880 |
| Agricultural science | 509 | 630 | 639 | 603 | 702 | 694 | 708 | 664 |
| Psychology | 220 | 259 | 385 | 317 | 302 | 332 | 361 | 484 |
| Social sciences | 2,009 | 2,215 | 2,384 | 2,478 | 2,490 | 2,637 | 2,743 | 2,806 |
| Engineering | 5,781 | 6,747 | 7,239 | 7,520 | 7,899 | 9,119 | 9,357 | 9,696 |
| Non-science and -engineering | 15,219 | 16,980 | 18,264 | 20,562 | 21,645 | 23,959 | 25,627 | 27,435 |
| Grand total | 28,264 | 32,123 | 34,602 | 37,611 | 39,652 | 44,109 | 46,506 | 48,756 |

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. Racial/ethnic categories as designated on the survey form. Race/ethnicity categories include only U.S. citizens and permanent residents. Nonresident aliens include foreign citizens on temporary visas only. No racial/ethnic data are collected for this group.

SOURCES: Tabulations by National Science Foundation/SRS; data from U.S. Department of Education/NCES IPEDS Completions Surveys, 1987–1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-38. Master's degrees awarded to U.S. citizens and permanent residents, by sex of recipient, field, and race/ethnicity: 1995**



| | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian | Unknown race/ ethnicity |
|---|---|---|---|---|---|---|---|
| Both sexes: | | | | | | | |
| Total science and engineering | 67,110 | 51,417 | 5,683 | 3,339 | 2,585 | 299 | 3,787 |
| Sciences | 48,189 | 37,596 | 3,111 | 2,674 | 1,874 | 256 | 2,678 |
| Physical science | 3,980 | 3,179 | 288 | 147 | 129 | 19 | 218 |
| Mathematical science | 3,034 | 2,342 | 239 | 151 | 75 | 11 | 216 |
| Computer science | 6,452 | 4,205 | 1,239 | 347 | 198 | 16 | 447 |
| Biological science | 4,543 | 3,589 | 417 | 162 | 167 | 20 | 188 |
| Agricultural science | 2,948 | 2,474 | 97 | 74 | 96 | 13 | 194 |
| Psychology | 13,537 | 11,107 | 298 | 863 | 656 | 85 | 528 |
| Social sciences | 13,695 | 10,700 | 533 | 930 | 553 | 92 | 887 |
| Engineering | 18,921 | 13,821 | 2,572 | 665 | 711 | 43 | 1,109 |
| Non-science and -engineering | 283,562 | 226,020 | 10,223 | 19,615 | 11,320 | 1,243 | 15,141 |
| Grand total | 350,672 | 277,437 | 15,906 | 22,954 | 13,905 | 1,542 | 18,928 |
| Women: | | | | | | | |
| Total science and engineering | 27,326 | 20,953 | 1,950 | 1,805 | 1,127 | 148 | 1,343 |
| Sciences | 24,029 | 18,713 | 1,401 | 1,604 | 994 | 145 | 1,172 |
| Physical science | 1,202 | 923 | 101 | 61 | 41 | 8 | 68 |
| Mathematical science | 1,269 | 988 | 105 | 87 | 22 | 6 | 61 |
| Computer science | 1,727 | 974 | 454 | 148 | 47 | 5 | 99 |
| Biological science | 2,379 | 1,849 | 208 | 112 | 92 | 9 | 109 |
| Agricultural science | 1,246 | 1,024 | 53 | 39 | 40 | 3 | 87 |
| Psychology | 9,775 | 8,005 | 219 | 645 | 482 | 55 | 369 |
| Social sciences | 6,431 | 4,950 | 261 | 512 | 270 | 59 | 379 |
| Engineering | 3,297 | 2,240 | 549 | 201 | 133 | 3 | 171 |
| Non-science and -engineering | 175,307 | 139,829 | 5,571 | 13,513 | 7,053 | 771 | 8,570 |
| Grand total | 202,633 | 160,782 | 7,521 | 15,318 | 8,180 | 919 | 9,913 |
| Men: | | | | | | | |
| Total science and engineering | 39,784 | 30,464 | 3,733 | 1,534 | 1,458 | 151 | 2,444 |
| Sciences | 24,160 | 18,883 | 1,710 | 1,070 | 880 | 111 | 1,506 |
| Physical science | 2,778 | 2,256 | 187 | 86 | 88 | 11 | 150 |
| Mathematical science | 1,765 | 1,354 | 134 | 64 | 53 | 5 | 155 |
| Computer science | 4,725 | 3,231 | 785 | 199 | 151 | 11 | 348 |
| Biological science | 2,164 | 1,740 | 209 | 50 | 75 | 11 | 79 |
| Agricultural science | 1,702 | 1,450 | 44 | 35 | 56 | 10 | 107 |
| Psychology | 3,762 | 3,102 | 79 | 218 | 174 | 30 | 159 |
| Social sciences | 7,264 | 5,750 | 272 | 418 | 283 | 33 | 508 |
| Engineering | 15,624 | 11,581 | 2,023 | 464 | 578 | 40 | 938 |
| Non-science and -engineering | 108,255 | 86,191 | 4,652 | 6,102 | 4,267 | 472 | 6,571 |
| Grand total | 148,039 | 116,655 | 8,385 | 7,636 | 5,725 | 623 | 9,015 |
| Women as percent of total | | | | | | | |
| Total science and engineering | 40.7 | 40.8 | 34.3 | 54.1 | 43.6 | 49.5 | 35.5 |
| Sciences | 49.9 | 49.8 | 45.0 | 60.0 | 53.0 | 56.6 | 43.8 |
| Physical science | 30.2 | 29.0 | 35.1 | 41.5 | 31.8 | 42.1 | 31.2 |
| Mathematical science | 41.8 | 42.2 | 43.9 | 57.6 | 29.3 | 54.5 | 28.2 |
| Computer science | 26.8 | 23.2 | 36.6 | 42.7 | 23.7 | 31.3 | 22.1 |
| Biological science | 52.4 | 51.5 | 49.9 | 69.1 | 55.1 | 45.0 | 58.0 |
| Agricultural science | 42.3 | 41.4 | 54.6 | 52.7 | 41.7 | 23.1 | 44.8 |
| Psychology | 72.2 | 72.1 | 73.5 | 74.7 | 73.5 | 64.7 | 69.9 |
| Social sciences | 47.0 | 46.3 | 49.0 | 55.1 | 48.8 | 64.1 | 42.7 |
| Engineering | 17.4 | 16.2 | 21.3 | 30.2 | 18.7 | 7.0 | 15.4 |
| Non-science and -engineering | 61.8 | 61.9 | 54.5 | 68.9 | 62.3 | 62.0 | 56.6 |
| Grand total | 57.8 | 58.0 | 47.3 | 66.7 | 58.8 | 59.6 | 52.4 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-38. Master's degrees awarded to U.S. citizens and permanent residents, by sex of recipient, field, and race/ethnicity: 1995**



| | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian | Unknown race/ ethnicity |
|---|---|---|---|---|---|---|---|
| Percent of women | | | | | | | |
| Total science and engineering | 100.0 | 76.7 | 7.1 | 6.6 | 4.1 | 0.5 | 4.9 |
| Sciences | 100.0 | 77.9 | 5.8 | 6.7 | 4.1 | 0.6 | 4.9 |
| Physical science | 100.0 | 76.8 | 8.4 | 5.1 | 3.4 | 0.7 | 5.7 |
| Mathematical science | 100.0 | 77.9 | 8.3 | 6.9 | 1.7 | 0.5 | 4.8 |
| Computer science | 100.0 | 56.4 | 26.3 | 8.6 | 2.7 | 0.3 | 5.7 |
| Biological science | 100.0 | 77.7 | 8.7 | 4.7 | 3.9 | 0.4 | 4.6 |
| Agricultural science | 100.0 | 82.2 | 4.3 | 3.1 | 3.2 | 0.2 | 7.0 |
| Psychology | 100.0 | 81.9 | 2.2 | 6.6 | 4.9 | 0.6 | 3.8 |
| Social sciences | 100.0 | 77.0 | 4.1 | 8.0 | 4.2 | 0.9 | 5.9 |
| Engineering | 100.0 | 67.9 | 16.7 | 6.1 | 4.0 | 0.1 | 5.2 |
| Non-science and -engineering | 100.0 | 79.8 | 3.2 | 7.7 | 4.0 | 0.4 | 4.9 |
| Grand total | 100.0 | 79.3 | 3.7 | 7.6 | 4.0 | 0.5 | 4.9 |

NOTES: Data on race/ethnicity were collected biennially from 1977 through 1989 and annually thereafter. 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 NSF. Racial/ethnic categories as designated on the survey form. These categories include U.S. citizens and foreign citizens on permanent visas (i.e., resident alients who have been admitted for permanent residency).

SOURCES: Tabulations by National Science Foundation/SRS; data from U.S. Department of Education/NCES biennial data from the HEGIS Earned Degrees Surveys, 1985, and IPEDS Completions Surveys, 1987–1993.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-39. Science and engineering doctorates, by field and race/ethnicity: 1985-1995**



| Field and race/ethnicity | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Science and engineering, total | 14,065 | 14,016 | 14,055 | 14,499 | 14,591 | 15,363 | 15,909 | 15,940 | 16,570 | 18,184 | 18,961 |
| Engineering, total | 1,594 | 1,726 | 1,913 | 2,146 | 2,229 | 2,346 | 2,474 | 2,520 | 2,697 | 3,053 | 3,336 |
| Chemical | 292 | 298 | 350 | 408 | 444 | 392 | 399 | 378 | 377 | 380 | 381 |
| Civil | 170 | 192 | 203 | 233 | 247 | 241 | 213 | 215 | 227 | 292 | 309 |
| Electrical | 353 | 410 | 393 | 503 | 539 | 599 | 686 | 719 | 795 | 899 | 971 |
| Mechanical | 251 | 267 | 308 | 327 | 325 | 368 | 359 | 426 | 434 | 538 | 558 |
| Other engineering | 528 | 559 | 659 | 675 | 674 | 746 | 817 | 782 | 864 | 944 | 1,117 |
| Sciences, total | 12,471 | 12,290 | 12,142 | 12,353 | 12,362 | 13,017 | 13,435 | 13,420 | 13,873 | 15,131 | 15,625 |
| Physical sciences, total | 2,187 | 2,166 | 2,242 | 2,258 | 2,131 | 2,341 | 2,299 | 2,356 | 2,330 | 2,789 | 2,840 |
| Astronomy | 84 | 91 | 73 | 104 | 82 | 96 | 86 | 106 | 111 | 112 | 141 |
| Chemistry | 1,432 | 1,413 | 1,472 | 1,451 | 1,383 | 1,497 | 1,460 | 1,440 | 1,400 | 1,616 | 1,623 |
| Physics | 662 | 643 | 682 | 681 | 654 | 725 | 739 | 790 | 806 | 1,044 | 1,059 |
| Other physical sciences | 9 | 19 | 15 | 22 | 12 | 23 | 14 | 20 | 13 | 17 | 17 |
| Earth, atmospheric, and ocean sciences | 465 | 427 | 435 | 520 | 547 | 535 | 618 | 541 | 504 | 613 | 593 |
| Mathematics | 418 | 402 | 396 | 386 | 428 | 422 | 518 | 507 | 590 | 657 | 771 |
| Computer sciences | 213 | 249 | 275 | 326 | 396 | 403 | 451 | 489 | 509 | 543 | 617 |
| Biological sciences | 3,256 | 3,241 | 3,141 | 3,323 | 3,299 | 3,379 | 3,521 | 3,567 | 3,751 | 4,085 | 4,321 |
| Agricultural sciences | 726 | 626 | 632 | 610 | 651 | 687 | 620 | 573 | 506 | 616 | 598 |
| Psychology | 2,864 | 2,832 | 2,806 | 2,729 | 2,737 | 2,992 | 3,018 | 2,986 | 3,159 | 3,137 | 3,169 |
| Social sciences | 2,342 | 2,347 | 2,215 | 2,201 | 2,173 | 2,258 | 2,390 | 2,401 | 2,524 | 2,691 | 2,716 |
| Non-science and -engineering, total | 10,629 | 10,503 | 10,507 | 10,414 | 10,435 | 11,240 | 11,509 | 12,016 | 12,105 | 12,693 | 12,949 |
| Health | 585 | 603 | 646 | 692 | 756 | 756 | 839 | 855 | 939 | 1,050 | 1,045 |
| Humanities [1] | 1,999 | 2,665 | 2,672 | 2,759 | 2,716 | 3,082 | 3,194 | 3,440 | 3,512 | 3,765 | 4,053 |
| Education | 5,906 | 5,802 | 5,665 | 5,477 | 5,410 | 5,788 | 5,781 | 5,985 | 5,940 | 6,050 | 5,895 |
| Professional/other | 2,139 | 1,433 | 1,524 | 1,486 | 1,553 | 1,614 | 1,695 | 1,736 | 1,714 | 1,828 | 1,956 |
| Grand total, all fields | 24,694 | 24,519 | 24,562 | 24,913 | 25,026 | 26,603 | 27,418 | 27,956 | 28,675 | 30,877 | 31,910 |
| White | | | | | | | | | | | |
| Science and engineering, total | 12,169 | 12,151 | 12,052 | 12,456 | 12,501 | 13,170 | 13,323 | 13,326 | 13,735 | 13,890 | 13,879 |
| Engineering, total | 1,188 | 1,354 | 1,458 | 1,655 | 1,726 | 1,840 | 1,837 | 1,880 | 2,025 | 2,020 | 2,086 |
| Chemical | 211 | 227 | 266 | 317 | 345 | 318 | 322 | 284 | 295 | 259 | 256 |
| Civil | 130 | 152 | 158 | 183 | 191 | 196 | 159 | 166 | 168 | 199 | 194 |
| Electrical | 259 | 319 | 283 | 363 | 405 | 450 | 478 | 487 | 553 | 548 | 588 |
| Mechanical | 176 | 210 | 230 | 253 | 241 | 286 | 266 | 326 | 328 | 337 | 334 |
| Other engineering | 412 | 446 | 521 | 539 | 544 | 590 | 612 | 617 | 681 | 677 | 714 |
| Sciences, total | 10,981 | 10,797 | 10,594 | 10,801 | 10,775 | 11,330 | 11,486 | 11,446 | 11,710 | 11,870 | 11,793 |
| Physical sciences, total | 1,906 | 1,875 | 1,956 | 1,948 | 1,828 | 2,008 | 1,968 | 1,973 | 1,911 | 2,025 | 1,921 |
| Astronomy | 77 | 79 | 69 | 93 | 74 | 86 | 83 | 95 | 100 | 97 | 111 |
| Chemistry | 1,243 | 1,209 | 1,267 | 1,258 | 1,188 | 1,284 | 1,239 | 1,219 | 1,145 | 1,179 | 1,110 |
| Physics | 580 | 571 | 606 | 577 | 555 | 618 | 633 | 641 | 656 | 736 | 686 |
| Other physical sciences | 6 | 16 | 14 | 20 | 11 | 20 | 13 | 18 | 10 | 13 | 14 |
| Earth, atmospheric, and ocean sciences | 425 | 397 | 394 | 480 | 498 | 494 | 557 | 485 | 455 | 504 | 464 |
| Mathematics | 350 | 343 | 319 | 332 | 369 | 372 | 419 | 425 | 476 | 479 | 535 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-39. Science and engineering doctorates, by field and race/ethnicity: 1985-1995**



| Field and race/ethnicity | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Computer sciences | 177 | 194 | 229 | 265 | 319 | 339 | 355 | 378 | 410 | 401 | 453 |
| Biological sciences | 2,913 | 2,888 | 2,759 | 2,966 | 2,904 | 2,975 | 3,041 | 3,068 | 3,146 | 3,108 | 3,116 |
| Agricultural sciences | 659 | 557 | 554 | 518 | 570 | 601 | 545 | 493 | 438 | 487 | 473 |
| Psychology | 2,591 | 2,548 | 2,516 | 2,445 | 2,453 | 2,648 | 2,652 | 2,636 | 2,805 | 2,731 | 2,715 |
| Social sciences | 1,960 | 1,995 | 1,867 | 1,847 | 1,834 | 1,893 | 1,949 | 1,988 | 2,069 | 2,135 | 2,116 |
| Non-science and -engineering, total | 9,137 | 9,085 | 9,070 | 9,005 | 9,069 | 9,709 | 9,856 | 10,273 | 10,292 | 10,695 | 10,729 |
| Health | 502 | 524 | 553 | 606 | 684 | 662 | 720 | 735 | 800 | 867 | 835 |
| Humanities [1] | 1,772 | 2,401 | 2,363 | 2,471 | 2,399 | 2,766 | 2,821 | 3,061 | 3,109 | 3,282 | 3,520 |
| Education | 4,994 | 4,923 | 4,820 | 4,668 | 4,634 | 4,901 | 4,883 | 5,025 | 4,942 | 5,035 | 4,779 |
| Professional/other | 1,869 | 1,237 | 1,334 | 1,260 | 1,352 | 1,380 | 1,432 | 1,452 | 1,441 | 1,511 | 1,595 |
| Grand total, all fields | 21,306 | 21,236 | 21,122 | 21,461 | 21,570 | 22,879 | 23,179 | 23,599 | 24,027 | 24,585 | 24,608 |
| Asian | | | | | | | | | | | |
| Science and engineering, total | 809 | 816 | 925 | 916 | 986 | 1,009 | 1,180 | 1,344 | 1,610 | 2,989 | 3,666 |
| Engineering, total | 281 | 262 | 327 | 332 | 361 | 359 | 405 | 451 | 527 | 867 | 1,031 |
| Chemical | 60 | 58 | 60 | 67 | 77 | 51 | 50 | 54 | 62 | 96 | 101 |
| Civil | 26 | 26 | 34 | 27 | 36 | 28 | 30 | 34 | 41 | 69 | 91 |
| Electrical | 63 | 71 | 78 | 103 | 93 | 115 | 140 | 175 | 199 | 304 | 322 |
| Mechanical | 58 | 31 | 61 | 57 | 66 | 69 | 62 | 78 | 93 | 179 | 189 |
| Other engineering | 74 | 76 | 94 | 78 | 89 | 96 | 123 | 110 | 132 | 219 | 328 |
| Sciences, total | 528 | 554 | 598 | 584 | 625 | 650 | 775 | 893 | 1,083 | 2,122 | 2,635 |
| Physical sciences, total | 152 | 147 | 143 | 138 | 156 | 164 | 172 | 226 | 265 | 600 | 751 |
| Astronomy | 2 | 6 | 1 | 5 | 2 | 5 | 0 | 4 | 4 | 10 | 22 |
| Chemistry | 112 | 110 | 108 | 85 | 96 | 99 | 122 | 134 | 157 | 332 | 416 |
| Physics | 36 | 31 | 34 | 47 | 57 | 58 | 50 | 88 | 103 | 255 | 312 |
| Other physical sciences | 2 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 3 | 1 |
| Earth, atmospheric, and ocean sciences | 19 | 14 | 18 | 14 | 23 | 15 | 17 | 27 | 22 | 89 | 104 |
| Mathematics | 33 | 28 | 41 | 33 | 24 | 27 | 57 | 52 | 79 | 142 | 208 |
| Computer sciences | 17 | 37 | 26 | 44 | 52 | 48 | 66 | 86 | 77 | 117 | 138 |
| Biological sciences | 151 | 168 | 170 | 171 | 201 | 200 | 261 | 269 | 370 | 720 | 924 |
| Agricultural sciences | 24 | 22 | 38 | 30 | 23 | 32 | 24 | 37 | 29 | 72 | 78 |
| Psychology | 44 | 42 | 48 | 47 | 55 | 53 | 59 | 59 | 73 | 109 | 121 |
| Social sciences | 88 | 96 | 114 | 107 | 91 | 111 | 119 | 137 | 168 | 273 | 311 |
| Non-science and -engineering, total | 261 | 245 | 243 | 319 | 282 | 297 | 351 | 417 | 402 | 556 | 634 |
| Health | 35 | 30 | 35 | 30 | 22 | 39 | 44 | 52 | 45 | 94 | 94 |
| Humanities [1] | 35 | 42 | 53 | 64 | 79 | 62 | 81 | 99 | 108 | 151 | 193 |
| Education | 98 | 95 | 95 | 130 | 102 | 104 | 130 | 142 | 141 | 172 | 174 |
| Professional/other | 93 | 78 | 60 | 95 | 79 | 92 | 96 | 124 | 108 | 139 | 173 |
| Grand total, all fields | 1,070 | 1,061 | 1,168 | 1,235 | 1,268 | 1,306 | 1,531 | 1,761 | 2,012 | 3,545 | 4,300 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-39. Science and engineering doctorates, by field and race/ethnicity: 1985-1995**



| Field and race/ethnicity | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Black | | | | | | | | | | | |
| Science and engineering, total | 374 | 339 | 319 | 361 | 366 | 373 | 459 | 407 | 468 | 496 | 557 |
| Engineering, total | 34 | 24 | 25 | 31 | 33 | 40 | 55 | 49 | 50 | 54 | 71 |
| Chemical | 6 | 4 | 4 | 7 | 5 | 10 | 8 | 13 | 6 | 8 | 3 |
| Civil | 4 | 4 | 4 | 1 | 5 | 1 | 12 | 3 | 5 | 8 | 11 |
| Electrical | 8 | 4 | 3 | 7 | 9 | 8 | 16 | 17 | 15 | 17 | 24 |
| Mechanical | 3 | 3 | 3 | 1 | 5 | 5 | 3 | 5 | 3 | 7 | 14 |
| Other engineering | 13 | 9 | 11 | 15 | 9 | 16 | 16 | 11 | 21 | 14 | 19 |
| Sciences, total | 340 | 315 | 294 | 330 | 333 | 333 | 404 | 358 | 418 | 442 | 486 |
| Physical sciences, total | 27 | 27 | 20 | 34 | 31 | 30 | 31 | 25 | 41 | 46 | 43 |
| Astronomy | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 1 |
| Chemistry | 23 | 18 | 13 | 22 | 26 | 24 | 22 | 17 | 31 | 34 | 33 |
| Physics | 4 | 8 | 5 | 12 | 5 | 5 | 9 | 6 | 7 | 11 | 9 |
| Other physical sciences | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| Earth, atmospheric, and ocean sciences | 4 | 0 | 2 | 3 | 4 | 3 | 3 | 6 | 4 | 6 | 3 |
| Mathematics | 7 | 6 | 11 | 4 | 8 | 4 | 11 | 4 | 8 | 11 | 5 |
| Computer sciences | 3 | 1 | 2 | 2 | 1 | 1 | 8 | 5 | 6 | 10 | 11 |
| Biological sciences | 53 | 48 | 60 | 48 | 56 | 50 | 60 | 61 | 74 | 75 | 105 |
| Agricultural sciences | 16 | 16 | 13 | 20 | 14 | 15 | 17 | 14 | 16 | 22 | 17 |
| Psychology | 105 | 111 | 93 | 105 | 97 | 115 | 130 | 106 | 119 | 124 | 150 |
| Social sciences | 125 | 106 | 93 | 114 | 122 | 115 | 144 | 137 | 150 | 148 | 152 |
| Non-science and -engineering, total | 669 | 617 | 591 | 609 | 596 | 676 | 701 | 706 | 809 | 778 | 898 |
| Health | 23 | 21 | 31 | 32 | 29 | 32 | 40 | 38 | 59 | 46 | 60 |
| Humanities [1] | 52 | 67 | 73 | 76 | 71 | 72 | 92 | 90 | 98 | 107 | 114 |
| Education | 505 | 464 | 417 | 417 | 432 | 496 | 471 | 499 | 555 | 519 | 610 |
| Professional/other | 89 | 65 | 70 | 84 | 64 | 76 | 98 | 79 | 97 | 106 | 114 |
| Grand total, all fields | 1,043 | 956 | 910 | 970 | 962 | 1,049 | 1,160 | 1,113 | 1,277 | 1,274 | 1,455 |
| Hispanic | | | | | | | | | | | |
| Science and engineering, total | 296 | 345 | 357 | 397 | 382 | 468 | 492 | 513 | 542 | 548 | 568 |
| Engineering, total | 22 | 35 | 34 | 63 | 47 | 54 | 60 | 71 | 66 | 66 | 77 |
| Chemical | 2 | 4 | 11 | 5 | 9 | 8 | 11 | 16 | 10 | 7 | 13 |
| Civil | 7 | 7 | 1 | 13 | 8 | 9 | 5 | 7 | 12 | 14 | 11 |
| Electrical | 4 | 9 | 6 | 14 | 14 | 13 | 15 | 17 | 17 | 21 | 15 |
| Mechanical | 3 | 6 | 5 | 7 | 3 | 5 | 9 | 11 | 5 | 8 | 8 |
| Other engineering | 6 | 9 | 11 | 24 | 13 | 19 | 20 | 20 | 22 | 16 | 30 |
| Sciences, total | 274 | 310 | 323 | 334 | 335 | 414 | 432 | 442 | 476 | 482 | 491 |
| Physical sciences, total | 30 | 41 | 56 | 63 | 59 | 72 | 65 | 72 | 79 | 90 | 73 |
| Astronomy | 0 | 2 | 0 | 2 | 2 | 2 | 1 | 4 | 2 | 2 | 4 |
| Chemistry | 17 | 25 | 44 | 48 | 43 | 57 | 46 | 42 | 51 | 59 | 43 |
| Physics | 13 | 13 | 12 | 13 | 14 | 13 | 18 | 26 | 26 | 29 | 26 |
| Other physical sciences | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

See explanatory information and SOURCES at end of table.

**Appendix table 4-39. Science and engineering doctorates, by field and race/ethnicity: 1985-1995**



| Field and race/ethnicity | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Earth, atmospheric, and ocean sciences | 6 | 4 | 5 | 7 | 9 | 13 | 16 | 16 | 13 | 8 | 12 |
| Mathematics | 12 | 12 | 11 | 4 | 11 | 10 | 9 | 12 | 16 | 13 | 15 |
| Computer sciences | 6 | 7 | 4 | 2 | 4 | 5 | 12 | 8 | 7 | 7 | 6 |
| Biological sciences | 59 | 66 | 62 | 76 | 71 | 89 | 95 | 102 | 114 | 131 | 126 |
| Agricultural sciences | 12 | 17 | 15 | 21 | 18 | 23 | 15 | 18 | 20 | 25 | 21 |
| Psychology | 69 | 90 | 95 | 93 | 93 | 109 | 122 | 133 | 131 | 133 | 145 |
| Social sciences | 80 | 73 | 75 | 68 | 70 | 93 | 98 | 81 | 96 | 75 | 93 |
| Non-science and -engineering, total | 338 | 334 | 351 | 296 | 312 | 369 | 375 | 396 | 431 | 481 | 487 |
| Health | 14 | 12 | 11 | 13 | 11 | 17 | 16 | 13 | 24 | 25 | 30 |
| Humanities [1] | 91 | 91 | 114 | 102 | 100 | 127 | 136 | 129 | 145 | 167 | 153 |
| Education | 190 | 204 | 201 | 158 | 171 | 190 | 189 | 214 | 222 | 241 | 255 |
| Professional/other | 43 | 27 | 25 | 23 | 30 | 35 | 34 | 40 | 40 | 48 | 49 |
| Grand total, all fields | 634 | 679 | 708 | 693 | 694 | 837 | 867 | 909 | 973 | 1,029 | 1,055 |
| American Indian | | | | | | | | | | | |
| Science and engineering, total | 41 | 52 | 53 | 44 | 53 | 43 | 56 | 69 | 43 | 64 | 69 |
| Engineering, total | 1 | 6 | 7 | 4 | 7 | 4 | 6 | 11 | 2 | 6 | 10 |
| Chemical | 0 | 0 | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 2 |
| Civil | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 |
| Electrical | 1 | 2 | 3 | 0 | 0 | 0 | 2 | 4 | 0 | 1 | 2 |
| Mechanical | 0 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| Other engineering | 0 | 2 | 1 | 0 | 5 | 2 | 1 | 4 | 1 | 4 | 4 |
| Sciences, total | 40 | 46 | 46 | 40 | 46 | 39 | 50 | 58 | 41 | 58 | 59 |
| Physical sciences, total | 3 | 5 | 7 | 6 | 10 | 3 | 10 | 12 | 5 | 6 | 9 |
| Astronomy | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| Chemistry | 2 | 5 | 6 | 5 | 5 | 3 | 9 | 6 | 2 | 4 | 7 |
| Physics | 1 | 0 | 1 | 1 | 3 | 0 | 1 | 6 | 2 | 2 | 2 |
| Other physical sciences | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Earth, atmospheric, and ocean sciences | 1 | 2 | 0 | 2 | 6 | 1 | 3 | 1 | 4 | 1 | 0 |
| Mathematics | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 1 | 2 | 2 |
| Computer sciences | 0 | 0 | 3 | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 0 |
| Biological sciences | 13 | 17 | 11 | 6 | 7 | 4 | 10 | 13 | 7 | 16 | 15 |
| Agricultural sciences | 4 | 0 | 2 | 6 | 2 | 4 | 4 | 0 | 1 | 1 | 2 |
| Psychology | 10 | 9 | 16 | 7 | 11 | 19 | 13 | 15 | 15 | 12 | 14 |
| Social sciences | 9 | 12 | 7 | 10 | 8 | 7 | 9 | 13 | 7 | 19 | 17 |
| Non-science and -engineering, total | 55 | 47 | 62 | 50 | 41 | 54 | 76 | 80 | 77 | 78 | 79 |
| Health | 2 | 6 | 3 | 5 | 3 | 1 | 5 | 5 | 6 | 6 | 9 |
| Humanities [1] | 6 | 6 | 10 | 4 | 7 | 6 | 10 | 18 | 10 | 20 | 18 |
| Education | 40 | 26 | 41 | 36 | 25 | 37 | 56 | 50 | 51 | 36 | 40 |
| Professional/other | 7 | 9 | 8 | 5 | 6 | 10 | 5 | 7 | 10 | 16 | 12 |
| Grand total, all fields | 96 | 99 | 115 | 94 | 94 | 97 | 132 | 149 | 120 | 142 | 148 |

[1] Categories differ from those published by other Federal sponsors and the National Research Council in that linguistics, history of science, American studies, and archaeology are included not in humanities but in social science.

NOTE: Details may not add to totals because of persons with unknown race/ethnicity.

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

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-40. Total doctorates awarded to U.S. citizens and permanent residents, by major field, sex and race/ethnicity: 1985-1995**



| Sex, race/ethnicity, and field | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| All sexes, all races | | | | | | | | | | | |
| Science and engineering, total | 14,065 | 14,016 | 14,055 | 14,499 | 14,591 | 15,363 | 15,909 | 15,940 | 16,570 | 18,184 | 18,961 |
| Engineering, total | 1,594 | 1,726 | 1,913 | 2,146 | 2,229 | 2,346 | 2,474 | 2,520 | 2,697 | 3,053 | 3,336 |
| Sciences, total | 12,471 | 12,290 | 12,142 | 12,353 | 12,362 | 13,017 | 13,435 | 13,420 | 13,873 | 15,131 | 15,625 |
| Non-science and -engineering, total | 10,629 | 10,503 | 10,507 | 10,414 | 10,435 | 11,240 | 11,509 | 12,016 | 12,105 | 12,693 | 12,949 |
| Grand total, all fields | 24,694 | 24,519 | 24,562 | 24,913 | 25,026 | 26,603 | 27,418 | 27,956 | 28,675 | 30,877 | 31,910 |
| Men, all races | | | | | | | | | | | |
| Science and engineering, total | 9,881 | 9,649 | 9,631 | 9,888 | 9,670 | 10,182 | 10,313 | 10,363 | 10,546 | 11,691 | 12,069 |
| Engineering, total | 1,458 | 1,564 | 1,739 | 1,950 | 1,954 | 2,070 | 2,158 | 2,192 | 2,349 | 2,605 | 2,818 |
| Sciences, total | 8,423 | 8,085 | 7,892 | 7,938 | 7,716 | 8,112 | 8,155 | 8,171 | 8,197 | 9,086 | 9,251 |
| Non-science and -engineering, total | 5,341 | 5,057 | 5,060 | 5,001 | 4,864 | 5,174 | 5,290 | 5,430 | 5,418 | 5,677 | 5,746 |
| Grand total, all fields | 15,222 | 14,706 | 14,691 | 14,889 | 14,534 | 15,356 | 15,603 | 15,793 | 15,964 | 17,368 | 17,815 |
| Men, American Indian | | | | | | | | | | | |
| Science and engineering, total | 21 | 33 | 32 | 29 | 33 | 25 | 37 | 42 | 25 | 40 | 44 |
| Engineering, total | 1 | 5 | 7 | 4 | 5 | 4 | 4 | 8 | 2 | 4 | 10 |
| Sciences, total | 20 | 28 | 25 | 25 | 28 | 21 | 33 | 34 | 23 | 36 | 34 |
| Non-science and -engineering, total | 19 | 25 | 30 | 23 | 16 | 27 | 37 | 40 | 35 | 31 | 37 |
| Grand total, all fields | 40 | 58 | 62 | 52 | 49 | 52 | 74 | 82 | 60 | 71 | 81 |
| Men, Asian | | | | | | | | | | | |
| Science and engineering, total | 620 | 621 | 694 | 694 | 745 | 757 | 806 | 926 | 1,079 | 2,169 | 2,557 |
| Engineering, total | 260 | 247 | 305 | 314 | 327 | 326 | 356 | 390 | 466 | 748 | 863 |
| Sciences, total | 360 | 374 | 389 | 380 | 418 | 431 | 450 | 536 | 613 | 1,421 | 1,694 |
| Non-science and -engineering, total | 146 | 145 | 130 | 176 | 160 | 152 | 166 | 208 | 203 | 300 | 311 |
| Grand total, all fields | 766 | 766 | 824 | 870 | 905 | 909 | 972 | 1,134 | 1,282 | 2,469 | 2,868 |
| Men, black | | | | | | | | | | | |
| Science and engineering, total | 236 | 187 | 189 | 224 | 213 | 225 | 266 | 237 | 260 | 282 | 289 |
| Engineering, total | 30 | 20 | 24 | 27 | 30 | 34 | 47 | 43 | 39 | 41 | 56 |
| Sciences, total | 206 | 167 | 165 | 197 | 183 | 191 | 219 | 194 | 221 | 241 | 233 |
| Non-science and -engineering, total | 260 | 244 | 247 | 219 | 239 | 254 | 282 | 280 | 317 | 270 | 319 |
| Grand total, all fields | 496 | 431 | 436 | 443 | 452 | 479 | 548 | 517 | 577 | 552 | 608 |
| Men, Hispanic | | | | | | | | | | | |
| Science and engineering, total | 182 | 227 | 216 | 248 | 227 | 290 | 306 | 308 | 320 | 318 | 336 |
| Engineering, total | 22 | 32 | 29 | 57 | 39 | 45 | 50 | 56 | 54 | 60 | 66 |
| Sciences, total | 160 | 195 | 187 | 191 | 188 | 245 | 256 | 252 | 266 | 258 | 270 |
| Non-science and -engineering, total | 168 | 146 | 166 | 137 | 149 | 159 | 152 | 174 | 197 | 199 | 200 |
| Grand total, all fields | 350 | 373 | 382 | 385 | 376 | 449 | 458 | 482 | 517 | 517 | 536 |
| Men, white | | | | | | | | | | | |
| Science and engineering, total | 8,525 | 8,333 | 8,222 | 8,428 | 8,213 | 8,648 | 8,584 | 8,623 | 8,723 | 8,731 | 8,670 |
| Engineering, total | 1,082 | 1,218 | 1,314 | 1,492 | 1,502 | 1,614 | 1,602 | 1,640 | 1,764 | 1,715 | 1,766 |
| Sciences, total | 7,443 | 7,115 | 6,908 | 6,936 | 6,711 | 7,034 | 6,982 | 6,983 | 6,959 | 7,016 | 6,904 |
| Non-science and -engineering, total | 4,656 | 4,391 | 4,388 | 4,368 | 4,215 | 4,513 | 4,564 | 4,642 | 4,608 | 4,825 | 4,815 |
| Grand total, all fields | 13,181 | 12,724 | 12,610 | 12,796 | 12,428 | 13,161 | 13,148 | 13,265 | 13,331 | 13,556 | 13,485 |

See explanatory information, if any, and SOURCE at end of table.

**Appendix table 4-40. Total doctorates awarded to U.S. citizens and permanent residents, by major field, sex and race/ethnicity: 1985-1995**



| Sex, race/ethnicity, and field | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Women, all races | | | | | | | | | | | |
| Science and engineering, total | 4,184 | 4,367 | 4,424 | 4,611 | 4,921 | 5,181 | 5,596 | 5,577 | 6,024 | 6,493 | 6,892 |
| Engineering, total | 136 | 162 | 174 | 196 | 275 | 276 | 316 | 328 | 348 | 448 | 518 |
| Sciences, total | 4,048 | 4,205 | 4,250 | 4,415 | 4,646 | 4,905 | 5,280 | 5,249 | 5,676 | 6,045 | 6,374 |
| Non-science and -engineering, total | 5,288 | 5,446 | 5,447 | 5,413 | 5,571 | 6,066 | 6,219 | 6,586 | 6,687 | 7,016 | 7,203 |
| Grand total, all fields | 9,472 | 9,813 | 9,871 | 10,024 | 10,492 | 11,247 | 11,815 | 12,163 | 12,711 | 13,509 | 14,095 |
| Women, American Indian | | | | | | | | | | | |
| Science and engineering, total | 20 | 19 | 21 | 15 | 20 | 18 | 19 | 27 | 18 | 24 | 25 |
| Engineering, total | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 0 | 2 | 0 |
| Sciences, total | 20 | 18 | 21 | 15 | 18 | 18 | 17 | 24 | 18 | 22 | 25 |
| Non-science and -engineering, total | 36 | 22 | 32 | 27 | 25 | 27 | 39 | 40 | 42 | 47 | 42 |
| Grand total, all fields | 56 | 41 | 53 | 42 | 45 | 45 | 58 | 67 | 60 | 71 | 67 |
| Women, Asian | | | | | | | | | | | |
| Science and engineering, total | 189 | 195 | 231 | 222 | 241 | 252 | 374 | 418 | 531 | 820 | 1,109 |
| Engineering, total | 21 | 15 | 22 | 18 | 34 | 33 | 49 | 61 | 61 | 119 | 168 |
| Sciences, total | 168 | 180 | 209 | 204 | 207 | 219 | 325 | 357 | 470 | 701 | 941 |
| Non-science and -engineering, total | 115 | 100 | 113 | 143 | 122 | 145 | 185 | 209 | 199 | 256 | 323 |
| Grand total, all fields | 304 | 295 | 344 | 365 | 363 | 397 | 559 | 627 | 730 | 1,076 | 1,432 |
| Women, black | | | | | | | | | | | |
| Science and engineering, total | 138 | 152 | 130 | 137 | 153 | 148 | 193 | 170 | 208 | 214 | 268 |
| Engineering, total | 4 | 4 | 1 | 4 | 3 | 6 | 8 | 6 | 11 | 13 | 15 |
| Sciences, total | 134 | 148 | 129 | 133 | 150 | 142 | 185 | 164 | 197 | 201 | 253 |
| Non-science and -engineering, total | 409 | 373 | 344 | 390 | 357 | 422 | 419 | 426 | 492 | 508 | 579 |
| Grand total, all fields | 547 | 525 | 474 | 527 | 510 | 570 | 612 | 596 | 700 | 722 | 847 |
| Women, Hispanic | | | | | | | | | | | |
| Science and engineering, total | 114 | 118 | 141 | 149 | 155 | 178 | 186 | 205 | 222 | 230 | 232 |
| Engineering, total | 0 | 3 | 5 | 6 | 8 | 9 | 10 | 15 | 12 | 6 | 11 |
| Sciences, total | 114 | 115 | 136 | 143 | 147 | 169 | 176 | 190 | 210 | 224 | 221 |
| Non-science and -engineering, total | 170 | 188 | 185 | 159 | 163 | 210 | 223 | 222 | 234 | 282 | 287 |
| Grand total, all fields | 284 | 306 | 326 | 308 | 318 | 388 | 409 | 427 | 456 | 512 | 519 |
| Women, white | | | | | | | | | | | |
| Science and engineering, total | 3,644 | 3,818 | 3,830 | 4,028 | 4,288 | 4,522 | 4,739 | 4,703 | 5,012 | 5,159 | 5,209 |
| Engineering, total | 106 | 136 | 144 | 163 | 224 | 226 | 235 | 240 | 261 | 305 | 320 |
| Sciences, total | 3,538 | 3,682 | 3,686 | 3,865 | 4,064 | 4,296 | 4,504 | 4,463 | 4,751 | 4,854 | 4,889 |
| Non-science and -engineering, total | 4,481 | 4,694 | 4,682 | 4,637 | 4,854 | 5,196 | 5,292 | 5,631 | 5,684 | 5,870 | 5,914 |
| Grand total, all fields | 8,125 | 8,512 | 8,512 | 8,665 | 9,142 | 9,718 | 10,031 | 10,334 | 10,696 | 11,029 | 11,123 |

NOTE: Details may not add to totals because of persons whose race/ethnicity is unknown.

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

**Appendix table 4-41. Doctorates in science and engineering awarded to U.S. citizens and permanent residents, by field, primary mechanism of support, and race/ethnicity: 1995**



| Field and primary mechanism of support | Total | White | Asian | Black | Hispanic | American Indian | Unknown race |
|---|---|---|---|---|---|---|---|
| Total, science and engineering | | | | | | | |
| All mechanisms | 18,961 | 13,879 | 3,666 | 557 | 568 | 69 | 222 |
| Fellowship/traineeship | 2,038 | 1,499 | 278 | 131 | 96 | 12 | 22 |
| Research assistantship | 5,460 | 3,703 | 1,518 | 59 | 106 | 16 | 58 |
| Teaching assistantship | 2,596 | 1,900 | 576 | 40 | 54 | 8 | 18 |
| Other sources, unknown | 8,867 | 6,777 | 1,294 | 327 | 312 | 33 | 124 |
| Physical sciences | | | | | | | |
| All mechanisms | 2,840 | 1,921 | 751 | 43 | 73 | 9 | 43 |
| Fellowship/traineeship | 189 | 144 | 18 | 11 | 12 | 2 | 2 |
| Research assistantship | 1,268 | 858 | 355 | 4 | 25 | 6 | 20 |
| Teaching assistantship | 478 | 312 | 141 | 5 | 17 | 0 | 3 |
| Other sources, unknown | 905 | 607 | 237 | 23 | 19 | 1 | 18 |
| Earth, atmospheric, and ocean sciences | | | | | | | |
| All mechanisms | 593 | 464 | 104 | 3 | 12 | 0 | 10 |
| Fellowship/traineeship | 33 | 27 | 4 | 0 | 2 | 0 | 0 |
| Research assistantship | 249 | 178 | 64 | 0 | 4 | 0 | 3 |
| Teaching assistantship | 62 | 54 | 8 | 0 | 0 | 0 | 0 |
| Other sources, unknown | 249 | 205 | 28 | 3 | 6 | 0 | 7 |
| Mathematical and computer sciences | | | | | | | |
| All mechanisms | 1,388 | 988 | 346 | 16 | 21 | 2 | 15 |
| Fellowship/traineeship | 93 | 76 | 6 | 4 | 4 | 1 | 2 |
| Research assistantship | 261 | 182 | 73 | 0 | 3 | 0 | 3 |
| Teaching assistantship | 463 | 307 | 145 | 4 | 4 | 0 | 3 |
| Other sources, unknown | 571 | 423 | 122 | 8 | 10 | 1 | 7 |
| Agricultural sciences | | | | | | | |
| All mechanisms | 598 | 473 | 78 | 17 | 21 | 2 | 7 |
| Fellowship/traineeship | 34 | 25 | 2 | 5 | 2 | 0 | 0 |
| Research assistantship | 274 | 209 | 53 | 3 | 5 | 1 | 3 |
| Teaching assistantship | 26 | 23 | 1 | 0 | 2 | 0 | 0 |
| Other sources, unknown | 264 | 216 | 22 | 9 | 12 | 1 | 4 |
| Biological sciences | | | | | | | |
| All mechanisms | 4,321 | 3,116 | 924 | 105 | 126 | 15 | 35 |
| Fellowship/traineeship | 896 | 663 | 172 | 26 | 28 | 1 | 6 |
| Research assistantship | 1,342 | 883 | 382 | 25 | 39 | 6 | 7 |
| Teaching assistantship | 448 | 341 | 86 | 9 | 10 | 0 | 2 |
| Other sources, unknown | 1,635 | 1,229 | 284 | 45 | 49 | 8 | 20 |
| Psychology | | | | | | | |
| All mechanisms | 3,169 | 2,715 | 121 | 150 | 145 | 14 | 24 |
| Fellowship/traineeship | 205 | 137 | 6 | 33 | 24 | 4 | 1 |
| Research assistantship | 365 | 327 | 17 | 12 | 7 | 0 | 2 |
| Teaching assistantship | 337 | 301 | 20 | 8 | 4 | 3 | 1 |
| Other sources, unknown | 2,262 | 1,950 | 78 | 97 | 110 | 7 | 20 |
| Social sciences | | | | | | | |
| All mechanisms | 2,716 | 2,116 | 311 | 152 | 93 | 17 | 27 |
| Fellowship/traineeship | 339 | 249 | 36 | 30 | 15 | 4 | 5 |
| Research assistantship | 286 | 235 | 41 | 3 | 6 | 0 | 1 |
| Teaching assistantship | 552 | 431 | 86 | 12 | 13 | 5 | 5 |
| Other sources, unknown | 1,539 | 1,201 | 148 | 107 | 59 | 8 | 16 |
| Engineering | | | | | | | |
| All mechanisms | 3,336 | 2,086 | 1,031 | 71 | 77 | 10 | 61 |
| Fellowship/traineeship | 249 | 178 | 34 | 22 | 9 | 0 | 6 |
| Research assistantship | 1,415 | 831 | 533 | 12 | 17 | 3 | 19 |
| Teaching assistantship | 230 | 131 | 89 | 2 | 4 | 0 | 4 |
| Other sources, unknown | 1,442 | 946 | 375 | 35 | 47 | 7 | 32 |

See explanatory notes and SOURCES at end of table.

**Appendix table 4-41. Doctorates in science and engineering awarded to U.S. citizens and permanent residents, by field, primary mechanism of support, and race/ethnicity: 1995**



| Field and primary mechanism of support | Total | White | Asian | Black | Hispanic | American Indian | Unknown race |
|---|---|---|---|---|---|---|---|
| Percentage distribution: | | | | | | | |
| Total, science and engineering | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 10.7 | 10.8 | 7.6 | 23.5 | 16.9 | 17.4 | 9.9 |
| Research assistantship | 28.8 | 26.7 | 41.4 | 10.6 | 18.7 | 23.2 | 26.1 |
| Teaching assistantship | 13.7 | 13.7 | 15.7 | 7.2 | 9.5 | 11.6 | 8.1 |
| Other sources, unknown | 46.8 | 48.8 | 35.3 | 58.7 | 54.9 | 47.8 | 55.9 |
| Physical sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 6.7 | 7.5 | 2.4 | 25.6 | 16.4 | 22.2 | 4.7 |
| Research assistantship | 44.6 | 44.7 | 47.3 | 9.3 | 34.2 | 66.7 | 46.5 |
| Teaching assistantship | 16.8 | 16.2 | 18.8 | 11.6 | 23.3 | 0.0 | 7.0 |
| Other sources, unknown | 31.9 | 31.6 | 31.6 | 53.5 | 26.0 | 11.1 | 41.9 |
| Earth, atmospheric, and ocean sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 0.0 | 100.0 |
| Fellowship/traineeship | 5.6 | 5.8 | 3.8 | 0.0 | 16.7 | 0.0 | 0.0 |
| Research assistantship | 42.0 | 38.4 | 61.5 | 0.0 | 33.3 | 0.0 | 30.0 |
| Teaching assistantship | 10.5 | 11.6 | 7.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other sources, unknown | 42.0 | 44.2 | 26.9 | 100.0 | 50.0 | 0.0 | 70.0 |
| Mathematical and computer sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 6.7 | 7.7 | 1.7 | 25.0 | 19.0 | 50.0 | 13.3 |
| Research assistantship | 18.8 | 18.4 | 21.1 | 0.0 | 14.3 | 0.0 | 20.0 |
| Teaching assistantship | 33.4 | 31.1 | 41.9 | 25.0 | 19.0 | 0.0 | 20.0 |
| Other sources, unknown | 41.1 | 42.8 | 35.3 | 50.0 | 47.6 | 50.0 | 46.7 |
| Agricultural sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 5.7 | 5.3 | 2.6 | 29.4 | 9.5 | 0.0 | 0.0 |
| Research assistantship | 45.8 | 44.2 | 67.9 | 17.6 | 23.8 | 50.0 | 42.9 |
| Teaching assistantship | 4.3 | 4.9 | 1.3 | 0.0 | 9.5 | 0.0 | 0.0 |
| Other sources, unknown | 44.1 | 45.7 | 28.2 | 52.9 | 57.1 | 50.0 | 57.1 |
| Biological sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 20.7 | 21.3 | 18.6 | 24.8 | 22.2 | 6.7 | 17.1 |
| Research assistantship | 31.1 | 28.3 | 41.3 | 23.8 | 31.0 | 40.0 | 20.0 |
| Teaching assistantship | 10.4 | 10.9 | 9.3 | 8.6 | 7.9 | 0.0 | 5.7 |
| Other sources, unknown | 37.8 | 39.4 | 30.7 | 42.9 | 38.9 | 53.3 | 57.1 |
| Psychology | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 6.5 | 5.0 | 5.0 | 22.0 | 16.6 | 28.6 | 4.2 |
| Research assistantship | 11.5 | 12.0 | 14.0 | 8.0 | 4.8 | 0.0 | 8.3 |
| Teaching assistantship | 10.6 | 11.1 | 16.5 | 5.3 | 2.8 | 21.4 | 4.2 |
| Other sources, unknown | 71.4 | 71.8 | 64.5 | 64.7 | 75.9 | 50.0 | 83.3 |
| Social sciences | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 12.5 | 11.8 | 11.6 | 19.7 | 16.1 | 23.5 | 18.5 |
| Research assistantship | 10.5 | 11.1 | 13.2 | 2.0 | 6.5 | 0.0 | 3.7 |
| Teaching assistantship | 20.3 | 20.4 | 27.7 | 7.9 | 14.0 | 29.4 | 18.5 |
| Other sources, unknown | 56.7 | 56.8 | 47.6 | 70.4 | 63.4 | 47.1 | 59.3 |
| Engineering | | | | | | | |
| All mechanisms | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Fellowship/traineeship | 7.5 | 8.5 | 3.3 | 31.0 | 11.7 | 0.0 | 9.8 |
| Research assistantship | 42.4 | 39.8 | 51.7 | 16.9 | 22.1 | 30.0 | 31.1 |
| Teaching assistantship | 6.9 | 6.3 | 8.6 | 2.8 | 5.2 | 0.0 | 6.6 |
| Other sources, unknown | 43.2 | 45.3 | 36.4 | 49.3 | 61.0 | 70.0 | 52.5 |

NOTE: Because of rounding, details may not add to totals.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995

**Appendix table 4-42. Recipients of science and engineering doctorates, by disability status: 1989-1995, selected years**



| Disability status | 1989 | 1993 | 1994 | 1995 |
|---|---|---|---|---|
| Total, science and engineering | 21,731 | 25,441 | 26,202 | 26,515 |
| Number reporting disability | 200 | 331 | 373 | 355 |
| Percentage reporting disability | 0.9 | 1.3 | 1.4 | 1.3 |
| Science | 17,188 | 19,743 | 20,380 | 20,508 |
| Number reporting disability | 175 | 286 | 314 | 292 |
| Percentage reporting disability | 1.0 | 1.4 | 1.5 | 1.4 |
| Engineering | 4,543 | 5,698 | 5,822 | 6,007 |
| Number reporting disability | 25 | 45 | 59 | 63 |
| Percentage reporting disability | 0.6 | 0.8 | 1.0 | 1.0 |

NOTE: Because survey forms differed prior to 1989 and in 1990 and 1991, and because some respondents in 1992 filled out the 1991 form, data for those years are not included in the table.

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

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-43. Recipients of science and engineering doctorates, by major field and disability status: 1995**



| Major field | All recipients | | Recipients with disabilities | | Recipients without disabilities | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Total, science and engineering | 26,515 | 100.0 | 355 | 100.0 | 26,160 | 100.0 |
| Total, science | 20,508 | 77.3 | 292 | 82.3 | 20,216 | 77.3 |
| Psychology | 3,419 | 12.9 | 72 | 20.3 | 3,347 | 12.8 |
| Social sciences | 3,877 | 14.6 | 70 | 19.7 | 3,807 | 14.6 |
| Physical sciences[1] | 4,618 | 17.4 | 50 | 14.1 | 4,568 | 17.5 |
| Mathematics and statistics | 1,190 | 4.5 | 10 | 2.8 | 1,180 | 4.5 |
| Computer science | 998 | 3.8 | 13 | 3.7 | 985 | 3.8 |
| Agricultural/biological sciences | 6,406 | 24.2 | 77 | 21.7 | 6,329 | 24.2 |
| Total, engineering | 6,007 | 22.7 | 63 | 17.7 | 5,944 | 22.7 |

[1] Includes earth, atmospheric, and ocean sciences.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-44. Doctorate recipients, by disability status and type of disability: 1989 and 1995**



| Disability status and type | 1989 | 1995 |
|---|---|---|
| Total, all recipients | 21,731 | 26,515 |
| Persons without disabilities | 21,531 | 26,160 |
| Persons with disabilities | 200 | 355 |
| Auditory | 35 | 45 |
| Orthopedic | 46 | 95 |
| Visual | 59 | 97 |
| Vocal | 3 | 5 |
| Other or more than one handicap | 42 | 86 |
| Unspecified handicap | 15 | 27 |

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

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-45. Doctorate recipients in science and engineering, by sex and type of disability: 1995**



| Disability status and type | Total | Men | Women |
|---|---|---|---|
| Total, all recipients | 26,515 | 18,242 | 8,273 |
| Persons without disabilities | 26,160 | 18,008 | 8,152 |
| Persons with disabilities | 355 | 234 | 121 |
| Auditory | 45 | 34 | 11 |
| Orthopedic | 95 | 61 | 34 |
| Visual | 97 | 70 | 27 |
| Vocal | 5 | 3 | 2 |
| Other or more than one handicap | 86 | 48 | 38 |
| Unspecified handicap | 27 | 18 | 9 |

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-46. Years between bachelor's and doctoral degrees for scientists and engineers, by disability status and sex: 1995**



| Years between degrees | Total recipients | | | Recipients with disabilities | | | Recipients without disabilities | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Total | 26,515 | 18,242 | 8,273 | 355 | 234 | 121 | 26,160 | 18,008 | 8,152 |
| 0 to 5 | 2,259 | 1,583 | 676 | 18 | 14 | 4 | 2,241 | 1,569 | 672 |
| 6 to 10 | 12,956 | 8,965 | 3,991 | 149 | 103 | 46 | 12,807 | 8,862 | 3,945 |
| 11 to 15 | 6,454 | 4,620 | 1,834 | 88 | 61 | 27 | 6,366 | 4,559 | 1,807 |
| 16 to 20 | 2,035 | 1,304 | 731 | 40 | 24 | 16 | 1,995 | 1,280 | 715 |
| 21 or more years | 1,533 | 819 | 714 | 54 | 28 | 26 | 1,479 | 791 | 688 |
| Unknown | 1,278 | 951 | 327 | 6 | 4 | 2 | 1,272 | 947 | 325 |
| Percentage distribution: | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| 0 to 5 | 8.5 | 8.7 | 8.2 | 5.1 | 6.0 | 3.3 | 8.6 | 8.7 | 8.2 |
| 6 to 10 | 48.9 | 49.1 | 48.2 | 42.0 | 44.0 | 38.0 | 49.0 | 49.2 | 48.4 |
| 11 to 15 | 24.3 | 25.3 | 22.2 | 24.8 | 26.1 | 22.3 | 24.3 | 25.3 | 22.2 |
| 16 to 20 | 7.7 | 7.1 | 8.8 | 11.3 | 10.3 | 13.2 | 7.6 | 7.1 | 8.8 |
| 21 or more years | 5.8 | 4.5 | 8.6 | 15.2 | 12.0 | 21.5 | 5.7 | 4.4 | 8.4 |
| Unknown | 4.8 | 5.2 | 4.0 | 1.7 | 1.7 | 1.7 | 4.9 | 5.3 | 4.0 |

NOTE: Total includes persons with unknown or unreported disability status.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 4-47. Years between bachelor's and doctoral degrees for scientists and engineers, by citizenship status and race/ethnicity of U.S. citizens and permanent residents: 1995**



| Years | Total | Total non-permanent residents | Total U.S. citizens and permanent residents | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian | Unknown or unreported |
|---|---|---|---|---|---|---|---|---|---|
| Total | 26,515 | 7,554 | 18,961 | 13,879 | 3,666 | 557 | 568 | 69 | 222 |
| 1 to 5 | 2,259 | 482 | 1,777 | 1,500 | 169 | 35 | 44 | 8 | 21 |
| 6 to 10 | 12,956 | 3,690 | 9,266 | 7,052 | 1,552 | 223 | 298 | 36 | 105 |
| 11 to 15 | 6,454 | 1,977 | 4,477 | 2,659 | 1,485 | 148 | 122 | 14 | 49 |
| 16 to 20 | 2,035 | 418 | 1,617 | 1,265 | 192 | 82 | 51 | 6 | 21 |
| More than 20 | 1,533 | 136 | 1,397 | 1,181 | 101 | 56 | 42 | 5 | 12 |
| Unknown | 1,278 | 851 | 427 | 222 | 167 | 13 | 11 | 0 | 14 |
| Percent distribution | | | | | | | | | |
| 1 to 5 | 8.5 | 6.4 | 9.4 | 10.8 | 4.6 | 6.3 | 7.7 | 11.6 | 9.5 |
| 6 to 10 | 48.9 | 48.8 | 48.9 | 50.8 | 42.3 | 40.0 | 52.5 | 52.2 | 47.3 |
| 11 to 15 | 24.3 | 26.2 | 23.6 | 19.2 | 40.5 | 26.6 | 21.5 | 20.3 | 22.1 |
| 16 to 20 | 7.7 | 5.5 | 8.5 | 9.1 | 5.2 | 14.7 | 9.0 | 8.7 | 9.5 |
| More than 20 | 5.8 | 1.8 | 7.4 | 8.5 | 2.8 | 10.1 | 7.4 | 7.2 | 5.4 |
| Unknown | 4.8 | 11.3 | 2.3 | 1.6 | 4.6 | 2.3 | 1.9 | 0.0 | 6.3 |

NOTE: Data for non-resident aliens include doctorate recipients whose citizenship is unknown.

SOURCE: National Science Foundation/SRS. Survey of Earned Doctorates 1995.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

## Appendix table 5-1. Scientists and engineers in the labor force, by occupation, sex, and highest degree: 1995



| Occupation | Total | | Bachelor's | | Master's | | Doctorate | |
|---|---|---|---|---|---|---|---|---|
| | Women | Men | Women | Men | Women | Men | Women | Men |
| Total science and engineering | 728,000 | 2,528,200 | 385,300 | 1,498,000 | 237,600 | 678,100 | 95,800 | 329,900 |
| Computer/mathematical sciences | 279,100 | 687,100 | 189,600 | 445,800 | 79,500 | 194,100 | 9,800 | 44,800 |
| Computer science | 240,900 | 613,900 | 178,500 | 426,700 | 58,500 | 166,000 | 3,600 | 18,900 |
| Mathematical science | 12,700 | 25,800 | 5,400 | 11,200 | 5,700 | 8,600 | 1,600 | 6,100 |
| Postsecondary computer/ mathematics teachers | 25,500 | 47,400 | 5,600 | 7,900 | 15,300 | 19,500 | 4,600 | 19,900 |
| Life sciences | 108,800 | 202,700 | 47,800 | 76,100 | 28,600 | 36,600 | 27,700 | 76,700 |
| Agricultural/food science | 11,600 | 32,600 | 7,600 | 17,300 | 2,500 | 7,100 | 1,500 | 8,200 |
| Biological sciences | 69,900 | 102,900 | 32,500 | 38,800 | 16,100 | 17,500 | 17,800 | 41,700 |
| Environmental science | 2,900 | 17,800 | 2,000 | 12,000 | 800 | 5,100 | 100 | 700 |
| Postsecondary life science teachers | 24,400 | 49,400 | 5,800 | 8,000 | 9,300 | 7,000 | 8,300 | 26,200 |
| Physical sciences | 60,900 | 220,900 | 34,300 | 96,700 | 16,900 | 52,900 | 9,800 | 70,900 |
| Chemistry | 29,700 | 84,200 | 19,600 | 46,700 | 6,100 | 14,800 | 4,000 | 22,600 |
| Earth/geology/oceanography | 13,300 | 59,800 | 6,700 | 30,400 | 5,300 | 20,100 | 1,300 | 9,300 |
| Physics and astronomy | 3,500 | 26,600 | 1,000 | 6,400 | 1,600 | 6,500 | 800 | 13,700 |
| Other physical sciences | 4,700 | 12,600 | 3,100 | 6,200 | 1,300 | 3,900 | 300 | 2,400 |
| Postsecondary physical science teachers | 9,700 | 37,700 | 3,800 | 7,200 | 2,600 | 7,600 | 3,300 | 22,800 |
| Social sciences | 160,600 | 160,900 | 32,000 | 29,600 | 81,300 | 56,700 | 43,000 | 70,900 |
| Economics | 9,600 | 24,500 | 4,100 | 7,200 | 4,000 | 11,600 | 1,500 | 5,600 |
| Political science | 4,000 | 5,000 | 2,100 | 3,000 | 1,600 | 1,100 | 300 | 900 |
| Psychology | 102,700 | 66,300 | 16,800 | 9,100 | 60,300 | 29,600 | 22,800 | 25,600 |
| Sociology/anthropology | 7,700 | 8,600 | 3,300 | 4,500 | 3,200 | 2,300 | 1,300 | 1,800 |
| Other social science | 6,300 | 6,400 | 1,800 | 2,000 | 2,200 | 2,700 | 1,400 | 1,600 |
| Postsecondary social science teachers | 30,200 | 50,100 | 3,800 | 3,800 | 10,100 | 9,400 | 15,700 | 35,300 |
| Engineering | 118,600 | 1,256,600 | 81,700 | 849,800 | 31,400 | 337,800 | 5,500 | 66,600 |
| Aerospace engineering | 4,600 | 70,600 | 2,900 | 41,000 | 1,500 | 25,300 | 200 | 4,200 |
| Chemical engineering | 9,400 | 63,500 | 6,300 | 40,300 | 2,200 | 17,700 | 900 | 5,500 |
| Civil engineering | 18,500 | 184,500 | 14,000 | 131,700 | 4,100 | 48,600 | 300 | 3,600 |
| Electrical engineering | 23,300 | 346,300 | 16,400 | 233,400 | 6,300 | 98,400 | 500 | 13,400 |
| Industrial engineering | 9,600 | 62,300 | 7,100 | 46,800 | 2,400 | 14,700 | 100 | 800 |
| Mechanical engineering | 15,000 | 246,200 | 10,300 | 185,100 | 4,000 | 53,300 | 700 | 7,400 |
| Other engineering | 35,900 | 254,000 | 24,500 | 166,300 | 9,800 | 72,200 | 1,600 | 15,200 |
| Postsecondary engineering teachers | 2,400 | 29,100 | 200 | 5,100 | 1,000 | 7,500 | 1,200 | 16,400 |

NOTES: Because of rounding, details may not add to totals. Total includes "professional and other degrees."
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-2. Employed scientists and engineers, by sex, race/ethnicity, disability status, and age: 1995**



| Sex, race/ethnicity, and disability status | Total | Less than 30 | 30-39 | 40-49 | 50 or over |
|---|---|---|---|---|---|
| Total | 3,185,600 | 430,900 | 1,124,000 | 954,500 | 676,100 |
| Sex | | | | | |
| Women | 713,500 | 129,700 | 277,500 | 209,300 | 97,000 |
| Men | 2,472,100 | 301,200 | 846,600 | 745,200 | 579,100 |
| Race/ethnicity | | | | | |
| Hispanic | 90,100 | 14,900 | 41,900 | 20,100 | 13,200 |
| White, non-Hispanic | 2,673,600 | 344,400 | 919,600 | 819,000 | 590,600 |
| Black, non-Hispanic | 107,500 | 21,000 | 39,000 | 31,100 | 16,400 |
| Asian | 304,600 | 49,600 | 119,900 | 81,500 | 53,600 |
| American Indian | 8,000 | 1,100 | 2,900 | 2,100 | 1,900 |
| Other | 1,700 | - | 700 | 600 | 500 |
| Disability status | | | | | |
| Persons without disabilities | 3,031,200 | 423,800 | 1,094,700 | 898,000 | 614,700 |
| Persons with disabilities | 154,300 | 7,100 | 29,300 | 56,500 | 61,400 |
| Percentage distribution: | | | | | |
| Total | 100.0 | 13.5 | 35.3 | 30.0 | 21.2 |
| Sex | | | | | |
| Women | 100.0 | 18.2 | 38.9 | 29.3 | 13.6 |
| Men | 100.0 | 12.2 | 34.2 | 30.1 | 23.4 |
| Race/ethnicity | | | | | |
| Hispanic | 100.0 | 16.5 | 46.5 | 22.3 | 14.7 |
| White, non-Hispanic | 100.0 | 12.9 | 34.4 | 30.6 | 22.1 |
| Black, non-Hispanic | 100.0 | 19.5 | 36.3 | 28.9 | 15.3 |
| Asian | 100.0 | 16.3 | 39.4 | 26.8 | 17.6 |
| American Indian | 100.0 | 13.8 | 36.3 | 26.3 | 23.8 |
| Other | 100.0 | - | 39.7 | 33.1 | 27.2 |
| Disability status | | | | | |
| Persons without disabilities | 100.0 | 14.0 | 36.1 | 29.6 | 20.3 |
| Persons with disabilities | 100.0 | 4.6 | 19.0 | 36.6 | 39.8 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-3. Employment status of scientists and engineers, by age, sex, and race/ethnicity: 1995**



| Age, sex, and race/ethnicity | Employment status | | | | | |
|---|---|---|---|---|---|---|
| | Total | Full-time employed in field | Full-time employed outside field | Part-time employed | Not employed | Not in labor force |
| All ages | 3,708,400 | 2,656,700 | 285,900 | 243,000 | 70,600 | 452,200 |
| Women | 835,500 | 524,600 | 71,700 | 117,100 | 14,500 | 107,500 |
| Men | 2,872,900 | 2,132,100 | 214,100 | 125,800 | 56,100 | 344,800 |
| White | 3,138,900 | 2,218,400 | 246,200 | 209,000 | 54,600 | 410,600 |
| Asian | 338,100 | 264,500 | 21,200 | 19,000 | 10,600 | 22,900 |
| Black | 119,100 | 87,600 | 11,700 | 8,200 | 2,700 | 8,900 |
| Hispanic | 102,000 | 77,600 | 6,300 | 6,200 | 2,600 | 9,300 |
| American Indian | 8,600 | 7,000 | 400 | 600 | 100 | 500 |
| Younger than 35 | 1,051,800 | 827,900 | 58,400 | 91,400 | 16,000 | 58,200 |
| Women | 305,100 | 209,500 | 16,700 | 43,300 | 4,800 | 30,900 |
| Men | 746,700 | 618,400 | 41,700 | 48,100 | 11,200 | 27,300 |
| White | 841,600 | 668,600 | 47,000 | 70,400 | 11,100 | 44,600 |
| Asian | 124,100 | 93,500 | 6,400 | 13,100 | 3,000 | 8,100 |
| Black | 42,900 | 32,600 | 3,100 | 4,200 | 600 | 2,400 |
| Hispanic | 40,400 | 30,800 | 1,800 | 3,500 | 1,300 | 3,000 |
| American Indian | 2,700 | 2,300 | 100 | 200 | - | 100 |
| 35 to 44 | 1,146,900 | 922,500 | 108,400 | 54,700 | 18,900 | 42,600 |
| Women | 292,600 | 183,200 | 29,700 | 39,600 | 6,200 | 34,000 |
| Men | 854,300 | 739,300 | 78,700 | 15,100 | 12,700 | 8,600 |
| White | 961,900 | 766,700 | 95,400 | 48,900 | 14,400 | 36,300 |
| Asian | 107,300 | 91,200 | 7,200 | 3,000 | 2,800 | 3,200 |
| Black | 38,900 | 32,300 | 3,200 | 1,200 | 1,200 | 900 |
| Hispanic | 34,600 | 28,700 | 2,300 | 1,400 | 300 | 1,900 |
| American Indian | 3,000 | 2,500 | 200 | 100 | 100 | 100 |
| 45 to 54 | 776,300 | 612,700 | 87,100 | 37,000 | 16,400 | 23,000 |
| Women | 161,900 | 104,200 | 20,000 | 23,600 | 2,300 | 11,800 |
| Men | 614,400 | 508,500 | 67,100 | 13,400 | 14,100 | 11,200 |
| White | 667,800 | 526,400 | 74,700 | 33,900 | 13,100 | 19,600 |
| Asian | 68,700 | 56,300 | 6,400 | 1,100 | 2,600 | 2,300 |
| Black | 23,400 | 16,600 | 4,300 | 1,400 | 500 | 700 |
| Hispanic | 14,900 | 12,100 | 1,700 | 600 | 200 | 300 |
| American Indian | 1,500 | 1,300 | - | 100 | - | 100 |
| 55 or older | 733,500 | 293,700 | 32,000 | 59,800 | 19,300 | 328,500 |
| Women | 75,900 | 27,800 | 5,400 | 10,600 | 1,200 | 30,800 |
| Men | 657,600 | 265,900 | 26,600 | 49,200 | 18,100 | 297,700 |
| White | 667,600 | 256,700 | 29,100 | 55,800 | 16,000 | 310,100 |
| Asian | 38,000 | 23,500 | 1,200 | 1,800 | 2,200 | 9,300 |
| Black | 13,900 | 6,100 | 1,100 | 1,300 | 300 | 5,000 |
| Hispanic | 12,100 | 6,000 | 500 | 700 | 800 | 4,000 |
| American Indian | 1,400 | 900 | 100 | 200 | - | 200 |

KEY: - = Fewer than 50 estimated.

NOTE: Because of rounding, details may not add to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS. 1995 SESTAT Integrated Data Files.

**Appendix table 5-4. Scientists and engineers who are unemployed or out of the labor force, by reason for not working, sex, race/ethnicity, and disability status: 1995**



| Reason for not working | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without Disabilities | Persons with Disabilities |
| Total | 522,800 | 122,000 | 400,900 | 465,200 | 33,500 | 11,600 | 11,800 | 600 | 441,900 | 80,900 |
| Family responsibilities | 53,400 | 49,100 | 4,300 | 46,400 | 4,600 | 700 | 1,500 | 100 | 51,600 | 1,700 |
| Chronic illness or permanent disability | 27,300 | 5,300 | 22,000 | 24,300 | 1,700 | 700 | 500 | 100 | 10,000 | 17,300 |
| Suitable job not available | 38,000 | 10,000 | 28,000 | 29,200 | 5,800 | 1,200 | 1,800 | - | 34,100 | 3,900 |
| Did not need or want to work | 52,500 | 28,500 | 24,000 | 46,800 | 3,400 | 900 | 1,300 | - | 49,800 | 2,700 |
| Other reason | 42,000 | 17,600 | 24,400 | 36,500 | 2,600 | 1,400 | 1,500 | 100 | 38,300 | 3,700 |
| Retired | 326,400 | 25,600 | 300,800 | 308,300 | 9,400 | 4,900 | 3,700 | 200 | 265,400 | 61,000 |
| Student | 49,800 | 17,700 | 32,100 | 34,500 | 9,300 | 2,300 | 3,600 | 200 | 48,400 | 1,500 |
| On layoff from a job | 36,900 | 6,300 | 30,600 | 29,000 | 5,800 | 1,100 | 1,000 | - | 33,600 | 3,300 |
| Percentage distribution: | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Family responsibilities | 10.2 | 40.2 | 1.1 | 10.0 | 13.7 | 6.0 | 12.7 | 16.7 | 11.7 | 2.1 |
| Chronic illness or permanent disability | 5.2 | 4.3 | 5.5 | 5.2 | 5.1 | 6.0 | 4.2 | 16.7 | 2.3 | 21.4 |
| Suitable job not available | 7.3 | 8.2 | 7.0 | 6.3 | 17.3 | 10.3 | 15.3 | - | 7.7 | 4.8 |
| Did not need or want to work | 10.0 | 23.4 | 6.0 | 10.1 | 10.1 | 7.8 | 11.0 | - | 11.3 | 3.3 |
| Other reason | 8.0 | 14.4 | 6.1 | 7.8 | 7.8 | 12.1 | 12.7 | 16.7 | 8.7 | 4.6 |
| Retired | 62.4 | 21.0 | 75.0 | 66.3 | 28.1 | 42.2 | 31.4 | 33.3 | 60.1 | 75.4 |
| Student | 9.5 | 14.5 | 8.0 | 7.4 | 27.8 | 19.8 | 30.5 | 33.3 | 11.0 | 1.9 |
| On layoff from a job | 7.1 | 5.2 | 7.6 | 6.2 | 17.3 | 9.5 | 8.5 | - | 7.6 | 4.1 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding and because respondents could select more than one reason, details may not add to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-5. Employed scientists and engineers who are working outside their field, by most important reason for working outside field, sex, and occupation: 1995**



| Reason for working outside field | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Total | 303,900 | 81,100 | 222,800 | 262,400 | 22,200 | 12,200 | 6,600 | 500 | 286,100 | 17,800 |
| Pay, promotion opportunities | 109,500 | 30,000 | 79,500 | 95,000 | 6,300 | 5,300 | 2,800 | 100 | 102,700 | 6,800 |
| Working conditions | 18,200 | 3,700 | 14,400 | 14,100 | 2,800 | 900 | 300 | - | 16,700 | 1,400 |
| Job location | 17,400 | 4,900 | 12,500 | 15,200 | 1,300 | 600 | 200 | - | 16,700 | 700 |
| Change in career or professional interests | 69,900 | 18,700 | 51,200 | 63,200 | 4,100 | 1,100 | 1,500 | - | 67,200 | 2,700 |
| Family-related reasons | 11,100 | 5,700 | 5,400 | 9,700 | 700 | 300 | 400 | 100 | 10,400 | 700 |
| Job in field not available | 48,700 | 13,000 | 35,700 | 40,400 | 4,900 | 2,500 | 600 | 200 | 44,900 | 3,800 |
| Other reason | 29,200 | 5,100 | 24,100 | 24,800 | 2,000 | 1,500 | 800 | 100 | 27,600 | 1,600 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-6. Part-time employed scientists and engineers, by reason for part-time status, sex, race/ethnicity, and disability status: 1995**



| Reason for part-time | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without Disability | Persons with Disability |
| Total | 243,000 | 117,100 | 125,800 | 209,000 | 19,000 | 8,200 | 6,200 | 600 | 227,700 | 15,300 |
| Family responsibilities | 58,300 | 49,600 | 8,700 | 53,400 | 2,600 | 1,000 | 1,200 | 100 | 56,900 | 1,400 |
| Chronic illness or permanent disability | 4,800 | 2,600 | 2,200 | 4,100 | 200 | - | 500 | - | 3,000 | 1,800 |
| Did not need or want to work full-time | 93,800 | 53,700 | 40,100 | 85,500 | 4,700 | 1,900 | 1,400 | 200 | 88,000 | 5,800 |
| Suitable full-time job not available | 38,900 | 14,600 | 24,200 | 32,200 | 4,100 | 1,300 | 1,100 | 100 | 36,100 | 2,800 |
| Other reason | 31,400 | 13,500 | 17,900 | 26,400 | 2,200 | 1,800 | 900 | 100 | 29,400 | 2,100 |
| Retired | 43,900 | 4,800 | 39,100 | 41,800 | 700 | 700 | 600 | 100 | 37,500 | 6,400 |
| Student | 79,800 | 30,800 | 49,000 | 59,900 | 12,400 | 4,400 | 2,900 | 100 | 78,000 | 1,800 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding and because respondents could select more than one reason, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-7. Employed scientists and engineers, by occupation, employment sector, sex, race/ethnicity, and disability status: 1995**



| Occupation and employment sector | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Science and engineering total | | | | | | | | | | |
| Total | 3,185,500 | 713,400 | 2,472,100 | 2,673,700 | 304,600 | 107,500 | 90,100 | 8,000 | 3,031,200 | 154,400 |
| College/university | 291,100 | 80,400 | 210,700 | 234,100 | 37,800 | 9,000 | 9,300 | 900 | 280,000 | 11,100 |
| Other educational institution | 275,200 | 108,200 | 167,000 | 228,900 | 21,500 | 15,400 | 8,800 | 500 | 256,500 | 18,700 |
| Business/industry, for profit | 1,970,300 | 355,900 | 1,614,400 | 1,663,000 | 195,900 | 54,800 | 51,700 | 4,300 | 1,884,600 | 85,700 |
| Self-employed | 113,800 | 36,300 | 77,500 | 106,100 | 4,300 | 1,200 | 1,800 | 300 | 106,600 | 7,200 |
| Private not-for-profit | 91,000 | 38,100 | 52,900 | 76,800 | 7,100 | 3,600 | 3,000 | 500 | 85,300 | 5,800 |
| Federal government | 252,400 | 47,500 | 204,900 | 210,800 | 17,900 | 13,700 | 8,800 | 1,100 | 238,900 | 13,500 |
| State or local government | 191,700 | 47,000 | 144,700 | 154,000 | 20,100 | 9,800 | 6,700 | 400 | 179,300 | 12,400 |
| Computer and mathematical sciences | | | | | | | | | | |
| Total | 949,600 | 274,900 | 674,500 | 784,900 | 100,300 | 39,300 | 22,900 | 1,600 | 903,200 | 46,100 |
| College/university | 41,000 | 8,900 | 32,000 | 30,500 | 7,400 | 1,700 | 1,200 | 100 | 39,500 | 1,400 |
| Other educational institution | 83,000 | 36,200 | 46,800 | 71,400 | 4,700 | 4,400 | 2,100 | 200 | 76,900 | 6,100 |
| Business/industry, for profit | 683,200 | 187,600 | 495,500 | 565,200 | 77,200 | 24,200 | 15,600 | 1,000 | 653,000 | 30,200 |
| Self-employed | 23,600 | 6,200 | 17,500 | 21,900 | 1,300 | 100 | 400 | - | 22,200 | 1,400 |
| Private not-for-profit | 27,600 | 10,700 | 16,900 | 22,300 | 3,100 | 1,000 | 1,100 | 100 | 26,400 | 1,200 |
| Federal government | 53,300 | 11,700 | 41,500 | 43,800 | 3,300 | 4,700 | 1,400 | 100 | 49,600 | 3,600 |
| State or local government | 37,900 | 13,600 | 24,300 | 29,800 | 3,300 | 3,200 | 1,100 | 100 | 35,600 | 2,200 |
| Life and related sciences | | | | | | | | | | |
| Total | 305,300 | 106,000 | 199,300 | 257,200 | 29,100 | 9,800 | 8,400 | 600 | 293,100 | 12,200 |
| College/university | 84,300 | 28,700 | 55,600 | 69,800 | 9,500 | 2,200 | 2,600 | 100 | 81,100 | 3,300 |
| Other educational institution | 64,700 | 26,700 | 38,000 | 51,700 | 7,400 | 3,400 | 2,200 | 100 | 61,700 | 3,000 |
| Business/industry, for profit | 75,600 | 27,200 | 48,400 | 63,900 | 7,700 | 2,100 | 1,900 | 100 | 72,900 | 2,700 |
| Self-employed | 7,400 | 2,100 | 5,300 | 7,100 | 200 | - | - | - | 7,200 | 200 |
| Private not-for-profit | 11,000 | 5,600 | 5,400 | 9,000 | 1,300 | 400 | 300 | - | 10,800 | 100 |
| Federal government | 37,700 | 10,000 | 27,700 | 33,900 | 1,800 | 1,200 | 600 | 200 | 36,100 | 1,600 |
| State or local government | 24,600 | 5,700 | 18,900 | 21,800 | 1,200 | 500 | 800 | 100 | 23,300 | 1,300 |
| Physical and related sciences | | | | | | | | | | |
| Total | 274,300 | 59,100 | 215,300 | 232,700 | 26,300 | 7,700 | 6,800 | 700 | 260,100 | 14,200 |
| College/university | 51,100 | 9,300 | 41,800 | 42,400 | 6,000 | 1,200 | 1,400 | 100 | 49,600 | 1,600 |
| Other educational institution | 28,500 | 6,300 | 22,200 | 24,300 | 3,000 | 500 | 700 | - | 24,800 | 3,700 |
| Business/industry, for profit | 138,600 | 31,800 | 106,800 | 117,100 | 13,100 | 4,400 | 3,500 | 600 | 132,400 | 6,200 |
| Self-employed | 6,500 | 300 | 6,200 | 6,000 | 400 | - | - | - | 5,900 | 500 |
| Private not-for-profit | 5,600 | 1,100 | 4,500 | 4,700 | 700 | - | 200 | - | 5,500 | 100 |
| Federal government | 27,600 | 6,500 | 21,200 | 24,400 | 1,500 | 800 | 800 | - | 27,000 | 700 |
| State or local government | 16,400 | 3,800 | 12,600 | 13,800 | 1,600 | 800 | 200 | - | 14,900 | 1,400 |

See explanatory information and SOURCES at end of table.

**Appendix table 5-7. Employed scientists and engineers, by occupation, employment sector, sex, race/ethnicity, and disability status: 1995**



| Occupation and employment sector | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Social and related sciences | | | | | | | | | | |
| Total | 317,500 | 158,600 | 158,900 | 277,900 | 11,600 | 16,600 | 9,800 | 1,500 | 298,600 | 18,900 |
| College/university | 71,900 | 29,100 | 42,700 | 61,700 | 4,300 | 2,900 | 2,500 | 400 | 68,200 | 3,700 |
| Other educational institution | 67,600 | 37,100 | 30,500 | 56,500 | 2,500 | 5,900 | 2,500 | 200 | 64,000 | 3,600 |
| Business/industry, for profit | 57,600 | 28,500 | 29,100 | 51,500 | 2,200 | 2,100 | 1,700 | 100 | 55,100 | 2,500 |
| Self-employed | 42,600 | 26,000 | 16,500 | 40,700 | 100 | 1,000 | 500 | 200 | 39,700 | 2,800 |
| Private not-for-profit | 33,700 | 19,800 | 13,900 | 29,400 | 800 | 2,200 | 1,000 | 300 | 29,900 | 3,800 |
| Federal government | 17,100 | 5,500 | 11,700 | 15,300 | 500 | 700 | 400 | 200 | 16,600 | 500 |
| State or local government | 27,000 | 12,600 | 14,500 | 22,800 | 1,200 | 1,800 | 1,200 | 100 | 25,100 | 2,000 |
| Engineering | | | | | | | | | | |
| Total | 1,338,900 | 115,000 | 1,223,900 | 1,120,900 | 137,400 | 34,300 | 42,100 | 3,400 | 1,276,100 | 62,800 |
| College/university | 42,800 | 4,400 | 38,500 | 29,600 | 10,600 | 1,000 | 1,500 | 100 | 41,600 | 1,200 |
| Other educational institution | 31,400 | 1,900 | 29,500 | 25,100 | 3,900 | 1,200 | 1,200 | - | 29,000 | 2,400 |
| Business/industry, for profit | 1,015,200 | 80,700 | 934,500 | 865,400 | 95,800 | 22,100 | 29,000 | 2,400 | 971,200 | 44,000 |
| Self-employed | 33,800 | 1,800 | 32,000 | 30,300 | 2,400 | 100 | 900 | 100 | 31,600 | 2,200 |
| Private not-for-profit | 13,200 | 900 | 12,200 | 11,400 | 1,200 | 100 | 400 | 100 | 12,700 | 500 |
| Federal government | 116,600 | 13,900 | 102,700 | 93,300 | 10,700 | 6,300 | 5,600 | 600 | 109,600 | 7,000 |
| State or local government | 85,900 | 11,400 | 74,500 | 65,800 | 12,800 | 3,500 | 3,500 | 100 | 80,400 | 5,500 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree

SOURCE: National Sciences Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-8. Scientists and engineers employed in academic institutions, by institutional type, highest degree, sex, race/ethnicity, and disability status: 1995**



| Highest degree and type of institution | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| All degrees | 566,300 | 188,600 | 377,600 | 462,800 | 59,200 | 24,500 | 18,000 | 1,600 | 536,500 | 30,000 |
| Primary school | 20,300 | 14,400 | 5,900 | 16,200 | 700 | 2,200 | 1,100 | 100 | 19,500 | 800 |
| Secondary school | 13,200 | 5,600 | 7,500 | 11,100 | 500 | 1,200 | 300 | - | 12,300 | 900 |
| 2-year college | 57,500 | 22,700 | 34,800 | 51,000 | 2,000 | 2,600 | 1,800 | 200 | 52,200 | 5,400 |
| 4-year college or university | 218,000 | 55,600 | 162,400 | 176,900 | 27,200 | 6,500 | 6,700 | 700 | 209,900 | 8,100 |
| Medical school | 40,000 | 16,500 | 23,500 | 32,000 | 5,200 | 1,600 | 1,100 | 100 | 38,200 | 1,800 |
| Research institute | 33,100 | 8,300 | 24,800 | 25,100 | 5,400 | 1,000 | 1,400 | 200 | 31,800 | 1,300 |
| Other | 21,500 | 9,900 | 11,600 | 18,900 | 1,300 | 700 | 600 | - | 20,000 | 1,500 |
| Combined 4-year, medical school, or research institute | 162,700 | 55,600 | 107,100 | 131,600 | 16,900 | 8,700 | 5,000 | 300 | 152,600 | 10,200 |
| Bachelors | 149,300 | 57,900 | 91,400 | 122,400 | 11,800 | 8,900 | 6,000 | 200 | 144,200 | 5,100 |
| Primary school | 3,000 | 1,700 | 1,300 | 1,500 | 200 | 900 | 300 | - | 2,900 | 100 |
| Secondary school | 4,700 | 1,900 | 2,800 | 3,500 | 500 | 500 | 100 | - | 4,700 | - |
| 2-year college | 13,100 | 4,100 | 9,000 | 12,000 | 400 | 600 | - | - | 12,300 | 700 |
| 4-year college or university | 47,600 | 17,700 | 29,900 | 38,700 | 4,600 | 2,000 | 2,100 | 100 | 47,200 | 400 |
| Medical school | 8,500 | 5,100 | 3,400 | 6,900 | 600 | 800 | 200 | - | 8,000 | 600 |
| Research institute | 7,300 | 2,900 | 4,400 | 5,600 | 800 | 500 | 400 | - | 7,200 | 100 |
| Other | 9,000 | 5,100 | 3,900 | 7,900 | 500 | 400 | 300 | - | 8,000 | 1,000 |
| Combined 4-year, medical school, or research institute | 56,200 | 19,600 | 36,600 | 46,300 | 4,200 | 3,200 | 2,500 | 100 | 54,000 | 2,200 |
| Masters | 174,700 | 73,900 | 100,700 | 142,300 | 18,600 | 8,200 | 5,100 | 400 | 162,800 | 11,800 |
| Primary school | 15,200 | 11,400 | 3,800 | 12,800 | 500 | 1,100 | 700 | 100 | 14,500 | 600 |
| Secondary school | 7,300 | 3,100 | 4,200 | 6,600 | - | 500 | 200 | - | 6,600 | 700 |
| 2-year college | 35,300 | 15,700 | 19,600 | 30,900 | 1,000 | 1,600 | 1,600 | 200 | 31,000 | 4,300 |
| 4-year college or university | 36,200 | 11,300 | 24,900 | 25,600 | 8,100 | 1,200 | 1,200 | 100 | 35,600 | 600 |
| Medical school | 3,400 | 1,900 | 1,500 | 2,000 | 1,000 | 200 | 100 | - | 3,300 | 100 |
| Research institute | 6,300 | 1,700 | 4,500 | 4,300 | 1,400 | 200 | 200 | - | 6,000 | 300 |
| Other | 8,400 | 3,500 | 4,900 | 7,500 | 400 | 300 | 200 | - | 8,000 | 400 |
| Combined 4-year, medical school, or research institute | 62,700 | 25,300 | 37,400 | 52,500 | 6,100 | 3,000 | 900 | - | 57,800 | 4,800 |
| Doctorate | 226,600 | 53,500 | 173,100 | 185,400 | 27,800 | 6,200 | 6,300 | 800 | 183,700 | 7,900 |
| Primary school | 1,600 | 1,100 | 500 | 1,400 | - | 200 | - | - | 1,600 | 100 |
| Secondary school | 1,000 | 500 | 500 | 800 | - | 100 | 100 | - | 800 | 200 |
| 2-year college | 8,100 | 2,500 | 5,600 | 7,000 | 500 | 400 | 200 | - | 7,700 | 400 |
| 4-year college or university | 134,000 | 26,500 | 107,400 | 112,500 | 14,300 | 3,200 | 3,400 | 500 | 126,800 | 7,100 |
| Medical school | 27,900 | 9,300 | 18,600 | 22,900 | 3,600 | 500 | 800 | 100 | 26,800 | 1,100 |
| Research institute | 19,400 | 3,700 | 15,700 | 15,100 | 3,100 | 300 | 800 | 100 | 18,500 | 900 |
| Other | 3,400 | 1,100 | 2,400 | 3,000 | 300 | - | 100 | - | 3,400 | 100 |
| Combined 4-year, medical school, or research institute | 31,200 | 8,800 | 22,400 | 22,800 | 5,800 | 1,500 | 1,000 | 100 | 29,000 | 2,200 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. All degrees includes "other" degree. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-9. Full-time ranked doctoral science and engineering faculty at 4-year colleges and universities, by academic rank, age, sex, race/ethnicity, and disability status: 1995**



| Age and rank | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| All ages/All ranks | 135,200 | 24,900 | 110,100 | 115,000 | 12,500 | 3,200 | 3,600 | 700 | 127,600 | 7,600 |
| Professor | 60,400 | 6,000 | 54,300 | 53,600 | 4,400 | 800 | 1,100 | 400 | 56,000 | 4,400 |
| Associate professor | 40,000 | 7,900 | 32,000 | 33,800 | 3,700 | 1,200 | 1,100 | 200 | 37,700 | 2,300 |
| Assistant professor | 34,800 | 11,000 | 23,800 | 27,600 | 4,400 | 1,200 | 1,400 | 100 | 33,900 | 900 |
| Younger than age 35 | 9,900 | 2,800 | 7,000 | 7,600 | 1,600 | 200 | 400 | - | 9,700 | 200 |
| Professor | 100 | - | - | - | - | - | - | - | 100 | - |
| Associate professor | 800 | 100 | 700 | 600 | 200 | - | - | - | 800 | - |
| Assistant professor | 9,000 | 2,700 | 6,300 | 7,000 | 1,400 | 200 | 400 | - | 8,800 | 200 |
| Age 35 to 44 | 44,600 | 10,500 | 34,000 | 36,700 | 5,100 | 1,100 | 1,500 | 200 | 43,300 | 1,200 |
| Professor | 5,800 | 700 | 5,000 | 4,900 | 700 | 100 | 100 | - | 5,600 | 200 |
| Associate professor | 18,400 | 3,600 | 14,800 | 15,400 | 1,900 | 300 | 600 | 100 | 17,700 | 600 |
| Assistant professor | 20,400 | 6,200 | 14,200 | 16,400 | 2,500 | 700 | 800 | 100 | 20,000 | 400 |
| Age 45 to 54 | 46,100 | 8,100 | 37,900 | 40,600 | 3,100 | 1,200 | 1,000 | 200 | 43,300 | 2,800 |
| Professor | 26,500 | 3,200 | 23,200 | 23,800 | 1,700 | 300 | 500 | 200 | 24,900 | 1,600 |
| Associate professor | 15,000 | 3,100 | 11,900 | 13,100 | 1,000 | 600 | 300 | - | 14,000 | 1,000 |
| Assistant professor | 4,600 | 1,800 | 2,800 | 3,700 | 400 | 300 | 200 | - | 4,400 | 200 |
| Age 55 or older | 34,700 | 3,500 | 31,100 | 30,300 | 2,700 | 800 | 500 | 300 | 31,300 | 3,300 |
| Professor | 28,100 | 2,000 | 26,000 | 24,900 | 2,000 | 500 | 400 | 200 | 25,500 | 2,600 |
| Associate professor | 5,800 | 1,200 | 4,600 | 4,800 | 500 | 300 | 100 | 100 | 5,100 | 600 |
| Assistant professor | 800 | 300 | 500 | 600 | 200 | - | - | - | 700 | 100 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-10. Full-time doctoral scientists and engineers employed at 4-year colleges and universities, by tenure status, age, sex, race/ethnicity, and disability status: 1995**



| Age and tenure | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| All ages | 170,400 | 35,700 | 134,700 | 141,500 | 19,700 | 3,800 | 4,600 | 600 | 161,800 | 8,600 |
| No tenure system at institution | 5,800 | 1,100 | 4,700 | 4,400 | 1,000 | 100 | 200 | - | 5,500 | 200 |
| No tenure system for my position | 26,600 | 8,000 | 18,600 | 20,400 | 5,000 | 500 | 700 | - | 25,900 | 800 |
| Tenured | 91,800 | 12,500 | 79,300 | 80,600 | 6,900 | 1,800 | 1,900 | 500 | 85,700 | 6,100 |
| On tenure track, not tenured | 30,700 | 8,900 | 21,800 | 24,100 | 3,900 | 1,200 | 1,400 | 100 | 29,800 | 900 |
| Not on tenure track | 15,500 | 5,200 | 10,300 | 12,000 | 2,900 | 200 | 400 | - | 14,900 | 600 |
| Younger than age 35 | 21,100 | 6,700 | 14,300 | 15,600 | 4,400 | 200 | 700 | - | 20,600 | 400 |
| No tenure system at institution | 800 | 200 | 500 | 600 | 200 | - | - | - | 800 | - |
| No tenure system for my position | 8,300 | 2,900 | 5,400 | 6,000 | 2,000 | 100 | 200 | - | 8,100 | 100 |
| Tenured | 600 | 100 | 500 | 400 | 200 | - | - | - | 600 | - |
| On tenure track, not tenured | 7,600 | 2,200 | 5,400 | 6,000 | 1,100 | 100 | 300 | - | 7,400 | 200 |
| Not on tenure track | 3,800 | 1,300 | 2,500 | 2,600 | 900 | - | 200 | - | 3,700 | 100 |
| Age 35 to 44 | 59,100 | 15,000 | 44,300 | 46,900 | 8,400 | 1,400 | 2,100 | 200 | 57,500 | 1,500 |
| No tenure system at institution | 2,300 | 500 | 1,800 | 1,800 | 400 | - | 100 | - | 2,300 | - |
| No tenure system for my position | 11,400 | 3,500 | 7,900 | 8,200 | 2,500 | 300 | 400 | - | 11,100 | 300 |
| Tenured | 20,500 | 3,800 | 16,800 | 17,400 | 2,100 | 300 | 600 | 100 | 19,900 | 600 |
| On tenure track, not tenured | 18,300 | 5,000 | 13,300 | 14,400 | 2,200 | 700 | 800 | 100 | 17,800 | 400 |
| Not on tenure track | 6,600 | 2,200 | 4,500 | 5,100 | 1,200 | 100 | 200 | - | 6,400 | 200 |
| Age 45 to 54 | 52,700 | 10,000 | 42,700 | 45,900 | 3,900 | 1,400 | 1,200 | 200 | 49,400 | 3,300 |
| No tenure system at institution | 2,000 | 300 | 1,700 | 1,500 | 300 | 100 | 100 | - | 1,900 | 100 |
| No tenure system for my position | 4,500 | 1,300 | 3,200 | 3,900 | 400 | 100 | 100 | - | 4,200 | 300 |
| Tenured | 38,200 | 5,700 | 32,500 | 34,200 | 2,200 | 800 | 800 | 200 | 35,900 | 2,300 |
| On tenure track, not tenured | 4,300 | 1,500 | 2,800 | 3,300 | 400 | 300 | 200 | - | 4,000 | 300 |
| Not on tenure track | 3,700 | 1,200 | 2,500 | 3,000 | 600 | 100 | - | - | 3,400 | 300 |
| Age 55 or older | 37,600 | 4,000 | 33,600 | 33,100 | 3,000 | 800 | 500 | 200 | 34,000 | 3,500 |
| No tenure system at institution | 700 | 100 | 600 | 600 | 100 | - | - | - | 600 | 100 |
| No tenure system for my position | 2,500 | 300 | 2,200 | 2,300 | 200 | - | - | - | 2,400 | 100 |
| Tenured | 32,400 | 2,900 | 29,500 | 28,600 | 2,400 | 700 | 500 | 200 | 29,200 | 3,200 |
| On tenure track, not tenured | 600 | 200 | 400 | 400 | 100 | 100 | - | - | 500 | - |
| Not on tenure track | 1,400 | 500 | 900 | 1,200 | 200 | - | - | - | 1,300 | 100 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-11. Full-time doctoral scientists and engineers employed in 4-year colleges or universities, by number of refereed publications and patents since 1990, sex, race, and disability status: 1995**



| Sex, race/ethnicity, and disability status | Total | Publications since 1990 | | | | | | Patents since 1990 [1] | |
|---|---|---|---|---|---|---|---|---|---|
| | | None | 1 or 2 | 3 to 5 | 6 to 10 | 11 to 20 | More than 20 | No | Yes |
| Total | 159,300 | 27,900 | 26,100 | 32,000 | 33,400 | 25,600 | 14,200 | 103,600 | 12,200 |
| Sex | | | | | | | | | |
| Women | 30,600 | 5,200 | 6,400 | 7,500 | 6,300 | 4,000 | 1,200 | 16,600 | 1,200 |
| Men | 128,700 | 22,700 | 19,700 | 24,600 | 27,100 | 21,600 | 13,000 | 86,900 | 11,000 |
| Race/Ethnicity | | | | | | | | | |
| Hispanic | 4,100 | 600 | 800 | 900 | 1,000 | 600 | 300 | 2,700 | 300 |
| White | 134,400 | 24,300 | 21,400 | 27,100 | 28,100 | 21,400 | 12,100 | 86,700 | 9,600 |
| Black | 3,600 | 1,000 | 900 | 900 | 500 | 300 | 100 | 2,100 | 200 |
| Asian | 16,400 | 2,000 | 2,900 | 2,900 | 3,800 | 3,200 | 1,700 | 11,900 | 2,000 |
| American Indian | 600 | 100 | 200 | 200 | 100 | 100 | - | 300 | - |
| Disability status | | | | | | | | | |
| Persons without disability | 150,300 | 25,800 | 24,700 | 30,400 | 31,700 | 24,300 | 13,400 | 98,100 | 11,600 |
| Persons with disability | 8,900 | 2,000 | 1,500 | 1,700 | 1,700 | 1,300 | 800 | 5,500 | 600 |

[1]Patents columns include only natural scientists and engineers.

KEY: - = Fewer than 50 estimated.

NOTES: Includes only those who received doctorates in 1990 or earlier. Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-12. Full-time doctoral scientists and engineers employed in 4-year colleges or universities, by support from federal grants or contracts, sex, race/ethnicity, and disability status: 1995**



| Support from federal grants or contracts | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Total | 202,800 | 44,900 | 157,900 | 165,500 | 25,600 | 5,200 | 5,700 | 800 | 192,100 | 10,700 |
| No | 112,000 | 25,400 | 86,700 | 92,100 | 13,000 | 3,400 | 2,900 | 600 | 105,400 | 6,700 |
| Yes | 90,800 | 19,600 | 71,200 | 73,400 | 12,600 | 1,800 | 2,800 | 200 | 86,700 | 4,100 |

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-13. Scientists and engineers employed in business or industry, by primary work activity, age, sex, race/ethnicity, and disability status: 1995**



| Primary work activity and age | All | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Total | 1,849,800 | 333,600 | 1,516,300 | 1,558,700 | 186,500 | 51,800 | 48,900 | 4,000 | 1,773,700 | 75,900 |
| Research and development | 699,100 | 92,700 | 606,400 | 587,000 | 74,700 | 16,900 | 18,600 | 1,800 | 670,900 | 28,100 |
| Teaching | 10,900 | 4,700 | 6,200 | 9,800 | 400 | 400 | 200 | 100 | 10,600 | 200 |
| Management/administration | 391,200 | 60,100 | 331,200 | 343,200 | 25,600 | 11,100 | 10,600 | 800 | 372,300 | 18,900 |
| Computer applications | 538,300 | 127,600 | 410,700 | 438,800 | 67,500 | 17,700 | 13,400 | 1,000 | 517,800 | 20,600 |
| Other | 210,300 | 48,500 | 161,800 | 179,900 | 18,300 | 5,700 | 6,100 | 300 | 202,100 | 8,100 |
| Younger than 35 | | | | | | | | | | |
| Research and development | 246,900 | 48,200 | 198,700 | 202,400 | 27,400 | 8,100 | 8,600 | 400 | 240,900 | 6,000 |
| Teaching | 2,800 | 1,400 | 1,400 | 2,400 | 100 | 200 | 100 | - | 2,800 | - |
| Management/administration | 115,300 | 27,200 | 88,100 | 98,500 | 8,000 | 4,400 | 3,800 | 600 | 113,400 | 1,900 |
| Computer applications | 200,500 | 50,900 | 149,500 | 157,000 | 29,800 | 7,600 | 5,600 | 600 | 196,600 | 3,800 |
| Other | 62,300 | 19,400 | 42,900 | 52,500 | 5,200 | 2,400 | 2,100 | 200 | 61,200 | 1,100 |
| 35 to 44 | | | | | | | | | | |
| Research and development | 251,000 | 30,700 | 220,300 | 212,400 | 25,500 | 5,400 | 6,500 | 1,000 | 242,000 | 9,100 |
| Teaching | 4,400 | 1,900 | 2,400 | 4,000 | 100 | 100 | 100 | 100 | 4,300 | 100 |
| Management/administration | 136,700 | 23,100 | 113,600 | 120,100 | 8,500 | 4,300 | 3,800 | 100 | 133,000 | 3,700 |
| Computer applications | 211,200 | 51,200 | 160,000 | 174,700 | 24,000 | 6,400 | 6,000 | 200 | 204,500 | 6,600 |
| Other | 70,700 | 15,500 | 55,200 | 60,000 | 5,600 | 2,100 | 2,800 | 100 | 68,600 | 2,100 |
| 45 to 54 | | | | | | | | | | |
| Research and development | 131,500 | 11,100 | 120,400 | 110,900 | 15,500 | 2,600 | 2,500 | 100 | 125,000 | 6,600 |
| Teaching | 2,700 | 1,300 | 1,400 | 2,500 | 200 | - | - | - | 2,500 | 200 |
| Management/administration | 95,800 | 8,200 | 87,600 | 84,600 | 6,700 | 2,200 | 2,300 | 100 | 85,700 | 10,100 |
| Computer applications | 98,100 | 21,400 | 76,800 | 81,900 | 11,200 | 3,300 | 1,400 | 200 | 89,800 | 8,300 |
| Other | 50,500 | 10,600 | 39,800 | 43,800 | 4,800 | 1,100 | 600 | - | 48,700 | 1,800 |
| 55 or older | | | | | | | | | | |
| Research and development | 69,600 | 2,700 | 66,900 | 61,300 | 6,300 | 700 | 1,100 | 200 | 63,100 | 6,500 |
| Teaching | 1,000 | - | 1,000 | 900 | - | 100 | - | - | 1,000 | - |
| Management/administration | 43,400 | 1,600 | 41,900 | 40,100 | 2,300 | 200 | 800 | 100 | 40,300 | 3,200 |
| Computer applications | 28,600 | 4,200 | 24,400 | 25,300 | 2,500 | 400 | 300 | 100 | 26,800 | 1,800 |
| Other | 26,900 | 3,000 | 23,900 | 23,600 | 2,600 | 100 | 500 | 100 | 23,700 | 3,100 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-14. Mean number of direct and indirect subordinates for supervisory[1] scientists and engineers employed in business or industry, by age, sex, race/ethnicity, and disability status: 1995**



| Sex, race/ethnicity, and disability status | Age | | | | |
|---|---|---|---|---|---|
| | Total | Younger than 35 | 35-44 | 45-54 | 55 or older |
| Total | 11.0 | 8.3 | 10.5 | 15.3 | 10.4 |
| Sex | | | | | |
| Women | 7.7 | 7.1 | 8.9 | 7.0 | 4.5 |
| Men | 11.5 | 8.5 | 10.8 | 16.5 | 10.6 |
| Race/ethnicity | | | | | |
| Hispanic | 10.6 | 8.3 | 10.4 | 13.9 | 14.9 |
| White | 11.3 | 8.4 | 10.8 | 16.0 | 10.3 |
| Black | 11.4 | 10.7 | 12.7 | 10.4 | 12.1 |
| Asian | 7.5 | 6.2 | 6.4 | 10.1 | 9.2 |
| American Indian | 9.1 | 8.2 | 5.6 | 7.2 | 21.5 |
| Disability status | | | | | |
| Persons without disability | 10.9 | 8.3 | 10.4 | 15.3 | 10.4 |
| Persons with disability | 12.3 | 4.4 | 13.0 | 15.6 | 10.1 |

[1] It should be noted that in the SESTAT data files, only first-line supervisors are considered scientists and engineers. Mid-level and top managers and administrators are not considered to be in science and engineering occupations. Because this analysis was limited to people employed as scientists and engineers, those mid-level and top managers and administrators were excluded.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-15. Scientists and engineers employed in business or industry, by occupation, size of employer, sex, race/ethnicity, and disability status: 1995**



| Size of employer | Total | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Total science and engineering | 1,849,800 | 333,500 | 1,516,200 | 1,558,700 | 186,300 | 51,800 | 48,900 | 3,900 | 1,773,800 | 75,900 |
| Fewer than 10 employees | 70,200 | 12,400 | 57,900 | 60,400 | 6,600 | 500 | 2,400 | 300 | 66,800 | 3,400 |
| 10-24 | 74,800 | 12,600 | 62,200 | 62,500 | 9,100 | 1,100 | 1,800 | 300 | 71,200 | 3,600 |
| 25-99 | 163,400 | 25,800 | 137,500 | 136,100 | 20,000 | 2,800 | 3,900 | 600 | 157,200 | 6,100 |
| 100-499 | 256,000 | 44,800 | 211,200 | 215,200 | 28,400 | 5,400 | 6,600 | 300 | 246,700 | 9,400 |
| 500-999 | 120,100 | 24,400 | 95,700 | 101,400 | 11,900 | 3,400 | 3,300 | 100 | 115,700 | 4,400 |
| 1,000-4,999 | 337,600 | 66,600 | 270,900 | 286,900 | 30,800 | 9,800 | 9,800 | 200 | 323,700 | 13,800 |
| 5,000 or more | 827,700 | 146,900 | 680,800 | 696,200 | 79,500 | 28,800 | 21,100 | 2,100 | 792,500 | 35,200 |
| Computer and mathematics sciences | 644,300 | 178,000 | 466,200 | 532,200 | 73,600 | 23,000 | 14,800 | 800 | 617,000 | 27,300 |
| Fewer than 10 employees | 20,400 | 4,000 | 16,400 | 17,500 | 2,100 | 200 | 600 | 100 | 19,900 | 500 |
| 10-24 | 19,200 | 4,000 | 15,200 | 15,300 | 3,200 | 300 | 200 | 200 | 18,200 | 1,000 |
| 25-99 | 48,000 | 11,700 | 36,300 | 38,900 | 7,500 | 1,100 | 600 | - | 46,000 | 2,000 |
| 100-499 | 83,700 | 22,900 | 60,800 | 69,500 | 9,300 | 2,700 | 2,200 | - | 80,700 | 3,000 |
| 500-999 | 41,100 | 12,200 | 28,800 | 33,900 | 4,800 | 1,300 | 1,100 | - | 39,400 | 1,700 |
| 1,000-4,999 | 125,900 | 39,200 | 86,700 | 104,700 | 13,400 | 4,800 | 2,900 | - | 120,000 | 5,900 |
| 5,000 or more | 306,000 | 84,000 | 222,000 | 252,400 | 33,300 | 12,600 | 7,200 | 500 | 292,800 | 13,200 |
| Life and related sciences | 71,200 | 25,500 | 45,800 | 59,900 | 7,400 | 2,000 | 1,800 | - | 68,400 | 2,500 |
| Fewer than 10 employees | 5,100 | 1,000 | 4,100 | 4,700 | 200 | - | 100 | - | 5,000 | - |
| 10-24 | 5,200 | 2,500 | 2,700 | 4,300 | 800 | - | 100 | - | 4,800 | 400 |
| 25-99 | 8,400 | 2,400 | 6,100 | 7,600 | 600 | 300 | - | - | 8,400 | 100 |
| 100-499 | 10,000 | 3,400 | 6,500 | 7,900 | 1,800 | - | 200 | - | 9,200 | 700 |
| 500-999 | 5,000 | 2,600 | 2,500 | 4,300 | 400 | - | 400 | - | 5,000 | - |
| 1,000-4,999 | 12,300 | 4,500 | 7,800 | 10,300 | 1,200 | 600 | 200 | - | 11,300 | 900 |
| 5,000 or more | 25,200 | 9,100 | 16,100 | 20,800 | 2,400 | 1,100 | 800 | - | 24,700 | 400 |
| Physical and related sciences | 131,500 | 30,500 | 101,100 | 110,800 | 12,700 | 4,000 | 3,200 | 600 | 126,000 | 5,600 |
| Fewer than 10 employees | 5,000 | 900 | 4,100 | 4,400 | 200 | - | 300 | - | 4,900 | 100 |
| 10-24 | 8,000 | 1,500 | 6,500 | 7,100 | 400 | 100 | 300 | - | 7,600 | 400 |
| 25-99 | 14,900 | 3,500 | 11,400 | 12,300 | 1,900 | 100 | 500 | 200 | 14,100 | 800 |
| 100-499 | 17,800 | 4,400 | 13,400 | 14,300 | 2,700 | 500 | 300 | - | 17,300 | 500 |
| 500-999 | 10,000 | 2,000 | 8,100 | 8,600 | 400 | 600 | 400 | 100 | 9,200 | 900 |
| 1,000-4,999 | 27,500 | 6,200 | 21,300 | 23,900 | 2,000 | 700 | 800 | - | 26,200 | 1,300 |
| 5,000 or more | 48,300 | 12,000 | 36,300 | 40,200 | 5,100 | 2,000 | 600 | 300 | 46,700 | 1,600 |
| Social and related sciences | 43,400 | 21,900 | 21,400 | 38,900 | 1,300 | 1,700 | 1,400 | - | 41,600 | 1,700 |
| Fewer than 10 employees | 8,600 | 4,400 | 4,200 | 7,700 | 100 | 200 | 500 | - | 8,100 | 400 |
| 10-24 | 4,300 | 2,400 | 1,900 | 4,100 | - | 200 | - | - | 4,300 | - |
| 25-99 | 6,600 | 3,200 | 3,400 | 6,300 | - | 200 | 100 | - | 6,200 | 500 |
| 100-499 | 9,000 | 5,200 | 3,800 | 8,100 | 300 | 500 | 100 | - | 8,900 | 100 |
| 500-999 | 2,600 | 1,300 | 1,300 | 2,400 | - | 100 | - | - | 2,000 | 600 |
| 1,000-4,999 | 3,600 | 2,500 | 1,100 | 3,200 | 100 | 100 | 300 | - | 3,600 | - |
| 5,000 or more | 8,700 | 2,900 | 5,700 | 7,100 | 800 | 400 | 400 | - | 8,500 | 100 |

See explanatory information and SOURCES at end of table.

**Appendix table 5-15. Scientists and engineers employed in business or industry, by occupation, size of employer, sex, race/ethnicity, and disability status: 1995**



| | | Sex | | Race/ethnicity | | | | | Disability status | |
|---|---|---|---|---|---|---|---|---|---|---|
| Size of employer | Total | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| Engineering | 959,400 | 77,600 | 881,600 | 817,200 | 91,100 | 21,000 | 27,500 | 2,300 | 920,500 | 38,500 |
| Fewer than 10 employees | 31,200 | 2,100 | 29,100 | 26,000 | 4,000 | 100 | 900 | 200 | 28,800 | 2,400 |
| 10-24 | 38,100 | 2,200 | 35,800 | 31,700 | 4,700 | 400 | 1,100 | 100 | 36,300 | 1,700 |
| 25-99 | 85,400 | 5,000 | 80,400 | 71,100 | 10,000 | 1,200 | 2,700 | 400 | 82,500 | 2,800 |
| 100-499 | 135,500 | 8,800 | 126,700 | 115,500 | 14,200 | 1,700 | 3,800 | 200 | 130,600 | 4,900 |
| 500-999 | 61,400 | 6,300 | 55,000 | 52,300 | 6,300 | 1,300 | 1,500 | - | 60,100 | 1,200 |
| 1,000-4,999 | 168,300 | 14,200 | 154,000 | 144,800 | 14,100 | 3,600 | 5,500 | 200 | 162,500 | 5,700 |
| 5,000 or more | 439,500 | 39,000 | 400,600 | 375,800 | 37,800 | 12,700 | 12,000 | 1,200 | 419,700 | 19,800 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons with Disabilities in Science and Engineering: 1998*

**Appendix table: 5-16. Doctoral scientists and engineers employed full time in business or industry and who received degrees in 1990 or earlier, by occupation, number of publications, applications for a U.S. patent, sex, race/ethnicity, and disability status: 1995**



| Publications and patents | Total | Sex | | Race/ethnicity | | | | | Physical disability | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Women | Men | White | Asian | Black | Hispanic | American Indian | Persons without disability | Persons with disability |
| **Publications** | | | | | | | | | | |
| Total, all scientists and engineers | 74,500 | 9,200 | 65,400 | 56,100 | 16,100 | 900 | 1,300 | 100 | 72,100 | 2,400 |
| None | 34,900 | 4,500 | 30,400 | 26,900 | 6,900 | 500 | 400 | 100 | 33,500 | 1,400 |
| 1 or 2 | 16,500 | 1,700 | 14,900 | 12,000 | 3,900 | 200 | 400 | - | 16,000 | 500 |
| 3 to 5 | 11,700 | 1,700 | 10,000 | 9,000 | 2,500 | 100 | 100 | - | 11,400 | 300 |
| 6 to 10 | 6,400 | 700 | 5,600 | 4,600 | 1,500 | 100 | 100 | - | 6,200 | 200 |
| 11 to 20 | 3,700 | 500 | 3,300 | 2,500 | 1,000 | - | 200 | - | 3,700 | - |
| More than 20 | 1,300 | 100 | 1,200 | 1,100 | 200 | - | - | - | 1,300 | - |
| **Patents** | | | | | | | | | | |
| All natural scientists and engineers [1] | | | | | | | | | | |
| No | 43,400 | 5,700 | 37,700 | 32,000 | 10,100 | 500 | 600 | - | 41,800 | 1,500 |
| Yes | 26,500 | 2,200 | 24,200 | 19,900 | 5,800 | 100 | 600 | - | 25,900 | 700 |
| Total | 69,900 | 7,900 | 61,900 | 51,900 | 15,900 | 600 | 1,200 | - | 67,700 | 2,200 |
| Computer and mathematics sciences | | | | | | | | | | |
| No | 9,400 | 1,700 | 7,700 | 7,200 | 1,900 | 100 | 100 | - | 9,100 | 300 |
| Yes | 2,100 | 100 | 2,000 | 1,700 | 400 | - | - | - | 2,100 | 100 |
| Total | 11,500 | 1,800 | 9,700 | 8,900 | 2,300 | 100 | 100 | - | 11,200 | 400 |
| Life and related sciences | | | | | | | | | | |
| No | 8,600 | 1,900 | 6,700 | 7,000 | 1,500 | - | 100 | - | 8,400 | 300 |
| Yes | 4,900 | 1,000 | 3,800 | 3,600 | 1,000 | - | 200 | - | 4,800 | 100 |
| Total | 13,500 | 2,900 | 10,500 | 10,600 | 2,500 | - | 300 | - | 13,200 | 400 |
| Physical and related sciences | | | | | | | | | | |
| No | 10,700 | 1,400 | 9,300 | 8,400 | 1,800 | 200 | 200 | - | 10,200 | 400 |
| Yes | 10,700 | 900 | 9,800 | 8,600 | 1,800 | 100 | 200 | - | 10,400 | 300 |
| Total | 21,400 | 2,300 | 19,100 | 17,000 | 3,600 | 300 | 400 | - | 20,600 | 700 |
| Engineering | | | | | | | | | | |
| No | 14,700 | 700 | 14,000 | 9,400 | 4,900 | 200 | 200 | - | 14,100 | 500 |
| Yes | 8,800 | 200 | 8,600 | 6,000 | 2,600 | - | 200 | - | 8,600 | 200 |
| Total | 23,500 | 900 | 22,600 | 15,400 | 7,500 | 200 | 400 | - | 22,700 | 700 |

[1] The prevalence of patents by social scientists was so low they were excluded from this analysis.

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-17. Median annual salaries of full-time employed scientists and engineers, by highest degree, occupation, sex, and age: 1995**



| Occupation and age | Sex | Highest degree | | | |
|---|---|---|---|---|---|
| | | All degrees | Bachelor's | Master's | Doctorate |
| Science and engineering total | | | | | |
| All ages | Women | $42,000 | $40,200 | $43,500 | $47,000 |
| | Men | 52,000 | 50,000 | 56,000 | 60,000 |
| 20-29 | Women | 31,500 | 35,000 | 42,000 | - |
| | Men | 36,000 | 38,000 | 42,000 | 38,600 |
| 30-39 | Women | 43,000 | 44,000 | 49,000 | 45,000 |
| | Men | 50,000 | 49,700 | 56,000 | 55,500 |
| 40-49 | Women | 47,000 | 48,000 | 53,000 | 51,300 |
| | Men | 58,000 | 57,000 | 60,000 | 60,000 |
| 50 or older | Women | 49,000 | 49,600 | 50,000 | 58,000 |
| | Men | 61,000 | 57,000 | 60,000 | 65,000 |
| Computer and mathematical sciences | | | | | |
| 20-29 | Women | 36,900 | 35,000 | 42,000 | - |
| | Men | 39,000 | 38,000 | 42,000 | 38,600 |
| 30-39 | Women | 45,000 | 44,000 | 49,000 | 45,000 |
| | Men | 50,000 | 49,700 | 56,000 | 55,500 |
| 40-49 | Women | 49,700 | 48,000 | 53,000 | 51,300 |
| | Men | 58,100 | 57,000 | 60,000 | 60,000 |
| 50 or older | Women | 50,000 | 49,600 | 50,000 | 58,000 |
| | Men | 60,000 | 57,000 | 60,000 | 65,000 |
| Life and related sciences | | | | | |
| 20-29 | Women | 20,500 | 20,000 | 24,200 | 25,000 |
| | Men | 21,000 | 19,900 | 24,000 | 28,000 |
| 30-39 | Women | 32,000 | 32,200 | 32,000 | 32,000 |
| | Men | 37,500 | 36,000 | 35,000 | 39,000 |
| 40-49 | Women | 45,000 | 41,000 | 36,300 | 54,000 |
| | Men | 48,000 | 40,000 | 45,000 | 58,800 |
| 50 or older | Women | 43,400 | - | 40,900 | 56,000 |
| | Men | 60,000 | 47,000 | 47,000 | 67,200 |
| Physical and related sciences | | | | | |
| 20-29 | Women | 28,100 | 27,500 | 34,000 | - |
| | Men | 25,000 | 25,000 | 20,000 | 34,000 |
| 30-39 | Women | 40,000 | 38,500 | 46,000 | 45,000 |
| | Men | 42,000 | 40,000 | 41,000 | 50,000 |
| 40-49 | Women | 45,000 | 45,000 | 41,000 | 56,000 |
| | Men | 56,400 | 50,000 | 57,800 | 64,000 |
| 50 or older | Women | 44,900 | - | - | 58,000 |
| | Men | 63,000 | 56,400 | 60,000 | 72,000 |

See explanatory information and SOURCES at end of table.

**Appendix table 5-17. Median annual salaries of full-time employed scientists and engineers, by highest degree, occupation, sex, and age: 1995**



| Occupation and age | Sex | Highest degree | | | |
|---|---|---|---|---|---|
| | | All degrees | Bachelor's | Master's | Doctorate |
| Social and related sciences | | | | | |
| 20-29 | Women | $22,000 | $20,000 | $26,000 | $34,000 |
| | Men | 26,000 | 25,000 | 24,500 | - |
| 30-39 | Women | 35,500 | 24,000 | 35,000 | 40,000 |
| | Men | 40,000 | - | 35,000 | 45,000 |
| 40-49 | Women | 41,000 | - | 37,000 | 47,000 |
| | Men | 48,000 | 42,000 | 40,000 | 55,000 |
| 50 or older | Women | 47,400 | - | 42,500 | 52,000 |
| | Men | 59,000 | - | 53,000 | 60,000 |
| Engineering | | | | | |
| 20-29 | Women | 39,000 | 38,000 | 42,800 | - |
| | Men | 38,400 | 38,000 | 42,000 | 50,000 |
| 30-39 | Women | 49,800 | 48,000 | 53,300 | 57,000 |
| | Men | 51,000 | 50,000 | 55,000 | 59,400 |
| 40-49 | Women | 52,000 | 48,600 | 60,000 | 65,000 |
| | Men | 60,000 | 58,500 | 64,000 | 70,000 |
| 50 or older | Women | 57,800 | 58,000 | - | 67,000 |
| | Men | 63,000 | 60,500 | 67,000 | 75,900 |

KEY: - = Fewer than 20 individuals reporting salary.

NOTES: Because of rounding, details may not add up to totals. Median salaries were not computed for groups with fewer than 20 individuals reporting salary. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-18. Scientists and engineers in the U.S. labor force, by occupation, race/ethnicity, and highest degree: 1995**



| Occupation | All degrees | | | | | | Bachelor's | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | White | Asian | Black | Hispanic | American Indian | Total | White | Asian | Black | Hispanic | American Indian |
| Science and engineering total | 3,256,200 | 2,728,300 | 315,200 | 110,200 | 92,700 | 8,100 | 1,883,300 | 1,616,500 | 132,200 | 72,400 | 56,300 | 4,800 |
| Computer/mathematical sciences | 966,200 | 797,700 | 102,500 | 40,100 | 23,600 | 1,700 | 635,400 | 539,300 | 47,500 | 29,200 | 17,800 | 1,100 |
| Computer/information sciences | 854,800 | 705,600 | 92,600 | 33,900 | 21,100 | 1,300 | 605,200 | 514,200 | 46,100 | 26,700 | 17,000 | 1,100 |
| Mathematical science | 38,500 | 32,000 | 2,700 | 2,500 | 800 | 100 | 16,600 | 14,200 | 200 | 1,200 | 400 | - |
| Postsecondary mathematics | 72,900 | 60,100 | 7,200 | 3,600 | 1,700 | 300 | 13,500 | 10,900 | 1,100 | 1,200 | 300 | - |
| Life and related sciences | 311,500 | 261,900 | 30,200 | 9,800 | 8,800 | 700 | 123,900 | 107,900 | 7,200 | 4,300 | 4,300 | 300 |
| Agricultural/food science | 44,200 | 38,200 | 2,700 | 1,500 | 1,700 | - | 24,900 | 22,000 | 700 | 1,100 | 1,000 | - |
| Biological science | 172,800 | 140,400 | 22,100 | 4,900 | 4,900 | 400 | 71,300 | 60,500 | 5,200 | 2,800 | 2,600 | 100 |
| Environmental science | 20,700 | 19,800 | 300 | 100 | 300 | 100 | 14,000 | 13,300 | 200 | 100 | 200 | 100 |
| Postsecondary life science | 73,800 | 63,400 | 5,100 | 3,300 | 1,900 | 100 | 13,800 | 12,000 | 1,000 | 300 | 500 | - |
| Physical and related sciences | 281,800 | 238,100 | 27,700 | 8,000 | 7,100 | 800 | 131,000 | 114,100 | 7,700 | 5,600 | 3,100 | 500 |
| Chemistry | 113,900 | 90,300 | 15,200 | 5,600 | 2,500 | 400 | 66,300 | 54,900 | 5,500 | 4,400 | 1,300 | 300 |
| Earth science | 73,100 | 66,300 | 3,600 | 700 | 2,200 | 300 | 37,100 | 34,100 | 1,300 | 300 | 1,100 | 200 |
| Physics | 30,100 | 25,600 | 3,700 | 300 | 400 | - | 7,400 | 6,800 | 200 | 200 | 200 | - |
| Other physical science | 17,300 | 15,300 | 1,000 | 300 | 600 | - | 9,300 | 8,600 | 100 | 200 | 400 | - |
| Postsecondary physics | 47,400 | 40,600 | 4,100 | 1,100 | 1,400 | 100 | 11,000 | 9,700 | 500 | 600 | 200 | - |
| Social and related sciences | 321,500 | 281,200 | 11,900 | 16,700 | 10,100 | 1,500 | 61,600 | 50,800 | 2,600 | 5,800 | 2,000 | 300 |
| Economics | 34,100 | 28,900 | 2,000 | 1,200 | 1,900 | 100 | 11,300 | 10,500 | 100 | 400 | 400 | - |
| Political science | 9,000 | 7,300 | 800 | 300 | 600 | - | 5,100 | 4,300 | 400 | 200 | 100 | - |
| Psychology | 169,000 | 151,900 | 3,200 | 8,500 | 4,600 | 900 | 25,900 | 20,500 | 1,200 | 2,900 | 1,100 | 200 |
| Sociology | 16,300 | 14,800 | 600 | 600 | 200 | 100 | 7,800 | 6,900 | 300 | 400 | 200 | 100 |
| Other social sciences | 12,700 | 10,700 | 500 | 1,100 | 300 | - | 3,800 | 2,900 | 100 | 600 | 100 | - |
| Postsecondary social science | 80,300 | 67,600 | 4,800 | 5,000 | 2,500 | 400 | 7,600 | 5,700 | 600 | 1,300 | 100 | - |
| Engineering | 1,375,200 | 1,149,300 | 143,000 | 35,700 | 43,000 | 3,400 | 931,500 | 804,400 | 67,300 | 27,500 | 29,000 | 2,500 |
| Aerospace engineering | 75,200 | 64,200 | 5,900 | 1,700 | 3,000 | 300 | 43,900 | 38,100 | 2,600 | 1,100 | 1,800 | 200 |
| Chemical engineering | 72,900 | 59,700 | 8,300 | 2,500 | 2,400 | - | 46,600 | 39,000 | 4,200 | 1,800 | 1,600 | - |
| Civil engineering | 203,000 | 167,300 | 24,000 | 3,600 | 7,600 | 400 | 145,700 | 124,800 | 12,400 | 2,900 | 5,300 | 300 |
| Electrical engineering | 369,600 | 294,900 | 48,900 | 11,900 | 13,000 | 900 | 249,800 | 205,900 | 24,900 | 9,300 | 8,800 | 800 |
| Industrial engineering | 71,900 | 62,000 | 3,900 | 3,400 | 2,100 | 300 | 53,900 | 46,700 | 2,000 | 3,200 | 1,700 | 200 |
| Mechanical engineering | 261,200 | 223,300 | 23,700 | 5,900 | 7,000 | 800 | 195,400 | 173,400 | 11,100 | 4,700 | 5,200 | 500 |
| Other engineering | 289,900 | 254,300 | 22,400 | 5,900 | 6,700 | 600 | 190,800 | 172,300 | 9,300 | 4,300 | 4,500 | 500 |
| Postsecondary engineering | 31,500 | 23,600 | 5,800 | 900 | 1,100 | 100 | 5,300 | 4,100 | 900 | 200 | 100 | - |

See explanatory information and SOURCES at end of table.

**Appendix table 5-18. Scientists and engineers in the U.S. labor force, by occupation, race/ethnicity, and highest degree: 1995**



| Occupation | Master's | | | | | | Doctorate | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | White | Asian | Black | Hispanic | American Indian | Total | White | Asian | Black | Hispanic | American Indian |
| Science and engineering total | 915,700 | 743,200 | 119,500 | 26,200 | 24,600 | 1,800 | 425,700 | 342,300 | 61,300 | 9,800 | 10,700 | 1,500 |
| Computer/mathematical sciences | 273,600 | 214,100 | 45,100 | 9,300 | 4,500 | 400 | 54,600 | 42,200 | 9,600 | 1,200 | 1,400 | 200 |
| Computer/information sciences | 224,500 | 172,600 | 41,500 | 6,500 | 3,600 | 100 | 22,500 | 16,900 | 4,700 | 400 | 500 | 100 |
| Mathematical science | 14,300 | 11,900 | 1,100 | 1,100 | 100 | 100 | 7,700 | 5,900 | 1,400 | 100 | 300 | - |
| Postsecondary mathematics | 34,800 | 29,700 | 2,600 | 1,700 | 800 | 200 | 24,500 | 19,400 | 3,500 | 700 | 600 | 100 |
| Life and related sciences | 65,200 | 54,700 | 6,500 | 2,500 | 1,100 | 100 | 104,400 | 84,700 | 14,800 | 1,900 | 2,800 | 200 |
| Agricultural/food science | 9,600 | 8,400 | 700 | 300 | 100 | - | 9,700 | 7,700 | 1,300 | 100 | 500 | - |
| Biological science | 33,600 | 27,300 | 4,700 | 900 | 500 | - | 59,500 | 45,500 | 11,100 | 900 | 1,800 | 200 |
| Environmental science | 5,900 | 5,700 | - | - | 100 | - | 800 | 800 | - | - | - | - |
| Postsecondary life science | 16,300 | 13,400 | 1,100 | 1,300 | 400 | - | 34,500 | 30,600 | 2,400 | 900 | 500 | - |
| Physical and related sciences | 69,800 | 58,000 | 8,300 | 1,000 | 2,200 | 200 | 80,700 | 65,700 | 11,600 | 1,400 | 1,700 | 200 |
| Chemistry | 20,900 | 15,800 | 3,900 | 700 | 500 | 100 | 26,600 | 19,500 | 5,800 | 600 | 700 | - |
| Earth science | 25,400 | 22,800 | 1,400 | 200 | 900 | 100 | 10,600 | 9,300 | 900 | 200 | 100 | - |
| Physics | 8,100 | 6,900 | 1,200 | - | 100 | - | 14,500 | 11,900 | 2,300 | 100 | 200 | - |
| Other physical science | 5,200 | 4,300 | 600 | - | 200 | - | 2,700 | 2,400 | 300 | - | - | - |
| Postsecondary physics | 10,200 | 8,200 | 1,300 | 100 | 600 | - | 26,100 | 22,600 | 2,300 | 500 | 600 | 100 |
| Social and related sciences | 138,000 | 122,800 | 3,800 | 6,200 | 4,800 | 400 | 113,900 | 100,500 | 5,400 | 4,200 | 3,100 | 700 |
| Economics | 15,600 | 12,700 | 1,000 | 800 | 1,200 | 100 | 7,100 | 5,700 | 900 | 100 | 400 | 100 |
| Political science | 2,700 | 1,900 | 300 | - | 400 | - | 1,200 | 1,000 | 100 | - | 100 | - |
| Psychology | 89,900 | 82,500 | 1,100 | 3,700 | 2,200 | 300 | 48,400 | 44,600 | 900 | 1,400 | 1,100 | 300 |
| Sociology | 5,500 | 5,000 | 300 | 100 | - | - | 3,100 | 2,900 | - | 100 | - | - |
| Other social sciences | 4,900 | 4,400 | 200 | 200 | - | - | 3,000 | 2,500 | 200 | 200 | 200 | - |
| Postsecondary social science | 19,500 | 16,200 | 900 | 1,500 | 1,000 | 100 | 51,000 | 43,800 | 3,300 | 2,300 | 1,300 | 400 |
| Engineering | 369,200 | 293,600 | 55,700 | 7,100 | 12,000 | 700 | 72,100 | 49,300 | 19,800 | 1,100 | 1,800 | 200 |
| Aerospace engineering | 26,800 | 22,700 | 2,300 | 500 | 1,200 | - | 4,400 | 3,200 | 1,000 | - | 100 | - |
| Chemical engineering | 19,900 | 16,300 | 2,400 | 500 | 600 | - | 6,400 | 4,500 | 1,700 | 100 | 200 | - |
| Civil engineering | 52,700 | 39,700 | 10,100 | 700 | 2,100 | 100 | 3,900 | 2,200 | 1,500 | 100 | 100 | - |
| Electrical engineering | 104,700 | 79,200 | 19,200 | 2,400 | 3,800 | 100 | 13,900 | 8,800 | 4,700 | 100 | 300 | - |
| Industrial engineering | 17,100 | 14,700 | 1,700 | 200 | 400 | 100 | 900 | 600 | 200 | - | - | - |
| Mechanical engineering | 57,300 | 44,900 | 9,600 | 1,100 | 1,500 | 300 | 8,100 | 4,800 | 3,000 | 100 | 200 | - |
| Other engineering | 82,000 | 69,600 | 9,000 | 1,400 | 2,000 | 100 | 16,800 | 12,200 | 4,100 | 200 | 300 | - |
| Postsecondary engineering | 8,500 | 6,500 | 1,300 | 200 | 500 | - | 17,600 | 13,000 | 3,600 | 400 | 600 | 100 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. All degrees includes "other" degrees. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-19. Doctoral scientists and engineers in the U.S. labor force, by race/ethnicity, occupation, and citizenship status: 1995**



| Citizenship and occupation | All | White | Asian | Black | Hispanic | American Indian | Other |
|---|---|---|---|---|---|---|---|
| Science and engineering total | 425,600 | 342,300 | 61,300 | 9,800 | 10,700 | 1,500 | 100 |
| Non-U.S. born | 110,000 | 45,000 | 56,800 | 2,900 | 5,200 | 100 | - |
| Computer and mathematical sciences | 18,100 | 7,700 | 9,200 | 400 | 800 | 100 | - |
| Life and related sciences | 26,400 | 10,900 | 13,400 | 600 | 1,600 | - | - |
| Physical and related sciences | 22,300 | 9,900 | 10,900 | 600 | 800 | - | - |
| Social and related sciences | 14,000 | 7,700 | 4,300 | 800 | 1,100 | - | - |
| Engineering | 29,300 | 8,900 | 18,900 | 600 | 900 | - | - |
| U.S. born | 315,600 | 297,300 | 4,500 | 6,900 | 5,500 | 1,300 | 100 |
| Computer and mathematical sciences | 36,500 | 34,500 | 400 | 900 | 500 | 100 | - |
| Life and related sciences | 78,000 | 73,800 | 1,400 | 1,300 | 1,200 | 200 | - |
| Physical and related sciences | 58,400 | 55,900 | 700 | 800 | 900 | 100 | - |
| Social and related sciences | 99,900 | 92,700 | 1,100 | 3,400 | 1,900 | 700 | - |
| Engineering | 42,800 | 40,400 | 900 | 500 | 900 | 100 | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-20. Employment status of scientists and engineers, by occupation and race/ethnicity: 1995**



| Occupation and race/ethnicity | Total | Full-time employed in field | Full-time employed outside field | Part-time employed | Not employed | Not in labor force |
|---|---|---|---|---|---|---|
| Science and engineering total | 3,708,500 | 2,656,800 | 285,800 | 243,000 | 70,600 | 452,300 |
| Hispanic | 102,000 | 77,600 | 6,300 | 6,200 | 2,600 | 9,300 |
| White | 3,138,900 | 2,218,400 | 246,200 | 209,000 | 54,600 | 410,600 |
| Black | 119,100 | 87,600 | 11,700 | 8,200 | 2,700 | 8,900 |
| Asian | 338,100 | 264,500 | 21,200 | 19,000 | 10,600 | 22,900 |
| American Indian | 8,600 | 7,000 | 400 | 600 | 100 | 500 |
| Other | 1,800 | 1,700 | - | - | - | 100 |
| Computer and mathematical sciences | 1,037,100 | 710,700 | 177,800 | 61,000 | 16,800 | 70,800 |
| Hispanic | 25,300 | 18,400 | 3,500 | 1,000 | 700 | 1,700 |
| White | 860,400 | 576,200 | 155,500 | 53,200 | 12,900 | 62,600 |
| Black | 42,000 | 30,100 | 6,900 | 2,200 | 800 | 1,900 |
| Asian | 107,000 | 84,000 | 11,800 | 4,500 | 2,300 | 4,500 |
| American Indian | 1,700 | 1,300 | 100 | 100 | 100 | 100 |
| Other | 700 | 700 | - | - | - | - |
| Life and related sciences | 364,700 | 266,100 | 9,900 | 29,300 | 6,200 | 53,100 |
| Hispanic | 10,600 | 7,300 | 200 | 1,100 | 300 | 1,700 |
| White | 306,000 | 223,800 | 8,500 | 24,800 | 4,700 | 44,100 |
| Black | 12,300 | 8,400 | 500 | 800 | 100 | 2,500 |
| Asian | 34,900 | 25,700 | 700 | 2,600 | 1,100 | 4,700 |
| American Indian | 700 | 700 | - | - | - | - |
| Other | 200 | 200 | - | - | - | 100 |
| Physical and related sciences | 331,000 | 239,300 | 10,300 | 24,900 | 7,500 | 49,300 |
| Hispanic | 8,300 | 6,100 | 500 | 300 | 300 | 1,200 |
| White | 282,500 | 202,900 | 8,300 | 21,500 | 5,500 | 44,400 |
| Black | 9,100 | 6,700 | 600 | 500 | 300 | 1,100 |
| Asian | 30,100 | 23,000 | 700 | 2,500 | 1,400 | 2,400 |
| American Indian | 1,000 | 600 | 200 | 100 | - | 200 |
| Other | - | - | - | - | - | - |
| Social and related sciences | 363,800 | 239,700 | 5,900 | 71,600 | 3,900 | 42,300 |
| Hispanic | 11,600 | 7,200 | 300 | 2,200 | 400 | 1,400 |
| White | 318,600 | 210,500 | 4,900 | 62,500 | 3,300 | 37,400 |
| Black | 18,200 | 12,300 | 700 | 3,500 | 100 | 1,500 |
| Asian | 13,700 | 8,500 | - | 3,200 | 100 | 1,800 |
| American Indian | 1,700 | 1,200 | - | 200 | - | 200 |
| Other | - | - | - | - | - | - |
| Engineering | 1,612,000 | 1,201,100 | 81,800 | 56,100 | 36,200 | 236,700 |
| Hispanic | 46,300 | 38,700 | 1,800 | 1,700 | 800 | 3,300 |
| White | 1,371,500 | 1,005,000 | 69,000 | 47,000 | 28,300 | 222,100 |
| Black | 37,500 | 30,200 | 3,000 | 1,100 | 1,400 | 1,800 |
| Asian | 152,400 | 123,300 | 7,900 | 6,100 | 5,700 | 9,400 |
| American Indian | 3,500 | 3,100 | 100 | 200 | - | 100 |
| Other | 800 | 800 | - | - | - | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-21. Median annual salaries of full-time employed scientists and engineers, by highest degree, occupation, race/ethnicity, and age: 1995**



| Occupation and race/ethnicity | All degrees | | | | | Bachelor's | | | | Master's | | | | Doctorate | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All ages | 20-29 | 30-39 | 40-49 | 50 or older | 20-29 | 30-39 | 40-49 | 50 or older | 20-29 | 30-39 | 40-49 | 50 or older | 20-29 | 30-39 | 40-49 | 50 or older |
| Science and engineering total | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | $50,500 | $35,000 | $49,500 | $56,000 | $60,000 | $35,000 | $48,000 | $55,000 | $60,000 | $37,500 | $52,000 | $57,800 | $60,000 | $36,000 | $49,000 | $60,000 | $65,000 |
| Asian | 50,000 | 38,000 | 48,000 | 56,000 | 58,400 | 35,000 | 46,000 | 51,400 | 53,000 | 42,000 | 50,000 | 59,000 | 60,000 | 34,000 | 50,000 | 60,000 | 67,700 |
| Black, non-Hispanic | 45,000 | 35,000 | 45,000 | 48,000 | 50,000 | 35,000 | 45,000 | 46,000 | 49,900 | 35,000 | 45,600 | 50,000 | 46,000 | 40,000 | 46,000 | 49,000 | 58,000 |
| Hispanic | 47,000 | 35,000 | 45,000 | 52,000 | 60,000 | 33,600 | 45,000 | 50,000 | 60,000 | 41,500 | 49,000 | 52,000 | 62,000 | 40,000 | 44,000 | 53,300 | 62,000 |
| American Indian | 48,000 | 34,000 | 42,000 | 48,000 | 60,000 | 34,000 | 42,000 | 48,000 | 64,000 | 7,200 | 42,300 | 37,000 | 61,000 | - | 41,000 | 50,000 | 60,000 |
| Computer and mathematical sciences | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | 38,000 | 38,000 | 48,000 | 55,000 | 56,000 | 38,000 | 48,000 | 55,000 | 56,000 | 40,200 | 55,000 | 58,300 | 58,000 | 36,000 | 55,000 | 59,800 | 63,500 |
| Asian | 38,000 | 38,000 | 48,700 | 50,000 | 45,000 | 38,000 | 48,700 | 50,000 | 45,000 | 45,000 | 54,000 | 60,000 | 60,000 | - | 56,000 | 55,000 | 63,000 |
| Black, non-Hispanic | 35,000 | 35,000 | 44,000 | 45,800 | - | 35,000 | 44,000 | 45,800 | - | 39,000 | 48,000 | 51,000 | - | - | 49,000 | 48,000 | 58,000 |
| Hispanic | 32,000 | 32,000 | 45,000 | 50,000 | - | 32,000 | 45,000 | 50,000 | - | - | 56,000 | - | - | - | 47,800 | 48,000 | 50,000 |
| American Indian | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Life and related sciences | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | 19,700 | 19,700 | 34,500 | 40,000 | 47,000 | 19,700 | 34,500 | 40,000 | 47,000 | 24,500 | 35,000 | 44,000 | 45,000 | 28,000 | 39,000 | 58,000 | 65,000 |
| Asian | - | - | - | - | - | - | - | - | - | - | 24,000 | - | - | 24,000 | 30,000 | 52,000 | 67,000 |
| Black, non-Hispanic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 19,600 | 49,000 | 50,000 |
| Hispanic | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 30,000 | 61,000 | 85,000 |
| American Indian | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Physical and related sciences | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | 27,000 | 27,000 | 40,000 | 48,600 | 57,500 | 27,000 | 40,000 | 48,600 | 57,500 | 25,700 | 42,000 | 57,300 | 60,000 | 38,000 | 51,300 | 64,000 | 72,000 |
| Asian | 27,000 | 27,000 | - | - | - | 27,000 | - | - | - | 29,000 | 38,000 | 48,000 | - | - | 44,000 | 57,000 | 65,400 |
| Black, non-Hispanic | 30,000 | 30,000 | - | - | - | 30,000 | - | - | - | - | 46,300 | - | - | - | 47,300 | 52,500 | 40,000 |
| Hispanic | 20,000 | 20,000 | 33,000 | - | - | 20,000 | 33,000 | - | - | - | 37,300 | - | - | - | 51,000 | 51,000 | 69,500 |
| American Indian | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Social and related sciences | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | 20,000 | 20,000 | 28,800 | 40,000 | - | 20,000 | 28,800 | 40,000 | - | 26,000 | 35,000 | 40,000 | 47,400 | 42,000 | 42,000 | 52,000 | 60,000 |
| Asian | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 45,000 | 50,900 | 60,000 |
| Black, non-Hispanic | - | - | - | - | - | - | - | - | - | - | 35,000 | 36,100 | - | - | 43,000 | 50,800 | 59,000 |
| Hispanic | - | - | - | - | - | - | - | - | - | - | 36,000 | - | - | - | 40,000 | 50,000 | 53,000 |
| American Indian | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 48,000 | 50,000 |
| Engineering | | | | | | | | | | | | | | | | | |
| White, non-Hispanic | 38,000 | 38,000 | 50,000 | 58,000 | 61,000 | 38,000 | 50,000 | 58,000 | 61,000 | 42,000 | 56,000 | 64,000 | 68,000 | 49,000 | 60,000 | 70,000 | 76,800 |
| Asian | 38,000 | 38,000 | 45,000 | 53,000 | 56,000 | 38,000 | 45,000 | 53,000 | 56,000 | 40,000 | 52,000 | 60,000 | 60,000 | 54,000 | 56,000 | 67,000 | 74,900 |
| Black, non-Hispanic | 40,000 | 40,000 | 48,000 | 54,300 | 50,000 | 40,000 | 48,000 | 54,300 | 50,000 | 42,000 | 50,000 | 65,000 | - | - | 55,000 | 69,600 | 68,000 |
| Hispanic | 37,500 | 37,500 | 48,000 | 53,000 | 62,900 | 37,500 | 48,000 | 53,000 | 62,900 | 43,000 | 52,000 | 65,000 | 66,000 | - | 52,000 | 55,000 | 60,000 |
| American Indian | 36,000 | 36,000 | 48,000 | - | - | 36,000 | 48,000 | - | - | - | - | - | - | - | - | - | - |

KEY: - = Fewer than 20 individuals reporting salary.

NOTES: Because of rounding, details may not add up to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foudation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-22. Scientists and engineers in the U.S. labor force, by occupation, sex, race/ethnicity, and highest degree: 1995**



| Occupation and highest degree | Total | | Hispanic | | White | | Black | | Asian | | American Indian | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men |
| All science and engineering | 727,800 | 2,528,200 | 21,000 | 70,600 | 583,400 | 2,118,500 | 40,900 | 67,600 | 71,300 | 241,800 | 2,000 | 6,000 |
| Bachelor's | 385,300 | 1,498,000 | 11,800 | 44,500 | 311,200 | 1,305,200 | 26,300 | 46,200 | 35,000 | 97,300 | 1,100 | 3,700 |
| Master's | 237,600 | 678,100 | 6,500 | 18,100 | 194,200 | 549,000 | 11,200 | 15,000 | 25,000 | 94,500 | 600 | 1,200 |
| Doctorate | 95,800 | 329,900 | 2,700 | 8,000 | 78,000 | 264,300 | 3,400 | 6,400 | 11,300 | 50,000 | 300 | 1,100 |
| Computer and mathematics sciences | 278,900 | 684,700 | 6,000 | 17,500 | 223,700 | 571,900 | 16,900 | 22,900 | 31,600 | 70,700 | 600 | 1,100 |
| Bachelor's | 189,600 | 445,800 | 4,600 | 13,200 | 155,000 | 384,300 | 12,000 | 17,200 | 17,500 | 30,000 | 500 | 700 |
| Master's | 79,500 | 194,100 | 1,200 | 3,200 | 61,500 | 152,600 | 4,200 | 5,100 | 12,400 | 32,800 | 100 | 200 |
| Doctorate | 9,800 | 44,800 | 200 | 1,100 | 7,200 | 35,000 | 700 | 600 | 1,700 | 7,900 | - | 200 |
| Computer and information science | | | | | | | | | | | | |
| Bachelor's | 178,500 | 426,700 | 4,600 | 12,500 | 145,600 | 368,600 | 10,800 | 15,900 | 17,000 | 29,100 | 500 | 600 |
| Master's | 58,500 | 166,000 | 600 | 3,000 | 44,100 | 128,500 | 2,600 | 4,000 | 11,200 | 30,200 | - | 100 |
| Doctorate | 3,600 | 18,900 | 100 | 400 | 2,400 | 14,500 | 300 | 100 | 800 | 3,900 | - | - |
| Mathematical science | | | | | | | | | | | | |
| Bachelor's | 5,400 | 11,200 | - | 400 | 5,000 | 9,300 | 300 | 900 | 100 | 100 | - | - |
| Master's | 5,700 | 8,600 | 100 | - | 4,700 | 7,200 | 600 | 500 | 300 | 800 | - | 100 |
| Doctorate | 1,600 | 6,100 | - | 200 | 1,300 | 4,600 | - | 100 | 200 | 1,200 | - | - |
| Postsecondary mathematics | | | | | | | | | | | | |
| Bachelor's | 5,600 | 7,900 | - | 300 | 4,500 | 6,400 | 800 | 400 | 400 | 700 | - | - |
| Master's | 15,300 | 19,500 | 500 | 200 | 12,800 | 16,900 | 1,000 | 700 | 900 | 1,700 | 100 | - |
| Doctorate | 4,600 | 19,900 | 100 | 600 | 3,400 | 16,000 | 300 | 400 | 700 | 2,800 | - | 100 |
| Life and related science | 104,100 | 189,400 | 3,000 | 5,300 | 85,100 | 162,100 | 3,900 | 4,800 | 11,700 | 16,800 | 300 | 400 |
| Bachelor's | 47,800 | 76,100 | 1,600 | 2,700 | 40,800 | 67,000 | 1,900 | 2,300 | 3,400 | 3,800 | 100 | 200 |
| Master's | 28,600 | 36,600 | 600 | 600 | 22,600 | 32,100 | 1,500 | 1,000 | 3,600 | 2,900 | 100 | - |
| Doctorate | 27,700 | 76,700 | 800 | 2,000 | 21,700 | 63,000 | 500 | 1,500 | 4,700 | 10,100 | 100 | 200 |
| Agricultural/food science | | | | | | | | | | | | |
| Bachelor's | 7,600 | 17,300 | 100 | 800 | 6,900 | 15,100 | 200 | 1,000 | 400 | 300 | - | - |
| Master's | 2,500 | 7,100 | 100 | 100 | 2,200 | 6,200 | - | 300 | 200 | 500 | - | - |
| Doctorate | 1,500 | 8,200 | 100 | 500 | 1,000 | 6,700 | - | 100 | 400 | 900 | - | - |
| Biological science | | | | | | | | | | | | |
| Bachelor's | 32,500 | 38,800 | 1,100 | 1,500 | 27,100 | 33,400 | 1,600 | 1,200 | 2,500 | 2,700 | 100 | 100 |
| Master's | 16,100 | 17,500 | 200 | 300 | 12,200 | 15,100 | 700 | 300 | 2,800 | 1,900 | - | - |
| Doctorate | 17,800 | 41,700 | 600 | 1,200 | 13,200 | 32,300 | 200 | 700 | 3,800 | 7,300 | 100 | 100 |
| Environmental science | | | | | | | | | | | | |
| Bachelor's | 2,000 | 12,000 | - | 200 | 2,000 | 11,300 | - | 100 | - | 200 | - | 100 |
| Master's | 800 | 5,100 | 100 | - | 600 | 5,000 | - | - | - | - | - | - |
| Doctorate | 100 | 700 | - | - | 100 | 700 | - | - | - | - | - | - |

See explanatory information and SOURCES at end of table.

**Appendix table 5-22. Scientists and engineers in the U.S. labor force, by occupation, sex, race/ethnicity, and highest degree: 1995**



| Occupation and highest degree | Total | | Hispanic | | White | | Black | | Asian | | American Indian | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men |
| Postsecondary life sciences | | | | | | | | | | | | |
| Bachelor's | 5,800 | 8,000 | 300 | 200 | 4,800 | 7,200 | 200 | 100 | 500 | 600 | - | - |
| Master's | 9,300 | 7,000 | 300 | 100 | 7,500 | 5,900 | 800 | 500 | 600 | 500 | - | - |
| Doctorate | 8,300 | 26,200 | 200 | 300 | 7,400 | 23,200 | 200 | 700 | 600 | 1,900 | - | - |
| Physical and related science | 61,000 | 220,500 | 2,100 | 5,000 | 47,000 | 190,800 | 3,300 | 4,800 | 8,300 | 19,400 | 300 | 600 |
| Bachelor's | 34,300 | 96,700 | 1,300 | 1,900 | 26,200 | 87,900 | 2,700 | 2,900 | 3,900 | 3,800 | 200 | 300 |
| Master's | 16,900 | 52,900 | 600 | 1,600 | 13,300 | 44,700 | 400 | 700 | 2,500 | 5,800 | 100 | 100 |
| Doctorate | 9,800 | 70,900 | 200 | 1,500 | 7,500 | 58,200 | 200 | 1,200 | 1,900 | 9,800 | - | 200 |
| Chemistry | | | | | | | | | | | | |
| Bachelor's | 19,600 | 46,700 | 500 | 800 | 13,900 | 41,000 | 1,800 | 2,600 | 3,400 | 2,100 | - | 300 |
| Master's | 6,100 | 14,800 | 400 | 100 | 4,300 | 11,600 | 100 | 500 | 1,300 | 2,500 | - | 100 |
| Doctorate | 4,000 | 22,600 | 100 | 700 | 2,800 | 16,700 | 100 | 500 | 1,000 | 4,800 | - | - |
| Earth science | | | | | | | | | | | | |
| Bachelor's | 6,700 | 30,400 | 500 | 700 | 5,700 | 28,400 | 100 | 100 | 200 | 1,100 | 200 | 100 |
| Master's | 5,300 | 20,100 | 100 | 800 | 4,800 | 18,000 | 200 | - | - | 1,400 | 100 | - |
| Doctorate | 1,300 | 9,300 | - | 100 | 1,200 | 8,100 | - | 200 | 100 | 800 | - | - |
| Physics | | | | | | | | | | | | |
| Bachelor's | 1,000 | 6,400 | - | 200 | 800 | 6,000 | 200 | - | - | 200 | - | - |
| Master's | 1,600 | 6,500 | - | 100 | 1,200 | 5,600 | - | - | 400 | 800 | - | - |
| Doctorate | 800 | 13,700 | - | 200 | 500 | 11,400 | - | 100 | 300 | 2,000 | - | - |
| Other physical science | | | | | | | | | | | | |
| Bachelor's | 3,100 | 6,200 | 200 | 100 | 2,700 | 5,900 | 200 | - | - | 100 | - | - |
| Master's | 1,300 | 3,900 | - | 200 | 1,000 | 3,300 | - | - | 200 | 400 | - | - |
| Doctorate | 300 | 2,400 | - | - | 200 | 2,200 | - | - | 100 | 200 | - | - |
| Postsecondary physical science | | | | | | | | | | | | |
| Bachelor's | 3,800 | 7,200 | 100 | 100 | 3,100 | 6,600 | 300 | 200 | 200 | 300 | - | - |
| Master's | 2,600 | 7,600 | - | 500 | 2,000 | 6,200 | - | 100 | 500 | 800 | - | - |
| Doctorate | 3,300 | 22,800 | 100 | 500 | 2,700 | 19,900 | - | 400 | 400 | 1,900 | - | 100 |
| Social and related science | 156,300 | 157,200 | 5,000 | 4,800 | 136,400 | 137,500 | - | 7,300 | - | 6,500 | 600 | 900 |
| Bachelor's | 32,000 | 29,600 | 1,000 | 1,100 | 25,700 | 25,100 | 3,600 | 2,200 | 1,600 | 1,000 | 100 | 200 |
| Master's | 81,300 | 56,700 | 2,900 | 1,800 | 72,700 | 50,000 | 3,400 | 2,800 | 2,000 | 1,800 | 200 | 200 |
| Doctorate | 43,000 | 70,900 | 1,100 | 1,900 | 38,000 | 62,400 | 1,900 | 2,300 | 1,700 | 3,700 | 300 | 500 |

See explanatory information and SOURCES at end of table.

**Appendix table 5-22. Scientists and engineers in the U.S. labor force, by occupation, sex, race/ethnicity, and highest degree: 1995**



| Occupation and highest degree | Total | | Hispanic | | White | | Black | | Asian | | American Indian | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men |
| Economics | | | | | | | | | | | | |
| Bachelor's | 4,100 | 7,200 | - | 400 | 4,000 | 6,500 | 100 | 200 | - | 100 | - | - |
| Master's | 4,000 | 11,600 | 700 | 400 | 2,700 | 10,000 | - | 700 | 600 | 400 | - | 100 |
| Doctorate | 1,500 | 5,600 | - | 300 | 1,100 | 4,600 | - | 100 | 300 | 600 | - | 100 |
| Political science | | | | | | | | | | | | |
| Bachelor's | 2,100 | 3,000 | 100 | - | 1,600 | 2,700 | 100 | 100 | 200 | 200 | - | - |
| Master's | 1,600 | 1,100 | 200 | 200 | 1,300 | 600 | - | - | - | 300 | - | - |
| Doctorate | 300 | 900 | - | 100 | 300 | 700 | - | - | - | 100 | - | - |
| Psychology | | | | | | | | | | | | |
| Bachelor's | 16,800 | 9,100 | 700 | 400 | 13,000 | 7,400 | 2,100 | 800 | 1,000 | 200 | - | 200 |
| Master's | 60,300 | 29,600 | 1,600 | 600 | 55,500 | 27,000 | 2,200 | 1,500 | 800 | 300 | 200 | 100 |
| Doctorate | 22,800 | 25,600 | 500 | 600 | 20,700 | 24,000 | 900 | 500 | 400 | 500 | 100 | 100 |
| Sociology | | | | | | | | | | | | |
| Bachelor's | 3,300 | 4,500 | - | 200 | 2,900 | 4,100 | 200 | 200 | 200 | 100 | 100 | - |
| Master's | 3,200 | 2,300 | - | - | 2,900 | 2,100 | - | - | 100 | 200 | - | - |
| Doctorate | 1,300 | 1,800 | - | - | 1,100 | 1,700 | 100 | - | - | - | - | - |
| Other social science | | | | | | | | | | | | |
| Bachelor's | 1,800 | 2,000 | 100 | - | 1,500 | 1,400 | 200 | 400 | - | 100 | - | - |
| Master's | 2,200 | 2,700 | - | - | 1,900 | 2,500 | 100 | 100 | 100 | 100 | - | - |
| Doctorate | 1,400 | 1,600 | 100 | 100 | 1,100 | 1,400 | 200 | - | 100 | 100 | - | - |
| Postsecondary social sciences | | | | | | | | | | | | |
| Bachelor's | 3,800 | 3,800 | - | 100 | 2,800 | 2,900 | 800 | 400 | 200 | 300 | - | - |
| Master's | 10,100 | 9,400 | 400 | 600 | 8,300 | 7,900 | 1,100 | 400 | 400 | 500 | - | 100 |
| Doctorate | 15,700 | 35,300 | 500 | 800 | 13,700 | 30,100 | 600 | 1,700 | 900 | 2,500 | 100 | 300 |
| Engineering | 118,600 | 1,254,200 | 4,800 | 38,000 | 91,000 | 1,056,200 | 8,100 | 27,700 | 14,400 | 128,500 | 200 | 3,100 |
| Bachelor's | 81,700 | 849,800 | 3,400 | 25,600 | 63,400 | 741,000 | 6,100 | 21,500 | 8,600 | 58,800 | 200 | 2,300 |
| Master's | 31,400 | 337,800 | 1,100 | 10,900 | 24,000 | 269,600 | 1,800 | 5,300 | 4,500 | 51,200 | - | 700 |
| Doctorate | 5,500 | 66,600 | 300 | 1,500 | 3,600 | 45,600 | 200 | 900 | 1,300 | 18,500 | - | 100 |
| Aerospace engineering | | | | | | | | | | | | |
| Bachelor's | 2,900 | 41,000 | 100 | 1,700 | 2,400 | 35,700 | 300 | 900 | 100 | 2,500 | - | 200 |
| Master's | 1,500 | 25,300 | - | 1,100 | 1,200 | 21,500 | 200 | 300 | 200 | 2,200 | - | - |
| Doctorate | 200 | 4,200 | - | 100 | 100 | 3,100 | - | - | - | 1,000 | - | - |
| Chemical engineering | | | | | | | | | | | | |
| Bachelor's | 6,300 | 40,300 | 300 | 1,300 | 4,500 | 34,500 | 600 | 1,200 | 900 | 3,300 | - | - |
| Master's | 2,200 | 17,700 | - | 600 | 1,700 | 14,600 | 200 | 400 | 200 | 2,200 | - | - |
| Doctorate | 900 | 5,500 | - | 100 | 700 | 3,700 | - | 100 | 100 | 1,600 | - | - |

See explanatory information and SOURCES at end of table.

**Appendix table 5-22. Scientists and engineers in the U.S. labor force, by occupation, sex, race/ethnicity, and highest degree: 1995**



| Occupation and highest degree | Total | | Hispanic | | White | | Black | | Asian | | American Indian | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men |
| Civil engineering | | | | | | | | | | | | |
| Bachelor's | 14,000 | 131,700 | 400 | 4,900 | 11,100 | 113,700 | 400 | 2,500 | 2,000 | 10,300 | - | 300 |
| Master's | 4,100 | 48,600 | 300 | 1,800 | 2,800 | 37,000 | 200 | 500 | 800 | 9,300 | - | 100 |
| Doctorate | 300 | 3,600 | - | 100 | 100 | 2,000 | - | 100 | 200 | 1,400 | - | - |
| Electrical engineering | | | | | | | | | | | | |
| Bachelor's | 16,400 | 233,400 | 800 | 8,100 | 10,900 | 195,000 | 1,700 | 7,600 | 2,900 | 22,000 | - | 800 |
| Master's | 6,300 | 98,400 | 200 | 3,500 | 4,000 | 75,200 | 600 | 1,900 | 1,600 | 17,600 | - | 100 |
| Doctorate | 500 | 13,400 | - | 300 | 100 | 8,600 | - | 100 | 300 | 4,400 | - | - |
| Industrial engineering | | | | | | | | | | | | |
| Bachelor's | 7,100 | 46,800 | 300 | 1,400 | 5,500 | 41,200 | 800 | 2,400 | 500 | 1,600 | - | 200 |
| Master's | 2,400 | 14,700 | - | 300 | 2,100 | 12,600 | 100 | 100 | 100 | 1,500 | - | 100 |
| Doctorate | 100 | 800 | - | - | 100 | 500 | - | - | - | 200 | - | - |
| Mechanical engineering | | | | | | | | | | | | |
| Bachelor's | 10,300 | 185,100 | 200 | 5,000 | 8,800 | 164,600 | 500 | 4,200 | 800 | 10,300 | - | 500 |
| Master's | 4,000 | 53,300 | 100 | 1,400 | 3,000 | 41,900 | 200 | 800 | 600 | 9,000 | - | 300 |
| Doctorate | 700 | 7,400 | - | 200 | 500 | 4,300 | 100 | 100 | 100 | 2,900 | - | - |
| Other engineering | | | | | | | | | | | | |
| Bachelor's | 24,500 | 166,300 | 1,200 | 3,300 | 20,100 | 152,300 | 1,700 | 2,600 | 1,300 | 7,900 | 200 | 300 |
| Master's | 9,800 | 72,200 | 300 | 1,700 | 8,300 | 61,200 | 300 | 1,100 | 900 | 8,100 | - | 100 |
| Doctorate | 1,600 | 15,200 | - | 300 | 1,100 | 11,100 | 100 | 100 | 400 | 3,700 | - | - |
| Postsecondary engineering | | | | | | | | | | | | |
| Bachelor's | 200 | 5,100 | - | - | 100 | 4,100 | - | 200 | 100 | 900 | - | - |
| Master's | 1,000 | 7,500 | 100 | 400 | 900 | 5,600 | - | 200 | 100 | 1,300 | - | - |
| Doctorate | 1,200 | 16,400 | 200 | 400 | 800 | 12,200 | - | 400 | 200 | 3,400 | - | 100 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "professional and other degrees." Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-23. Employment status of scientists and engineers, by occupation, sex, and race/ethnicity: 1995**



| Occupation, sex, and race/ethnicity | Total | Full-time employed in field | Full-time employed outside field | Part-time employed | Not employed | Not in labor force |
|---|---|---|---|---|---|---|
| Science and engineering total | 3,708,300 | 2,656,700 | 285,900 | 242,900 | 70,500 | 452,300 |
| Women | | | | | | |
| Hispanic | 25,000 | 17,000 | 900 | 2,900 | 500 | 3,700 |
| White, non-Hispanic | 684,000 | 417,100 | 59,100 | 104,200 | 10,600 | 92,900 |
| Black, non-Hispanic | 44,600 | 31,700 | 4,200 | 4,200 | 1,100 | 3,500 |
| Asian | 79,300 | 57,200 | 7,300 | 5,600 | 2,200 | 7,000 |
| American Indian | 2,300 | 1,500 | 300 | 200 | - | 300 |
| Other | 300 | 200 | - | - | - | 100 |
| Men | | | | | | |
| Hispanic | 77,000 | 60,600 | 5,400 | 3,300 | 2,000 | 5,600 |
| White, non-Hispanic | 2,454,900 | 1,801,300 | 187,100 | 104,800 | 44,000 | 317,700 |
| Black, non-Hispanic | 74,500 | 56,000 | 7,500 | 3,900 | 1,600 | 5,400 |
| Asian | 258,800 | 207,200 | 13,900 | 13,400 | 8,400 | 15,900 |
| American Indian | 6,300 | 5,400 | 200 | 400 | 100 | 200 |
| Other | 1,500 | 1,500 | - | - | - | - |
| Computer and mathematics sciences | | | | | | |
| Women | | | | | | |
| Hispanic | 6,900 | 4,800 | 800 | 400 | - | 800 |
| White, non-Hispanic | 253,600 | 141,600 | 48,000 | 31,000 | 3,300 | 29,800 |
| Black, non-Hispanic | 18,000 | 11,800 | 3,100 | 1,500 | 400 | 1,200 |
| Asian | 33,800 | 25,000 | 5,000 | 1,200 | 400 | 2,100 |
| American Indian | 700 | 500 | 100 | 100 | - | 100 |
| Other | - | - | - | - | - | - |
| Men | | | | | | |
| Hispanic | 18,400 | 13,600 | 2,700 | 600 | 700 | 900 |
| White, non-Hispanic | 606,700 | 434,500 | 107,500 | 22,200 | 9,600 | 32,900 |
| Black, non-Hispanic | 24,000 | 18,200 | 3,900 | 700 | 400 | 800 |
| Asian | 73,200 | 58,900 | 6,800 | 3,300 | 1,800 | 2,400 |
| American Indian | 1,000 | 800 | 100 | 100 | 100 | - |
| Other | 700 | 700 | - | - | - | - |
| Life and related sciences | | | | | | |
| Women | | | | | | |
| Hispanic | 3,900 | 2,300 | - | 800 | 100 | 800 |
| White, non-Hispanic | 105,600 | 70,000 | 2,100 | 14,000 | 2,300 | 17,200 |
| Black, non-Hispanic | 5,600 | 3,900 | - | 300 | - | 1,400 |
| Asian | 14,600 | 10,500 | 400 | 1,300 | 500 | 1,900 |
| American Indian | 200 | 200 | - | - | - | - |
| Other | 200 | 200 | - | - | - | 100 |
| Men | | | | | | |
| Hispanic | 6,600 | 5,000 | 200 | 300 | 200 | 1,000 |
| White, non-Hispanic | 200,400 | 153,800 | 6,400 | 10,900 | 2,400 | 26,900 |
| Black, non-Hispanic | 6,700 | 4,600 | 500 | 500 | - | 1,100 |
| Asian | 20,300 | 15,200 | 300 | 1,300 | 700 | 2,800 |
| American Indian | 500 | 400 | - | - | - | - |
| Other | - | - | - | - | - | - |
| Physical and related sciences | | | | | | |
| Women | | | | | | |
| Hispanic | 2,900 | 1,900 | - | 100 | 200 | 800 |
| White, non-Hispanic | 59,900 | 36,300 | 2,400 | 7,300 | 1,100 | 12,900 |
| Black, non-Hispanic | 3,300 | 2,600 | 200 | 200 | 100 | - |
| Asian | 9,300 | 6,900 | - | 900 | 500 | 1,100 |
| American Indian | 300 | 100 | 200 | - | - | - |
| Other | - | - | - | - | - | - |

See explanatory information and SOURCES at end of table.

**Appendix table 5-23. Employment status of scientists and engineers, by occupation, sex, and race/ethnicity: 1995**



| Occupation, sex, and race/ethnicity | Total | Full-time employed in field | Full-time employed outside field | Part-time employed | Not employed | Not in labor force |
|---|---|---|---|---|---|---|
| Men | | | | | | |
| Hispanic | 5,400 | 4,200 | 500 | 200 | 100 | 400 |
| White, non-Hispanic | 222,500 | 166,600 | 5,900 | 14,200 | 4,400 | 31,400 |
| Black, non-Hispanic | 5,900 | 4,100 | 400 | 300 | 100 | 1,000 |
| Asian | 20,800 | 16,200 | 700 | 1,700 | 900 | 1,400 |
| American Indian | 700 | 500 | - | - | - | 100 |
| Other | - | - | - | - | - | - |
| Social and related sciences | | | | | | |
| Women | | | | | | |
| Hispanic | 6,200 | 3,800 | - | 1,100 | 100 | 1,100 |
| White, non-Hispanic | 160,000 | 92,100 | 2,200 | 44,700 | 1,700 | 19,400 |
| Black, non-Hispanic | 9,600 | 6,600 | 300 | 2,000 | 100 | 700 |
| Asian | 5,900 | 3,700 | - | 1,500 | 100 | 600 |
| American Indian | 800 | 500 | - | 100 | - | 200 |
| Other | - | - | - | - | - | - |
| Men | | | | | | |
| Hispanic | 5,400 | 3,400 | 300 | 1,100 | 200 | 300 |
| White, non-Hispanic | 158,600 | 118,400 | 2,700 | 17,900 | 1,600 | 18,000 |
| Black, non-Hispanic | 8,600 | 5,700 | 400 | 1,600 | - | 800 |
| Asian | 7,800 | 4,800 | - | 1,600 | 100 | 1,200 |
| American Indian | 900 | 800 | - | 100 | - | - |
| Other | - | - | - | - | - | - |
| Engineering | | | | | | |
| Women | | | | | | |
| Hispanic | 5,000 | 4,200 | 100 | 500 | 100 | 200 |
| White, non-Hispanic | 104,800 | 77,100 | 4,400 | 7,300 | 2,300 | 13,700 |
| Black, non-Hispanic | 8,200 | 6,800 | 600 | 200 | 500 | 200 |
| Asian | 15,600 | 11,100 | 1,800 | 600 | 800 | 1,200 |
| American Indian | 300 | 300 | - | - | - | - |
| Other | 41,200 | 34,500 | 1,800 | 1,200 | 800 | 3,000 |
| Men | | | | | | |
| Hispanic | 1,266,700 | 927,900 | 64,600 | 39,700 | 26,000 | 208,500 |
| White, non-Hispanic | 29,300 | 23,400 | 2,400 | 900 | 1,000 | 1,700 |
| Black, non-Hispanic | 136,900 | 112,100 | 6,200 | 5,500 | 4,900 | 8,200 |
| Asian | 3,200 | 2,900 | 100 | 200 | - | 100 |
| American Indian | 800 | 800 | - | - | - | - |
| Other | 800 | 800 | - | - | - | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-24. Full-time doctoral scientists and engineers in 4-year colleges or universities, by academic rank, sex, and race/ethnicity: 1995**



| Sex and academic rank | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian |
|---|---|---|---|---|---|---|
| Both sexes | | | | | | |
| Total | 170,400 | 141,500 | 19,700 | 3,900 | 4,600 | 700 |
| Not applicable at this institution | 2,600 | 2,100 | 400 | - | 100 | - |
| Not applicable for my position | 24,200 | 17,900 | 5,100 | 500 | 600 | - |
| Professor | 60,400 | 53,600 | 4,400 | 800 | 1,100 | 400 |
| Associate professor | 40,000 | 33,800 | 3,700 | 1,200 | 1,100 | 200 |
| Assistant professor | 34,800 | 27,600 | 4,400 | 1,200 | 1,400 | 100 |
| Instructor | 2,000 | 1,500 | 300 | - | 100 | - |
| Lecturer | 1,700 | 1,500 | 100 | - | 100 | - |
| Adjunct faculty | 2,200 | 1,800 | 300 | - | - | - |
| Other | 2,500 | 1,600 | 800 | - | 100 | - |
| Women | | | | | | |
| Total | 35,700 | 29,600 | 3,600 | 1,100 | 1,200 | 100 |
| Not applicable at this institution | 400 | 400 | 100 | - | - | - |
| Not applicable for my position | 7,500 | 5,700 | 1,400 | 200 | 200 | - |
| Professor | 6,000 | 5,300 | 400 | 100 | 100 | 100 |
| Associate professor | 7,900 | 6,900 | 400 | 300 | 200 | - |
| Assistant professor | 11,000 | 8,900 | 1,000 | 500 | 500 | 100 |
| Instructor | 1,000 | 800 | 100 | - | 100 | - |
| Lecturer | 600 | 500 | - | - | - | - |
| Adjunct faculty | 700 | 600 | 100 | - | - | - |
| Other | 600 | 400 | 100 | - | - | - |
| Men | | | | | | |
| Total | 134,700 | 111,900 | 16,000 | 2,800 | 3,300 | 600 |
| Not applicable at this institution | 2,100 | 1,700 | 300 | - | 100 | - |
| Not applicable for my position | 16,800 | 12,300 | 3,800 | 300 | 400 | - |
| Professor | 54,300 | 48,300 | 4,100 | 700 | 1,000 | 300 |
| Associate professor | 32,000 | 26,900 | 3,200 | 900 | 900 | 200 |
| Assistant professor | 23,800 | 18,700 | 3,400 | 800 | 900 | - |
| Instructor | 1,000 | 700 | 200 | - | - | - |
| Lecturer | 1,100 | 1,000 | 100 | - | - | - |
| Adjunct faculty | 1,500 | 1,200 | 300 | - | - | - |
| Other | 1,900 | 1,200 | 700 | - | 100 | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-25. Full-time doctoral scientists and engineers in 4-year colleges or universities, by sex, race/ethnicity, and tenure: 1995**



| Sex and tenure | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian |
|---|---|---|---|---|---|---|
| Both sexes | | | | | | |
| Total | 170,400 | 141,500 | 19,600 | 3,900 | 4,500 | 700 |
| No tenure system at this institution | 5,800 | 4,400 | 1,000 | 100 | 200 | - |
| No tenure system for my position | 26,600 | 20,400 | 5,000 | 500 | 700 | - |
| Tenured | 91,800 | 80,600 | 6,900 | 1,800 | 1,900 | 500 |
| On tenure track but not tenured | 30,700 | 24,100 | 3,900 | 1,200 | 1,400 | 100 |
| Not on tenure track | 15,500 | 12,000 | 2,900 | 200 | 400 | - |
| Women | | | | | | |
| Total | 35,700 | 29,600 | 3,600 | 1,100 | 1,200 | 100 |
| No tenure system at this institution | 1,100 | 900 | 200 | - | - | - |
| No tenure system for my position | 8,000 | 6,300 | 1,200 | 200 | 300 | - |
| Tenured | 12,500 | 11,100 | 600 | 400 | 300 | 100 |
| On tenure track but not tenured | 8,900 | 7,200 | 800 | 400 | 500 | - |
| Not on tenure track | 5,200 | 4,100 | 800 | 100 | 200 | - |
| Men | | | | | | |
| Total | 134,700 | 111,900 | 16,000 | 2,800 | 3,300 | 600 |
| No tenure system at this institution | 4,700 | 3,600 | 800 | 100 | 200 | - |
| No tenure system for my position | 18,600 | 14,100 | 3,800 | 300 | 400 | - |
| Tenured | 79,300 | 69,500 | 6,300 | 1,400 | 1,600 | 500 |
| On tenure track but not tenured | 21,800 | 16,900 | 3,100 | 800 | 900 | - |
| Not on tenure track | 10,300 | 7,800 | 2,000 | 200 | 200 | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-26. Scientists and engineers employed in business or industry, by sex, race/ethnicity, and primary work activity: 1995**



| Primary work activity and sex | Race/ethnicity | | | | | | |
|---|---|---|---|---|---|---|---|
| | Total | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian | Other |
| Total | 1,849,800 | 1,558,700 | 186,400 | 51,700 | 48,900 | 3,800 | 100 |
| Women | 333,500 | 268,200 | 38,900 | 17,000 | 8,600 | 700 | - |
| Men | 1,516,300 | 1,290,500 | 147,500 | 34,700 | 40,300 | 3,100 | 100 |
| Reseach and development | | | | | | | |
| Women | 92,700 | 71,100 | 13,200 | 5,500 | 2,600 | 300 | - |
| Men | 606,400 | 515,900 | 61,500 | 11,300 | 16,000 | 1,500 | 100 |
| Teaching | | | | | | | |
| Women | 4,700 | 4,500 | - | 100 | 100 | - | - |
| Men | 6,200 | 5,300 | 400 | 300 | 100 | 100 | - |
| Management and administration | | | | | | | |
| Women | 60,100 | 50,000 | 5,100 | 2,900 | 1,800 | 200 | - |
| Men | 331,200 | 293,200 | 20,500 | 8,200 | 8,700 | 600 | - |
| Computer applications | | | | | | | |
| Women | 127,600 | 101,100 | 17,200 | 6,100 | 3,100 | 200 | - |
| Men | 410,700 | 337,700 | 50,200 | 11,600 | 10,300 | 800 | - |
| Other | | | | | | | |
| Women | 48,500 | 41,500 | 3,300 | 2,500 | 1,000 | 100 | - |
| Men | 161,800 | 138,400 | 14,900 | 3,200 | 5,100 | 200 | - |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-27. Median annual salaries of full-time employed scientists and engineers, by occupation, age, sex, and race/ethnicity: 1995**



| Occupation and age | Women | | | | | Men | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian | White, non-Hispanic | Asian | Black, non-Hispanic | Hispanic | American Indian |
| Science and engineering total | | | | | | | | | | |
| 20-29 | $31,000 | $34,000 | $33,000 | $28,500 | $31,000 | $36,000 | $40,000 | $36,000 | $36,000 | $34,000 |
| 30-39 | 43,000 | 45,000 | 43,000 | 39,000 | 35,000 | 50,000 | 50,000 | 47,000 | 47,000 | 48,000 |
| 40-49 | 47,692 | 45,000 | 47,500 | 41,000 | 48,000 | 58,800 | 59,000 | 48,900 | 54,000 | 49,000 |
| 50 or older | 49,344 | 48,000 | 34,000 | 50,000 | 58,000 | 62,000 | 60,000 | 54,000 | 60,000 | 61,000 |
| Computer and mathematics sciences | | | | | | | | | | |
| 20-29 | 38,000 | 38,500 | 32,000 | - | - | 38,600 | 43,000 | 36,000 | 35,000 | - |
| 30-39 | 45,000 | 48,000 | 41,000 | 40,000 | - | 50,000 | 54,000 | 49,200 | 48,000 | - |
| 40-49 | 50,000 | 50,000 | 48,000 | - | - | 59,000 | 59,000 | 48,900 | 55,000 | - |
| 50 or older | 50,000 | 47,400 | - | - | - | 60,000 | 59,000 | 53,000 | 54,000 | - |
| Life and related sciences | | | | | | | | | | |
| 20-29 | 20,000 | 26,000 | - | - | - | 21,000 | 15,000 | - | - | - |
| 30-39 | 33,000 | 28,800 | 27,800 | 32,000 | - | 39,500 | 30,000 | 31,000 | 36,000 | - |
| 40-49 | 45,000 | 38,000 | 36,300 | 29,000 | - | 48,500 | 51,300 | 48,000 | 43,000 | - |
| 50 or older | 43,400 | 50,000 | 33,000 | - | - | 60,000 | 65,000 | 41,300 | 43,500 | - |
| Physical and related sciences | | | | | | | | | | |
| 20-29 | 29,000 | 29,500 | - | - | - | 25,000 | 25,000 | - | 16,000 | - |
| 30-39 | 40,000 | 45,000 | 45,000 | 38,900 | - | 42,500 | 40,000 | 43,000 | 35,000 | - |
| 40-49 | 46,000 | 43,000 | - | - | - | 57,800 | 50,000 | 45,000 | 52,000 | - |
| 50 or older | 44,900 | 46,100 | - | - | - | 65,000 | 55,000 | 47,000 | 60,000 | - |
| Social and related sciences | | | | | | | | | | |
| 20-29 | 23,000 | - | - | 16,000 | - | 25,000 | - | - | - | - |
| 30-39 | 35,500 | 45,000 | 34,200 | 35,000 | - | 39,000 | 40,000 | 49,900 | 40,000 | - |
| 40-49 | 41,500 | 45,000 | 37,800 | 42,500 | - | 48,600 | 55,000 | 35,000 | 48,000 | - |
| 50 or older | 47,400 | 53,700 | 29,000 | 50,000 | - | 59,000 | 56,000 | 63,000 | 53,000 | - |
| Engineering | | | | | | | | | | |
| 20-29 | 38,800 | 37,700 | 42,000 | 40,000 | - | 38,000 | 39,000 | 40,000 | 40,000 | 37,800 |
| 30-39 | 49,600 | 50,000 | 49,100 | 49,700 | - | 52,000 | 50,000 | 48,000 | 49,000 | 48,000 |
| 40-49 | 52,000 | 48,000 | - | - | - | 60,000 | 60,000 | 58,000 | 58,600 | - |
| 50 or older | 60,000 | 51,000 | - | - | - | 64,000 | 60,000 | 62,000 | 65,000 | - |

KEY: - = Fewer than 20 individuals reporting salary.

NOTES: Because of rounding, details may not add up to totals. Total includes "other" race/ethnicity. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Table 5-28. U.S. population and scientists and engineers, by type of disability: 1995**



| U.S. population 15-64 years old | | | Scientists and engineers | | |
|---|---|---|---|---|---|
| Disability status and type | Number (in thousands) | Percent | Disability status and type | Number | Percent |
| Total population 15-64 years old | 171,112 | 100.0 | Total scientists and engineers | 3,708,400 | 100.0 |
| Having difficulty: | 31,061 | 18.2 | Moderate or severe difficulty or unable to do: | 235,300 | 6.3 |
| Seeing words and letters | 4,163 | 2.4 | Seeing words and letters | 87,100 | 2.3 |
| Hearing normal conversation | 4,702 | 2.7 | Hearing normal conversation | 110,100 | 3.0 |
| Having speech understood | 1,242 | 0.7 | | | |
| Lifting and carrying 10 pounds | 8,219 | 4.8 | Lifting and carrying 10 pounds | 59,000 | 1.6 |
| Climbing stairs without resting | 8,758 | 5.1 | | | |
| Walking 3 city blocks | 8,934 | 5.2 | Walking without assistance or using stairs | 50,700 | 1.4 |

NOTES: Because of rounding, details may not add up to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-29. Scientists and engineers with disabilities who are in the labor force, by age at onset of disability: 1995**



| Age at onset | Number | Percent |
|---|---|---|
| Total | 160,800 | 100.0 |
| Since birth | 11,100 | 6.9 |
| Younger than 10 | 14,400 | 9.0 |
| 10 to 19 | 22,300 | 13.9 |
| 20 to 29 | 26,700 | 16.6 |
| 30 to 39 | 24,100 | 15.0 |
| 40 to 49 | 39,800 | 24.8 |
| 50 or older | 22,400 | 13.9 |

NOTES: Because of rounding, details may not add up to totals.
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

*Women, Minorities, and Persons With Disabilities in Science and Engineering: 1998*

**Appendix table 5-30. Employment status of scientists and engineers, by age and disability status: 1995**



| Age and disability status | Employment status: Total | Full-time employed in field | Full-time employed outside field | Part-time employed | Not employed | Not in labor force |
|---|---|---|---|---|---|---|
| All ages | | | | | | |
| Persons without disabilities..... | 3,473,100 | 2,534,600 | 268,900 | 227,700 | 64,100 | 377,800 |
| Persons with disabilities..... | 235,300 | 122,100 | 17,000 | 15,300 | 6,500 | 74,500 |
| Younger than 35 | | | | | | |
| Persons without disabilities..... | 1,030,000 | 811,000 | 57,100 | 89,900 | 15,300 | 56,700 |
| Persons with disabilities..... | 21,700 | 16,900 | 1,400 | 1,400 | 600 | 1,500 |
| 35 to 44 | | | | | | |
| Persons without disabilities..... | 1,102,800 | 887,900 | 105,200 | 53,100 | 17,400 | 39,300 |
| Persons with disabilities..... | 44,100 | 34,600 | 3,100 | 1,600 | 1,500 | 3,200 |
| 45 to 54 | | | | | | |
| Persons without disabilities..... | 714,300 | 569,500 | 77,900 | 33,900 | 14,400 | 18,600 |
| Persons with disabilities..... | 62,000 | 43,200 | 9,200 | 3,200 | 2,000 | 4,400 |
| 55 or older | | | | | | |
| Persons without disabilities..... | 626,000 | 266,300 | 28,700 | 50,800 | 17,000 | 263,100 |
| Persons with disabilities..... | 107,500 | 27,400 | 3,300 | 9,000 | 2,400 | 65,400 |
| Percentage distribution: | | | | | | |
| Younger than 35 | | | | | | |
| Persons without disabilities..... | 100.0 | 78.7 | 5.5 | 8.7 | 1.5 | 5.5 |
| Persons with disabilities..... | 100.0 | 77.9 | 6.5 | 6.5 | 2.8 | 6.9 |
| 35 to 44 | | | | | | |
| Persons without disabilities..... | 100.0 | 80.5 | 9.5 | 4.8 | 1.6 | 3.6 |
| Persons with disabilities..... | 100.0 | 78.5 | 7.0 | 3.6 | 3.4 | 7.3 |
| 45 to 54 | | | | | | |
| Persons without disabilities..... | 100.0 | 79.7 | 10.9 | 4.7 | 2.0 | 2.6 |
| Persons with disabilities..... | 100.0 | 69.7 | 14.8 | 5.2 | 3.2 | 7.1 |
| 55 or older | | | | | | |
| Persons without disabilities..... | 100.0 | 42.5 | 4.6 | 8.1 | 2.7 | 42.0 |
| Persons with disabilities..... | 100.0 | 25.5 | 3.1 | 8.4 | 2.2 | 60.8 |

NOTE: Because of rounding, details may not add to totals. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS. 1995 SESTAT Integrated Data Files.

**Appendix table 5-31. Scientists and engineers in the U.S. labor force, by occupation, disability status, and highest degree: 1995**



| Occupation | All degrees | | Bachelor's | | Master's | | Doctorate | |
|---|---|---|---|---|---|---|---|---|
| | Persons without disabilities | Persons with disabilities | Persons without disabilities | Persons with disabilities | Persons without disabilities | Persons with disabilities | Persons without disabilities | Persons with disabilities |
| Total science and engineering | 3,095,300 | 160,800 | 1,793,000 | 90,400 | 867,700 | 48,100 | 405,100 | 20,600 |
| Computer and mathematics sciences | 918,000 | 48,200 | 604,500 | 30,800 | 258,400 | 15,200 | 52,400 | 2,200 |
| Computer and information science | 812,600 | 42,200 | 575,000 | 30,200 | 213,300 | 11,100 | 21,700 | 900 |
| Mathematical science | 36,700 | 1,800 | 16,200 | 400 | 13,100 | 1,200 | 7,400 | 300 |
| Postsecondary mathematics | 68,700 | 4,300 | 13,200 | 300 | 32,000 | 2,900 | 23,300 | 1,100 |
| Life and related sciences | 299,200 | 12,300 | 120,000 | 3,900 | 62,600 | 2,600 | 99,500 | 4,900 |
| Agricultural/food sciences | 42,000 | 2,200 | 23,300 | 1,600 | 9,500 | - | 9,000 | 600 |
| Biological science | 167,400 | 5,500 | 69,900 | 1,300 | 32,000 | 1,600 | 57,000 | 2,400 |
| Environmental science | 19,700 | 900 | 13,100 | 800 | 5,800 | - | 800 | 100 |
| Postsecondary life sciences | 70,100 | 3,700 | 13,600 | 200 | 15,300 | 1,000 | 32,700 | 1,800 |
| Physical and related sciences | 267,300 | 14,400 | 124,500 | 6,500 | 65,000 | 4,800 | 77,500 | 3,100 |
| Chemistry | 108,000 | 5,900 | 62,700 | 3,500 | 19,400 | 1,500 | 25,800 | 900 |
| Earth sciences | 70,300 | 2,800 | 35,600 | 1,500 | 24,500 | 900 | 10,200 | 400 |
| Physics | 28,000 | 2,000 | 6,600 | 800 | 7,500 | 600 | 13,900 | 600 |
| Other physical sciences | 16,900 | 300 | 9,200 | 100 | 5,000 | 200 | 2,700 | 100 |
| Postsecondary physics | 44,100 | 3,400 | 10,400 | 600 | 8,600 | 1,600 | 24,900 | 1,100 |
| Social and related sciences | 301,900 | 19,500 | 58,300 | 3,300 | 129,700 | 8,300 | 106,700 | 7,200 |
| Economics | 33,000 | 1,200 | 10,800 | 500 | 15,400 | 200 | 6,700 | 400 |
| Political science | 8,900 | 100 | 5,100 | - | 2,700 | - | 1,100 | 100 |
| Psychology | 157,100 | 11,900 | 23,800 | 2,100 | 83,300 | 6,500 | 45,800 | 2,500 |
| Sociology | 15,000 | 1,400 | 7,200 | 600 | 4,900 | 600 | 2,900 | 100 |
| Other social sciences | 12,500 | 200 | 3,800 | - | 4,900 | - | 2,900 | 200 |
| Postsecondary social sciences | 75,500 | 4,800 | 7,600 | - | 18,600 | 1,000 | 47,200 | 3,800 |
| Engineering | 1,308,900 | 66,300 | 885,700 | 45,900 | 352,000 | 17,200 | 69,000 | 3,100 |
| Aerospace engineering | 71,700 | 3,500 | 41,300 | 2,600 | 26,000 | 800 | 4,200 | 100 |
| Chemical engineering | 70,200 | 2,800 | 45,000 | 1,600 | 18,900 | 1,000 | 6,300 | 200 |
| Civil engineering | 190,500 | 12,500 | 137,900 | 7,900 | 48,700 | 4,100 | 3,500 | 400 |
| Electrical engineering | 353,300 | 16,300 | 238,400 | 11,400 | 100,700 | 4,100 | 13,000 | 800 |
| Industrial engineering | 67,300 | 4,600 | 50,000 | 3,900 | 16,500 | 600 | 800 | 100 |
| Mechanical engineering | 252,200 | 9,100 | 188,200 | 7,200 | 55,500 | 1,800 | 8,000 | 100 |
| Other engineering | 274,300 | 15,600 | 180,000 | 10,800 | 77,900 | 4,100 | 16,200 | 600 |
| Postsecondary engineering | 29,500 | 2,000 | 4,900 | 500 | 7,800 | 700 | 16,800 | 900 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add to totals. Total includes "professional or other degrees."
Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.

**Appendix table 5-32. Median annual salaries of full-time employed scientists and engineers, by highest degree, occupation, disability status, and age: 1995**



| Occupation and age | Bachelor's | | Master's | | Doctorate | |
|---|---|---|---|---|---|---|
| | Persons without disabilities | Persons with disabilities | Persons without disabilities | Persons with disabilities | Persons without disabilities | Persons with disabilities |
| Science and engineering total | | | | | | |
| 20 to 29 | $35,000 | $37,000 | $38,500 | $23,000 | $38,000 | - |
| 30 to 39 | 48,000 | 47,800 | 51,000 | 49,000 | 49,000 | 49,000 |
| 40 to 49 | 55,000 | 51,000 | 58,000 | 48,800 | 60,000 | 55,000 |
| 50 or older | 59,856 | 55,000 | 60,000 | 60,000 | 65,400 | 65,000 |
| Computer and mathematical sciences | | | | | | |
| 20 to 29 | 37,000 | - | 42,000 | - | 40,000 | - |
| 30 to 39 | 48,000 | 47,000 | 55,000 | - | 55,000 | 49,000 |
| 40 to 49 | 55,000 | 48,000 | 59,000 | 49,000 | 58,000 | 66,000 |
| 50 or older | 56,000 | 46,700 | 58,000 | 50,000 | 63,500 | 59,000 |
| Life and related sciences | | | | | | |
| 20 to 29 | 20,000 | - | 24,000 | - | 27,000 | - |
| 30 to 39 | 34,500 | - | 35,000 | - | 36,000 | 35,000 |
| 40 to 49 | 40,000 | - | 44,000 | - | 57,700 | 53,800 |
| 50 or older | 46,200 | - | 43,400 | - | 65,000 | 70,000 |
| Physical and related sciences | | | | | | |
| 20 to 29 | 27,000 | - | 25,700 | - | 37,000 | - |
| 30 to 39 | 40,000 | - | 42,000 | - | 50,000 | 55,000 |
| 40 to 49 | 47,000 | - | 56,900 | - | 62,500 | 62,000 |
| 50 or older | 55,000 | - | 58,000 | - | 70,400 | 68,900 |
| Social and related sciences | | | | | | |
| 20 to 29 | 21,000 | - | 26,000 | - | 42,000 | - |
| 30 to 39 | 31,000 | - | 35,000 | - | 43,000 | 40,000 |
| 40 to 49 | 34,000 | - | 40,000 | - | 52,000 | 48,000 |
| 50 or older | 46,000 | - | 48,000 | - | 60,000 | 55,000 |
| Engineering | | | | | | |
| 20 to 29 | 38,000 | 41,000 | 42,000 | - | 49,900 | - |
| 30 to 39 | 50,000 | 52,000 | 55,000 | 58,000 | 59,000 | 58,800 |
| 40 to 49 | 57,000 | 61,000 | 63,000 | 60,000 | 70,000 | 63,000 |
| 50 or older | 61,000 | 60,000 | 66,000 | 70,000 | 76,000 | 74,000 |

KEY: - = Fewer than 50 estimated.

NOTES: Because of rounding, details may not add up to totals. Median salaries were not computed with fewer than 20 individuals reporting salary. Scientists and engineers are defined in terms of field of employment not degree field.

SOURCE: National Science Foundation/SRS 1995 SESTAT Integrated Data Files.