DOCUMENT RESUME

ED 436 430 SE 063 062

AUTHOR Ilardi, Brian
TITLE Graduate Enrollment in Science and Engineering Continued To Decline in 1998.
INSTITUTION National Science Foundation, Washington, DC. Div. of Science Resources Studies.
REPORT NO NSF-00-307
PUB DATE 1999-12-15
NOTE 5p.
AVAILABLE FROM National Science Foundation, Div. of Science Resources Studies, 4201 Wilson Blvd., Arlington, VA 22230. Tel: 301-947-2722. For full text: <http://www.nsf.gov/sbe/srs>.
PUB TYPE Collected Works - Serials (022) -- Reports - Research (143)
JOURNAL CIT SRS Data Brief; v1999 Dec 15 1999
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Educational Trends; *Engineering Education; Engineers; *Enrollment Trends; Foreign Students; *Graduate Study; Higher Education; Minority Groups; School Demography; *Science Education; Scientists; Sex Differences
IDENTIFIERS National Science Foundation

ABSTRACT

This Science Resources Studies Data Brief reports on statistics related to graduate enrollment in science and engineering in the United States for 1998. The data presented here were obtained from the National Science Foundation's 1998 Survey of Graduate Students and Postdoctorates in Science and Engineering, which collected data at 601 institutions in the United States and outlying areas. The number of science and engineering graduate students fell for the fifth consecutive year, although enrollment in computer science and electrical engineering increased. The study also notes that enrollment for minority groups has continued to rise. (WRM)

Division of Science Resources Studies

DATA BRIEF

National Science Foundation

Directorate for Social, Behavioral, and Economic Sciences

December 15, 1999

Graduate Enrollment in Science and Engineering Continued to Decline in 1998

by Brian Ilardi

In contrast to the overall trend in graduate enrollment in science and engineering, enrollment in computer science and electrical engineering is increasing.

The number of science and engineering (S&E) graduate students in the United States fell in 1998, the fifth consecutive decrease since a peak enrollment in 1993 (table 1). In fall 1998, there were 405,280 students enrolled in S&E programs at the graduate level, a 0.6 percent decrease from the 1997 level of 407,689. Decreases occurred in both science enrollment, which fell 0.5 percent, and in engineering enrollment, which fell 0.7 percent. Part-time S&E enrollment dropped a full percentage point to 125,763; full-time enrollment fell 0.4 percent.

Engineering enrollment decreased from 101,033 in 1997 to 100,287 in 1998. In two fields, enrollment experienced slight increases: electrical engineering (up 2.5 percent) and "other" engineering (up 2.5 percent). Industrial engineering (down 5.8 percent) and civil engineering (down 4.0 percent) were among the fields that had the greatest decreases in enrollment (table 2).

Table 1. Graduate enrollment in science and engineering, by enrollment status, citizenship and race/ethnicity: 1990-98

Citizenship and race/ethnicity	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	397,135	412,697	430,644	435,886	431,251	422,555	415,363	407,689	405,280
Full-time	265,399	277,174	290,510	294,030	293,048	287,253	284,194	280,708	279,517
Part-time	131,736	135,523	140,134	141,856	138,203	135,302	131,169	126,981	125,763
U.S. citizens and permanent residents	294,318	304,063	321,182	330,169	329,095	324,017	317,209	308,725	303,304
Black, non-Hispanic	12,774	13,691	15,445	17,118	17,611	18,283	19,071	19,352	19,654
American Indian/Alaskan Natives	1,054	1,120	1,243	1,309	1,383	1,516	1,539	1,600	1,614
Asian or Pacific Islander	17,155	18,136	21,752	24,059	26,474	25,901	25,947	25,973	26,844
Hispanic	10,159	11,045	12,246	13,381	13,281	14,117	14,638	15,004	15,595
White, non-Hispanic	238,472	243,602	253,435	256,859	255,719	245,889	238,077	227,992	220,700
Other or unknown	14,704	16,469	17,061	17,443	14,627	18,311	17,937	18,804	18,898
Non-U.S. citizens	102,817	108,634	109,462	105,717	102,156	98,538	98,154	98,964	101,976

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Graduate Students and Postdoctorates in Science and Engineering, 1998.

Enrollment by Field

Total enrollment for science programs decreased from 306,656 in 1997 to 304,993 in 1998 (table 2). This decrease occurred in all major science fields except computer science (where enrollment was up 5.1 percent) and agricultural science (which experienced no change). The field where enrollment declined the most was social sciences, with a drop of 2.6 percent. Enrollment dropped by about 2 percent in mathematical sciences (down 1.6 percent); earth, atmospheric, and ocean sciences (down 1.9 percent); and physical sciences (down 1.7 percent). The declines were slight in biological sciences and in psychology (down 0.1 and 0.3 percent respectively).

Enrollment by Citizenship, Sex, and Race/Ethnicity

Foreign student enrollment in S&E in the United States rose 3.0 percent in 1998[1] (table 1). This increase was the second consecutive

[1]Trends in enrollment are complicated by the following two factors. In 1991 and earlier years, permanent residents in this survey were included with foreign; beginning in 1992, permanent residents were included with U.S. citizens. The Chinese Student Protection Act of 1992 allowed Chinese students to apply for permanent U.S. residency in 1993. These factors resulted in a lower number of foreign graduate students—and a higher number of U.S. students—than would otherwise have been the case.

Electronic Dissemination

SRS data are available through the World Wide Web (http://www.nsf.gov/sbe/srs/). For more information about obtaining reports, contact pubs@nsf.gov or call (301) 947-2722. For NSF's Telephonic Device for the Deaf, dial (703) 306-0090.

00-307

Graduate Enrollment in Science and Engineering Continued to Decline...—page 2

Table 2. Graduate enrollment in science and engineering, by field: 1990-98

Field	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	397,135	412,697	430,644	435,886	431,251	422,555	415,363	407,689	405,280
Sciences, total	289,510	299,121	312,609	319,028	318,228	315,356	312,140	306,656	304,993
Physical sciences	34,075	34,710	35,348	35,318	34,449	33,417	32,355	31,108	30,565
Earth, atmospheric and ocean sciences	13,984	14,480	15,347	15,805	16,042	15,805	15,280	14,644	14,364
Computer sciences	34,257	34,610	36,293	36,189	34,128	33,432	34,592	35,996	37,850
Mathematical sciences	19,774	19,952	20,355	20,000	19,579	18,509	18,015	16,729	16,463
Agricultural sciences	11,316	11,506	11,827	11,914	12,199	12,367	11,914	11,814	11,811
Biological sciences	49,989	51,778	54,177	56,452	58,143	58,736	58,128	57,135	57,060
Psychology	48,167	51,343	53,484	54,557	54,554	53,641	53,209	53,207	53,055
Social sciences	77,948	80,742	85,778	88,793	89,134	89,449	88,647	86,023	83,825
Engineering, total	107,625	113,576	118,035	116,858	113,023	107,199	103,223	101,033	100,287
Chemical engineering	6,735	7,127	7,397	7,516	7,608	7,424	7,373	7,274	7,060
Civil engineering	15,542	17,398	19,572	19,583	19,925	19,218	18,528	17,049	16,374
Electrical engineering	33,722	35,182	36,460	35,314	33,050	30,747	29,736	30,618	31,398
Industrial/manufacturing engineering	11,248	12,676	13,525	13,596	13,661	13,143	12,399	11,736	11,059
Mechanical engineering	16,879	17,730	18,637	18,477	17,761	16,363	15,509	15,045	14,696
Metallurgical and materials engineering	4,941	5,160	5,512	5,363	5,191	4,920	4,713	4,649	4,644
Other	18,558	18,303	16,932	17,009	15,827	13,584	14,965	14,689	15,056

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Graduate Students and Postdoctorates in Science and Engineering,1998.

The number of foreign and minority S&E graduate students increased in 1998.

increase in foreign enrollment following a 4-year decline (between 1993 and 1996) in which enrollment dropped 10.3 percent. Most of this increase was seen in engineering, where foreign student enrollment rose 4 percent between 1997 and 1998. In contrast, graduate enrollment of U.S. citizens and permanent residents dropped 1.8 percent from 1997 to 1998, the fifth drop since a peak in 1993.

S&E graduate enrollment trends differed somewhat by sex (figure 1). Total enrollment among men decreased—as it has since 1993—dropping 1.6 percent from 245,643 in 1997 to 241,828 in 1998. Female enrollment increased 1 percent to 163,452 in 1998. The increase in female enrollment was attributable entirely to enrollment by nonwhite females, which increased 3.5 percent, while white female enrollment fell 1.7 percent. White male enrollment fell 4.3 percent, in 1998, while nonwhite male enrollment rose 1.3 percent.

Against a background of declining graduate S&E enrollment, enrollment of minorities continues to rise. Among U.S. citizen and permanent resident graduate students in 1998, 6 percent were black, 5 percent were Hispanic, and 0.5 percent were American Indian/Alaskan Native. S&E graduate enrollment for these groups has been generally increasing in the 1990s (figure 2). From 1997 to 1998, enrollment for blacks rose 2 percent; American Indians/Alaskan Natives, 1 percent; and Hispanics, 4 percent. Enrollment for Asians or Pacific Islanders rose 3 percent.

Data Source

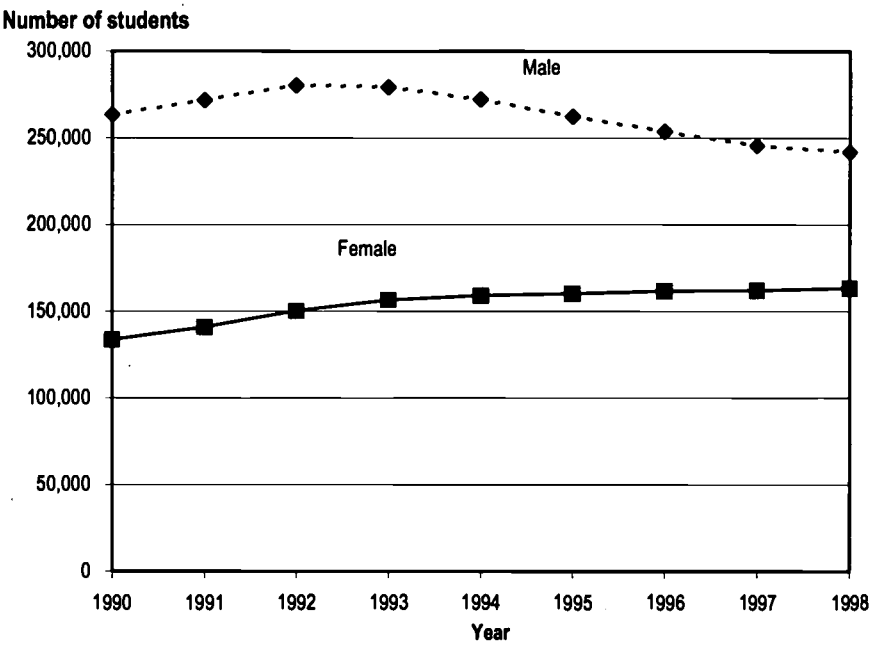
The data presented here were obtained from the National Science Foundation's 1998 Survey of Graduate Students and Postdoctorates in Science and Engineering. Data were collected from approximately 11,700 departments at 601 institutions of higher education in the United States and outlying areas. The departmental response rate was 98.2 percent; however, 15 percent of the responding departments required partial imputation of missing data. More detailed information is available in the forthcoming report, *Graduate Students and Postdoctorates in Science and Engineering: Fall 1998.*

For further information, contact:

Joan Burrelli
Division of Science Resources Studies
National Science Foundation
4201 Wilson Boulevard, Suite 965
Arlington, VA 22230

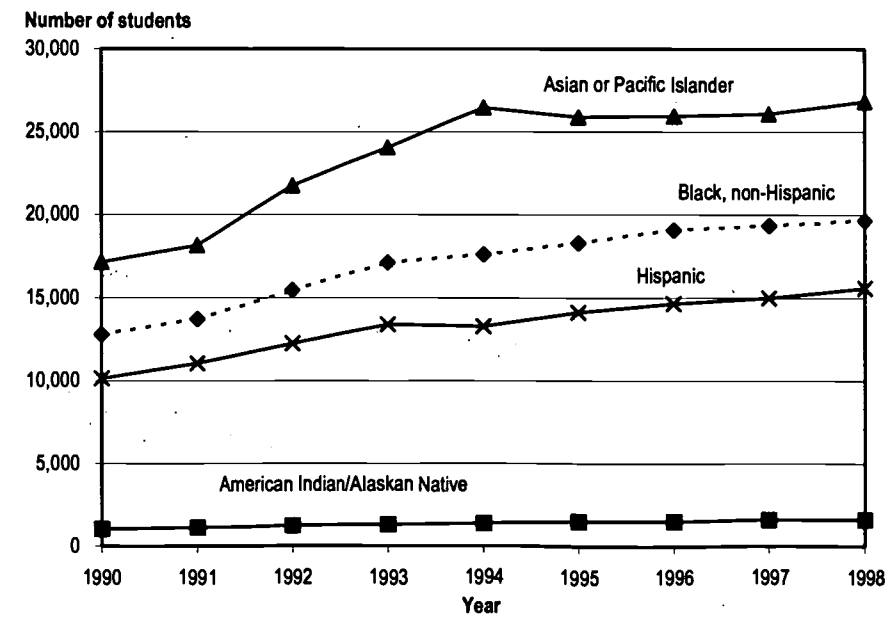
703-306-1774 x6942
jburrelli@nsf.gov

Figure 1. Graduate enrollment in science and engineering, by sex: 1990-98



SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Graduate Students and Postdoctorates in Science and Engineering,1998.

Figure 2. Graduate enrollment in science and engineering, by race/ethnicity of non-white U.S. citizens and permanent residents: 1990-98



SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Graduate Students and Postdoctorates in Science and Engineering, 1998.

NATIONAL SCIENCE FOUNDATION
ARLINGTON, VA 22230

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

RETURN THIS COVER SHEET TO ROOM P35 IF YOU DO NOT WISH TO RECEIVE THIS MATERIAL ☐ OR IF CHANGE OF ADDRESS IS NEEDED ☐, INDICATE CHANGE INCLUDING ZIP CODE ON THE LABEL (DO NOT REMOVE LABEL).

BULK RATE
POSTAGE & FEES PAID
National Science Foundation
Permit No. G-69

8 1

NSF 00-307

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☐ This document is covered by a signed "Reproduction Release (Blanket) form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☑ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").