National Center for Science and Engineering Statistics

InfoBrief

Postdoctoral Appointments Rise While Graduate Enrollment Slows

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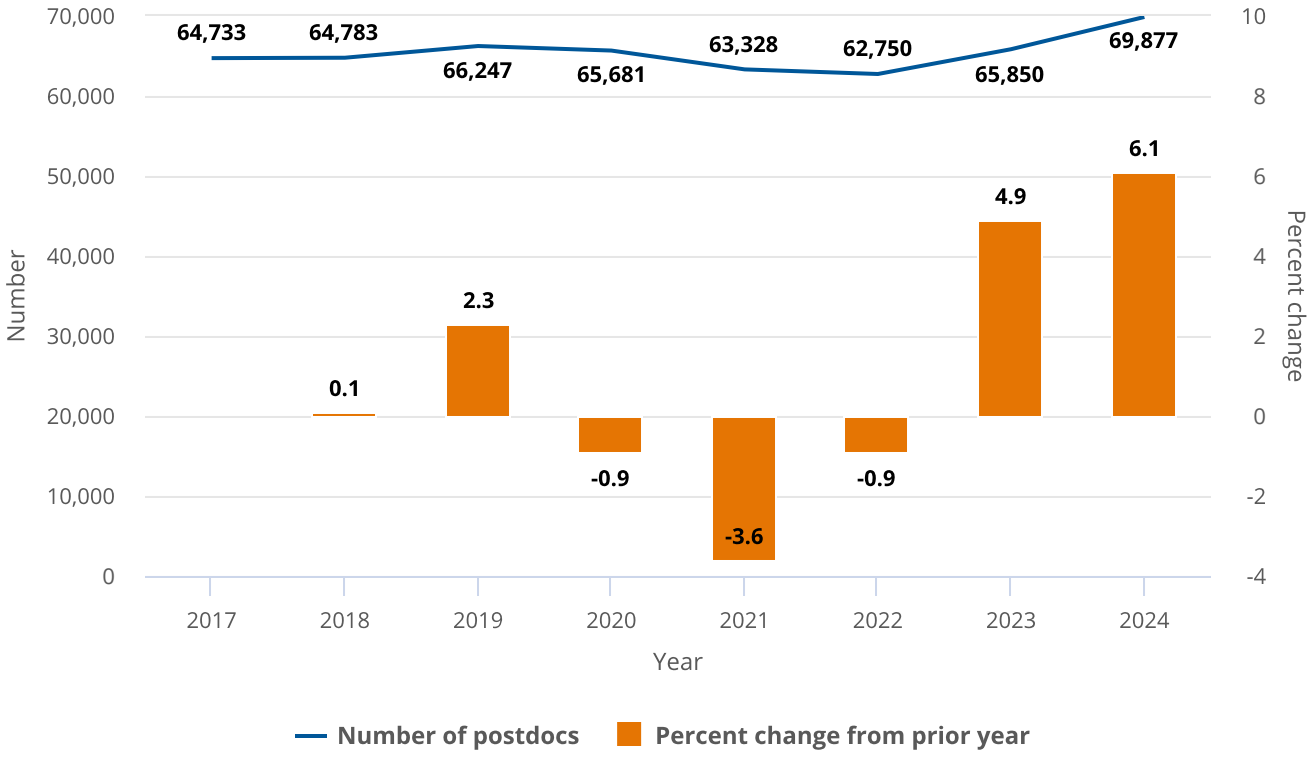
Between 2023 and 2024, the number of postdoctoral appointees (postdocs) rose by 6.1%, from 65,850 to 69,877—the highest number ever reported to the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS) (figure 1). Before 2024, the 66,247 postdocs reported in 2019 was the highest number of postdocs at GSS institutions. The number of postdocs declined from 2020 to 2022 before increasing for each of the last two survey cycles. Graduate student counts were more complex, with generally stable enrollment in the master's science, engineering, and health (SEH) program between 2023 and 2024 and a slight increase in enrollment in doctoral SEH programs during that period (table 1).

Figure 1. Postdoc employment: 2017–24



Note(s):
For more information on the mapping of fields and codes in the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS), see table A-6 at https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e/2024#methodology.

Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

Table 1. Enrollment of master's students and doctoral students in science, engineering, and health, by field: 2020–24

(Number and percent change)

Characteristic	Master's students								Doctoral students							
							Percent change								Percent change	
	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24
All graduate students	414,478	466,613	501,311	510,866	504,279	505,930	22.1	0.3	283,335	293,543	297,223	307,229	306,907	312,148	10.2	1.7
Science and engineering	354,354	400,922	435,003	449,087	443,876	447,040	26.2	0.7	268,021	276,912	279,163	287,961	287,899	293,339	9.4	1.9
Science	267,904	305,796	331,983	348,520	343,450	347,469	29.7	1.2	196,742	203,988	206,183	212,969	212,907	216,898	10.2	1.9
Agricultural and veterinary sciences	6,487	6,801	6,949	6,901	6,873	6,973	7.5	1.5	4,313	4,443	4,647	4,854	4,854	5,044	16.9	3.9
Biological and biomedical sciences	39,920	42,728	43,062	44,703	44,414	46,661	16.9	5.1	54,905	58,155	59,638	60,863	60,839	62,357	13.6	2.5
Computer and information sciences	80,690	102,199	129,972	143,530	141,116	137,358	70.2	-2.7	18,174	19,531	20,583	22,484	22,484	24,010	32.1	6.8
Geosciences, atmospheric, and ocean sciences	5,277	5,520	5,186	4,793	4,793	4,909	-7.0	2.4	6,515	6,770	6,784	6,801	6,801	6,857	5.2	0.8
Mathematics and statistics	18,284	20,639	20,798	20,105	20,101	19,948	9.1	-0.8	13,687	13,619	13,589	13,788	13,788	14,031	2.5	1.8
Multidisciplinary and interdisciplinary sciences	10,980	11,994	16,931	21,928	21,709	26,426	140.7	21.7	3,553	3,774	4,014	4,501	4,501	5,215	46.8	15.9
Natural resources and conservation	8,793	10,012	9,807	9,486	9,352	9,150	4.1	-2.2	3,705	3,910	3,955	4,004	4,004	4,182	12.9	4.4
Physical sciences	6,275	6,409	6,256	6,000	5,987	6,008	-4.3	0.4	36,341	37,732	37,836	38,329	38,329	39,329	8.2	2.6
Psychology	47,279	51,878	48,321	49,474	47,812	49,516	4.7	3.6	21,115	21,447	21,121	24,354	24,354	23,408	10.9	-3.9
Social sciences	43,919	47,616	44,701	41,600	41,293	40,520	-7.7	-1.9	34,434	34,607	34,016	32,991	32,953	32,465	-5.7	-1.5
Engineering	86,450	95,126	103,020	100,567	100,426	99,571	15.2	-0.9	71,279	72,924	72,980	74,992	74,992	76,441	7.2	2.0
Aerospace, aeronautical, and astronautical engineering	4,326	5,065	5,263	5,380	5,380	5,563	28.6	3.4	2,645	2,773	2,832	2,884	2,884	3,032	14.6	5.1
Biological, biomedical, and biosystems engineering	4,536	5,192	5,177	5,204	5,204	5,475	20.7	5.2	8,239	8,867	9,265	9,999	9,999	10,330	25.4	3.3
Chemical, petroleum, and chemical-related engineering	2,942	2,983	3,011	2,658	2,658	2,664	-9.4	0.2	7,612	7,713	7,590	7,888	7,888	7,935	4.2	0.6
Civil, environmental, transportation, and related engineering fields	10,819	11,730	12,621	12,082	12,064	11,360	5.0	-5.8	7,485	7,878	7,754	7,852	7,852	7,899	5.5	0.6
Electrical, electronics, communications, and computer engineering	25,312	27,695	32,316	31,093	31,086	30,841	21.8	-0.8	17,720	17,570	17,585	17,706	17,706	17,774	0.3	0.4
Industrial, manufacturing, systems engineering, and operations research	11,030	11,949	12,579	11,873	11,852	11,704	6.1	-1.2	3,839	3,921	3,856	3,889	3,889	4,046	5.4	4.0
Mechanical engineering	14,305	15,718	16,029	15,335	15,335	15,136	5.8	-1.3	11,477	11,540	11,523	11,679	11,679	11,858	3.3	1.5
Metallurgical, mining, materials, and related engineering fields	2,299	2,518	2,545	2,462	2,462	2,503	8.9	1.7	4,882	4,904	4,573	4,782	4,782	4,858	-0.5	1.6
Other engineering	10,881	12,276	13,479	14,480	14,385	14,325	31.7	-0.4	7,380	7,758	8,002	8,313	8,313	8,709	18.0	4.8
Health	60,124	65,691	66,308	61,779	60,403	58,890	-2.1	-2.5	15,314	16,631	18,060	19,268	19,008	18,809	22.8	-1.0
Clinical medicine	29,748	34,021	33,251	28,484	28,239	26,645	-10.4	-5.6	4,796	5,612	5,966	6,174	6,006	6,399	33.4	6.5
Other health	30,376	31,670	33,057	33,295	32,164	32,245	6.2	0.3	10,518	11,019	12,094	13,094	13,002	12,410	18.0	-4.6

Note(s):
The 2023adjusted column removes the data from the institutions determined to be no longer eligible for the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS) during the 2024 frame review. For more information, see the InfoBrief *Impact of the 2024 GSS Institutional Eligibility Review on Counts of GSS Master's Students* at https://ncses.nsf.gov/pubs/nsf25346. For more information on the mapping of fields and codes in the GSS, see table A-6 at https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e/2024#methodology.

Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

These and other findings in this InfoBrief are from the 2024 GSS. Data from the GSS provide insight into the composition of the current and future science and engineering (S&E) workforce by collecting data on graduate students, postdocs, and doctorate-holding nonfaculty researchers (NFRs) in SEH fields. This survey is funded by the National Center for Science and Engineering Statistics (NCSES) within the U.S. National Science Foundation and by the National Institutes of Health (NIH). In this InfoBrief, single-year changes in graduate enrollment have been adjusted to take the frame changes from the 2024 eligibility review into account. For more information on the eligibility review, see the section "Data Sources and Limitations" below.

Field of Study Trends for Master's and Doctoral Students

Between 2023 and 2024, enrollment of master's students remained stable overall, but it grew 1.2% in science, remained stable in engineering (-0.9%), and decreased 2.5% in health (table 1). Doctoral enrollment increased slightly during this period, based on increases in science (1.9%) and engineering (2.0%), which offset a small decline in health programs (1.0%).

Master's Enrollment Trends, by Field

Master's enrollment in SEH fields increased 22.1% between 2020 and 2024, with enrollment in biological and biomedical sciences and in multidisciplinary and interdisciplinary sciences increasing in each year. From 2020 to 2024, these two fields saw increases of 16.9% (from 39,920 to 46,661) and 140.7% (from 10,980 to 26,426), respectively (table 1). From 2023 to 2024, the largest numeric and percentage increase was in multidisciplinary and interdisciplinary sciences enrollment, with a 21.7% increase (from 21,709 to 26,426). Within multidisciplinary and interdisciplinary sciences, data science and analytics drove this growth (table 1 and data tables: table 1-2).

As in previous years, computer and information sciences was the largest broad field in the GSS, enrolling over a quarter (27.1%) of master's students in 2024 (table 1 and data tables: table 2-7). From 2021 to 2023, computer and information sciences was consistently the fastest growing field for master's students. In 2024, enrollment of master's students in this field declined for the first time since 2020, from 141,116 in 2023 to 137,358 in 2024 (2.7%). Even with this 1-year decline, the overall enrollment of master's students in computer and information sciences in 2024 was 70.2% higher than it was in 2020 (table 1).

Among engineering broad fields, only three fields increased enrollment between 2023 and 2024: biological, biomedical, and biosystems engineering (5.2%); aerospace, aeronautical, and astronautical engineering (3.4%); and metallurgical, mining, materials, and related engineering (1.7%). All the remaining engineering subfields either remained stable or declined, with the largest decline in civil, environmental, transportation, and related fields (5.8%). Enrollment in the health field continued to decline, with a 2.5% decline from 2023 to 2024, mostly due to declining enrollment in public health (see data tables: table 1-2).

Doctoral Enrollment Trends, by Field

In 2024, doctoral enrollment rose to a record high of 312,148 (table 1). From 2023 to 2024, both science and engineering grew (1.9% and 2.0%, respectively), whereas health declined slightly (1.0%). Over the past 5 years, however, health fields had the largest growth (22.8%), followed by science (10.2%) and engineering (7.2%).

Within the sciences, doctoral enrollment in 7 of the 10 broad fields grew every year between 2020 and 2024. Of the remaining 3 science fields, mathematics and statistics enrollment grew from 2022 to 2024, psychology enrollment grew unevenly from 2020 to 2024, and social sciences enrollment declined most of the years from 2020 to 2024, with a 5.7% decline in enrollment over that period, including a 1.5% decline between 2023 and 2024. Offsetting the decline in the social sciences enrollment, enrollment in multidisciplinary and interdisciplinary sciences increased by 15.9% from 2023 to 2024 and enrollment in computer and information sciences and in biological and biomedical sciences grew by 6.8% and 2.5%, respectively, during that period (table 1).

Trends in Enrollment, by Citizenship Status

In 2024, 322,037 students were enrolled full time in master's programs, down slightly (1.0%) from the 2023 count of 325,267. Looking over the past 5 years, full-time enrollment in master's programs was lower in 2020 than in 2019 due to the COVID-19 pandemic (data tables: table 1-9 and NSF 22-313[1]). From 2020 to 2024, full-time enrollment in master's programs increased 32.1%, but such enrollment decreased slightly (1.0%) between 2023 and 2024 (table 2). Full-time enrollment in doctoral programs rose by 2.3% from 2023 to 2024 (from 268,495 to 274,601), with an overall 10.9% increase from 2020 to 2024.

Table 2. Enrollment of master's students and doctoral students in science, engineering, and health, by enrollment intensity, sex, citizenship status, race, and ethnicity: 2020–24

(Number and percent change)

Characteristic	Master's students								Doctoral students							
							Percent change								Percent change	
	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24
All graduate students	414,478	466,613	501,311	510,866	504,279	505,930	22.1	0.3	283,335	293,543	297,223	307,229	306,907	312,148	10.2	1.7
Part-time students	170,619	179,659	181,693	180,895	179,012	183,893	7.8	2.7	35,679	36,674	37,540	38,612	38,412	37,547	5.2	-2.3
U.S. citizens and permanent residents[a]	146,539	158,843	153,345	149,590	147,963	151,033	3.1	2.1	25,818	27,403	28,145	29,589	29,395	28,872	11.8	-1.8
Male	75,037	78,723	76,439	74,444	73,873	77,412	3.2	4.8	12,934	13,447	13,515	13,572	13,520	13,370	3.4	-1.1
Female	71,502	80,120	76,906	75,146	74,090	73,621	3.0	-0.6	12,884	13,956	14,630	16,017	15,875	15,502	20.3	-2.3
Hispanic or Latino	19,314	21,809	22,200	22,074	21,946	22,960	18.9	4.6	2,550	2,666	2,978	3,064	3,057	3,153	23.6	3.1
Not Hispanic or Latino																
American Indian or Alaska Native	562	612	537	517	512	541	-3.7	5.7	158	175	174	181	181	186	17.7	2.8
Asian	16,531	18,932	19,522	19,350	19,254	21,440	29.7	11.4	2,061	2,218	2,359	2,487	2,479	2,570	24.7	3.7
Black or African American	14,853	16,213	15,518	15,939	15,694	16,049	8.1	2.3	2,503	2,858	2,977	3,757	3,731	3,743	49.5	0.3
Native Hawaiian or Other Pacific Islander	284	280	269	296	292	284	0.0	-2.7	40	42	38	53	53	45	12.5	-15.1
White	81,476	86,873	81,680	77,898	76,909	75,188	-7.7	-2.2	16,204	17,071	17,081	17,301	17,163	16,367	1.0	-4.6
More than one race	4,692	5,316	5,079	5,212	5,178	5,419	15.5	4.7	784	913	874	937	928	961	22.6	3.6
Unknown race and ethnicity	8,827	8,808	8,540	8,304	8,178	9,152	3.7	11.9	1,518	1,460	1,664	1,809	1,803	1,847	21.7	2.4
Temporary visa holders	24,080	20,816	28,348	31,305	31,049	32,860	36.5	5.8	9,861	9,271	9,395	9,023	9,017	8,675	-12.0	-3.8
Male	14,819	12,508	17,573	19,254	19,089	20,053	35.3	5.1	6,374	5,885	5,943	5,614	5,611	5,419	-15.0	-3.4
Female	9,261	8,308	10,775	12,051	11,960	12,807	38.3	7.1	3,487	3,386	3,452	3,409	3,406	3,256	-6.6	-4.4
Full-time students	243,859	286,954	319,618	329,971	325,267	322,037	32.1	-1.0	247,656	256,869	259,683	268,617	268,495	274,601	10.9	2.3
U.S. citizens and permanent residents[a]	167,766	178,812	168,660	164,019	161,226	171,182	2.0	6.2	146,928	150,539	150,149	152,610	152,510	152,422	3.7	-0.1
Male	66,803	69,780	64,543	63,296	62,580	67,944	1.7	8.6	74,278	74,407	73,050	72,972	72,952	72,167	-2.8	-1.1
Female	100,963	109,032	104,117	100,723	98,646	103,238	2.3	4.7	72,650	76,132	77,099	79,638	79,558	80,255	10.5	0.9
Hispanic or Latino	24,436	26,872	26,103	26,025	25,770	28,882	18.2	12.1	16,379	17,827	18,340	19,265	19,259	19,911	21.6	3.4
Not Hispanic or Latino																
American Indian or Alaska Native	722	744	794	694	678	662	-8.3	-2.4	600	574	577	592	592	554	-7.7	-6.4
Asian	18,544	21,675	21,351	21,580	21,351	23,883	28.8	11.9	15,958	17,378	18,194	19,132	19,121	19,938	24.9	4.3
Black or African American	15,989	16,916	15,880	15,825	15,430	17,189	7.5	11.4	8,571	9,315	9,641	10,755	10,741	10,708	24.9	-0.3
Native Hawaiian or Other Pacific Islander	294	317	272	248	245	235	-20.1	-4.1	160	153	159	157	157	160	0.0	1.9
White	93,614	97,735	90,532	85,349	83,773	84,954	-9.3	1.4	92,761	92,519	90,364	88,929	88,868	86,814	-6.4	-2.3
More than one race	6,377	6,985	6,923	6,908	6,835	7,369	15.6	7.8	5,726	6,257	6,455	6,947	6,945	7,154	24.9	3.0
Unknown race and ethnicity	7,790	7,568	6,805	7,390	7,144	8,008	2.8	12.1	6,773	6,516	6,419	6,833	6,827	7,183	6.1	5.2
Temporary visa holders	76,093	108,142	150,958	165,952	164,041	150,855	98.3	-8.0	100,728	106,330	109,534	116,007	115,985	122,179	21.3	5.3
Male	45,489	65,845	92,976	101,681	100,246	91,258	100.6	-9.0	64,179	66,682	68,070	71,488	71,480	74,744	16.5	4.6
Female	30,604	42,297	57,982	64,271	63,795	59,597	94.7	-6.6	36,549	39,648	41,464	44,519	44,505	47,435	29.8	6.6
First-time, full-time students	102,096	147,266	147,317	153,545	151,712	142,279	39.4	-6.2	41,173	46,670	47,416	50,253	50,217	51,321	24.6	2.2
U.S. citizens and permanent residents[a]	79,715	82,441	72,404	75,236	74,010	81,016	1.6	9.5	27,744	27,515	26,758	27,049	27,018	27,565	-0.6	2.0
Male	32,396	32,799	28,218	30,058	29,742	33,136	2.3	11.4	13,419	12,694	12,294	12,456	12,452	12,608	-6.0	1.3

Table 2. Enrollment of master's students and doctoral students in science, engineering, and health, by enrollment intensity, sex, citizenship status, race, and ethnicity: 2020–24

(Number and percent change)

Characteristic	Master's students								Doctoral students							
							Percent change								Percent change	
	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24	2020	2021	2022	2023	2023adjusted	2024	2020–24	2023adjusted–24
Female	47,319	49,642	44,186	45,178	44,268	47,880	1.2	8.2	14,325	14,821	14,464	14,593	14,566	14,957	4.4	2.7
Hispanic or Latino	11,483	12,193	10,881	11,666	11,529	13,114	14.2	13.7	3,383	3,669	3,579	3,677	3,674	3,677	8.7	0.1
Not Hispanic or Latino																
American Indian or Alaska Native	306	337	353	307	301	272	-11.1	-9.6	96	85	108	86	86	98	2.1	14.0
Asian	9,685	11,187	10,072	10,810	10,654	12,331	27.3	15.7	3,153	3,329	3,384	3,532	3,529	3,759	19.2	6.5
Black or African American	7,664	7,606	6,717	7,360	7,173	8,160	6.5	13.8	1,726	2,038	1,850	2,053	2,047	2,012	16.6	-1.7
Native Hawaiian or Other Pacific Islander	135	150	113	100	100	92	-31.9	-8.0	27	33	26	24	24	21	-22.2	-12.5
White	44,007	44,446	38,316	38,430	37,840	39,634	-9.9	4.7	16,886	16,060	15,407	15,137	15,119	15,126	-10.4	*
More than one race	3,063	3,293	3,141	3,207	3,163	3,558	16.2	12.5	1,160	1,195	1,276	1,392	1,392	1,381	19.1	-0.8
Unknown race and ethnicity	3,372	3,229	2,811	3,356	3,250	3,855	14.3	18.6	1,313	1,106	1,128	1,148	1,147	1,491	13.6	30.0
Temporary visa holders	22,381	64,825	74,913	78,309	77,702	61,263	173.7	-21.2	13,429	19,155	20,658	23,204	23,199	23,756	76.9	2.4
Male	12,678	40,068	45,912	48,178	47,727	36,580	188.5	-23.4	8,193	11,704	12,405	13,908	13,905	14,306	74.6	2.9
Female	9,703	24,757	29,001	30,131	29,975	24,683	154.4	-17.7	5,236	7,451	8,253	9,296	9,294	9,450	80.5	1.7

* = value < 0.05%.

[a] Race and ethnicity data are available for U.S. citizens and permanent residents only.

Note(s):
The 2023adjusted column removes the data from the institutions determined to be no longer eligible for the Survey of Graduate Students and Postdoctorates in Science and Engineering (GSS) during the 2024 frame review. For more information, see the InfoBrief *Impact of the 2024 GSS Institutional Eligibility Review on Counts of GSS Master's Students* at https://ncses.nsf.gov/pubs/nsf25346.

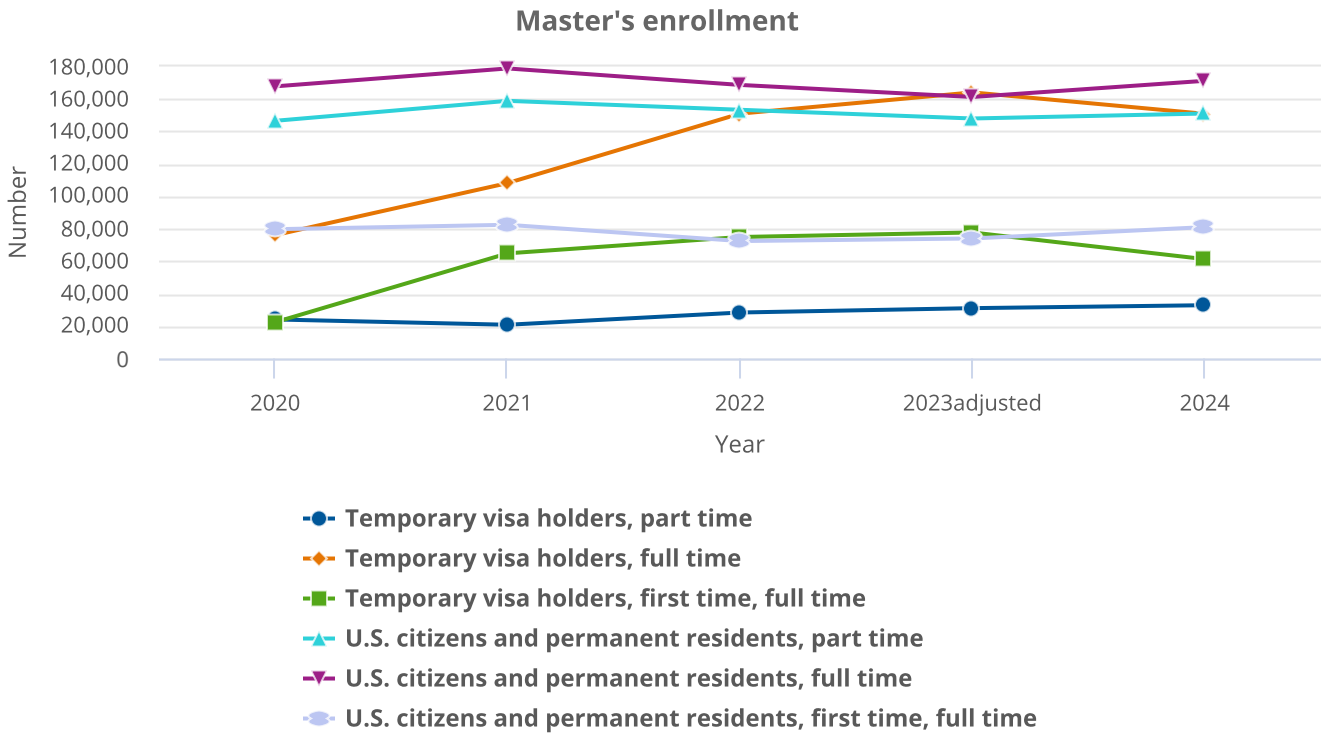
Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

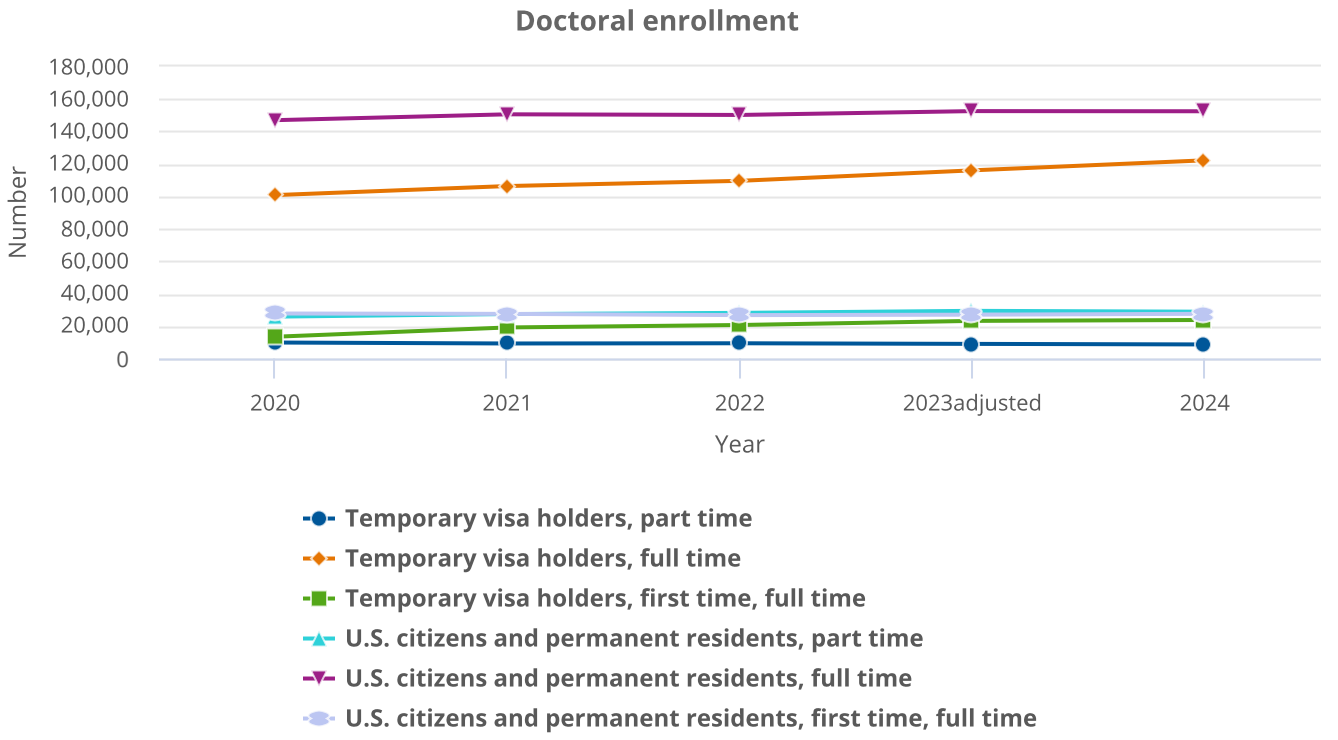
From 2023 to 2024, part-time enrollment in master's programs increased by 2.7% (4,881), and part-time enrollment in doctoral programs declined by 2.3% (865). Over the previous 5 years, from 2020 to 2024, part-time master's enrollment increased by 7.8%, whereas part-time doctoral enrollment increased 5.2%.

Temporary Visa Holders

From 2021 to 2023, enrollment of temporary visa holders consistently increased in SEH master's degree and full-time doctoral degree programs, yet between 2023 and 2024, enrollment for these groups slowed or declined, with differences across enrollment intensity and degree type (figure 2 and table 2). Among temporary visa holders enrolled in master's degree programs, the number of part-time students increased 5.8% (from 31,049 in 2023 to 32,860 in 2024), the number of full-time students decreased by 8.0% (from 164,041 to 150,855), and the number of first-time, full-time students fell by 21.2% (from 77,702 to 61,263).

Figure 2. Enrollment of master's and doctoral students in science, engineering, and health fields, by citizenship status and enrollment type: 2020–24





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Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

Among temporary visa holders in doctoral degree programs, the number of part-time students declined by 3.8% (from 9,017 in 2023 to 8,675 in 2024), whereas the number full-time students increased by 5.3% (from 115,985 to 122,179). First-time, full-time enrollment of temporary visa–holding doctoral students increased 2.4% (from 23,199 in 2023 to 23,756 in 2024) (data tables: table 1-7).

Among temporary visa holders in SEH, graduate enrollment for men and women from 2023 to 2024 followed the overall trends described above, increasing for part-time master's students and for full-time doctoral students and decreasing for full-time master's students and part-time doctoral students. Among full-time master's students who were temporary visa holders, the percentage decline of female student counts was smaller than that for male students. Conversely, the percentage increase in the number of female students was slightly larger than the increase for male students. Specifically, part-time master's enrollment for temporary visa holders from 2023 to 2024 increased by 7.1% for women and 5.1%, for men (table 2). However, full-time master's enrollment for temporary visa holders from 2023 to 2024 decreased by 6.6% for women and 9.0% for men. Between 2023 and 2024, part-time doctoral enrollment for temporary visa holders decreased by 4.4% for women and 3.4% for men; however, full-time doctoral enrollment for temporary visa holders increased by 6.6% for women and 4.6% for men.

U.S. Citizens and Permanent Residents

For the first time since 2021, the enrollment of U.S. citizens and permanent residents in SEH master's programs in 2024 increased over the past year. Specifically, part-time enrollment increased by 2.1% from 2023 to 2024 (from 147,693 to 151,033), and full-time enrollment for this group increased by 6.2% (from 161,226 to 171,182) (table 2). Since 2020, part-time and full-time enrollment in master's programs rose by 3.1% and 2.0%, respectively. Additionally, first-time, full-time master's enrollment increased by 9.5% (from 74,010 to 81,016) from 2023 to 2024.

The trends among doctoral students differed. Among U.S. citizens or permanent residents in doctoral programs, part-time enrollment decreased by 1.8% (from 29,395 in 2023 to 28,872 in 2024), and full-time enrollment remained relatively stable with a modest decrease of 88 students. Yet, first-time, full-time enrollment in doctoral programs for U.S. citizens or permanent residents grew 2.0% (from 27,018 to 27,565) from 2023 to 2024.

Demographic Trends in Enrollment

With regards to the race and ethnicity of U.S. citizens and permanent residents, the number of master's students reported as unknown race and ethnicity increased by 12.0% (from 15,322 in 2023 to 17,160 in 2024) (table 2). This change reflects an increase of 18.6% in first-time, full-time master's students reported as unknown race and ethnicity (from 3,250 in 2023 to 3,855 in 2024). For first-time, full-time doctoral students, the 1-year change in the percentage of unknown race and ethnicity was 30.0% (from 1,147 in 2023 to 1,491 in 2024). Because doctoral programs take longer to complete than master's programs, the impact of this upsurge of persons with unknown race and ethnicity attending first time, full time had a greater impact on the percentage increase of full-time doctoral students than on that of full-time master's students (12.1% vs. 5.2% increase from 2023 to 2024). However, data users should note that counts by group may not be comparable year to year because the reporting of unknown race and ethnicity may not be random across racial and ethnic groups.

Among full-time master's students who were U.S. citizens or permanent residents, enrollment increased by 4.7% for women (from 98,646 in 2023 to 103,238 in 2024) and by 8.6% for men (from 62,580 to 67,944) (table 2). For U.S. citizens or permanent residents enrolled first time, full time in master's programs, the number of men increased by 11.4% (from 29,742 to 33,136) and the number of women increased by 8.2% (from 44,268 to 47,880) during the same period.

Overall, U.S. citizen and permanent resident enrollment in full-time doctoral programs remained stable, with a minor shift between the enrollment in the number of men (decreased by 1.1%, from 72,952 to 72,167) and women (increased by 0.9%, from 79,558 to 80,255). First-time, full-time enrollment for doctoral programs increased for men by 1.3% (from 12,452 to 12,608), whereas the count for women increased by 2.7% (from 14,566 to 14,957).

Trends in Postdoc and Nonfaculty Researcher Employment

Overall, postdoc employment increased to a record high of 69,877 in 2024 (a 6.1% increase from 2023) (figure 1, table 3, and data tables: table 1-15). The number of NFRs reported to the GSS also rose between 2023 and 2024 (table 3). NFR employment counts have increased by 18.5% since 2020 and by 2.3% over the most recent year, from 34,342 in 2023 to 35,142 in 2024.

Table 3. Postdoc and nonfaculty researcher employment, by field: 2020–24

(Number and percent change)

Characteristic	Postdoctoral appointees							Nonfaculty researchers						
						Percent change							Percent change	
	2020	2021	2022	2023	2024	2020–24	2023–24	2020	2021	2022	2023	2024	2020–24	2023–24
All surveyed fields	65,681	63,328	62,750	65,850	69,877	6.4	6.1	29,661	30,548	32,279	34,342	35,142	18.5	2.3
Science and engineering	47,203	45,529	45,008	47,033	49,247	4.3	4.7	22,133	22,720	23,778	25,175	25,002	13.0	-0.7
Science	38,741	37,189	36,673	37,982	39,702	2.5	4.6	18,212	18,728	19,423	20,600	20,566	12.9	-0.2
Agricultural and veterinary sciences	1,678	1,595	1,705	1,993	2,177	29.7	9.2	964	902	1,068	1,238	1,234	28.0	-0.3
Biological and biomedical sciences	21,902	20,245	19,585	19,520	20,234	-7.6	3.7	8,112	8,187	8,207	8,589	8,795	8.4	2.4
Computer and information sciences	823	880	859	987	1,042	26.6	5.6	458	457	507	631	653	42.6	3.5
Geosciences, atmospheric, and ocean sciences	1,790	1,797	1,787	1,919	2,043	14.1	6.5	2,150	2,308	2,448	2,455	2,253	4.8	-8.2
Mathematics and statistics	1,076	1,112	1,110	1,220	1,238	15.1	1.5	201	235	251	307	199	-1.0	-35.2
Multidisciplinary and interdisciplinary sciences	832	878	840	988	1,061	27.5	7.4	679	816	931	818	890	31.1	8.8
Natural resources and conservation	845	889	936	937	969	14.7	3.4	573	620	605	663	649	13.3	-2.1
Physical sciences	6,937	6,823	6,877	7,220	7,570	9.1	4.8	2,890	2,895	2,894	3,095	3,093	7.0	-0.1
Psychology	1,312	1,325	1,308	1,344	1,392	6.1	3.6	749	803	786	950	892	19.1	-6.1
Social sciences	1,546	1,645	1,666	1,854	1,976	27.8	6.6	1,436	1,505	1,726	1,854	1,908	32.9	2.9
Engineering	8,462	8,340	8,335	9,051	9,545	12.8	5.5	3,921	3,992	4,355	4,575	4,436	13.1	-3.0
Aerospace, aeronautical, and astronautical engineering	233	277	244	254	246	5.6	-3.1	149	144	153	166	167	12.1	0.6
Biological, biomedical, and biosystems engineering	1,696	1,616	1,540	1,594	1,685	-0.6	5.7	525	589	685	674	680	29.5	0.9
Chemical, petroleum, and chemical-related engineering	1,157	1,167	1,239	1,501	1,552	34.1	3.4	330	307	313	349	363	10.0	4.0
Civil, environmental, transportation, and related engineering fields	1,006	968	1,018	1,070	1,166	15.9	9.0	488	479	569	654	583	19.5	-10.9
Electrical, electronics, communications, and computer engineering	1,302	1,275	1,217	1,339	1,381	6.1	3.1	706	755	734	799	698	-1.1	-12.6
Industrial, manufacturing, systems engineering, and operations research	194	127	143	170	162	-16.5	-4.7	155	107	197	221	164	5.8	-25.8
Mechanical engineering	1,149	1,200	1,189	1,317	1,459	27.0	10.8	469	529	527	560	566	20.7	1.1
Metallurgical, mining, materials, and related engineering fields	630	562	542	557	588	-6.7	5.6	299	259	280	249	260	-13.0	4.4
Other engineering	1,095	1,148	1,203	1,249	1,306	19.3	4.6	800	823	897	903	955	19.4	5.8
Health	18,478	17,799	17,742	18,817	20,630	11.6	9.6	7,528	7,828	8,501	9,167	10,140	34.7	10.6
Clinical medicine	16,287	15,561	15,630	16,393	17,919	10.0	9.3	6,500	6,751	7,351	7,798	8,618	32.6	10.5
Other health	2,191	2,238	2,112	2,424	2,711	23.7	11.8	1,028	1,077	1,150	1,369	1,522	48.1	11.2

Note(s):
For more information on the mapping of fields and codes in the Survey of Graduate Students and Postdoctorates in Science and Engineering, see table A-6 at https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e/2024#methodology.

Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

Field of Research

From 2023 to 2024, postdoctoral appointments increased by 4.6% in science, 5.5% in engineering, and 9.6% in health (table 3). In 2024, the two fields with the most postdocs were biological and biomedical sciences (20,234) and clinical medicine (17,919). These are the only two fields employing more than 10,000 postdocs; together, they accounted for 54.6% of all postdoctoral employment.

Several broad fields had notable 1-year changes in the number of postdocs from 2023 to 2024. In the science fields, agricultural and veterinary sciences increased by 9.2%, multidisciplinary and interdisciplinary sciences increased by 7.4%, social sciences increased by 6.6%, and geosciences, atmospheric, and ocean sciences increased by 6.5%. In engineering fields, mechanical engineering increased by 10.8% and civil, environmental, transportation, and related engineering fields increased by 9.0%. In the health fields, both clinical medicine (9.3%) and other health (11.8%) increased. All other subfields rose as well, with the exception of aerospace, aeronautical, and astronautical engineering (-3.1%) and industrial, manufacturing, systems engineering, and operations research (-4.7%).

From 2020 to 2024, NFR employment increased by 18.5%, and between 2023 and 2024, it rose by 2.3% (from 34,342 to 35,142), which is the most NFRs ever reported to the GSS (table 3 and data tables: table 1-1). The overall growth in NFRs was due to a 10.6% increase in the health fields. Specifically, clinical medicine grew by 820 NFRs. Similar to postdoc appointments, biological and biomedical sciences and clinical medicine were the two largest fields, employing about half (49.6%) of NFRs reported in the GSS (data tables: data table 2-1). The number of postdocs and NFRs in the social sciences increased in every year from 2020 to 2024, even as doctoral enrollment declined (table 2 and table 3).

Demographics of Postdocs

Between 2023 and 2024, the number of postdocs increased or remained stable in all racial and ethnic subgroups except for Native Hawaiians and Other Pacific Islanders (table 4). In 2024, 58.3% of postdocs were temporary visa holders, similar to the 57.9% in 2023 (data tables: table 1-7). Temporary visa–holding postdocs increased 6.8% (from 38,149 to 40,746) from 2023 to 2024, with similar count increases for both male and female postdocs (1,303 and 1,294, respectively). Female postdocs who held temporary visas increased by 8.6% from 2023 to 2024 and 24.2% from 2020 to 2024, with male postdocs on temporary visas experiencing smaller percentage growth in these two periods (5.7% and 7.9%, respectively).

Table 4. Postdoc employment, by sex, citizenship status, race, and ethnicity: 2020–24

(Number and percent change)

Characteristic	2020	2021	2022	2023	2024	Percent change 2020–24	Percent change 2023–24
All surveyed fields	65,681	63,328	62,750	65,850	69,877	6.4	6.1
U.S. citizens and permanent residents[a]	29,890	29,755	27,289	27,701	29,131	-2.5	5.2
Male	15,579	15,480	14,247	14,321	14,790	-5.1	3.3
Female	14,311	14,275	13,042	13,380	14,341	0.2	7.2
Hispanic or Latino	2,027	2,142	2,192	2,352	2,599	28.2	10.5
Not Hispanic or Latino							
American Indian or Alaska Native	72	80	92	111	123	70.8	10.8
Asian	5,696	6,014	5,286	5,631	5,793	1.7	2.9
Black or African American	1,081	1,138	1,141	1,230	1,389	28.5	12.9
Native Hawaiian or Other Pacific Islander	52	40	34	57	38	-26.9	-33.3
White	17,123	16,369	15,221	14,585	14,662	-14.4	0.5
More than one race	555	687	638	694	847	52.6	22.0
Unknown race and ethnicity	3,284	3,285	2,685	3,041	3,680	12.1	21.0
Temporary visa holders	35,791	33,573	35,461	38,149	40,746	13.8	6.8
Male	22,660	21,040	21,791	23,137	24,440	7.9	5.7
Female	13,131	12,533	13,670	15,012	16,306	24.2	8.6

[a] Race and ethnicity data are available for U.S. citizens and permanent residents only.

Source(s):
National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering.

The number of U.S. citizen and permanent resident postdocs increased by 5.2% (from 27,701 to 29,131) between 2023 to 2024, although overall counts declined by 2.5% since 2020 (table 4). Among U.S. citizen and permanent resident postdocs, the number of women grew by 7.2% and the number of men increased by 3.3%. Among U.S. citizens and permanent residents, the number of female postdocs was similar in 2024 and 2020, whereas the number of male postdocs declined by 5.1% to 14,790 during this period.

Data Sources and Limitations

Conducted since 1966, the GSS is an annual survey of all academic institutions in the United States that grant research-based master's or doctoral degrees in SEH fields. The 2024 GSS collected data from 23,121 organizational units (departments, programs, affiliated research centers, and health care facilities) at 635 eligible institutions and their affiliates in the United States, Puerto Rico, and Guam. The unit response rate was 97.8%, and the 2024 GSS institutional response rate was 93.7%; an overview of the survey is available at https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e.

In summer 2024, the GSS conducted a comprehensive eligibility review of institutions with six or fewer organizational units in the 2023 GSS. As a result of the eligibility review, 53 institutions were identified as no longer offering research-based master's or doctoral programs in GSS fields and thus no longer GSS eligible. In 2023, these institutions reported 0.8% of graduate students, including 1.3% of master's students, under 0.1% of doctoral students, postdoctoral appointees, and doctorate-holding NFRs. Thus, the tables in this InfoBrief show both the published (2023) and adjusted (2023adjusted) GSS counts, whereas the discussion focuses on the 2023 adjusted values only. This adjustment allows for more accurate comparisons between 2023 and 2024 data and prevents attributing changes in trends due to the eligibility review to 2024. For more information on the eligibility review and the impact on the GSS, see the 2024 survey's Technical Notes and the publication *Impact of the 2024 GSS Institutional Eligibility Review on Counts of GSS Master's Students*.[2]

In 2020, the GSS amended its taxonomy to align with a revised NCSES Taxonomy of Disciplines (TOD) and 2020 National Center for Education Statistics (NCES) Classification of Instructional Programs (CIP). As such, these changes did not lead to a large shift in overall reported GSS counts, and data remain comparable to data from 2017 to 2019. New CIP codes, such as data science and medical clinical sciences were added, along with other CIP codes in the GSS-eligible series; although these CIP codes are newly eligible, a review of unit names from prior years indicates that many of them were being reported prior to 2020. Some additional adjustments in the GSS reporting taxonomy allow for additional detail in some fields based on the 2020 CIP codes reported to GSS. Finally, similar to the structure for science and health in the GSS taxonomy, engineering was reorganized to report broad fields. For more information about the 2020 GSS taxonomy change, see the 2020 data tables: table A-17, table A-18a, and table A-18b.[3]

GSS health fields are collected under the advisement of NIH. These GSS fields are about a third of all health fields in the Department of Education's CIP taxonomy. NIH information on trends seen within these selected health fields can be found at https://report.nih.gov/nihdatabook/.

The full set of data tables from the 2024 survey is available at https://ncses.nsf.gov/surveys/graduate-students-postdoctorates-s-e. Data are also available in NCSES's interactive data tool (https://ncsesdata.nsf.gov/builder/gss). For more information about the survey, contact NCSES.

Notes

1 National Center for Science and Engineering Statistics (NCSES). 2021. *Universities Report Growth in U.S. Citizen and Permanent Resident Enrollment Along with Declines in Enrollment of Temporary Visa Holders at Master's and Doctoral Levels Due to the COVID-19 Pandemic*. NSF 22-313. Alexandria, VA: U.S. National Science Foundation. Available at https://ncses.nsf.gov/pubs/nsf22313.

2 National Center for Science and Engineering Statistics (NCSES). 2025. *Impact of the 2024 GSS Institutional Eligibility Review on Counts of GSS Master's Students*. NSF 25-346. Alexandria, VA: U.S. National Science Foundation. Available at https://ncses.nsf.gov/pubs/nsf25346.

3 National Center for Science and Engineering Statistics (NCSES). 2022. *Survey of Graduate Students and Postdoctorates in Science and Engineering*. NSF 22-319. Alexandria, VA: U.S. National Science Foundation. Available at https://ncses.nsf.gov/pubs/nsf22319.

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Contact Us

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
U.S. National Science Foundation
Alexandria, VA 22314
Tel: (703) 292-8780
FIRS: (800) 877-8339
TDD: (800) 281-8749
E-mail: ncsesweb@nsf.gov