



2024 DOCTORATE RECIPIENTS

FROM U.S. UNIVERSITIES

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
U.S. National Science Foundation



About this report

The Survey of Earned Doctorates (SED), the data source for this report, is an annual census of individuals who earn research doctoral degrees from accredited U.S. academic institutions. The survey is sponsored by the National Center for Science and Engineering Statistics (NCSES) within the U.S. National Science Foundation and by three other federal agencies: the National Institutes of Health, the Department of Education, and the National Endowment for the Humanities.

Monitoring the number of degrees awarded in science and engineering fields is an important part of the mission of NCSES, the nation's leading provider of statistical data on the U.S. science and engineering enterprise. Data from the SED are reported in several publications. The most comprehensive and widely cited publication is this summary report, *Doctorate Recipients from U.S. Universities*. This report calls attention to major trends in doctoral education and is organized into three themes that highlight important questions about doctorate recipients. Readers are invited to explore trends in greater depth through detailed data tables and interactive graphics at the report website (<https://nces.nsf.gov/sed/>). Technical notes and related resources are provided to aid in interpreting the data, and the report's content is available for downloading. SED data are also available via an interactive data tool (<https://ncesdata.nsf.gov/builder/sed>) and the SED Restricted Data Analysis System (<https://ncesdata.nsf.gov/rdas>).

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Executive summary

Doctoral education trains scientists, engineers, researchers, and scholars, all of whom are critical to the nation's progress. These individuals discover, create, and share new knowledge and new ways of thinking that lead, directly and indirectly, to new products, services, and works of art. Annual counts of doctorate recipients from U.S. universities are measures of the incremental investment in human resources devoted to science, engineering, research, and scholarship, and these counts can serve as leading indicators of the capacity for knowledge creation and innovation in various domains.

Changes in the characteristics of doctorate recipients over time reflect political, economic, social, technological, and demographic trends. These include the following:

- Changes in doctorate recipient demographics
- Changes in the number of doctorates awarded in specific science and engineering (S&E) fields
- Shifting academic employment opportunities after graduation
- Trends in the pursuit of postdoctoral (postdoc) research positions by field

Understanding these trends and changes is necessary to inform policy discussions regarding this country's doctoral education system.

The data in this report cover the 2024 academic year (1 July 2023 to 30 June 2024) and were collected from doctoral students who completed the Survey of Earned Doctorates (SED) as they approached graduation.

Key takeaways from the 2024 SED data include the following:

- The number of doctorate recipients from U.S. universities increased from 57,806 in 2023 to 58,131 in 2024.
- In the past 2 decades, the number of doctorates awarded to temporary visa holders increased by 76% in S&E fields and by 24% in non-S&E fields, compared with a 61% increase in S&E and a 20% decline in non-S&E doctorates awarded to U.S. citizens and permanent residents.
- Between 2023 and 2024, the proportion of doctorate recipients with definite employment commitments declined in all S&E broad fields. The largest declines were in physical sciences and mathematics and statistics (6 percentage points each); in biological and biomedical sciences (5 percentage points); and in agricultural sciences and natural resources, health sciences, and engineering (4 percentage points each).
- In the past 20 years, the proportion of non-postdoc U.S. employment commitments in academia declined in all S&E fields, while the proportion of those in industry or business increased. Despite this long-term trend, between 2023 and 2024 the proportion of non-postdoc commitments in academia increased in all S&E fields except psychology. In industry or business, the proportion of these commitments declined in all S&E fields since at least 2022.
- Between 2023 and 2024, the proportion of definite commitments for postdoc positions increased in most S&E fields. The largest increases, between 6 and 8 percentage points, were in physical sciences, biological and biomedical sciences, and computer and information sciences.

U.S. doctorate awards

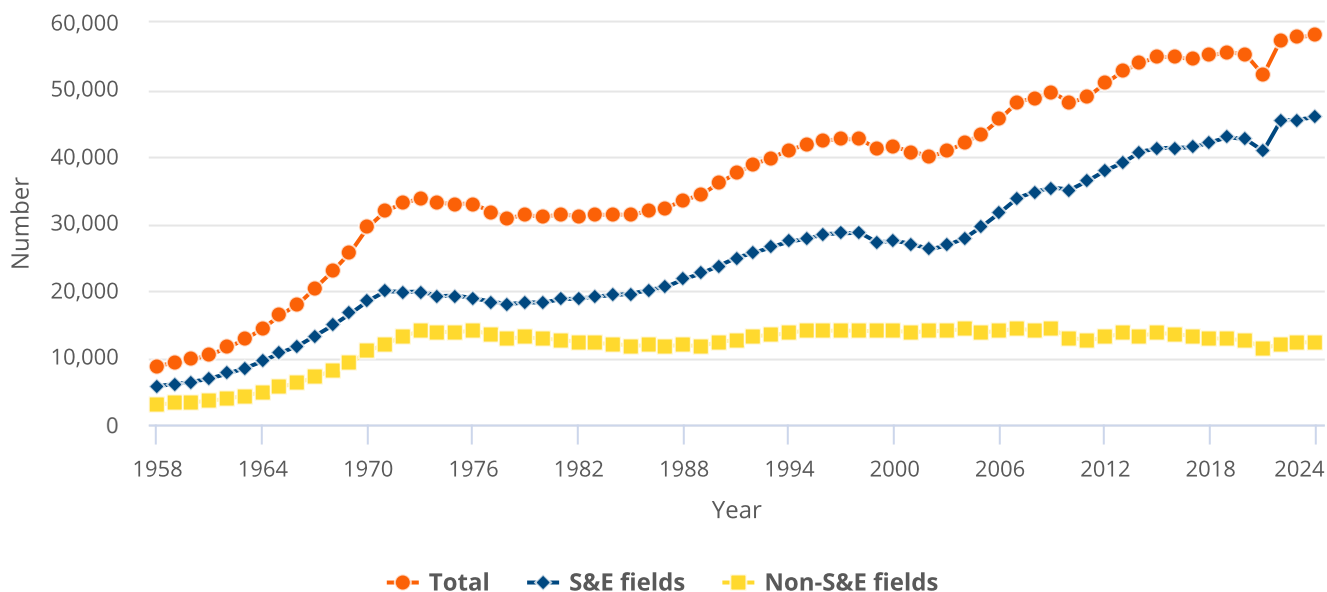
Each annual cohort of doctorate recipients augments the supply of prospective scientists, engineers, researchers, and scholars available to the U.S. labor market. Data on the composition of these cohorts reveal demographic changes.

Overall trends

The number of research doctoral degrees awarded by U.S. institutions increased from 57,806 in 2023 to 58,131 in 2024 (figure 1).¹ This increase is similar to the increase between 2022 and 2023. Since the Survey of Earned Doctorates (SED) began collecting data in academic year 1958, there has been an upward trend in the number of doctorates awarded by U.S. institutions—with an average annual growth of 3.0%, punctuated by periods of slower growth and some declines.

Since the survey's inception, the number of doctorates in science and engineering (S&E) fields has exceeded the number of non-S&E doctorates and this gap has widened over time.² From 2004 to 2024, the number of S&E doctorate recipients increased by 65%, while the number of non-S&E doctorate recipients decreased by 15%. As a result, the proportion of S&E doctorates to all doctorates climbed from 66% in 2004 to 79% in 2024.

Figure 1. Doctorates awarded by U.S. colleges and universities: 1958–2024



S&E = science and engineering.

Note(s):

The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the "Data source" section.

Source(s):

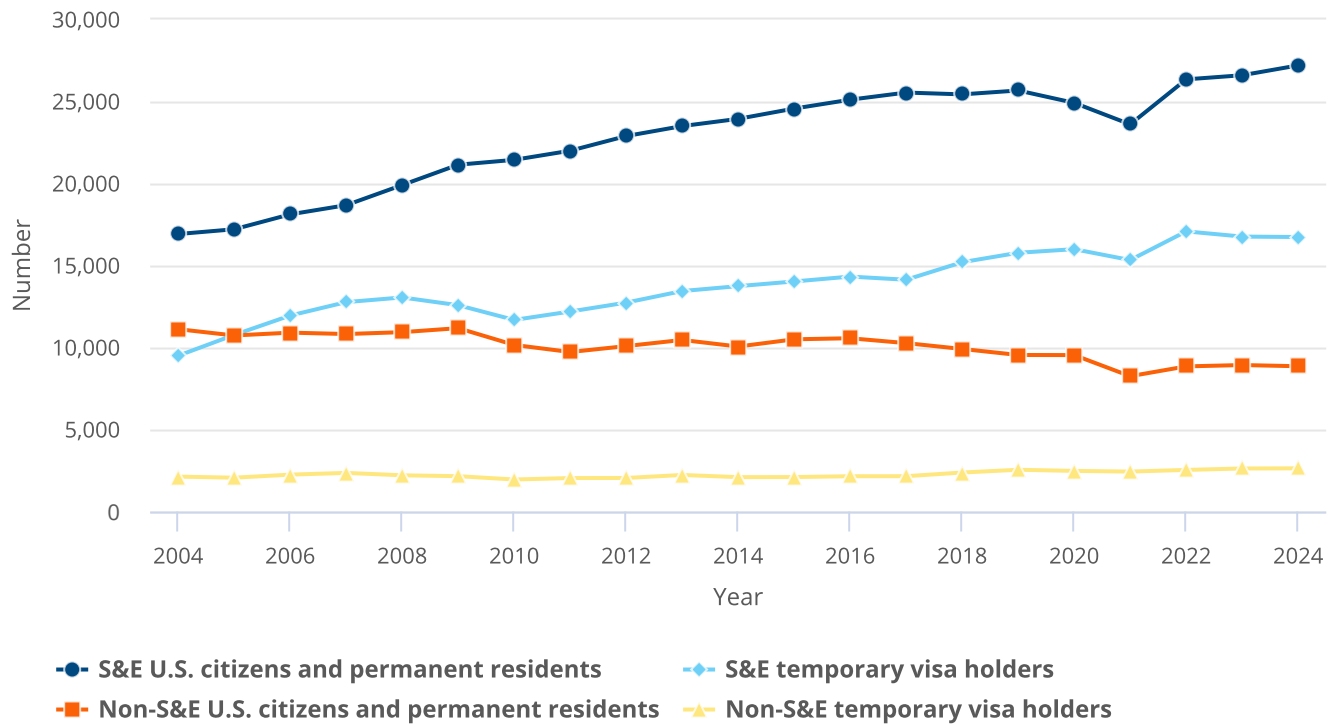
National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-1](#).

Citizenship

Trends in citizenship

In 2024, U.S. institutions awarded 45,929 total S&E doctorates. Of the 43,942 S&E doctorate recipients who reported their citizenship, U.S. citizens and permanent residents earned 27,204 (62%) of the S&E doctorates, an increase of 600 from 2023. Temporary visa holders earned 16,738 (38%), a slight decline of 27 from 2023 (figure 2). Over the past 20 years, the average proportions of U.S. citizens and permanent residents and temporary visa holders earning S&E doctorates from U.S. institutions has remained stable at 62% and 38%, respectively. Overall, the number of S&E doctorates awarded to temporary visa holders has increased by 76% since 2004 and by 22% since 2014. Over the past 20 years, the proportion of S&E doctorates awarded to temporary visa holders peaked at 41% in 2007, declined to 35% in 2010, held steady at about 36% between 2011 and 2017, and grew to 39% through 2020, where it remained about the same through 2024.³ Starting from a larger base, the number of S&E doctorates awarded to U.S. citizens and permanent residents experienced a slower relative increase over the past 20 years (61% since 2004 and 14% since 2014) compared with the increase in S&E doctorates awarded to temporary visa holders.

Figure 2. Doctorates awarded in S&E and non-S&E fields, by citizenship status: 2004–24



S&E = science and engineering.

Note(s):

Excludes respondents who did not report citizenship. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

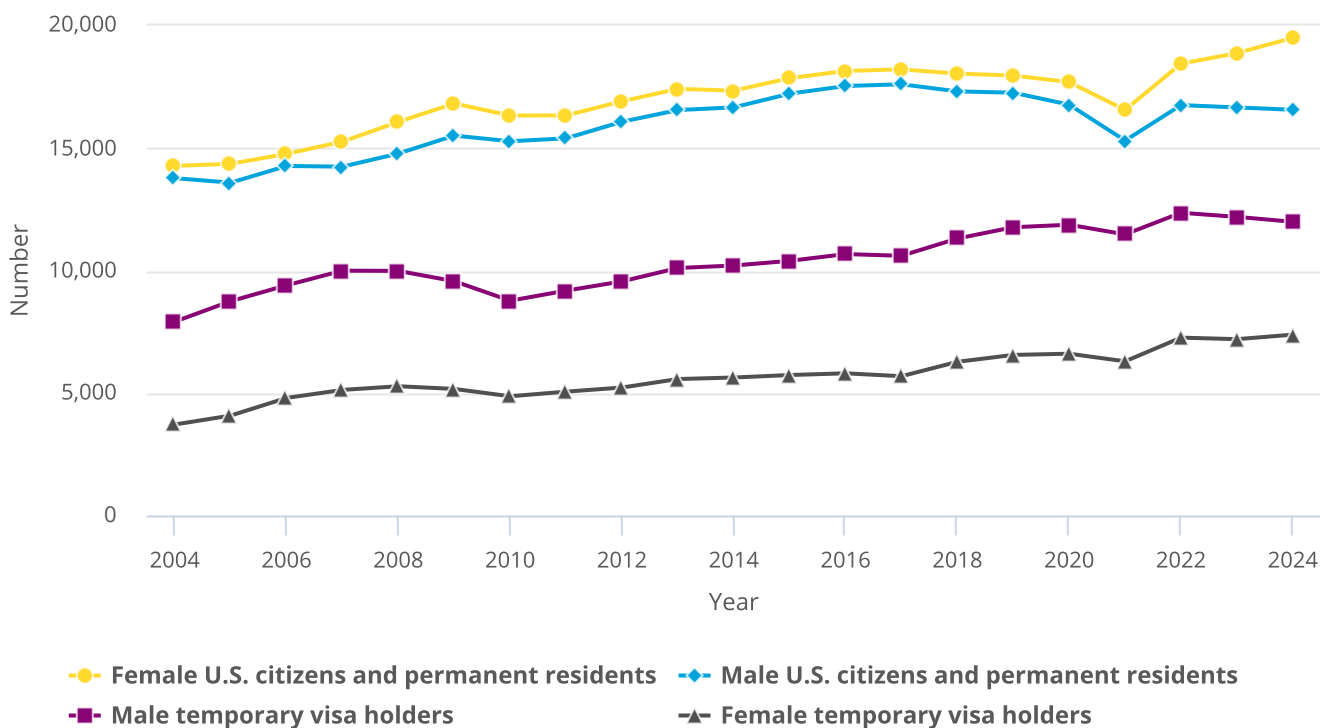
National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-6](#) and [table 1-7](#).

Citizenship and sex

In 2024, women earned 48% of all doctorates awarded by U.S. institutions (up from 45% in 2004), and men earned 52% (down from 55% in 2004) (figure 3). These proportions, however, varied by citizenship. Among U.S. citizens and permanent residents, women earned 54% of doctorates awarded in 2024, while men earned 46%. Among temporary visa holders, men earned 62% of doctorates awarded and women earned 38%.

Between 2004 and 2024, the proportion of women among U.S. citizens and permanent residents earning doctorates increased from 51% to 54%, while the proportion of their male counterparts earning doctorates declined from 49% to 46%. During this period, among temporary visa holders, the proportion of men earning doctorates declined from 68% to 62%, while the proportion of women increased from 32% to 38%. From 2023 to 2024, the number of female doctorate recipients who were U.S. citizens and permanent residents increased by 624, and female temporary visa holders increased by 185. In contrast, during the same period, the number of male doctorate recipients, regardless of citizenship status, decreased, continuing the decline observed between 2022 and 2023.

Figure 3. Doctorates awarded, by sex and citizenship: 2004–24



Note(s):

Excludes respondents who did not report sex or citizenship. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the "Data source" section.

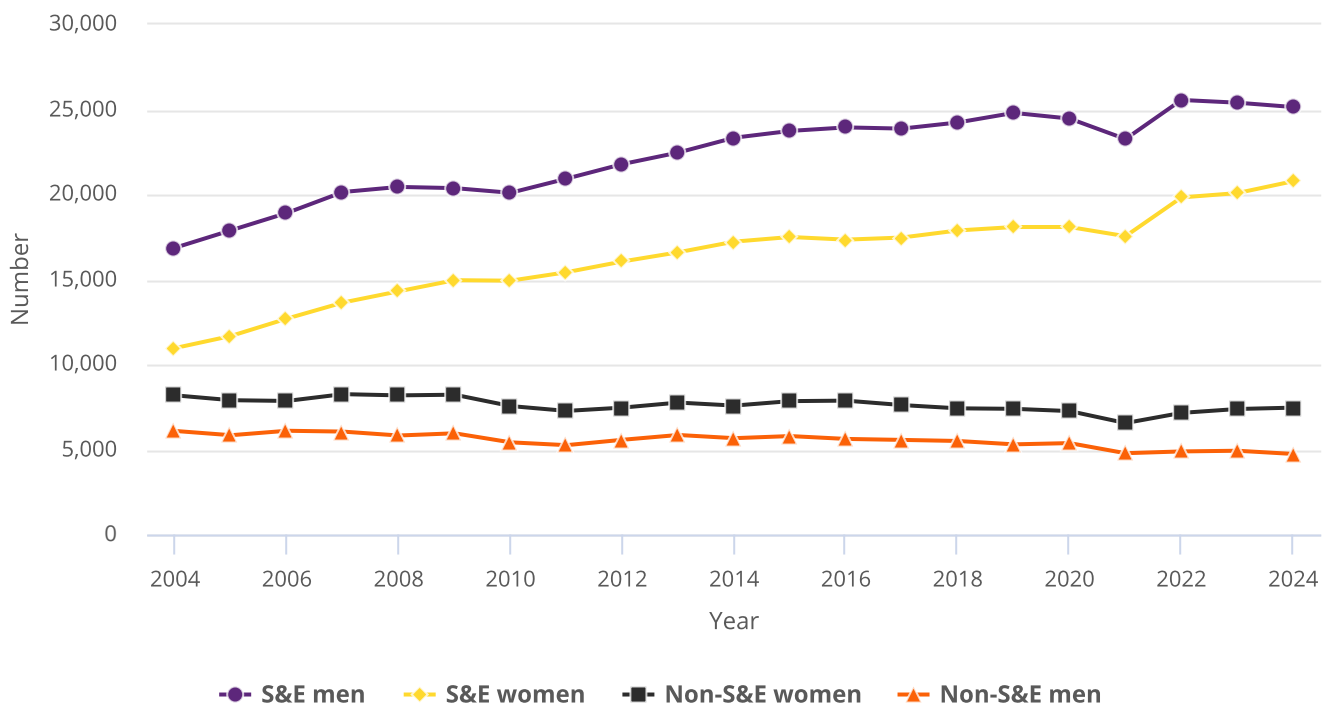
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 1-9 and table 1-10.

Sex and field

In the past 20 years, all of the growth in the number of doctorates earned by both men and women has been in S&E fields (figure 4). During this period, the number of female doctorate recipients in S&E fields increased by 89% (from 10,969 in 2004 to 20,782 in 2024), compared with a 49% increase in the number of male S&E doctorate recipients (from 16,872 in 2004 to 25,146 in 2024). The proportion of female doctorate recipients in S&E increased from 39% in 2004 to 42% in 2009, remained fairly stable through 2019, and increased to 45% by 2024. While the proportion of female doctorate recipients in non-S&E fields has always been higher than that in S&E fields, the proportion of women earning non-S&E doctorates hovered at about 58% through 2021 and grew to 61% by 2024. In the past 20 years, the number of doctorates in non-S&E fields awarded to men declined by 22% (from 6,093 in 2004 to 4,739 in 2024), and the number awarded to women declined by 9% (from 8,186 to 7,463).

Figure 4. Doctorates awarded, by sex and field: 2004–24



S&E = science and engineering.

Note(s):

Excludes respondents who did not report sex. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

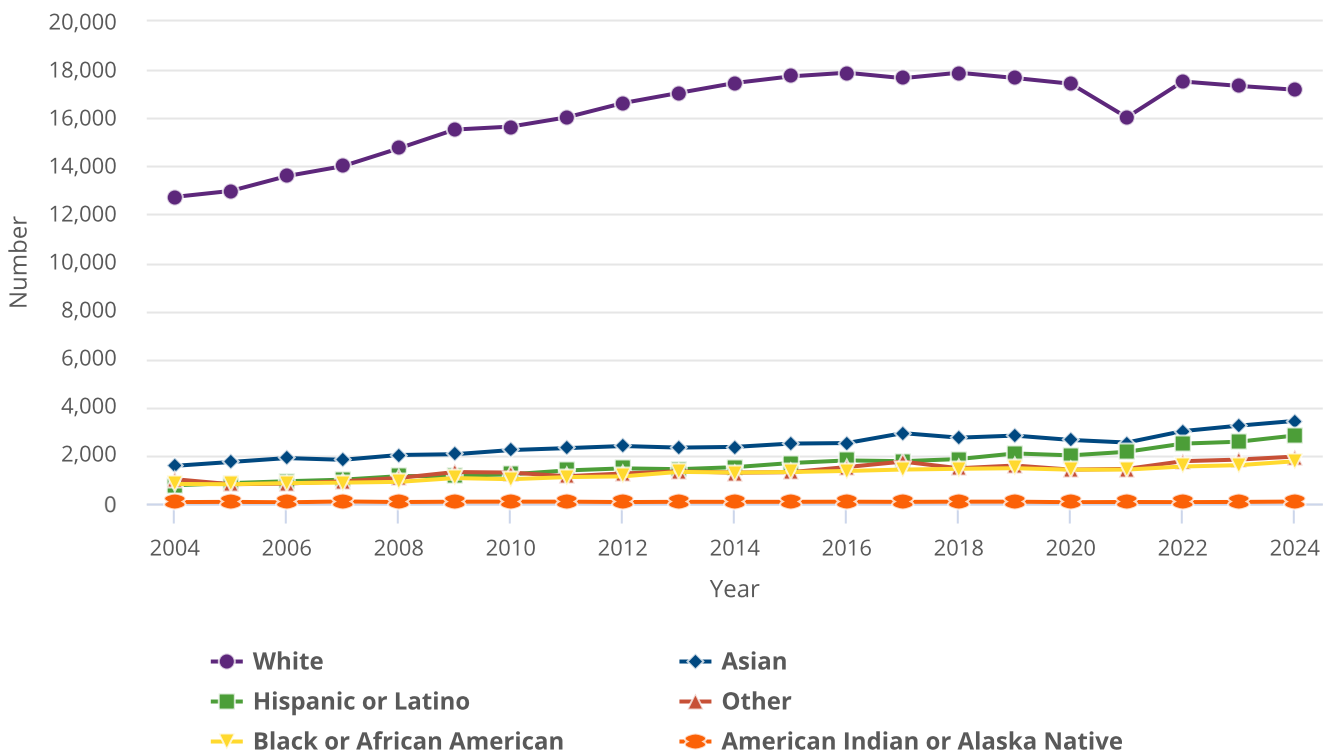
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-4](#) and [table 1-5](#).

Race and ethnicity

While the overall number of doctorates earned by U.S. citizens and permanent residents has increased between 2004 and 2024, the rate of growth, or in some cases decline, varied across racial and ethnic groups. In S&E and in non-S&E fields, the proportion of Asian, Hispanic or Latino, and Black or African American doctorate recipients among U.S. citizens and permanent residents increased, while the proportion of White and American Indian or Alaska Native doctorate recipients declined (figure 5 and figure 6). From 2004 to 2024, the proportion of S&E doctorates earned by White U.S. citizens and permanent residents declined from 75% to 63%, and the proportion earned by Asian U.S. citizens and permanent residents increased from 9% to 13% (figure 5).⁴ In the past 20 years among U.S. citizens and permanent residents awarded S&E doctorates, the number of Hispanic or Latino doctorate recipients increased from 757 (4%) to 2,823 (10%)⁵ and the number of Black or African American doctorate recipients increased from 812 (5%) in 2004 to 1,754 (6%) in 2024. The 2024 number of S&E doctorates awarded to Hispanic or Latino and Black or African American recipients represented the highest number for each group over the last 2 decades. In the same period, the number of American Indian or Alaska Native doctorate recipients in S&E among U.S. citizens and permanent residents fluctuated between 50 and 86. Between 2023 and 2024, S&E doctorates awarded to American Indians or Alaska Natives increased from 66 to 81, remaining under 0.5% of S&E doctorates awarded.

Figure 5. Doctorates earned by U.S. citizens and permanent residents in S&E, by race and ethnicity: 2004–24



S&E = science and engineering.

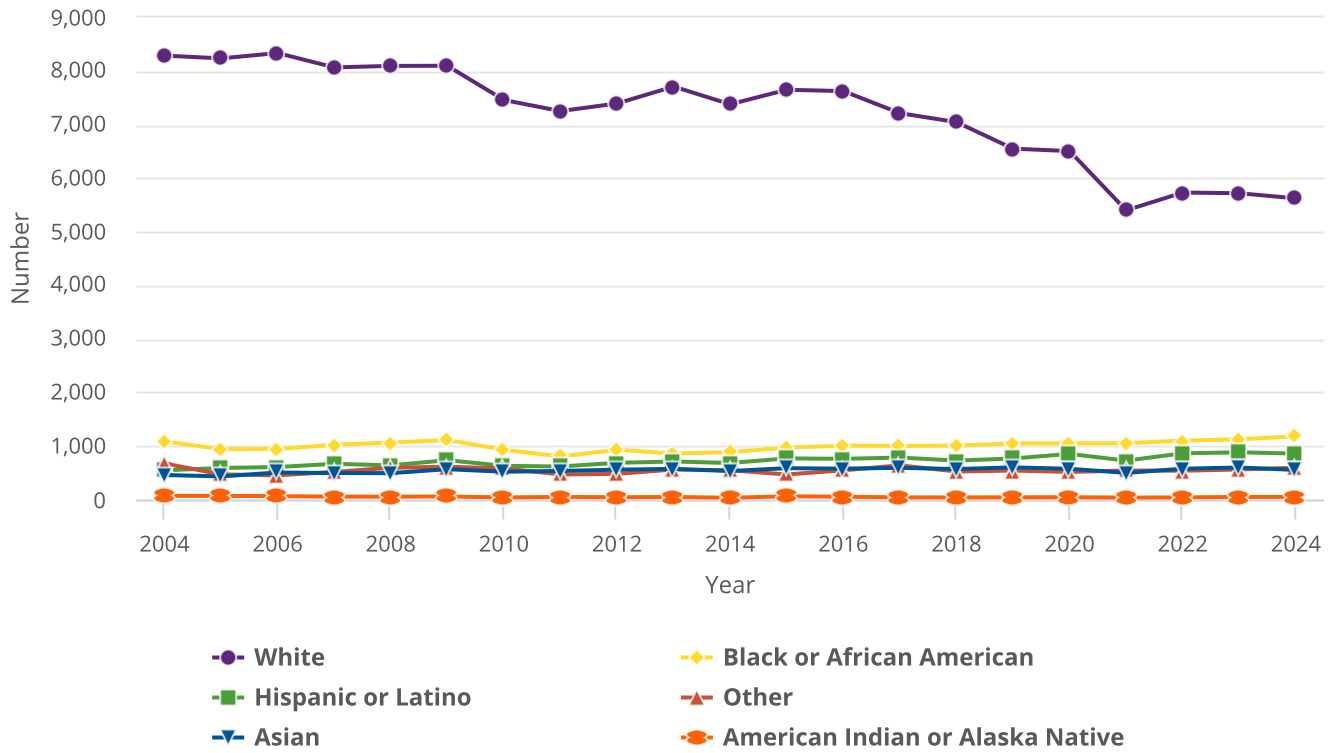
Note(s):

Hispanic may be any race. Other includes Native Hawaiian or Other Pacific Islander, more than one race, unreported race, and unreported ethnicity. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 1-8 and table 1-11.

Figure 6. Doctorates earned by U.S. citizens and permanent residents in non-S&E, by race and ethnicity: 2004–24



S&E = science and engineering.

Note(s):

Hispanic may be any race. Other includes Native Hawaiian or Other Pacific Islander, more than one race, unreported race, and unreported ethnicity. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-8](#) and [table 1-11](#).

Field of doctorate

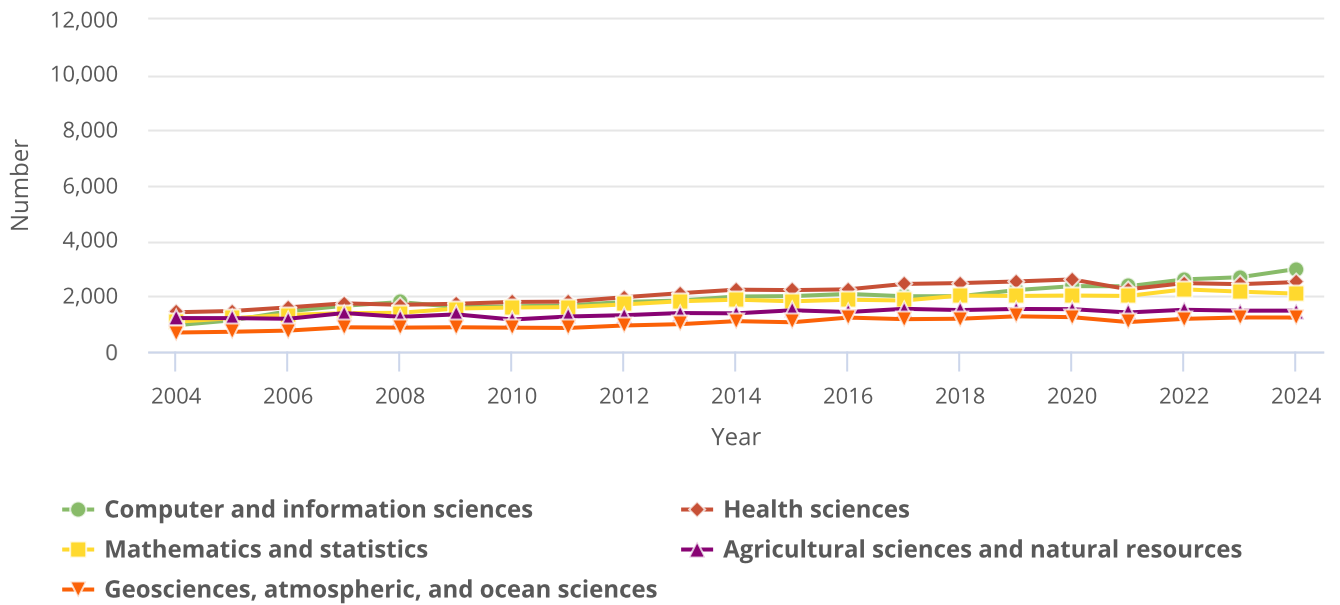
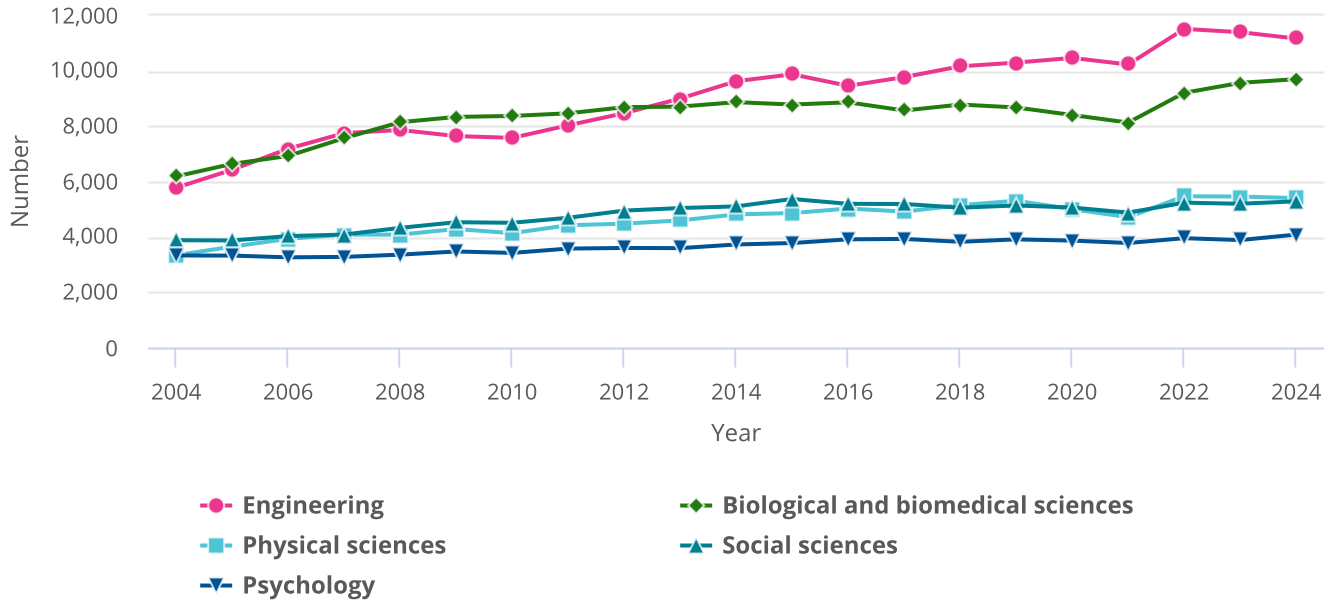
As researchers expand their understanding of the world, new fields of study emerge, and existing fields change. Observing which fields are attracting students can provide early insight into where future research breakthroughs may occur.

Field of doctorate trends

S&E fields

Doctorates in S&E fields are a growing share of all research doctorates awarded. There are 10 trend broad fields (broad field) in S&E (see “[Glossary](#)”) and, over the past 20 years, the number of doctorate recipients has increased in each of them ([figure 7](#)). However, doctorates in psychology, social sciences, and agricultural sciences and natural resources have declined slightly as a proportion of all (S&E and non-S&E) doctorates, despite increases in the number awarded in each field.⁶ Engineering grew the most in terms of its share of all doctorates awarded, from 14% in 2004 to 19% in 2024, followed by computer and information sciences, which grew from 2% of all doctorates in 2004 to 5% in 2024. Between 2023 and 2024, the number of doctorate recipients grew the most in two S&E fields: computer and information sciences (by 296, or 11%) and psychology (by 200, or 5%).⁷ The largest declines between 2023 and 2024 were in engineering (by 229, or 2%) and mathematics and statistics (by 72, or 3%).

Figure 7. Doctorate recipients in S&E trend broad fields: 2004–24



S&E = science and engineering.

Note(s):

The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

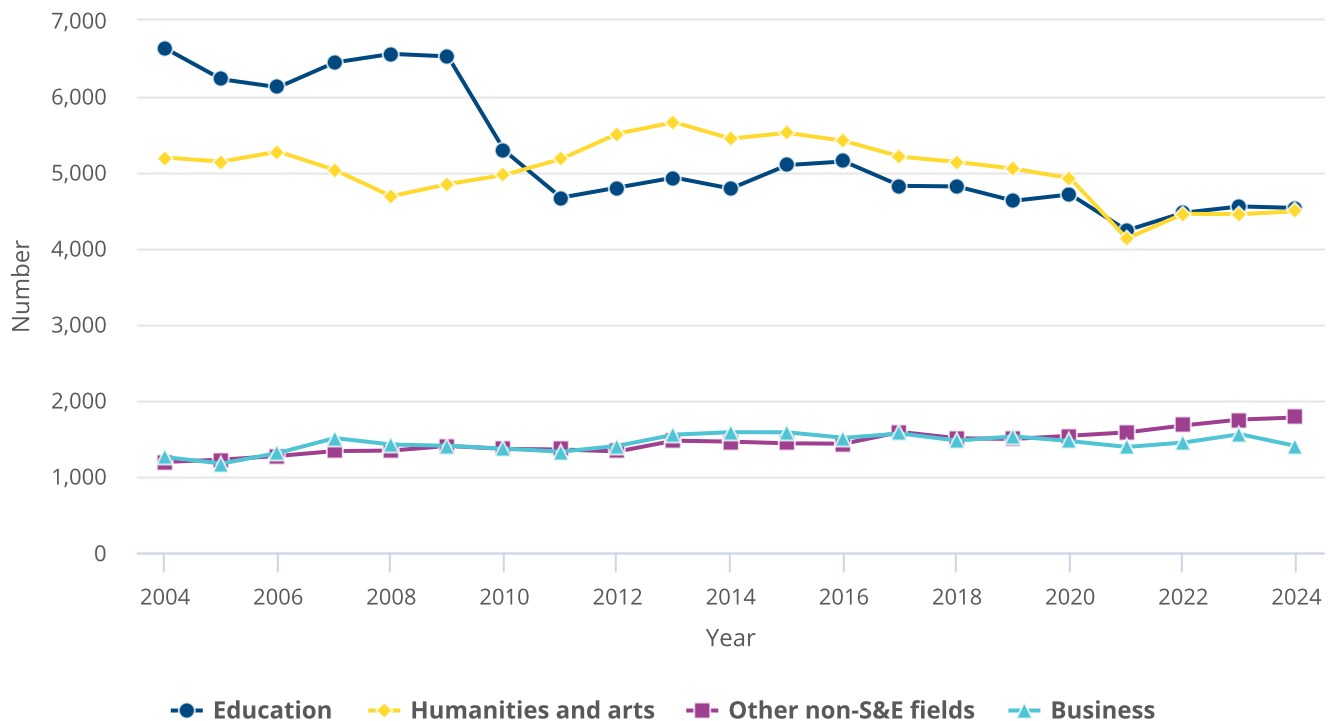
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2023. Related detailed table 1-3.

Non-S&E fields

In the past 20 years, the number of research doctorates awarded in humanities and arts declined while the number in other non-S&E fields increased (figure 8).⁸ The number of research doctorates in business was higher in 2024 than in 2004, but the number fluctuated between the years. From 2014 to 2024, the number of doctorates awarded in education declined by 255.⁹ Between 2023 and 2024, the number of doctorates awarded increased in humanities and arts and in other non-S&E fields (by 39 and 27, respectively) and declined in business (by 157).¹⁰

Figure 8. Doctorates awarded in non-S&E trend broad fields: 2004–24



S&E = science and engineering.

Note(s):

The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years. For more information on this and details on the drop in education doctorates between 2009 and 2011, see the “Data source” section.

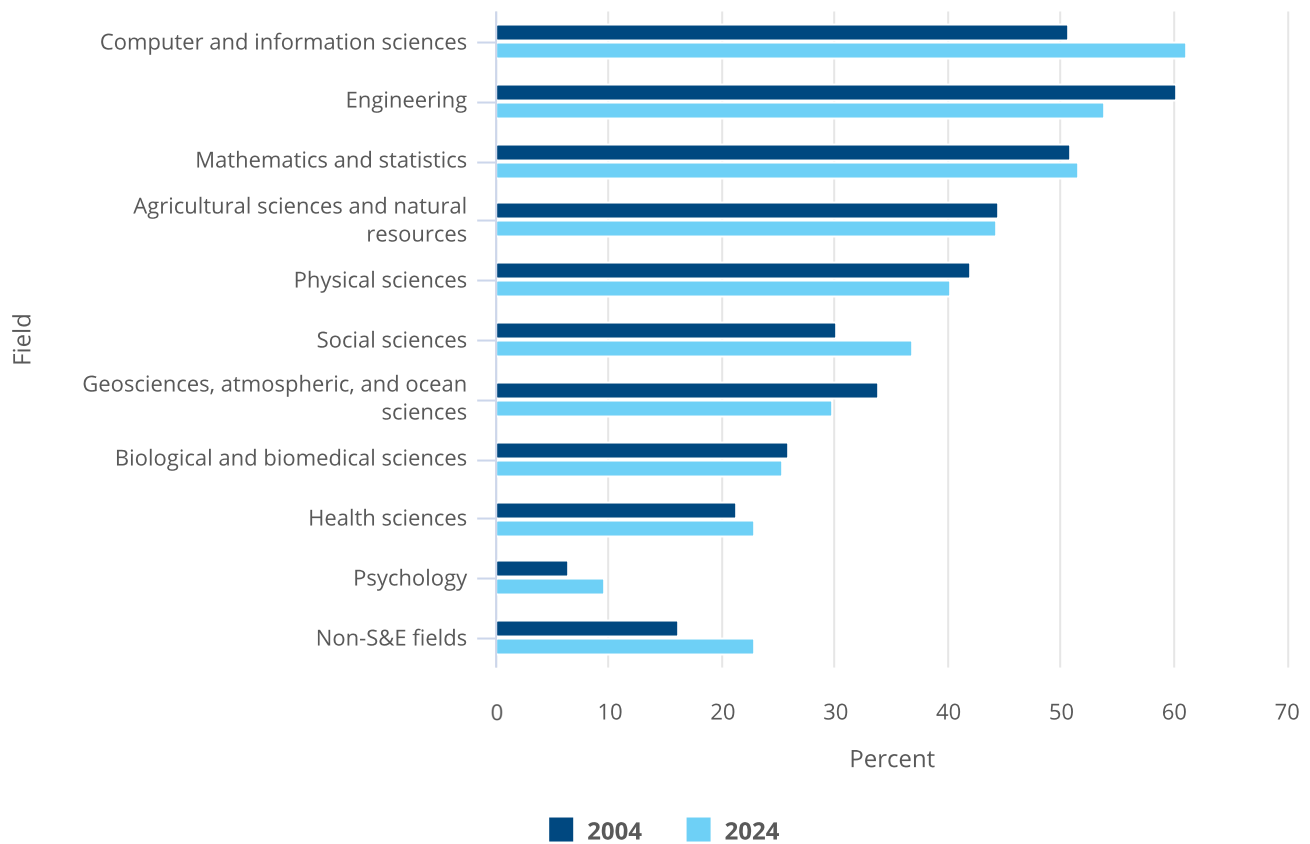
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-3](#).

Citizenship status

In the past 20 years, the number of doctorates awarded to temporary visa holders increased in every broad field except for education.¹¹ In 2024, temporary visa holders earned the majority of doctorates in computer and information sciences (61%), engineering (54%), and mathematics and statistics (51%) (figure 9). The largest increases in the proportion of doctorates awarded to temporary visa holders since 2004 (3 percentage points or more) were in computer and information sciences, social sciences, psychology, and non-S&E fields.¹² During this period, the proportion of temporary visa holder doctorate recipients declined in engineering and in geosciences, atmospheric, and ocean sciences.

Figure 9. Doctorate recipients on temporary visas, by trend broad field: 2004 and 2024



S&E = science and engineering.

Note(s):

Percentages are based on the number of doctorate recipients who reported citizenship status. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 1-6.

U.S. citizens and permanent residents

In 2024, 63% of the 27,204 U.S. citizen and permanent resident doctorate recipients in S&E fields identified as White, 13% as Asian, 10% as Hispanic or Latino, 6% as Black or African American, and 4% as more than one race (table 1). The remaining 3% identified as American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or did not report their race or ethnicity. In 2024, White doctorate recipients accounted for the majority of the U.S. citizens and permanent residents in each S&E field, ranging from 55% in computer and information sciences to 75% in agricultural sciences and natural resources (table 2).

Among other U.S. citizen and permanent resident racial and ethnic groups, Asian doctorate recipients earned the next largest shares of S&E doctoral degrees in computer and information sciences (22%), engineering (17%), mathematics and statistics (15%), biological and biomedical sciences (14%), and physical sciences (12%); Hispanic or Latino doctorate recipients earned the next largest shares in psychology (13%), social sciences (11%), geosciences, atmospheric, and ocean sciences (9%), and agricultural sciences and natural resources (8%); and Black or African American doctorate recipients earned the next largest share in health sciences (14%).¹³

Table 1. S&E doctorates awarded to U.S. citizens and permanent residents, by race or ethnicity: 2024

(Number and percent)

Race and ethnicity	Number	Percent
U.S. citizens and permanent residents	27,204	100.0
Hispanic or Latino	2,823	10.4
Not Hispanic or Latino	24,381	89.6
American Indian or Alaska Native	81	0.3
Asian	3,428	12.6
Black or African American	1,754	6.4
White	17,170	63.1
More than one race	1,083	4.0
Other race or race not reported	386	1.4
Ethnicity not reported	479	1.8

S&E = science and engineering.

Note(s):

Hispanic may be any race. Other race or race not reported includes Native Hawaiian and Other Pacific Islanders and those who did not report their race. Percentages may not sum to 100% due to rounding. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the "Data source" section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 1-11.

Table 2. Doctorates awarded to U.S. citizens and permanent residents, by race or ethnicity and trend broad field: 2024

(Number)

Field	All U.S. citizens and permanent residents	U.S. citizens and permanent residents							Ethnicity not reported
		Hispanic or Latino	Not Hispanic or Latino					Other race or race not reported	
			American Indian or Alaska Native	Asian	Black or African American	White	More than one race		
All fields	36,062	3,682	129	3,980	2,936	22,793	1,377	516	649
Science and engineering	27,204	2,823	81	3,428	1,754	17,170	1,083	386	479
Agricultural sciences and natural resources	800	62	4	59	33	600	13	9	20
Biological and biomedical sciences	6,996	850	15	987	331	4,339	294	94	86
Computer and information sciences	1,103	76	2	243	66	609	50	33	24
Engineering	4,910	413	8	830	234	3,063	190	77	95
Geosciences, atmospheric, and ocean sciences	834	77	1	56	24	621	38	3	14
Health sciences	1,811	148	10	176	258	1,099	55	36	29
Mathematics and statistics	975	66	2	145	36	654	35	18	19
Physical sciences	3,121	329	5	382	100	2,103	119	33	50
Psychology	3,450	448	13	251	369	2,095	155	36	83
Social sciences	3,204	354	21	299	303	1,987	134	47	59
Non-S&E	8,858	859	48	552	1,182	5,623	294	130	170
Business	655	47	2	110	94	349	15	21	17
Education	3,714	383	26	200	654	2,250	107	37	57
Humanities and arts	3,344	334	15	159	197	2,388	125	50	76
Other non-S&E	1,145	95	5	83	237	636	47	22	20

S&E = science and engineering.

Note(s):

Hispanic may be any race. Other race or race not reported includes Native Hawaiian and Other Pacific Islanders and those who did not report their race. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the "Data source" section.

Source(s):

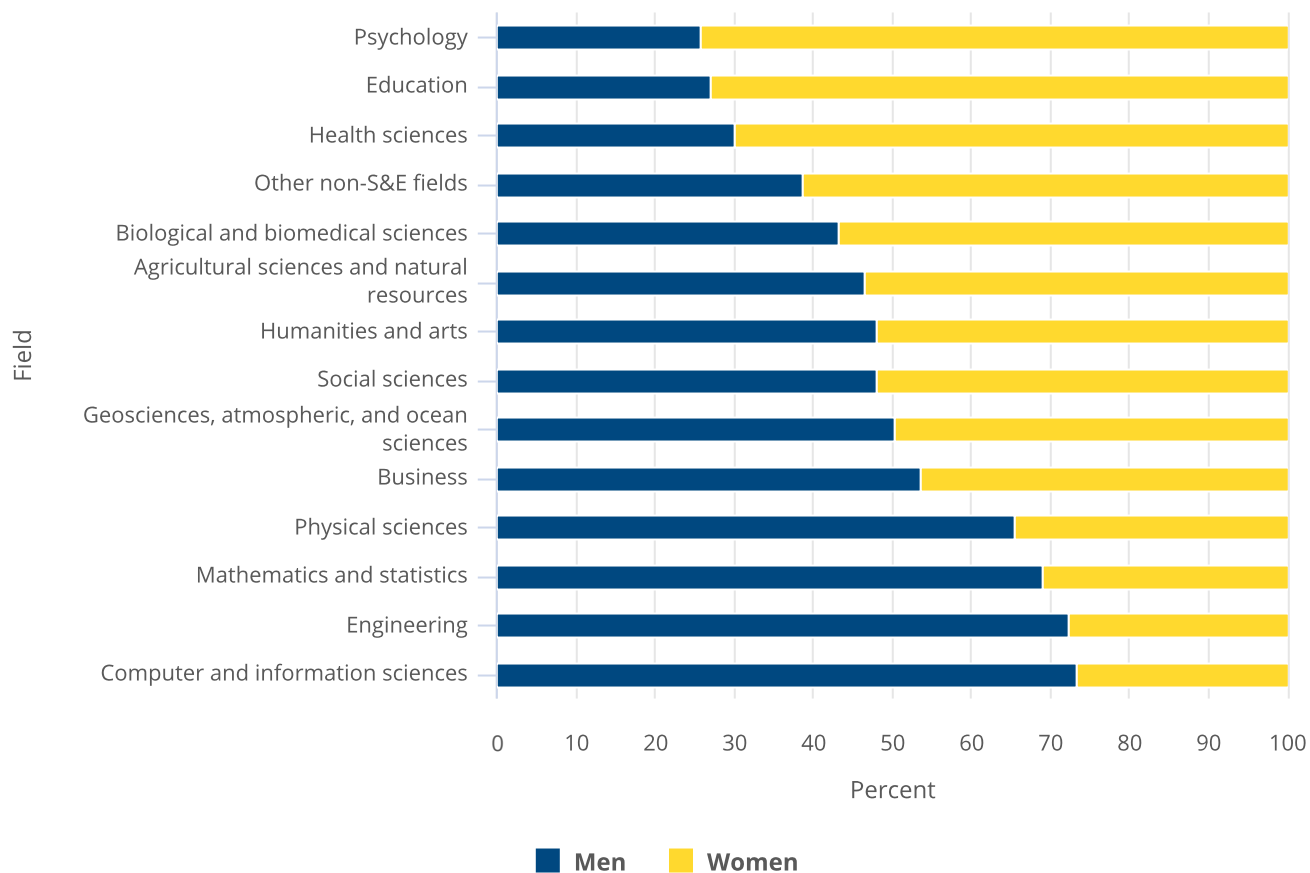
National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 1-11](#).

Sex

The distribution of men and women varies considerably across fields of study (figure 10). In 2024, women earned more than half of the doctorates in psychology, education, health sciences, other non-S&E fields, biological and biomedical sciences, and agricultural sciences and natural resources.¹⁴ Men earned more than half of the doctorates awarded in computer and information sciences, engineering, mathematics and statistics, physical sciences, and business. The percentage of men and women earning doctorates were similar in geosciences, atmospheric, and ocean sciences; humanities and arts; and social sciences.

From 2004 to 2024, the proportion of female doctorate recipients grew in all broad fields except for health sciences; the largest increases (9 percentage points or more) were in agricultural sciences and natural resources; geosciences, atmospheric, and ocean sciences; business; engineering; and biological and biomedical sciences.¹⁵ During this period, the shares of doctorates awarded to men and women in health sciences and in humanities and arts stayed relatively unchanged.

Figure 10. Doctorates awarded, by sex and trend broad field: 2024



S&E = science and engineering.

Note(s):

The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 1-4 and table 1-5.

Postgraduation trends

A graduate's first position after earning a doctoral degree may reflect broad economic conditions and can shape later career opportunities, earnings, and choices. Over the longer term, the early career patterns of doctorate recipients may influence the decisions of future students considering careers as scientists, engineers, scholars, and researchers.

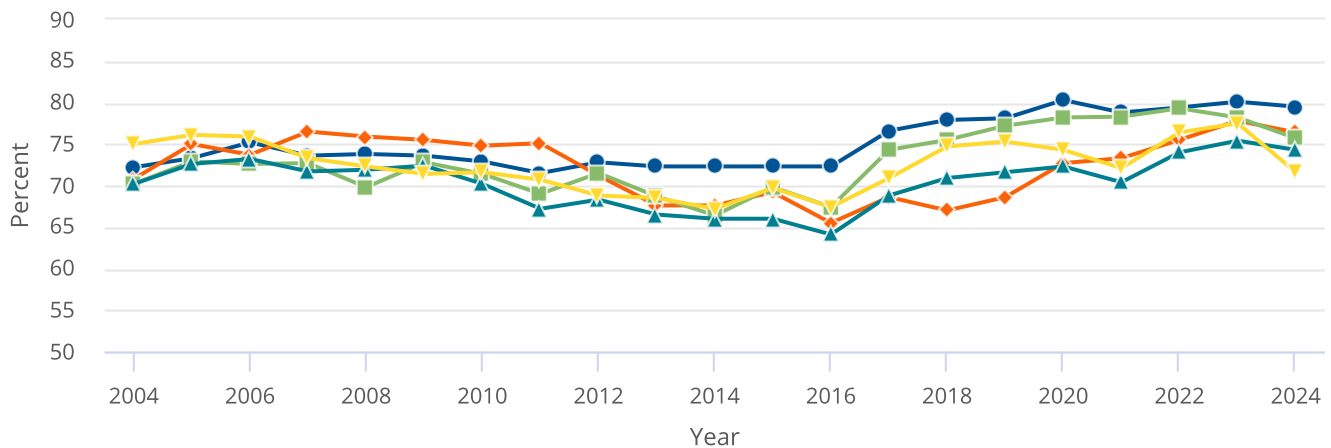
Definite commitments at graduation

At any given time, the job market outlook for new doctorate recipients will be better in some doctorate fields than in others. In general, doctorate recipients in S&E fields tend to have robust postgraduation career prospects. Of the 45,929 S&E doctorate recipients in 2024, 41,567 responded to the postgraduation commitment questions at the time of survey completion. Of those who responded to this question, 29,122 (70%) had definite commitments for employment or postdoctoral study or training (postdoc) positions. The survey measures a point in time, and some of the 12,445 (30%) who did not indicate having a postgraduate commitment may have had one after responding to the survey.¹⁶ The proportions of 2024 doctorate recipients in S&E with definite commitments for employment or postdoc positions ranged from 63% in biological and biomedical sciences to 80% in psychology (figure 11). The overall proportion of S&E doctorate recipients with definite commitments was the same in 2024 and in 2004 (70%) but with a great deal of fluctuation throughout this period.¹⁷ In general, most fields show a decline in definite commitments between 2004 and the mid-2010s, with lows between 2014 and 2016, followed by a rebound through 2023 and a decline between 2023 and 2024. Psychology was the exception to this pattern; definite commitments among doctorate recipients in psychology did not experience a dip in the years between 2013 and 2017.

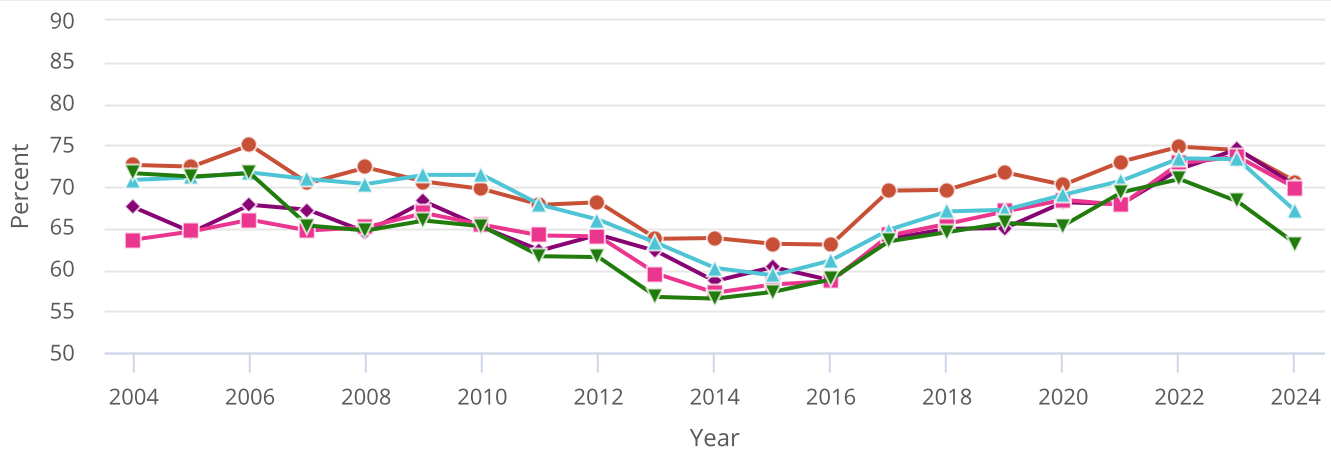
Between 2023 and 2024, the proportion of doctorate recipients with definite commitments declined in all S&E broad fields. The largest percentage-point declines in definite commitments were in physical sciences and mathematics and statistics (6 percentage points each); in biological and biomedical sciences (5 percentage points); and in agricultural sciences and natural resources, health sciences, and engineering (4 percentage points each). Smaller declines (between 1 and 2 percentage points) were experienced in computer and information sciences; geosciences, atmospheric, and ocean sciences; social sciences; and psychology.

Overall, the proportion of non-S&E doctorate recipients reporting definite commitments was the same in 2024 as in 2004 (71%).¹⁸ Since 2004, the proportion of doctorate recipients reporting definite commitments increased about 1–2 percentage points in education, humanities and arts, and other non-S&E fields and declined by 2 percentage points in business. These proportions are still higher than during the dip from 2014 to 2016 (figure 12). Doctorate recipients in non-S&E fields experienced drops in commitments in 2021 during the COVID-19 pandemic, but commitments rebounded in 2022 and 2023 for all broad fields. However, between 2023 and 2024, definite commitments declined in each broad field except other non-S&E fields; the largest decline was in business (7 percentage points). In 2024, psychology had the highest proportion of definite commitments of all S&E and non-S&E fields (80%). Biological and biomedical sciences had the lowest proportion among all S&E and non-S&E fields (63%) (figure 11 and figure 12).

Figure 11. Definite commitments among doctorate recipients, by S&E trend broad field: 2004–24



- Psychology
- Computer and information sciences
- ▼ Mathematics and statistics
- ◆ Geosciences, atmospheric, and ocean sciences
- ▲ Social sciences



- Health sciences
- Agricultural sciences and natural resources
- Engineering
- ▼ Biological and biomedical sciences
- ▲ Physical sciences

S&E = science and engineering.

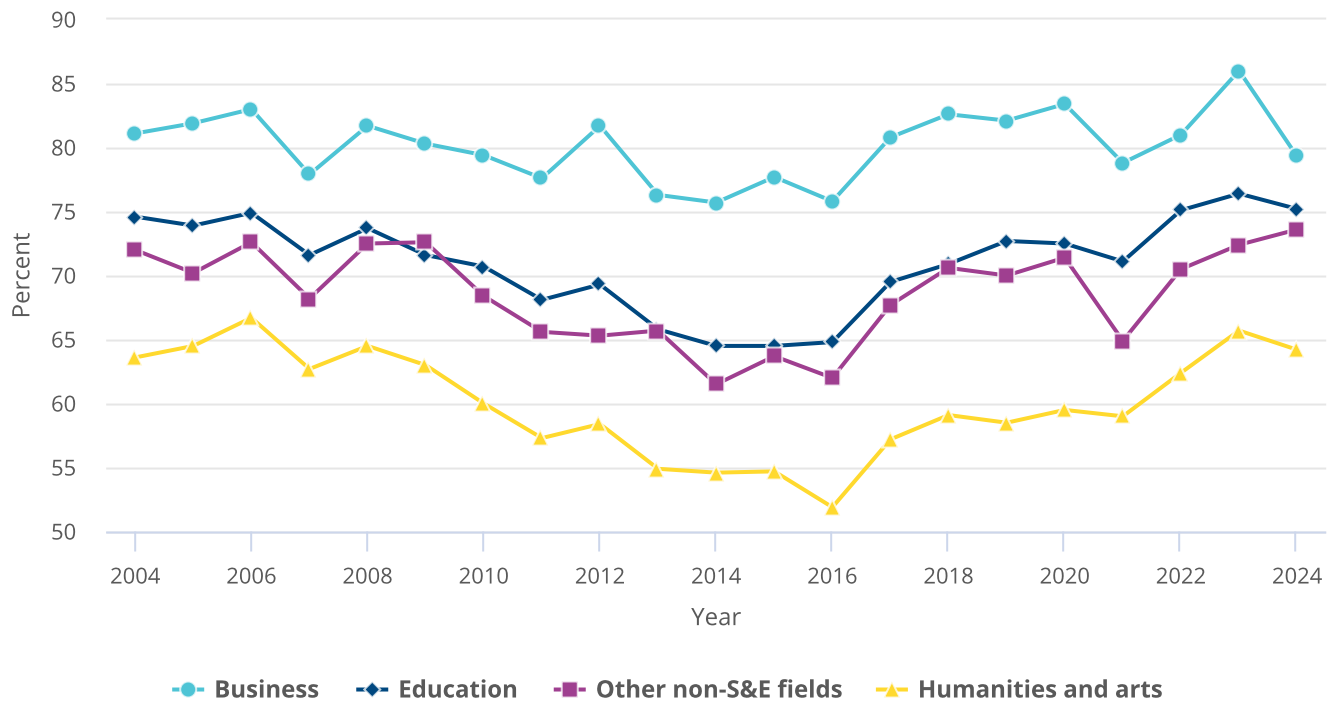
Note(s):

Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment or postdoctoral study in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item. The postgraduation status question was changed in 2017 to capture postgraduation employment plans more accurately; some of the increase between 2016 and 2017 may be partly attributable to this change. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the "Data source" section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 2-1](#).

Figure 12. Definite commitments among doctorate recipients, by non-S&E trend broad field: 2004–24



S&E = science and engineering.

Note(s):

Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment or postdoctoral study in the coming year. Percentages are based on the number of doctorate recipients who responded to the postgraduation status item. The postgraduation status question was changed in 2017 to capture postgraduation employment plans more accurately; some of the increase between 2016 and 2017 may be partly attributable to this change. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 2-1](#).

First postgraduate positions in the United States

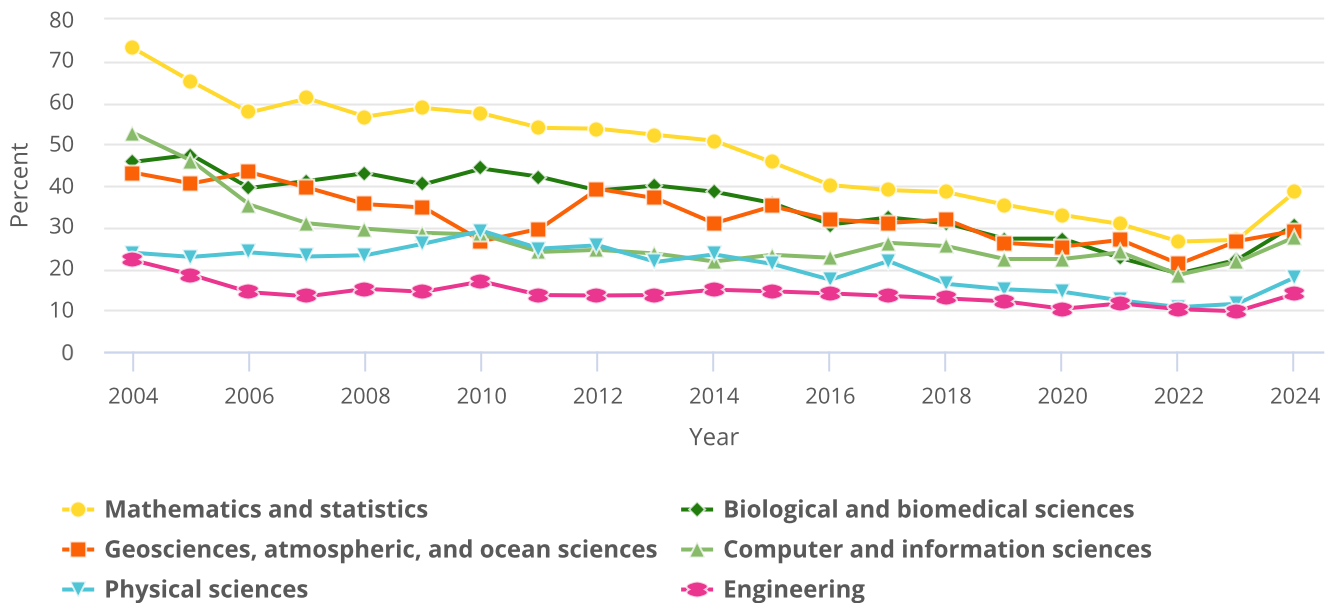
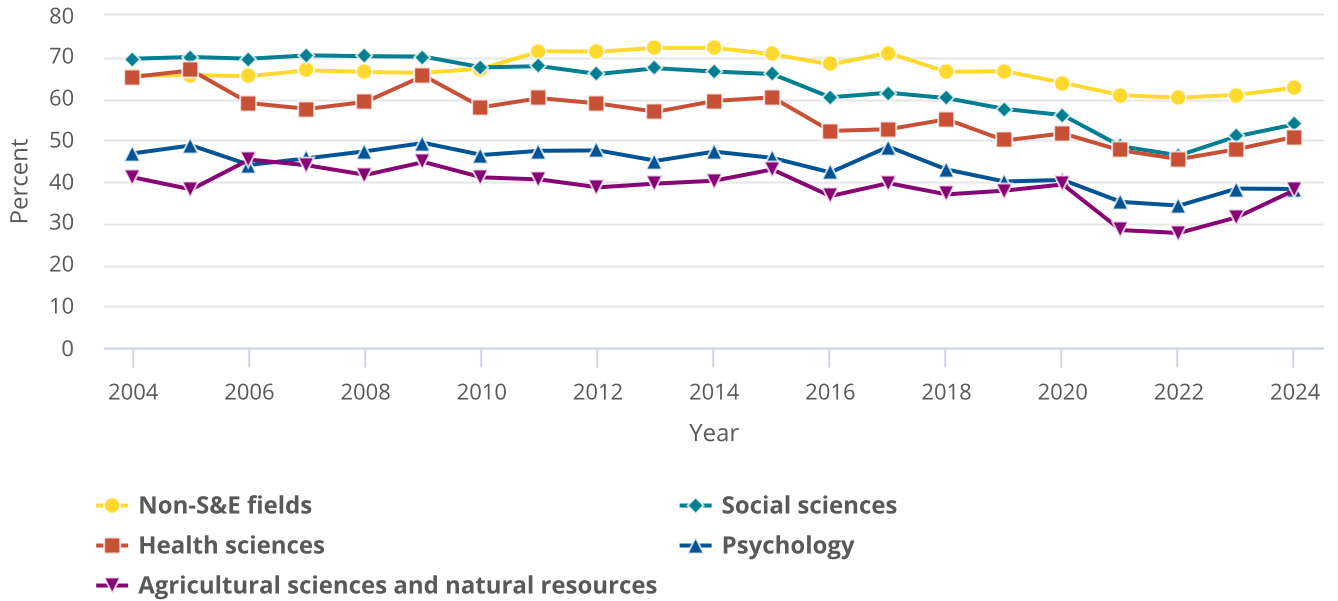
In 2024, 20,469 doctorate recipients reported non-postdoc employment commitments in the United States.¹⁹ Of these recipients with non-postdoc employment commitments, 40% (8,098) were in academia, 40% (8,266) were in industry or business, 8% (1,552) were in government, 7% (1,331) were in nonprofits, and 6% (1,222) were in other or did not report the sector. In addition, 13,296 doctorate recipients reported having a postdoc commitment in the United States in 2024.

Academic employment

Doctorate recipients have shifted away from non-postdoc academic employment over time. In 2024, 40% of doctorate recipients with definite non-postdoc employment commitments in the United States reported that their principal job would be in academia,²⁰ down from 56% in 2004. In the past 20 years, the proportion of non-postdoc academic employment commitments in the United States declined in all S&E fields. The largest percentage-point declines between 2004 and 2024 were in mathematics and statistics, dropping from 73% to 39%, followed by computer and information sciences, dropping from 53% to 28%.²¹

The proportion of doctorate recipients who reported non-postdoc employment commitments in academia in 2024 was highest in non-S&E fields (63%) and lowest in physical sciences (18%) and engineering (14%) (figure 13). Between 2023 and 2024, the proportion of doctorate recipients with non-postdoc academic employment commitments increased in all S&E fields except psychology. The largest increases were in mathematics and statistics (12 percentage points), biological and biomedical sciences (8 percentage points), agricultural sciences and natural resources (7 percentage points), and physical sciences (6 percentage points).

Figure 13. Definite non-postdoc employment commitments in academia in the United States, by trend broad field: 2004–24



S&E = science and engineering.

Note(s):

Definite employment commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment (excludes postdoctoral study) in the coming year. Percentages are based on the number of doctorate recipients who reported definite employment commitments (including those missing employer type) and plans to stay in the United States. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

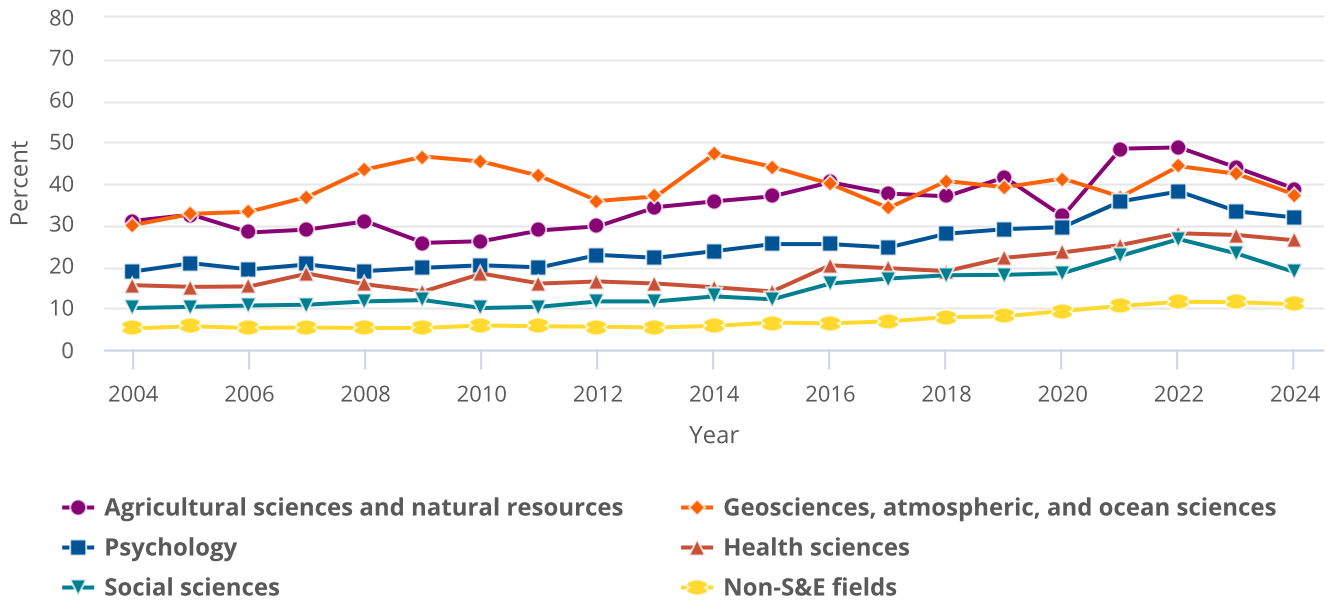
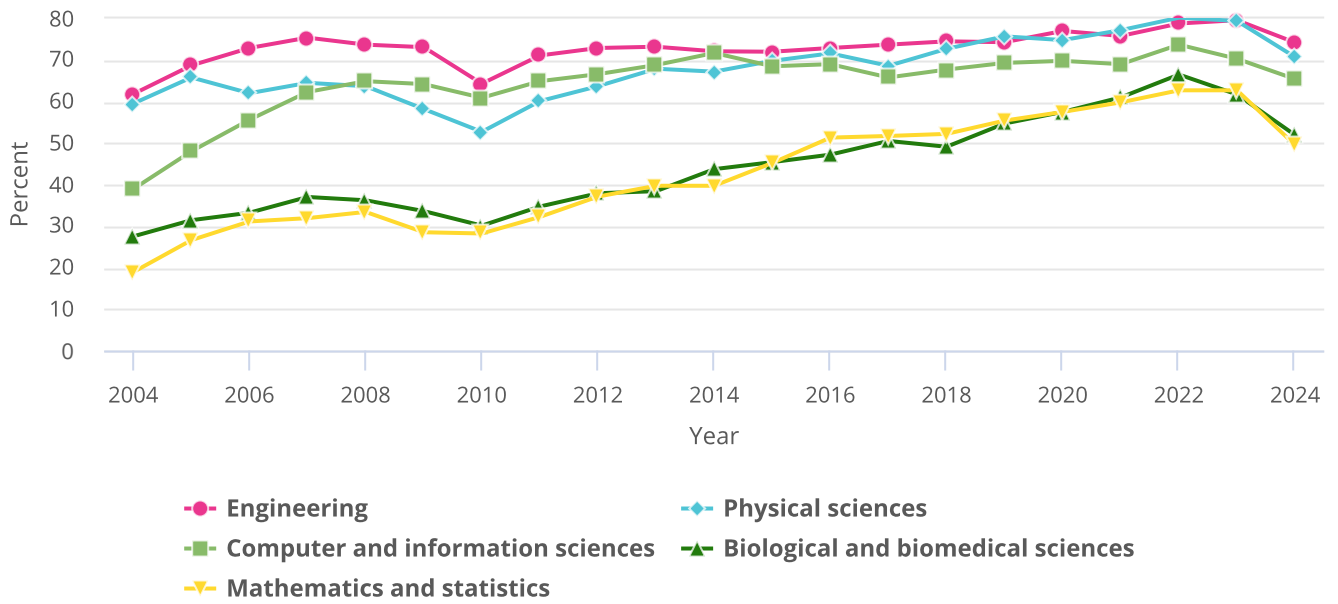
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 2-6.

Industry or business employment

In contrast to the decline in definite non-postdoc employment commitments in academia, the proportion of doctorate recipients with non-postdoc commitments in industry or business in the United States more than doubled since 2004, comprising 40% of all 2024 doctorate recipient employment commitments.²² Definite commitments in industry or business have become more prevalent in all fields. In 2004, only physical sciences (60%) and engineering (62%) had more than half of their doctorate recipients commit to non-postdoc employment positions in industry or business (figure 14). By 2024, several more fields had nearly 50% or more of their doctorate recipients commit to industry or business positions: computer and information sciences, biological and biomedical sciences, and mathematics and statistics. In comparison, 26% of the doctorate recipients in health sciences and 19% of those in social sciences had definite commitments in industry or business—the lowest among S&E fields. While employment commitments in industry or business increased across all fields over the past 20 years, they have declined in each field since at least 2022.²³

Figure 14. Definite non-postdoc employment commitments in industry or business in the United States, by trend broad field: 2004–24



S&E = science and engineering.

Note(s):

Definite employment commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment (excludes postdoctoral study) in the coming year. Definite commitments in industry or business includes doctorate recipients who are self-employed. Percentages are based on the number of doctorate recipients who reported definite employment commitments (including those missing employer type) and plans to stay in the United States. The survey data collection for field of study changed in 2021, which may affect the data comparability across years. For more information, see the “Data source” section.

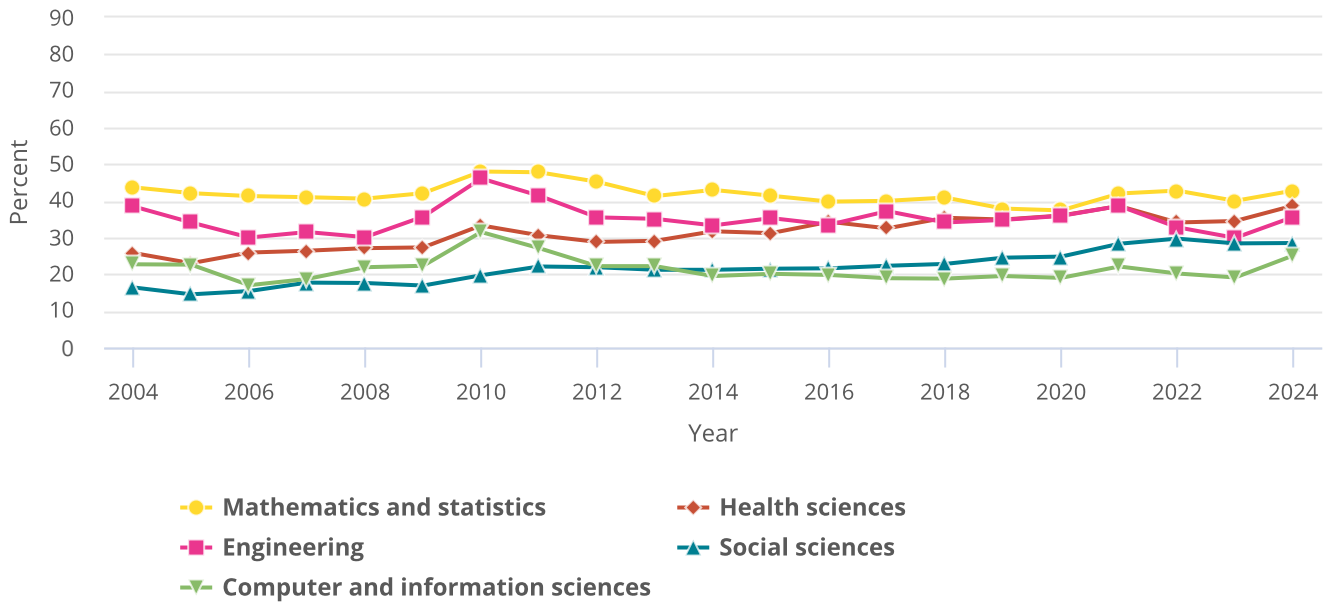
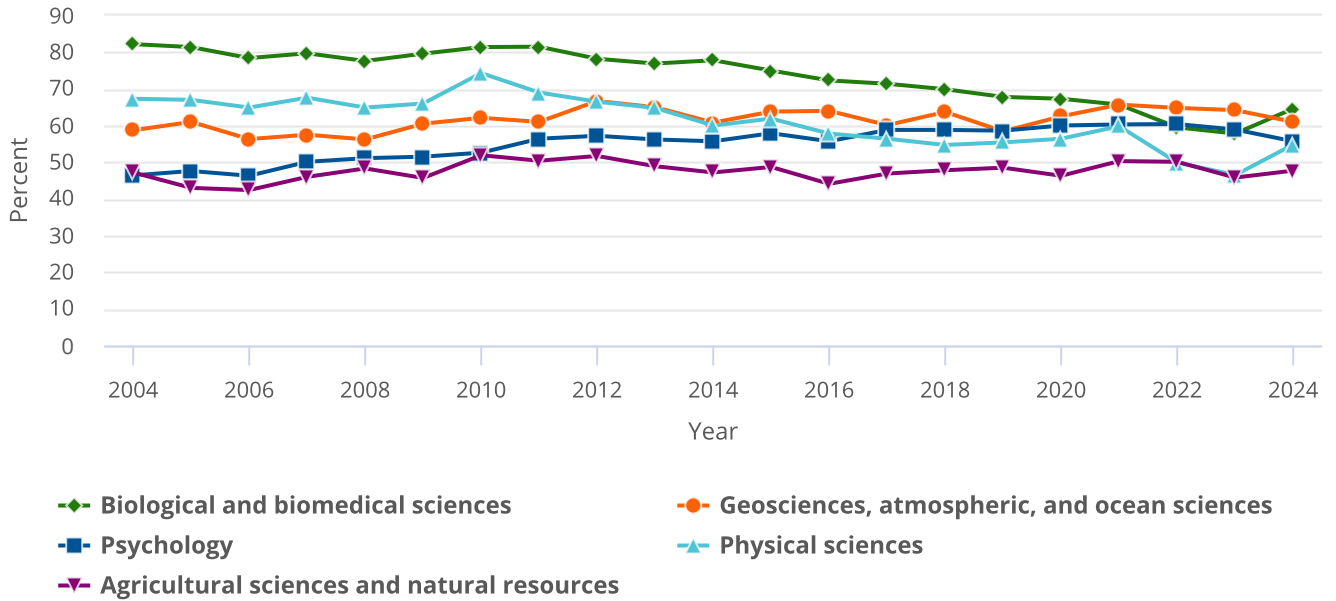
Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed table 2-6.

Postdoc positions

Twenty-year trends in postdoc commitments varied by field.²⁴ Historically, postdoc positions have been a customary part of the early career paths of doctorate recipients in biological and biomedical sciences; physical sciences; and geosciences, atmospheric, and ocean sciences—comprising half or more of definite commitments. Although the proportions of postdoc commitments in biological and biomedical sciences and in physical sciences remained above 50%, between 2004 and 2024 they dropped 18 and 12 percentage points, respectively (figure 15). In the past 20 years, 6 of the 10 S&E broad fields experienced increases in postdoc rates. The largest increases in postdoc rates were in health sciences (13 percentage points), social sciences (12 percentage points), and psychology (9 percentage points). The postdoc rate in geosciences, atmospheric, and ocean sciences has been above 50% since at least 2004 and the rate in psychology has been above 50% since 2007. Between 2023 and 2024, the postdoc rate increased in most of the S&E broad fields. The largest increases were in physical sciences (8 percentage points), in biological and biomedical sciences (7 percentage points), and in computer and information sciences and engineering (6 percentage points each). Between 2023 and 2024, the postdoc rate decreased in geosciences, atmospheric, and ocean sciences and in psychology (3 percentage points each).

Figure 15. S&E U.S. postdoc rate for doctorate recipients, by trend broad field: 2004–24



S&E = science and engineering.

Note(s):

Percentages are based on the number of doctorate recipients who reported definite commitments in the coming year, who reported whether their commitment was for employment or postdoctoral study, and who plan to live in the United States. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

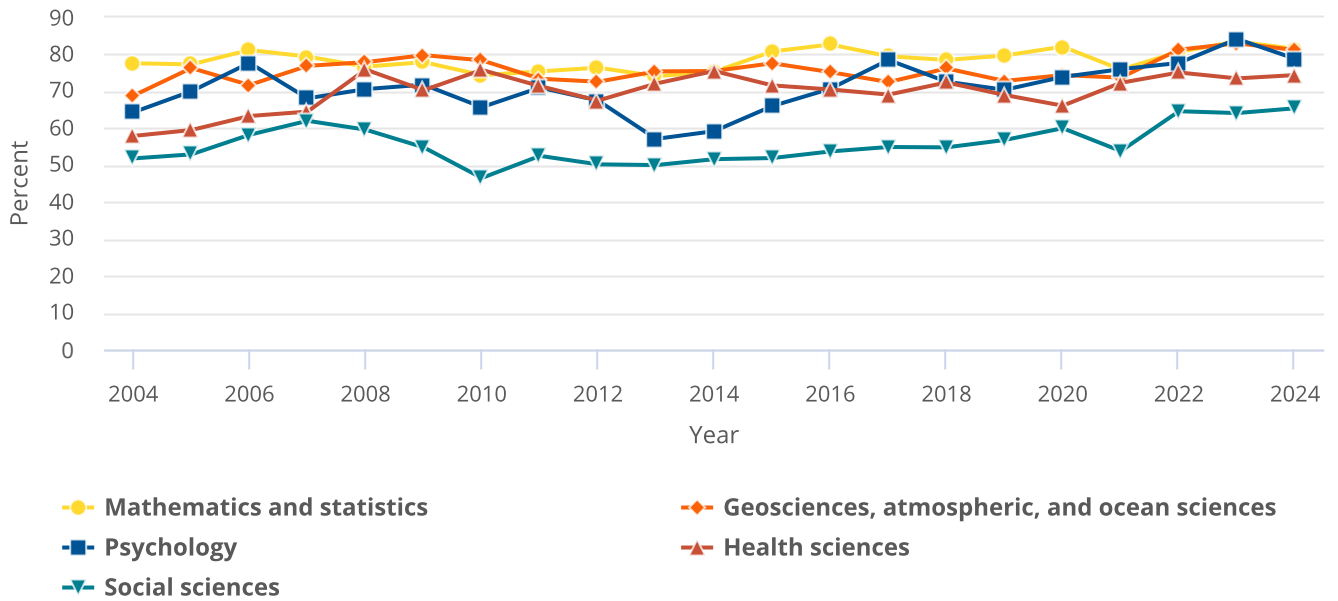
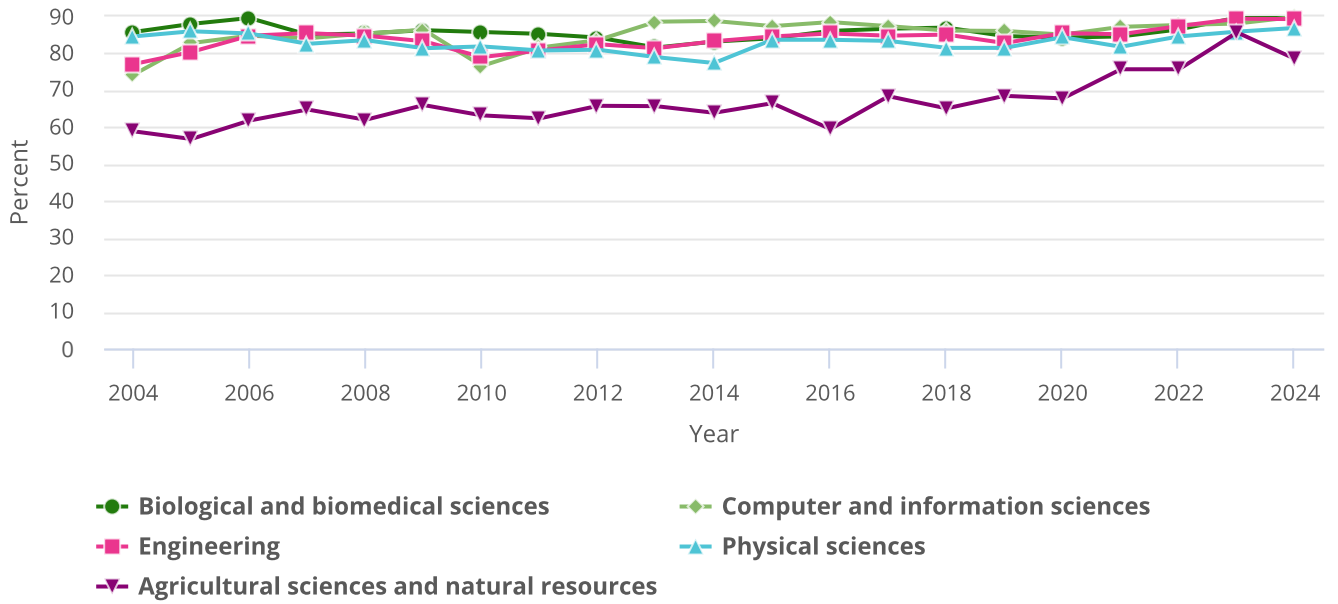
National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 2-3](#).

Temporary visa holders

Among S&E doctorate recipients who are temporary visa holders, the proportion reporting definite commitments in the United States after earning a doctoral degree generally increased from 2004 to 2024. In 2024, 85% of S&E temporary visa holder doctorate recipients with definite commitments reported that the location of their postdoc or employment position was in the United States, up from 75% in 2004.²⁵ Between 2004 and 2024, the largest increase in the expected stay rate (see “Glossary”) of temporary visa holder doctorate recipients was in agricultural sciences and natural resources (20 percentage points); the smallest was in physical sciences (2 percentage points) (figure 16).

In 2024, in all S&E fields, the majority of temporary visa holder doctorate recipients expected to stay in the United States. Expected stay rates were over 80% in 6 out of the 10 S&E fields. The highest rates were in biological and biomedical sciences (90%), computer and information sciences (90%), engineering (89%), and physical sciences (87%); the lowest were among doctorate recipients in health sciences (74%) and social sciences (65%). Between 2023 and 2024, stay rates increased between 1 and 2 percentage points in most S&E fields but declined by 7 percentage points in agricultural and natural resources, by 5 percentage points in psychology, and by 2 percentage points each in mathematics and statistics and in geosciences, atmospheric, and ocean sciences.

Figure 16. S&E temporary visa holder doctorate recipients with definite commitments in the United States, by trend broad field: 2004–24



S&E = science and engineering.

Note(s):

Definite commitment refers to a doctorate recipient who is either returning to predoctoral employment or has signed a contract (or otherwise made a definite commitment) for employment or postdoctoral study in the coming year. Percentages are based on the number of S&E temporary visa holder doctorate recipients who reported definite commitments. The survey data collection for field of study changed in 2021, which may affect the data comparison across years. This figure uses the trend field taxonomy that facilitates trend data comparisons with prior years; for more information, see the “Data source” section.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2024. Related detailed [table 6-3](#).

Glossary

Academia. Employment in academia includes 4-year colleges or universities; medical schools; university-affiliated research institutes; community or 2-year colleges; and foreign educational institutions.

Definite commitment. A commitment, through a contract or other method, by doctorate recipients to accept employment or a postdoctoral study or training (postdoc) position in the coming year or to return to predoctoral employment.

Definite non-postdoc employment commitment. A definite commitment by doctorate recipients for employment (excluding postdocs) in the coming year.

Expected stay rate. The proportion of temporary visa holder doctorate recipients with definite commitments in the United States at graduation among all temporary visa holders.

Field. Beginning in 2021, the SED collects over 1,600 fields for reporting of field of research doctorate, using a modified version of the 2020 Classification of Instructional Programs (CIP)—compared with 334 fields collected in 2020 and previous years. The SED-CIP codes were then aggregated into 306 detailed field codes nested into 68 major fields and 16 broad fields and are used to report field of doctorate data in the detailed data tables.

Trend broad field. To facilitate trend data comparisons, historical field data were estimated based on a crosswalk of the new 2021 SED-CIP codes to the SED field of study codes used in prior survey years. The trend data reported in this report use 14 trend broad fields (excluding multidisciplinary/interdisciplinary sciences)—10 S&E fields: agricultural sciences and natural resources; biological and biomedical sciences; computer and information sciences; engineering; geosciences, atmospheric, and ocean sciences; health sciences; mathematics and statistics; physical sciences; psychology; social sciences; and 4 non-S&E fields: business, education, humanities and arts, and other non-S&E fields. (See “Field” under “Time series data changes” in the “Data source” section.)

Industry or business. Employment in industry or business includes positions where the principal employer is either a for-profit company or organization or self-employment.

NCSES. National Center for Science and Engineering Statistics.

Non-S&E. Non-science and engineering: Trend non-S&E broad fields used to compare data over time are based on historical fields that included business; education; humanities and arts (combined); and other non-S&E fields, such as communications.

Postdoctoral study or training (postdoc) position. A temporary position primarily for gaining additional education and training in research, usually awarded in academe, industry, government, or a nonprofit organization. Postdoc positions include fellowships, research apprenticeships, traineeships, internships (clinical residency), other training, and unspecified further training or study.

Race and ethnicity. Doctorate recipients who report Hispanic or Latino heritage, regardless of racial designation, are counted as Hispanic or Latino, and those who do not answer the Hispanic or Latino ethnicity question are counted as “ethnicity not reported.” Respondents who indicate that they are not Hispanic or Latino and indicate a single race are reported in their respective racial groups. Respondents who indicate they are not Hispanic or Latino and select two or more races are reported as “more than one race.”

Research doctorate. A doctoral degree that is oriented toward preparing students to make original intellectual contributions in a field of study and that is not primarily intended for the practice of a profession. Research doctorates require the completion of a dissertation or equivalent project. In this report, the terms “doctorate” and “doctoral degree” are used to represent any of the research doctoral degrees covered by the SED. Professional doctoral degrees, such as the MD, DDS, JD, and PsyD, are not covered by the survey.

S&E. Science and engineering: Trend S&E broad fields used to compare data over time are based on 10 fields that include agricultural sciences and natural resources; biological and biomedical sciences; computer and information sciences; engineering; geosciences, atmospheric, and ocean sciences; health sciences; mathematics and statistics; physical sciences; psychology; and social sciences. The trend broad fields do not include multidisciplinary/interdisciplinary sciences, which was added to the SED field of study taxonomy in 2021.

Data source

The Survey of Earned Doctorates (SED) is the sole data source for *Doctorate Recipients from U.S. Universities: 2024*. The principal elements of the 2024 SED data collection are described in this section. More detailed information, including the “Technical Notes” and related technical tables, are available at <https://nces.gov/surveys/earned-doctorates/2024>.

This product has been reviewed for unauthorized disclosure of confidential information under NCSES-DRN25-039.

Survey eligibility. The SED collects information on research doctorate recipients only. Research doctorates require the completion of a dissertation or equivalent project, are oriented toward preparing students to make original intellectual contributions in a field of study, and are not primarily intended for the practice of a profession. The 2024 SED recognized 13 distinct types of research doctorates. In 2024, 98.5% of research doctorate recipients earned a PhD.

The population eligible for the 2024 survey consisted of all individuals who received a research doctorate from an accredited U.S. academic institution in the 12-month period from 1 July 2023 to 30 June 2024.

Survey universe. The total universe consisted of 58,131 persons in 459 institutions that conferred research doctorates in academic year 2024.

Data collection. Institutional coordinators at each doctorate-awarding institution distributed the SED Web survey link to individuals receiving a research doctorate. The self-administered Web survey is the primary mode of SED completion. Nonrespondents were contacted by e-mail, mail, and text message to complete the Web survey. If the series of follow-up e-mails, mailings, and text messages was unsuccessful, the survey contractor attempted to reach nonrespondents to complete an abbreviated survey by computer-assisted telephone interviewing. RTI International served as the 2024 SED data collection contractor on behalf of NCSES.

Survey response rates. In 2024, 91.5% of research doctorate recipients completed the survey. Limited records (field of study, doctoral institution, and sex) are constructed for nonrespondents from administrative records of the university—commencement programs, graduation lists, and other public records—and are included in the reported total of doctorate recipients. The survey response rates for 1970–2023 and the item response rates for 2018–24 are provided in [table A-2](#) and [table A-3](#) of the survey’s 2024 “Technical Notes.”

Time series data changes.

EdD program reclassification. After a multiyear review of Doctor of Education (EdD) degree programs participating in the SED, 143 programs were reclassified from research doctorate to professional doctorate over the 2010–11 period. No additional reclassifications of EdD degree programs are planned. SED data are no longer being collected from graduates earning degrees from the reclassified EdD programs, and this has affected the reporting of the number of doctorates awarded by sex, citizenship, race, and ethnicity. [Figure 8](#) in this report shows the impact of the decline in the number of doctoral degrees awarded in education from 2009 to 2011. Readers should note that the declines from 2009 to 2010 and from 2010 to 2011 are at least partly attributable to the EdD reclassification.

Field. Beginning in 2021, field of doctorate data are collected using a modified version of the 2020 Classification of Instructional Programs (CIP) codes and reported using a new SED-specific taxonomy ([table A-4](#)). Adjustments to the 2020 CIP for the SED data collection (SED-CIP) included, among other changes, the addition of over 50 fields of study codes collected in the SED but not covered in the 2020 CIP. The SED-CIP now collects over 1,650 fields for field of study reporting, compared with the 334 field codes collected in the 2020 SED and prior years. The SED-CIP codes collected are then aggregated into 309 detailed fields nested under 68 major fields and 16 broad fields, which are used for reporting in

the 2024 detailed data tables. This field structure is aligned with the NCSES Taxonomy of Disciplines (TOD) to facilitate comparison with other NCSES surveys as well as with the Integrated Postsecondary Education Data System (IPEDS) Completions survey. A crosswalk of the SED-CIP codes to new SED broad, major, and detailed fields of study is shown in [table A-5](#) of the 2024 “[Technical Notes](#).”

To facilitate the trend data comparison with prior years, [table A-6](#) presents a crosswalk of the SED-CIP codes to the SED trend broad, major, and fine fields of study which can be used to construct the comparable 2021, 2022, 2023, and 2024 data. All the figures and tables in this publication are based on the trend field taxonomy and match the field-level counts in multiyear trend data tables ([table 1-1](#) through [table 2-8](#)); they do not match those in the 2024 data tables ([table 3-1](#) through [table 9-9](#)), which are based on the new SED-CIP codes. Readers interested in single year data for 2021 and subsequent years can search the detailed tables based on the CIP taxonomy ([table 3-1](#) through [table 9-9](#)).

Data license. Microdata from the Doctorate Records File (cumulative SED data file) may be obtained through a restricted-use data license. (See <https://nces.nsf.gov/licensing>.)

Notes

- 1** Data on doctorate recipients for previous years are updated with data received from institutions and respondents after the close of data collection for a given year. Updates and corrections to graduation dates can also change the overall counts for prior years. The published tables reflect these changes and thus may not match previously published data.
- 2** In 2021, the method for classifying fields of study changed to using the National Center for Education Statistics 2020 revision to the Classification of Instructional Programs (CIP). This SED-CIP method is aligned with the Taxonomy of Disciplines from the National Center for Science and Engineering Statistics (NCSES) to facilitate comparisons with other NCSES surveys as well as with the Integrated Postsecondary Education Data System (IPEDS) Completions survey. A new trend taxonomy was developed to be able to crosswalk and compare data following the 2021 SED-CIP reclassification with data collected prior to 2021. All figures and tables in this publication are based on the trend taxonomy. This leads to slight differences in counts between individual year SED-CIP data from 2021 onward and multiyear data using the trend taxonomy crosswalk. See the “[Data source](#)” section for more details.
- 3** The calculation of these proportions excluded doctorate recipients who did not report citizenship.
- 4** For additional data on the race and ethnicity of doctorate recipients, see SED 2024 related detailed [table 1-11](#). Race categories exclude Hispanic origin; Hispanic may be any race.
- 5** In 2004, there were 16,921 S&E U.S. citizen and permanent resident doctorate recipients; in 2024, there were 27,204. (See [figure 2](#).)
- 6** The proportion of doctorate recipients by trend broad field out of all doctorate recipients (S&E and non-S&E) can be derived using data from [figure 1](#) for the total number of doctorate recipients and [figure 7](#) and [figure 8](#) for the number of doctorate recipients by field.
- 7** Beginning in 2021, field of doctorate data are collected using a modified version of the 2020 CIP codes and reported using a new SED-specific taxonomy ([table A-4](#)). For more details on data comparability, see the 2024 “[Technical Notes](#)” and the [SED 2021 Taxonomy Changes Working Paper](#).
- 8** Other non-S&E fields include fields such as communications and journalism, public administration and social services, and multidisciplinary/interdisciplinary studies. Some of the overall increase in the other non-S&E fields category after 2021 may be due to the changes in the SED taxonomy in 2021 (see “[Data source](#)” section for details).
- 9** The drop in the number of doctorate recipients in the field of education between 2009 and 2011 is at least partly attributable to the reclassification of Doctor of Education (EdD) programs. For details, see “[Time series data changes](#)” in the “[Data source](#)” section.
- 10** The data in this section are based on the trend broad fields, that is, the set of broad fields used for trend data across all years that offer data that are generally comparable across years. However, the increase in the number of doctorate recipients in non-S&E fields between 2021 and 2024 can also be observed when comparing the data on non-S&E fields using the SED-CIP taxonomy implemented since the 2021 SED.
- 11** For additional data by citizenship status of doctorate recipients, see SED 2024 related detailed [table 1-6](#).
- 12** In non-S&E fields, the proportion of temporary visa holders increased the most in business, from 42% in 2004 to 50% in 2024. See detailed [table 1-6](#).
- 13** For additional details by field, see SED 2024 related detailed [table 1-11](#).

- 14** For additional data on the fields of education, humanities and arts, and other non-S&E fields, see SED 2024 related detailed [table 1-4](#).
- 15** For time trend data on the number of doctorate recipients by field and sex, see SED 2024 related detailed [table 1-4](#).
- 16** For data on doctorate recipients with definite postgraduation commitments for employment or postdoctoral training, see SED 2024 related detailed [table 2-1](#).
- 17** See SED 2024 related detailed [table 2-1](#).
- 18** See SED 2024 related detailed [table 2-1](#).
- 19** Special tabulation from the 2024 Survey of Earned Doctorates. In 2024, 33,765 of the 58,131 doctorate recipients had definite employment or postdoctoral training commitments in the United States; 15,182 of those reporting their postgraduation location as the United States either did not have definite commitments or did not report their status. Of the 33,765 who reported definite employment or postdoctoral training, 20,469 (61%) had definite commitments in employment, and 13,296 (39%) in postdoc positions. See SED 2024 related detailed [table 2-6](#).
- 20** For data on doctorate recipients with definite postgraduation employment commitments in academia, see SED 2024 related detailed [table 2-6](#). Academia includes 4-year colleges or universities; medical schools; university-affiliated research institutes; community or 2-year colleges; and foreign educational institutions.
- 21** In 2004, 256 of 350 doctorate recipients in mathematics and statistics had non-postdoc academic employment commitments, compared to 260 out of 675 doctorate recipients in 2024. In 2004, 206 out of 391 doctorate recipients in computer and information sciences had non-postdoc academic employment commitments, compared to 378 out of 1,372 doctorate recipients in 2024. These counts are the underlying numbers used to calculate the percentages in related detailed [table 2-6](#).
- 22** For data on doctorate recipients with definite postgraduation employment commitments in industry or business, see related detailed [table 2-6](#).
- 23** For a discussion on recent trends in employment commitment, see NCSES. 2023. *Research Doctorate Conferrals Rebound, Leading to Record Number of U.S. Doctorate Recipients in 2022*. NSF 23-353. Alexandria, VA: U.S. National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf23353>.
- 24** Postdoc commitments or postdoc rates are the percentage of doctorate recipients with commitments to postdoc or other training positions in any sector. Employment rates in academia and industry or business are based on the number of doctorate recipients with commitments to non-postdoc employment. As a result, commitments in postdoc, academia, and industry positions do not sum to 100.
- 25** Special tabulation from the 2024 SED. In 2004, 4,354 of the 5,840 S&E temporary visa holder doctorate recipients reported that the location of their postdoc or employment position was in the United States. In 2024, 9,681 of the 11,438 S&E doctorate recipients did.

Acknowledgments and citation

Acknowledgments

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Under NCSES contract, staff at RTI International conducted the 2024 survey and played a valuable role in the resulting publications.

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