



National Center for Science and
Engineering Statistics

Reference

Directorate Profiles: Technical Notes

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Overview

The *Directorate Profiles* series presents data on research doctorate recipients from U.S. academic institutions whose degree is associated with the directorates of the U.S. National Science Foundation (NSF). There are seven profiles, one each for the following NSF directorates: [Biological Sciences \(BIO\)](#), [Computer and Information Science and Engineering \(CISE\)](#), [STEM Education \(EDU\)](#), [Engineering \(ENG\)](#), [Geosciences \(GEO\)](#), [Mathematical and Physical Sciences \(MPS\)](#), and [Social, Behavioral and Economic Sciences \(SBE\)](#). The profiles use survey data from the National Center for Science and Engineering Statistics (NCSES) within NSF.

NCSES has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN26-029).

Data Sources

The data were derived from two NCSES survey sources: the [Survey of Earned Doctorates](#) (SED) and the [Survey of Doctorate Recipients](#) (SDR). The data presented for both the SED and the SDR were derived by NCSES analysts from [restricted use microdata files](#). SED data used in these *Directorate Profiles* reflect the characteristics of research doctorate recipients at the time of their graduation in academic years 2005, 2015, and 2025. SDR data used reflect the characteristics for the employed population of science, engineering, or health research doctorate recipients under age 76 as of the week of 1 February 2023.

SED

The SED is an annual census of all individuals who earned a research doctorate from an accredited U.S. institution in a given academic year. For more detailed information about the SED and its methodology, please see the survey's Technical Notes (available at <https://nces.nsf.gov/surveys/earned-doctorates/2025#methodology>).

SDR

The SDR is a biennial survey that collects longitudinal data on demographic and general employment characteristics of individuals who have received a research doctorate in a science, engineering, or health field from an accredited U.S. institution. The SED provides the sampling frame for the SDR through its annual update of the longstanding Doctorate Records File, a cumulative listing of all U.S.-earned doctorate recipients dating back to 1920. For more detailed information on the SDR and its methodology, please see the survey's Technical Notes (<https://nces.nsf.gov/surveys/doctorate-recipients/2023#methodology>).

Defining Field of Degree

The fields of degree included in each *Directorate Profile* are those related to the work of the respective NSF directorates. Because of overlapping interests in degree fields among some NSF directorates, several degree-code values were assigned to more than one field and included in more than one profile ([table 1](#)).

Table 1. Doctorate fields included in each profile, by NSF directorate

(Fields)

Directorate	Field of degree
Biological Sciences (BIO)	Agricultural sciences and natural resources
	Biochemistry
	Bioinformatics, biostatistics, and computational biology
	Cell molecular biology
	Microbiology
	Neurosciences and neurobiology
	Other biological sciences
Computer and Information Science and Engineering (CISE)	Computer and information sciences
	Computer engineering
	Computer science
	Information science and systems
STEM Education (EDU)	Education administration
	Education research
	Science and math education
	Non-science and math education
	Teacher education
	Other education
Engineering (ENG)	Bioengineering and biomedical engineering
	Chemical engineering
	Civil engineering
	Electrical engineering
	Materials science engineering
	Mechanical engineering
	Other engineering
Geosciences (GEO)	Atmospheric sciences
	Earth sciences
	Environmental science
	Ocean sciences
Mathematical and Physical Sciences (MPS)	Chemistry
	Materials sciences
	Mathematics and statistics
	Physics and astronomy
Social, Behavioral and Economic Sciences (SBE)	Economics
	Political science
	Psychology
	Sociology
	Other social sciences

NSF = National Science Foundation.

Note(s):

Because of overlapping interests in degree fields among some NSF directorates, several degree-code values were assigned to more than one field group and included in more than one profile.

Source(s):

National Center for Science and Engineering Statistics.

Degree fields in visualizations based on SED data use the SED trend fields that facilitate data comparability over time amid survey field taxonomy changes. See the [SED Technical Notes, "Data Comparability."](#) The SDR degree field data were based on the SDR field of study codes.

Efforts were made to harmonize the degree fields between the two data sources. However, each survey has differences in the eligible degree fields (all fields in the SED versus only science, engineering, or health fields in the SDR) due to the respective surveys' differing target populations. The differences are most notable in the education degree data found in the profile for EDU. For that directorate, SDR data include only a single education field (educational psychology). However, SED data are available across six degree categories: (1) education administration, (2) education research (which includes the detailed field of educational psychology), (3) non-science and math education, (4) science and math education, (5) teacher education, and (6) other education.

Graphics: Data and Methodology

The following sections provide the data source, tabular view, and other relevant methodological information for each visualization topic presented across the *Directorate Profiles*.

Number

The *Directorates Profiles* column chart visualization for the number of research doctorate recipients for the academic years 2005, 2015, and 2025 is based on SED data. This visualization’s data are also presented below in tabular form ([table A-1](#)).

Table A-1. Research doctorate recipients: 2005, 2015, and 2025

(Number)

Directorate	2005	2015	2025
Biological Sciences (BIO)	7,406	10,106	11,248
Computer and Information Science and Engineering (CISE)	1,422	2,693	5,919
STEM Education (EDU)	6,214	5,098	4,597
Engineering (ENG)	6,426	9,875	11,521
Geosciences (GEO)	843	1,154	1,256
Mathematical and Physical Sciences (MPS)	5,441	7,743	7,787
Social, Behavioral and Economic Sciences (SBE)	7,794	9,943	9,439

Source(s):
National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

Sex

SED data are used for the 100% stacked column chart showing the distribution of research doctorate recipients by sex for the academic years 2005, 2015, and 2025. The 2025 SED has two response options for sex: male and female. The distribution calculation excludes respondents who did not report sex ([table A-2](#)).

Table A-2. Research doctorate recipients, by sex: 2005, 2015, and 2025

(Percent)

Directorate	2005		2015		2025	
	Male	Female	Male	Female	Male	Female
Biological Sciences (BIO)	53	47	47	53	43	57
Computer and Information Science and Engineering (CISE)	81	19	79	21	74	26
STEM Education (EDU)	33	67	31	69	26	74
Engineering (ENG)	82	18	77	23	71	29
Geosciences (GEO)	65	35	56	44	51	49
Mathematical and Physical Sciences (MPS)	74	26	70	30	66	34
Social, Behavioral and Economic Sciences (SBE)	44	56	42	58	37	63

Note(s):
Excludes respondents who did not report sex. Detail may not add to 100% because of rounding.

Source(s):
National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

Field of degree

SED data are used for the 100% stacked column chart showing the distribution of research doctorate recipients by field of degree for academic year 2025 ([table A-3](#)). Each profile presents data on the degree fields of interest to the NSF directorate; see section [Defining Field of Degree](#) for more information.

Table A-3. Research doctorate recipients, by field of degree: 2025

(Percent)

Directorate	Field of degree	Percent
Biological Sciences (BIO)	Agricultural sciences and natural resources	11
	Bioinformatics, biostatistics, and computational biology	11
	Biochemistry	9
	Neurosciences and neurobiology	11
	Cell molecular biology	10
	Microbiology	6
	Other biological sciences	41
Computer and Information Science and Engineering (CISE)	Computer engineering	33
	Computer science	43
	Computer and information sciences	17
	Information science and systems	7
STEM Education (EDU)	Education research	48
	Education administration	18
	Non-science and math education	14
	Science and math education	7
	Teacher education	3
	Other education	11
Engineering (ENG)	Electrical engineering	24
	Mechanical engineering	17
	Bioengineering and biomedical engineering	12
	Civil engineering	10
	Materials science engineering	9
	Chemical engineering	10
	Other engineering	18
Geosciences (GEO)	Earth sciences	53
	Atmospheric sciences	22
	Environmental science	11
	Ocean sciences	14
Mathematical and Physical Sciences (MPS)	Chemistry	37
	Mathematics and statistics	28
	Physics and astronomy	27
	Materials sciences	8
Social, Behavioral and Economic Sciences (SBE)	Psychology	43
	Economics	15
	Political science	11
	Sociology	6
	Other social sciences	25

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2025.

Citizenship status and field of degree

SED data are used for the 100% stacked bar chart showing the distribution of research doctorate recipients by citizenship status for academic year 2025. SED data have the following options for citizenship status: U.S. citizen, permanent resident, and temporary visa holder. For these profiles, responses were collapsed into two categories: U.S. citizens and permanent residents and temporary visa holders. The distribution calculation excludes respondents who did not report citizenship ([table A-4](#)).

Table A-4. Research doctorate recipients, by citizenship status and field of degree: 2025

(Percent)

Directorate	Field of degree	U.S. citizens and permanent residents	Temporary visa holder
Biological Sciences (BIO)	Total	74	26
	Agricultural sciences and natural resources	58	42
	Bioinformatics, biostatistics, and computational biology	62	38
	Biochemistry	67	33
	Neurosciences and neurobiology	83	17
	Cell molecular biology	79	21
	Microbiology	85	15
	Other biological sciences	78	22
Computer and Information Science and Engineering (CISE)	Total	39	61
	Computer engineering	35	65
	Computer science	39	61
	Computer and information sciences	45	55
	Information science and systems	46	54
STEM Education (EDU)	Total	86	14
	Education research	86	14
	Education administration	92	8
	Non-science and math education	84	16
	Science and math education	81	19
	Teacher education	76	24
	Other education	88	12
Engineering (ENG)	Total	47	53
	Electrical engineering	36	64
	Mechanical engineering	47	53
	Bioengineering and biomedical engineering	69	31
	Civil engineering	37	63
	Materials science engineering	48	52
	Chemical engineering	53	47
	Other engineering	47	53
Geosciences (GEO)	Total	72	28
	Earth sciences	70	30
	Atmospheric sciences	74	26
	Environmental science	67	33
	Ocean sciences	79	21
Mathematical and Physical Sciences (MPS)	Total	58	42
	Chemistry	64	36
	Mathematics and statistics	48	52
	Physics and astronomy	61	39
	Materials sciences	46	54
Social, Behavioral and Economic Sciences (SBE)	Total	74	26
	Psychology	88	12
	Economics	37	63
	Political science	71	29
	Sociology	81	19
	Other social sciences	72	28

Note(s):

Excludes respondents who did not report citizenship. Detail may not add to 100% because of rounding.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2025.

Definite non-postdoctoral employment commitments, by sector

SED data are used for the 100% stacked column chart showing the distribution of research doctorate recipients with definite non-postdoctoral employment commitments (including military service) by employer type for academic years 2005, 2015, and 2025. The 14 employer types included as response options in the employment commitments variable were collapsed to create three categories: educational institution, government, and business or industry. The educational institution category includes U.S. 4-year colleges or universities, U.S. medical schools, U.S. university-affiliated research institutes, U.S. community or 2-year colleges, U.S. elementary or secondary schools, and foreign (i.e., non-U.S.) educational institutions. Government includes U.S. federal, state, and local governments, as well as foreign (i.e., non-U.S.) governments. Business or industry includes for-profit industries or businesses, not-for-profit organizations, those who are self-employed, and other. The distribution calculation excludes respondents who did not report employer type ([table A-5](#)).

Table A-5. Research doctorate recipients with definite non-postdoctoral employment commitments, by sector: 2005, 2015, and 2025

(Percent)

Directorate	Year	Educational institution ^a	Government ^b	Business or industry ^c
Biological Sciences (BIO)	2005	48	16	36
	2015	39	11	49
	2025	37	10	53
Computer and Information Science and Engineering (CISE)	2005	45	4	51
	2015	24	5	71
	2025	22	4	74
STEM Education (EDU)	2005	87	4	8
	2015	86	4	10
	2025	79	5	16
Engineering (ENG)	2005	23	10	67
	2015	17	10	72
	2025	16	7	77
Geosciences (GEO)	2005	40	24	35
	2015	39	14	46
	2025	31	23	46
Mathematical and Physical Sciences (MPS)	2005	37	7	56
	2015	30	5	65
	2025	27	5	68
Social, Behavioral and Economic Sciences (SBE)	2005	66	11	23
	2015	64	12	24
	2025	54	12	34

^a Educational institution includes U.S. 4-year colleges or universities, U.S. medical schools, U.S. university-affiliated research institutes, U.S. community or 2-year colleges, U.S. elementary or secondary schools, and foreign (i.e., non-U.S.) educational institutions.

^b Government includes U.S. federal, state, and local governments, as well as foreign (i.e., non-U.S.) governments.

^c Business or industry includes for-profit industries or businesses, not-for-profit organizations, those who are self-employed, and other.

Note(s):

Excludes respondents who did not report employer type. Employment commitments include military service. Detail may not add to 100% because of rounding.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

Percentage with no graduate education-related debt

SED data are used for the highlighted percentage of academic year 2025 research doctorate recipients with no graduate education-related debt at the time of graduation. The percentage calculation excludes respondents who did not report debt information.

Graduate education-related debt among those with graduate debt

SED data are used for the pie chart showing the distribution by amount of debt for academic year 2025 doctorate recipients who reported graduate education-related debt. The distribution calculation excludes respondents who did not report debt information ([table A-6](#)).

Table A-6. Research doctorate recipients with graduate education-related debt among those with graduate debt: 2025

(Percent)

Directorate	\$10,000 or less	\$10,001–\$30,000	\$30,001–\$60,000	\$60,001 or more
Biological Sciences (BIO)	29	26	19	26
Computer and Information Science and Engineering (CISE)	34	30	18	18
STEM Education (EDU)	13	18	22	47
Engineering (ENG)	37	29	17	17
Geosciences (GEO)	39	28	16	17
Mathematical and Physical Sciences (MPS)	40	28	16	17
Social, Behavioral and Economic Sciences (SBE)	16	20	18	46

Note(s):

Excludes respondents who did not report debt information. Detail may not add to 100% because of rounding.

Source(s):

National Center for Science and Engineering Statistics, Survey of Earned Doctorates, 2025.

Employment sector, by field of degree

SDR data are used for the 100% stacked bar chart showing the distribution of employed research doctorate recipients under age 76 by employment sector and field of degree as of 2023 ([table A-7](#)). The SDR includes data on three employment sectors: (1) educational institution, (2) business or industry, and (3) government. Educational institution includes 4-year colleges or universities, medical schools (including university-affiliated hospital or medical centers), university-affiliated research institutes, 2-year colleges, community colleges, technical institutes, precollege institutions, and other educational institutions. Business or industry includes private for profit, private not for profit, self-employed or business owners in incorporated or nonincorporated business, and employers not broken out separately. Government includes U.S. federal, state, and local governments, as well as non-U.S. governments.

Table A-7. Research doctorate recipients, by employment sector and field of degree: 2023

(Percent)

Directorate	Field of degree	Educational institution ^a	Government ^b	Business or industry ^c
Biological Sciences (BIO)	Total	44	11	45
	Agricultural sciences and natural resources	45	16	38
	Bioinformatics, biostatistics, and computational biology	33	8	59
	Biochemistry	40	8	52
	Neurosciences and neurobiology	50	8	42
	Cell molecular biology	40	9	51
	Microbiology	42	14	45
	Other biological sciences	46	11	43
Computer and Information Science and Engineering (CISE)	Total	37	3	60
	Computer engineering	31	3	66
	Computer science	37	2	61
	Computer and information sciences	39	4	57
	Information science and systems	49	5	46
STEM Education (EDU)	Educational psychology	61	6	34
Engineering (ENG)	Total	30	8	62
	Electrical engineering	27	5	68

Table A-7. Research doctorate recipients, by employment sector and field of degree: 2023

(Percent)

Directorate	Field of degree	Educational institution ^a	Government ^b	Business or industry ^c
	Mechanical engineering	34	7	59
	Bioengineering and biomedical engineering	34	6	60
	Civil engineering	39	15	46
	Materials science engineering	21	7	72
	Chemical engineering	21	7	73
	Other engineering	38	9	53
Geosciences (GEO)	Total	48	19	33
	Earth sciences	50	15	35
	Atmospheric sciences	47	21	31
	Environmental science	43	23	34
	Ocean sciences	46	24	30
Mathematical and Physical Sciences (MPS)	Total	40	8	53
	Chemistry	35	7	58
	Mathematics and statistics	58	4	38
	Physics and astronomy	41	11	48
	Materials sciences	28	9	64
Social, Behavioral and Economic Sciences (SBE)	Total	54	9	36
	Psychology	42	9	49
	Economics	57	13	30
	Political science	67	10	24
	Sociology	75	5	20
	Other social sciences	69	8	23

^a Educational institution includes 4-year colleges or universities, medical schools (including university-affiliated hospital or medical centers), university-affiliated research institutes, 2-year colleges, community colleges, technical institutes, precollege institutions, and other educational institutions.

^b Government includes U.S. federal, state, and local governments, as well as non-U.S. governments.

^c Business or industry includes private for profit, private not for profit, self-employed or business owners in incorporated or nonincorporated business, and employers not broken out separately.

Note(s):

Educational psychology is the only detailed education field of degree available in the Survey of Doctorate Recipients. Detail may not add to 100% because of rounding.

Source(s):

National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2023.

Median salary, by field of degree

SDR data are used for the bar chart showing the median salary for employed research doctorate recipients under age 76 by field of degree as of 2023 ([table A-8](#)).

Table A-8. Median salary of research doctorate recipients, by field of degree: 2023

(Dollars)

Directorate	Field of degree	Median salary
Biological Sciences (BIO)	Total	117,000
	Agricultural sciences and natural resources	98,000
	Bioinformatics, biostatistics, and computational biology	150,000
	Biochemistry	129,000
	Neurosciences and neurobiology	120,000
	Cell molecular biology	126,000
	Microbiology	120,000
	Other biological sciences	112,000
Computer and Information Science and Engineering (CISE)	Total	170,000
	Computer engineering	175,000

Table A-8. Median salary of research doctorate recipients, by field of degree: 2023

(Dollars)

Directorate	Field of degree	Median salary
	Computer science	175,000
	Computer and information sciences	139,000
	Information science and systems	128,000
STEM Education (EDU)	Educational psychology	95,000
Engineering (ENG)	Total	147,000
	Electrical engineering	170,000
	Mechanical engineering	140,000
	Bioengineering and biomedical engineering	140,000
	Civil engineering	117,000
	Materials science engineering	149,000
	Chemical engineering	149,000
	Other engineering	135,000
Geosciences (GEO)	Total	103,000
	Earth sciences	102,000
	Atmospheric sciences	108,000
	Environmental science	99,000
	Ocean sciences	109,000
Mathematical and Physical Sciences (MPS)	Total	128,000
	Chemistry	125,000
	Mathematics and statistics	109,000
	Physics and astronomy	134,000
	Materials sciences	146,000
Social, Behavioral and Economic Sciences (SBE)	Total	100,000
	Psychology	103,000
	Economics	130,000
	Political science	100,000
	Sociology	95,000
	Other social sciences	87,000

Note(s):

Educational psychology is the only detailed education field of degree available in the Survey of Doctorate Recipients.

Source(s):

National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2023.

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