



Employment and Educational Characteristics of Scientists and Engineers

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Nearly 22 million persons classified as scientists and engineers were employed in the United States as of October 2010: about 5.4 million in science and engineering (S&E) occupations, 7 million in S&E-related occupations, and 9.5 million in occupations other than S&E (non-S&E) (table 1). These estimates are from the National Science Foundation's Scientists and Engineers Statistical Data System (SESTAT).

Data available through SESTAT are collected by three surveys: the National Survey of College Graduates (NSCG), the National Survey of Recent College Graduates (NSRCG), and the Survey of Doctorate Recipients (SDR). SESTAT integrates these data, and combined, the data provide a profile of scientists and engineers in the United States. (See "Definitions" for a full description of how scientists and engineers are classified.) This InfoBrief presents data from all four sources.

Scientists and Engineers in the United States

Data from SESTAT show that as of October 2010, scientists are about 17% of the S&E workforce, with computer and information scientists constituting

the largest group. Engineers are about 7% of the S&E workforce. A majority of engineers work in three fields: electrical engineering (25%), mechanical engineering (19%), and civil engineering (15%). Nearly one-third of individuals in the S&E workforce have S&E-related occupations, with the largest concentration being in health-related professions (62%).

Other detailed data from SESTAT show that 44% of individuals who were trained as scientists (especially in the social sciences) or engineers work in non-S&E occupations. Thirty percent of these individuals work in other non-S&E occupations, a category that encompasses a wide variety of jobs.

Women are 45% of the overall S&E workforce and hold 28% of S&E jobs. Female scientists and engineers constitute 68% of individuals who work in health-related occupations. In science occupations, 70% of psychologists are women. Of individuals in engineering occupations, 87% are men.

Nearly three-quarters of employed scientists and engineers are white, and most (70%) scientists and engineers in S&E occupations are white. Asian

scientists and engineers are the next largest group, constituting 18% of employment in S&E occupations.

NSCG

The NSCG is the core of SESTAT, providing data collected over time that detail the characteristics of the entire college-educated population in the United States. Its population of college graduates includes scientists and engineers who hold at least a bachelor's degree. The NSCG provides information on individuals educated or employed in S&E fields and non-S&E fields.

Of the nearly 52 million college-educated persons represented by the 2010 NSCG, 59% reported their highest degree to be in a non-S&E degree field. Another 12% reported their highest degree to be in an S&E-related degree field, predominately health fields. About 28% reported S&E fields, with social or related sciences (11%) being the most commonly reported S&E field (table 2).

The degree fields chosen by native-born and foreign-born college graduates differ significantly. Native-born U.S. citizens comprise 86% of the

TABLE 1. Employed scientists and engineers, by occupation, sex, and race/ethnicity: 2010

Occupation	All employed		Female	Male	Hispanic	Not Hispanic					Multiple race
						White	Asian	Black	American Indian or Alaska Native	Native Hawaiian or Other Pacific Islander	
All occupations	21,903,000	9,765,000	12,138,000	1,468,000	16,155,000	2,542,000	1,318,000	58,000	69,000	294,000	
S&E occupations	5,398,000	1,487,000	3,911,000	282,000	3,772,000	997,000	246,000	10,000	12,000	78,000	
Scientist	3,829,000	1,287,000	2,542,000	183,000	2,649,000	735,000	191,000	6,000	7,000	59,000	
Biological/life scientist	519,000	256,000	264,000	25,000	109,000	1,000	13,000	361,000	S	9,000	
Computer/information scientist	2,179,000	509,000	1,670,000	100,000	500,000	2,000	130,000	1,410,000	3,000	34,000	
Mathematical scientist	121,000	55,000	66,000	5,000	27,000	D	4,000	83,000	D	1,000	
Physical scientist	253,000	75,000	178,000	12,000	35,000	1,000	7,000	193,000	1,000	4,000	
Psychologist	171,000	119,000	52,000	12,000	6,000	*	8,000	142,000	S	3,000	
Social scientist	197,000	111,000	86,000	10,000	15,000	*	9,000	160,000	D	3,000	
Postsecondary teacher	389,000	162,000	226,000	17,000	41,000	1,000	21,000	301,000	1,000	7,000	
Engineer	1,569,000	200,000	1,369,000	99,000	1,123,000	262,000	56,000	5,000	5,000	19,000	
Aerospace engineer	91,000	10,000	81,000	8,000	68,000	9,000	3,000	D	S	3,000	
Chemical engineer	69,000	13,000	55,000	4,000	48,000	14,000	2,000	*	D	1,000	
Civil engineer	228,000	34,000	193,000	18,000	169,000	26,000	9,000	1,000	1,000	3,000	
Electrical engineer	385,000	46,000	340,000	20,000	240,000	100,000	17,000	D	2,000	5,000	
Industrial engineer	74,000	13,000	61,000	6,000	53,000	11,000	3,000	D	D	*	
Mechanical engineer	299,000	22,000	277,000	17,000	235,000	33,000	9,000	1,000	*	3,000	
Other engineer	380,000	56,000	324,000	24,000	285,000	54,000	11,000	S	1,000	4,000	
Postsecondary teacher	43,000	5,000	38,000	1,000	25,000	15,000	1,000	D	D	*	
S&E-related occupations	6,957,000	3,898,000	3,059,000	447,000	5,193,000	788,000	393,000	21,000	29,000	85,000	
Health-related occupation	4,325,000	2,953,000	1,373,000	295,000	3,168,000	508,000	263,000	14,000	21,000	57,000	
S&E manager	861,000	260,000	601,000	43,000	679,000	84,000	37,000	S	3,000	10,000	
S&E precollege teacher	917,000	480,000	437,000	55,000	769,000	45,000	40,000	1,000	1,000	7,000	
S&E technician/technologist	654,000	157,000	497,000	45,000	430,000	130,000	37,000	D	4,000	7,000	
Other S&E-related occupation	199,000	48,000	150,000	10,000	147,000	21,000	S	D	D	S	
Non-S&E occupations	9,549,000	4,380,000	5,169,000	739,000	7,190,000	756,000	678,000	27,000	28,000	130,000	

* = estimate less than 500. D = suppressed to avoid disclosure of confidential information. S = suppressed for reliability; coefficient of variation exceeds publication standards.

S&E = science and engineering.

NOTES: Numbers are rounded to nearest 1,000. Detail may not add to total because of rounding and suppression. Scientists and engineers refer to all persons with bachelor's or higher degree in S&E or S&E-related fields, plus persons holding a non-S&E bachelor's or higher degree who were employed in an S&E or S&E-related occupation in 2010.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Scientists and Engineers Statistical Data System (SESTAT), 2010.

college-educated population residing in the United States. Given the large size of the native-born population, the distribution of fields in which their highest degree was earned is very similar to that of the overall college-educated population.

Foreign-born college graduates (including naturalized U.S. citizens and non-U.S. citizens) are more likely to hold

S&E and S&E-related degrees. Among the 7.2 million college-educated persons who are foreign-born, 42% hold S&E degrees and another 17% hold S&E-related degrees as their highest degree.

NSRCG

Whereas NSCG data in SESTAT cover the general college-educated population, the NSRCG adds the influx of recent college graduates at the bach-

elor's and master's degree level. The 2010 NSRCG data represent almost 1.5 million recent bachelor's and master's graduates in science, engineering, and health (SEH) fields from academic years 2008 and 2009 (about 1.1 million bachelor's graduates and 340,000 master's graduates).

As of October 2010, 82% of recent SEH graduates were employed. The unem-

TABLE 2. Citizenship status of the college-educated population, by field of highest degree: 2010

Field of highest degree	Total	Native-born U.S. citizen	Foreign-born			
			All foreign-born	U.S. citizen, naturalized	Non-U.S. citizen, permanent resident	Non-U.S. citizen, temporary resident
All degree fields	51,567,000	44,320,000	7,248,000	4,415,000	1,827,000	1,006,000
Biological, agricultural, and environmental life sciences	2,256,000	1,832,000	423,000	230,000	128,000	65,000
Computer and mathematical sciences	2,329,000	1,630,000	700,000	376,000	193,000	131,000
Physical and related sciences	881,000	648,000	233,000	142,000	56,000	35,000
Social and related sciences	5,758,000	5,064,000	695,000	439,000	181,000	75,000
Engineering	3,236,000	2,214,000	1,022,000	554,000	267,000	201,000
S&E-related fields	6,425,000	5,201,000	1,224,000	786,000	303,000	135,000
Non-S&E fields	30,682,000	27,731,000	2,951,000	1,888,000	699,000	364,000

S&E = science and engineering.

NOTES: Numbers are rounded to nearest 1,000. Detail may not add to total because of rounding. College-educated population in this table refers to individuals residing in United States as of 1 October 2010 with at least a bachelor's degree earned by 1 January 2009.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics, National Survey of College Graduates, 2010.

ployment rate for this group was 6.8%, which compares favorably against the 9.5% civilian unemployment rate in October 2010.²

The vast majority of recent graduates employed in 2010 were working full time, ranging from 70% of those with degrees in social and related sciences to 89% of engineering graduates (table 3).

Other detailed data from the NSRCG show that part-time employment was more common among bachelor's graduates (24%) than among master's graduates (16%). Being a student was the most commonly cited reason given by recent bachelor's and master's graduates alike for working part-time. Bachelor's graduates provided "Full-time job not available" as the second most-mentioned reason for part-time employment, and master's graduates provided "Did not need or want to work more hours" as their second most-mentioned reason.

SDR

The SDR data further supplement the NSCG and the NSRCG data in SESTAT with doctoral scientists and engineers who earned their SEH doctorates from U.S. academic institutions.

The unemployment rate for SEH doctorate recipients as of October 2010 was 2.4%. The median annual salaries among those working full time varied across employment sector, with engineers reporting median salaries (\$115,000) that were higher than those reported by doctorate recipients in the science and health fields (\$95,000 and \$93,000, respectively) (table 4).

Across the three broad fields of degree, doctorate recipients working in the private, for-profit sector reported median annual salaries higher than those reported by doctorate recipients working in 4-year educational institutions. Individuals who had earned a doctorate in a science field and were employed in the federal government reported median salaries of \$110,000: lower than those reported by individuals employed in the private, for-profit sector (\$120,000) but higher than those reported by their counterparts working in the private, nonprofit sector (\$101,000).

In general, earnings rose with experience. In the science fields, doctorate recipients who earned their doctorates before 2001 had a median salary 51% higher than that of more recent

doctorate recipients (\$106,000 versus \$70,000). Among engineers, this difference was 37% (\$130,000 versus \$95,000). For those holding a doctoral degree in a health field, the difference was 27% (\$104,000 versus \$82,000).

Definitions

Non-S&E degree fields. Management and administration, education (except science and math teacher education), social service and related fields, sales and marketing, arts and humanities. Other non-S&E fields include communications, journalism, criminal justice, law, and library sciences.

Non-S&E occupations. Non-S&E managers and management-related occupations, non-S&E teachers, social services and related occupations, sales and marketing, and arts and humanities-related occupations. Other non-S&E occupations include bookkeepers, secretaries, lawyers, librarians, protective services, and construction and repair occupations.

Race and ethnicity. All graduates, both U.S. citizens and non-U.S. citizens, are included in the race and ethnicity data presented in this report. American Indians or Alaska Natives, Asians,

TABLE 3. Full- and part-time employment status of recent college graduates in science, engineering, and health fields, by level and field of degree: 2010

Degree level and field	All employed		Employed full time		Employed part time	
	Number	Percent	Number	Percent	Number	Percent
All degrees, all fields	1,224,000	100.0	953,000	77.9	270,000	22.1
Biological, agricultural, and environmental life sciences	138,000	100.0	98,000	71.0	40,000	29.0
Computer and mathematical sciences	127,000	100.0	109,000	85.8	18,000	14.2
Physical and related sciences	45,000	100.0	36,000	80.0	9,000	20.0
Social and related sciences	433,000	100.0	303,000	70.0	129,000	29.8
Engineering	169,000	100.0	151,000	89.3	18,000	10.7
Health	313,000	100.0	257,000	82.1	56,000	17.9
Bachelor's, all fields	922,000	100.0	699,000	75.8	223,000	24.2
Biological, agricultural, and environmental life sciences	120,000	100.0	83,000	69.2	37,000	30.8
Computer and mathematical sciences	88,000	100.0	74,000	84.1	13,000	14.8
Physical and related sciences	35,000	100.0	28,000	80.0	8,000	22.9
Social and related sciences	361,000	100.0	251,000	69.5	110,000	30.5
Engineering	113,000	100.0	100,000	88.5	13,000	11.5
Health	205,000	100.0	164,000	80.0	41,000	20.0
Master's, all fields	302,000	100.0	255,000	84.4	47,000	15.6
Biological, agricultural, and environmental life sciences	18,000	100.0	15,000	83.3	3,000	16.7
Computer and mathematical sciences	39,000	100.0	35,000	89.7	4,000	10.3
Physical and related sciences	9,000	100.0	8,000	88.9	1,000	11.1
Social and related sciences	72,000	100.0	52,000	72.2	19,000	26.4
Engineering	57,000	100.0	52,000	91.2	5,000	8.8
Health	107,000	100.0	93,000	86.9	15,000	14.0

NOTES: Numbers are rounded to nearest 1,000. Recent science, engineering, and health graduates are those who earned bachelor's or master's degrees in these fields from U.S. postsecondary institutions between 1 July 2007 and 30 June 2009. Employed graduates who worked 35 or more hours per week on principal job during a typical week are classified as full time; all other employed graduates are classified as part time. Detail may not add to total because of rounding.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics, National Survey of Recent College Graduates, 2010.

blacks or African Americans, Native Hawaiians or Other Pacific Islanders, whites, and persons reporting more than one race refer to individuals who are not of Hispanic origin. Persons of Hispanic origin may be of any race.

S&E degree fields. Biological/agricultural/environmental life sciences, computer and information sciences, mathematics and statistics, physical sciences, psychology, social sciences, and engineering. S&E-related fields include health, science and mathematics teacher education, technology and technical fields, and other S&E-related fields, such as architecture/environmental design and actuarial science.

S&E occupations. Computer and mathematical scientists; biological, agricultural, and other life scientists; physical and related scientists; social and related scientists; and engineers. S&E-related occupations include health-related occupations, S&E managers, S&E precollege teachers, S&E technicians and technologists, and other S&E-related occupations, such as architects and actuaries.

S&E workforce. See *scientists and engineers*.

Scientists and engineers. Persons residing in the United States on 1 October 2010 who had ever received a bachelor's or higher degree in an S&E

or S&E-related field or who held a non-S&E bachelor's or higher degree and were employed on 1 October in an S&E or S&E-related occupation.

Data Sources

Data presented here are from the 2010 Scientists and Engineers Statistical Data System (SESTAT), which comprises three large demographic and workforce surveys of individuals conducted by the National Science Foundation: the National Survey of College Graduates, the National Survey of Recent College Graduates, and the Survey of Doctorate Recipients. The 2010 SESTAT included people who were trained in S&E or S&E-related fields or were working

TABLE 4. Median annual salaries of doctoral scientists and engineers employed full time, by employment sector, years since doctorate, and broad field of doctorate: 2010 (Dollars)

Employment sector and years since doctorate	Science	Engineering	Health
All full-time employed	95,000	115,000	93,000
<10	70,000	95,000	82,000
≥10	106,000	130,000	104,000
4-year educational institution ^a	80,000	97,000	85,000
<10	58,000	75,000	76,000
≥10	93,000	116,000	96,000
Private, for-profit ^b	120,000	120,000	129,000
<10	100,000	100,000	109,000
≥10	130,000	135,000	144,000
Private, non-profit	101,000	121,000	105,000
<10	71,000	94,000	92,000
≥10	122,000	142,000	125,000
Federal government	110,000	119,000	110,000
<10	87,000	100,000	90,000
≥10	124,000	132,000	125,000
State/local government	84,000	87,000	79,000
<10	71,000	79,000	90,000
≥10	87,000	89,000	71,000
Self-employed ^c	90,000	70,000	96,000
<10	79,000	S	D
≥10	93,000	77,000	98,000
Other ^d	71,000	66,000	73,000
<10	65,000	51,000	58,000
≥10	75,000	74,000	79,000

D = suppressed to avoid disclosure of confidential information. S = suppressed for reliability; coefficient of variation exceeds publication standards.

^a Includes 4-year colleges or universities, medical schools (including university-affiliated hospitals or medical centers), and university-affiliated research institutes.

^b Includes those self-employed in an incorporated business.

^c Self-employed or owner of nonincorporated business.

^d Includes 2-year colleges, community colleges, or technical institutes, and other precollege educational institutions, as well as employees not elsewhere classified.

NOTE: Median annual salaries are for principal job and are rounded to nearest \$1,000.

SOURCE: National Science Foundation/National Center for Science and Engineering Statistics, Survey of Doctorate Recipients, 2010.

in S&E or S&E-related occupations. The 2010 SESTAT surveys had a reference week of 1 October 2010, with an eligible population of persons under age 76 residing in the United States. All demographic, employment, and education data on scientists and engineers represent the status of these individuals during the reference week. For information, please contact the SESTAT project officer, Steven L. Proudfoot (sproudfo@nsf.gov).

National Survey of College Graduates (NSCG).—Data from the 2010 NSCG were collected from the college-educated population residing in the United States as of 1 October 2010 with at least one degree earned before 1 January 2009. The NSCG data are collected through a dual-frame design that includes a returning sample from the 2008 NSCG and a newly selected sample derived from the 2009 American Community Survey. For

survey information, please contact the NSCG project officer, John Finamore (jfinamor@nsf.gov).

National Survey of Recent College Graduates (NSRCG).—Data from the 2010 NSRCG were collected from bachelor's and master's graduates who received SEH degrees from a U.S. academic institution between 1 July 2007 and 30 June 2009. For survey information, please contact the NSRCG project officer, Flora Lan (flan@nsf.gov).

Survey of Doctorate Recipients (SDR).—Data from the 2010 SDR (sponsored by the National Science Foundation and the National Institutes of Health) were collected from doctoral graduates who received SEH research degrees from a U.S. academic institution before 1 July 2009. For survey information, please contact the SDR project officer, Lynn Milan (lmilan@nsf.gov).

Data Availability

Data presented in this report are now available through SESTAT at <http://www.nsf.gov/statistics/sestat/>. Data from these sources are also included in reports such as *Science and Engineering Indicators* and *Women, Minorities, and Persons with Disabilities in Science and Engineering*, and in data tools, such as Science and Engineering State Profiles. SESTAT public use data files are available at <http://sestat.nsf.gov/datadownload/>.

Forthcoming individual reports from each of the three component SESTAT surveys will provide the results of each survey in greater detail. For more information on this report, or on SESTAT, please contact Steven L. Proudfoot. For specific information on the NSCG, NSRCG, or SDR, please contact the respective project officer.

Notes

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2. Bureau of Labor Statistics civilian unemployment rate; available at <http://data.bls.gov/timeseries/LNS14000000> [accessed on 4 December 2012].

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