



Numbers of Doctorates Awarded in the United States Declined in 2010

by Mark K. Fiegener¹

U.S. academic institutions awarded 48,069 research doctorates in 2010, down from 49,554 awards in 2009 and the first decline in doctorates awarded since 2002. The 2010 decline was magnified by the recent reclassification of many Doctor of Education (EdD) degree programs from the research doctorate to the professional doctorate category, and consequently the discontinuation of data collection from the reclassified degree programs by the Survey of Earned Doctorates (SED). The reclassification resulted in a substantially lower number of doctorates awarded in education than would have been the case had the graduates of the reclassified EdD degree programs participated in the 2010 SED (see “Data Sources and Limitations” for details). The total number of doctorates awarded in fields other than education also declined from 2009 to 2010, but by a much smaller amount than the decline in number of education doctorates.

Field of Study

Science and Engineering

The number of doctorates awarded in science and engineering (S&E) fields of study dipped slightly from 2009 after 7 consecutive years of growth (table 1). In total, 33,141 S&E doctorates were

awarded in 2010 (68.9% of all doctorates), 1.0% fewer than in 2009 but an increase of 27.6% since 2000. Doctoral awards were down from 2009 in five of the eight major science fields of study, with agricultural sciences showing the largest decrease (15.7%) and much smaller decreases (none greater than 2%) in physical sciences; psychology; social sciences; and earth, atmospheric, and ocean sciences. Computer sciences posted the largest gain (3.5%) over 2009.

Over the 2000–10 decade, doctorates awarded in agricultural sciences and psychology both fell by more than 5%, but numbers of doctorates in all other major science fields increased. Biological sciences reported the largest increase over the period, growing to 8,052 doctoral awards in 2010, almost one-quarter of all S&E doctorates. Computer sciences experienced the fastest growth (albeit starting from a lower base number of doctorates), nearly doubling in number over the decade.

Doctorates awarded in engineering fields fell to 7,552 in 2010, a 1.2% decrease from 2009 and the second straight year of decline following 6 consecutive years of growth. Materials science engineering and electrical engineering were the only engineering

fields showing noticeable growth in doctoral awards in 2010, increasing by 7.2% and 4.8%, respectively. Aerospace/aeronautical engineering and industrial/manufacturing engineering reported declines of more than 15% from 2009 to 2010. Except for other engineering (a category that includes 21 separate engineering subfields), electrical engineering remains the largest engineering subfield, awarding 23.5% of the total number of engineering doctorates in 2010.

Despite the recent declines in the numbers of engineering doctorates awarded, all engineering subfields experienced substantial growth over the decade. Materials science engineering and other engineering showed the largest percentage increases over the period, at 65.8% and 69.1%, respectively.

Non-Science and Engineering

The number of 2010 doctorates awarded in non-S&E fields other than education grew 0.8% over the 2009 total (table 1), led by a 2.1% increase in number of doctorates in humanities. Even after the EdD reclassification, education remained the largest non-S&E field, reporting 5,294 doctorates awarded in 2010.

TABLE 1. Doctorates awarded, by major field of study: 2000–10

Field	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All fields	41,372	40,744	40,030	40,766	42,122	43,382	45,620	48,133	48,774	49,554	48,069
Science and engineering	25,966	25,529	24,608	25,283	26,275	27,984	29,867	31,831	32,836	33,466	33,141
Science	20,643	20,019	19,527	20,002	20,498	21,557	22,682	24,081	24,972	25,820	25,589
Agricultural sciences	1,037	977	1,009	1,060	1,045	1,038	1,033	1,140	1,088	1,167	984
Biological sciences	5,853	5,694	5,695	5,696	5,942	6,366	6,651	7,238	7,797	8,024	8,052
Biochemistry	776	729	781	772	703	693	784	864	899	858	865
Molecular biology	706	711	623	615	725	724	780	709	786	763	701
Neurosciences	495	486	491	474	584	690	741	777	883	982	953
Other biological sciences	3,876	3,768	3,800	3,835	3,930	4,259	4,346	4,888	5,229	5,421	5,533
Computer sciences	861	830	809	867	948	1,129	1,453	1,655	1,787	1,609	1,665
Earth, atmospheric, and ocean sciences	665	630	671	647	671	714	757	875	865	877	864
Mathematics	1,050	1,010	919	993	1,076	1,205	1,325	1,388	1,400	1,553	1,589
Physical sciences ^a	3,407	3,396	3,205	3,323	3,350	3,643	3,928	4,081	4,081	4,284	4,201
Chemistry	1,989	1,982	1,923	2,040	1,986	2,126	2,363	2,318	2,246	2,392	2,306
Physics and astronomy	1,389	1,384	1,264	1,247	1,349	1,517	1,565	1,763	1,835	1,892	1,895
Psychology	3,615	3,401	3,206	3,277	3,327	3,322	3,258	3,271	3,355	3,472	3,421
Social sciences	4,155	4,081	4,013	4,139	4,139	4,140	4,277	4,433	4,599	4,834	4,813
Engineering	5,323	5,510	5,081	5,281	5,777	6,427	7,185	7,750	7,864	7,646	7,552
Aerospace/aeronautical engineering	214	202	209	200	201	219	238	267	266	297	252
Chemical engineering	619	636	607	568	638	774	799	817	873	807	821
Civil engineering	480	501	540	552	547	622	655	703	713	709	645
Electrical engineering	1,330	1,346	1,211	1,238	1,389	1,547	1,786	1,967	1,888	1,695	1,776
Industrial/manufacturing engineering	176	206	230	214	217	221	234	279	280	252	214
Materials science engineering	404	448	364	438	474	493	583	646	636	625	670
Mechanical engineering	807	878	771	752	754	892	1,044	1,071	1,082	1,094	987
Other engineering	1,293	1,293	1,149	1,319	1,557	1,659	1,846	2,000	2,126	2,167	2,187
Non-science and engineering	15,406	15,215	15,422	15,483	15,847	15,398	15,753	16,302	15,938	16,088	14,928
Education	6,442	6,356	6,508	6,651	6,635	6,227	6,121	6,448	6,561	6,528	5,294
Health	1,591	1,540	1,655	1,633	1,718	1,784	1,907	2,143	2,090	2,096	2,112
Humanities	5,213	5,178	5,050	5,019	5,012	4,950	5,124	4,873	4,502	4,661	4,759
Foreign languages and literature	642	620	627	623	587	607	615	607	627	598	603
History	1,019	991	983	895	927	881	917	886	923	989	963
Letters	1,612	1,493	1,455	1,416	1,407	1,389	1,457	1,341	1,420	1,413	1,518
Other humanities	1,940	2,074	1,985	2,085	2,091	2,073	2,135	2,039	1,532	1,661	1,675
Other non-science and engineering fields	2,160	2,141	2,209	2,180	2,482	2,437	2,601	2,838	2,785	2,803	2,763
Business management/administration	1,070	1,067	1,114	1,037	1,256	1,170	1,311	1,506	1,421	1,405	1,366
Communication	389	390	397	415	450	487	510	560	557	626	637
Fields not elsewhere classified	697	684	698	728	776	779	773	765	807	772	760
Unknown field	4	0	0	0	0	1	7	7	0	0	0

^a Field totals for 2000–04 include other physical sciences fields not shown separately.

NOTE: Groupings of major fields and subfields of study differ from questionnaire and summary reports in that American/U.S. studies, archaeology, and history, science, and technology and society are in social sciences, not humanities; agricultural economics is in social sciences, not agricultural sciences; public administration is in social sciences, not other non-science and engineering fields; and agricultural business and management is included in business management/administration, not agricultural sciences, according to National Science Foundation taxonomy.

SOURCE: NSF/NIH/USED/NEH/USDA/NASA, 2010 Survey of Earned Doctorates.

Over the past decade, doctoral awards in non-S&E fields (other than education) increased 7.5%. The number of doctorates awarded in health showed substantial growth (32.7%) over this period, as did the number of doctorates in other non-S&E fields (27.9%). The number of doctorates awarded in humanities fell 8.7% from 2000 to 2010.

Demographics

Sex

S&E doctorates earned both by men and by women declined slightly from 2009 to 2010, by 1.3% and 0.4%, respectively (table 2). Over the period 2005–10, the percentage change in female S&E doctorate recipients (28.6%) was more than double that of their male counterparts (12.5%). As a result, the share of S&E doctorates awarded to women increased from 37.7% in 2005 to 40.9% in 2010. Women earned the majority of non-S&E doctorates awarded over the 5-year period, reaching a 60.0% share in 2010.

Race and Ethnicity among U.S. Citizens and Permanent Residents

The number of S&E doctoral degrees earned by U.S. citizens and permanent residents who self-reported as members of racial or ethnic minority groups increased to 4,739 in 2010, a 3.4% increase over 2009 and a rise of 35.5% from the 2005 total (table 2).² In comparison the number of S&E doctorates earned by individuals who self-reported as white grew 0.8% in 2010 and 21.2% over the period 2005–10.

Of all S&E doctorates earned by U.S. citizens and permanent residents, those earned by individuals self-reporting as members of minority groups rose from 21.8% in 2005 to 23.7% in 2010. The number of S&E doctorates earned over this period grew for all groups except

TABLE 2. Doctorates awarded, by selected characteristics of doctorate recipients: 2005–10

Characteristic	2005	2006	2007	2008	2009	2010
All doctorate recipients	43,382	45,620	48,133	48,774	49,554	48,069
Science and engineering ^a	27,984	29,867	31,831	32,836	33,466	33,141
Male	17,404	18,371	19,542	19,857	19,842	19,584
Female	10,539	11,477	12,277	12,972	13,596	13,548
U.S. citizen or permanent resident ^b	16,045	16,865	17,322	18,530	19,715	19,983
White	12,291	12,779	13,183	13,915	14,781	14,898
All other race or ethnicity	3,497	3,817	3,868	4,265	4,583	4,739
American Indian or Alaska Native	67	45	81	59	75	76
Asian	1,635	1,792	1,699	1,920	1,981	2,125
Black or African American	707	748	792	826	951	903
Hispanic or Latino ^c	805	889	931	1,085	1,100	1,155
Native Hawaiian or Other Pacific Islander	39	46	45	48	46	38
Two or more races	244	297	320	327	430	442
Temporary visa holders	10,426	11,587	12,369	12,626	12,211	11,302
Non-science and engineering ^a	15,398	15,753	16,302	15,938	16,088	14,928
Male	6,330	6,648	6,664	6,413	6,492	5,964
Female	9,043	9,083	9,624	9,522	9,590	8,957
U.S. citizen or permanent resident ^b	11,911	12,181	12,191	12,308	12,604	11,590
White	9,222	9,380	9,202	9,325	9,316	8,610
All other race or ethnicity	2,527	2,610	2,817	2,799	3,109	2,788
American Indian or Alaska Native	73	73	62	63	71	46
Asian	550	629	643	641	723	703
Black or African American	1,093	1,070	1,182	1,194	1,280	1,099
Hispanic or Latino ^c	626	646	722	686	780	695
Native Hawaiian or Other Pacific Islander	30	20	20	21	29	17
Two or more races	155	172	188	194	226	228
Temporary visa holders	2,421	2,618	2,794	2,627	2,503	2,323

^a Total includes doctorate recipients who did not indicate their sex.

^b Total includes doctorate recipients who did not indicate race and were not of Hispanic ethnicity and those of unknown race or ethnicity.

^c Includes Mexican American, Puerto Rican, and other Hispanic ethnicities.

SOURCE: NSF/NIH/USED/NEH/USDA/NASA, 2010 Survey of Earned Doctorates.

Native Hawaiians and Other Pacific Islanders: 13.4% for American Indians and Alaska Natives; 30.0% for Asians; 27.7% for black or African Americans; 43.5% for Hispanics or Latinos; and 81.1% for individuals reporting two or more races.³ Asians constituted the largest group (44.8%) among S&E doctorate recipients reporting minority race or ethnicity in 2010, followed by Hispanics (24.4%), blacks (19.1%), individuals reporting two or more races (9.3%), American Indians and Alaska Natives (1.6%), and Native Hawaiians and Other Pacific Islanders (0.8%).

A total of 2,788 U.S. citizens and permanent residents who self-reported as members of minority groups earned non-S&E doctoral degrees in 2010. In 2010, 24.1% of non-S&E doctorates awarded to U.S. citizens and permanent residents were earned by individuals self-reporting as members of minority groups. In 2010, blacks constituted the largest group (39.4%) of non-S&E doctorate recipients reporting minority race or ethnicity, followed by Asians (25.2%), Hispanics (24.9%), individuals reporting two or more races (8.2%), American Indians and Alaska Natives

(1.6%), and Native Hawaiians and Other Pacific Islanders (0.6%).

Citizenship

The number of S&E doctorate recipients with temporary visas decreased 7.4% from 2009 to 2010 (table 2), the second consecutive year of decline after several years of growth. Despite the recent downturn, the number of S&E doctorates awarded to temporary visa holders grew 8.4% from 2005 to 2010. The number of S&E doctorates awarded to U.S. citizens and permanent residents increased by 1.4% from 2009 to 2010 and by 24.5% over the 5-year period.

The proportion of S&E doctorates awarded to temporary visa holders declined from 37.3% in 2005 to 34.1% in 2010. Temporary visa holders constitute a much smaller share of the doctorate recipients in non-S&E fields, earning 15.6% of the non-S&E doctorates awarded in 2010.

Data Sources and Limitations

Survey of Earned Doctorates

Data reported in this InfoBrief were collected by the 2010 Survey of Earned Doctorates (SED), a survey of all individuals who earned research doctoral degrees from an accredited academic institution in the United States or Puerto Rico during academic year 2010 (1 July 2009 to 30 June 2010). Research doctoral programs are oriented toward preparing students to make original contributions to knowledge in a field; they typically require the completion of a dissertation or equivalent project and are not primarily intended for the practice of a profession. The SED recognized 18 distinct types of research doctorates in 2010. The vast majority (95.8%) of 2010 research doctorate recipients received the Doctor of Philosophy (PhD) degree and another

3.1% received the Doctor of Education (EdD) degree. In this report, the terms “doctorate” and “doctoral degree” are used to represent any of the research doctoral degrees covered by the survey. Professional doctorates, such as the MD, DDS, JD, and PsyD, are not covered by the SED.

The SED is sponsored by six federal agencies: the National Science Foundation, the National Institutes of Health (U.S. Department of Health and Human Services), the U.S. Department of Education, the U.S. Department of Agriculture, the National Endowment for the Humanities, and the National Aeronautics and Space Administration. In 2010, 92.9% of the 48,069 new doctorate recipients completed the survey. Limited records are constructed for nonrespondents from administrative lists of the university, such as commencement programs and graduation lists. Consequently, the 2010 item response rates for some items exceed the 92.9% unit response rate: the field of study information used in this report was obtained for all doctorate recipients, information on sex was obtained for 99.97%, race/ethnicity for 93.2%, and citizenship status for 94.0%.

EdD Degree Program Reclassifications

After a 3-year review of the EdD degree programs participating in the SED, 77 programs were reclassified from research doctorate to professional doctorate in 2010. Beginning with 2010, SED data are no longer being collected from graduates earning degrees from the reclassified EdD programs. The exact number of individuals who graduated with doctorates in the 77 reclassified EdD programs is unknown; however, the number of 2010 doctorates awarded in education programs reported here is substantially lower than would have been the case had those individuals participated in the 2010

SED. In 2009, 1,136 doctorate recipients earned degrees from EdD degree programs that were reclassified in 2010. Of these doctorate recipients, 96% identified their field of study as education, 2% reported a science and engineering field of study, and 2% identified a non-science and engineering field of study other than education.

Data Comparability and Availability

Readers are cautioned that the 2010 data on education doctorates are not strictly comparable with data of previous years, and cross-year comparisons of numbers of education doctorates do not appear in this report. Cross-year comparisons of doctorates awarded in non-science and engineering (non-S&E), a category of fields that subsumes education, are reported, but the counts explicitly exclude education doctorates from the total numbers of non-S&E doctorates. As the effects of the EdD reclassification on the number of 2010 doctorates awarded in fields other than education are small, cross-year comparisons of doctorates in those fields are reported.

The major fields and subfields of study are reported differently in this InfoBrief than in the SED questionnaire instrument and the interagency report *Doctorate Recipients from U.S. Universities: 2010* (forthcoming). In this InfoBrief, the major field “health” is in the non-S&E category rather than in S&E. The fine fields American/U.S. studies; archeology; and history, science, and technology and society are counted in social sciences (S&E category) rather than humanities (non-S&E category). Agricultural economics is included in social sciences rather than agricultural sciences. Finally, public administration is counted in social sciences (S&E category) rather than professional fields (non-S&E category).

The full set of detailed tables from this survey, providing more information on doctorates awarded, will appear in *Doctorate Recipients from U.S. Universities: 2010* and forthcoming reports of the *Science and Engineering Doctorate Awards* series, at <http://www.nsf.gov/statistics/doctorates/>. Individual detailed tables from recent surveys may be available in advance of publication of the full reports. For further information, please contact the author.

Notes

1. Mark K. Fiegener, Human Resources Statistics Program, National Center for Science and Engineering Statistics, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230 (mfiegene@nsf.gov; 703-292-4622).

2. Minority groups include American Indian or Alaska Native, Asian, black or African American, Hispanic or

Latino (Mexican American, Puerto Rican, and other Hispanic ethnicities), Native Hawaiian or Other Pacific Islander, and persons who reported being two or more races.

3. In this report, “black” is used interchangeably with “black or African American,” and “Hispanic” is used interchangeably with “Hispanic or Latino.”

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

National Science Foundation
ARLINGTON, VA 22230
OFFICIAL BUSINESS

PRESORTED STANDARD
U.S. POSTAGE PAID
National Science Foundation

NSF 12-303