

TABLE 10
Higher education R&D expenditures, by R&D field: FYs 2010–22

(Dollars in thousands)

Field	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All R&D fields	61,286,610	65,274,393	65,729,007	66,977,566	67,161,428	68,519,962	71,736,671	75,148,301	79,024,262	83,488,120	86,302,262	89,694,837	97,680,528
Science	49,061,829	51,955,427	51,914,870	52,608,816	52,761,785	53,843,479	56,236,111	58,936,243	62,018,905	65,419,110	67,563,860	70,288,825	76,226,286
Computer and information sciences	1,638,047	1,742,486	1,822,321	2,067,869	1,927,578	1,962,053	2,079,440	2,192,315	2,397,625	2,637,165	2,924,673	2,952,940	3,224,949
Geosciences, atmospheric sciences, and ocean sciences	2,991,741	3,153,174	3,173,011	3,195,029	3,227,092	3,246,105	3,082,816	3,147,878	3,159,553	3,185,919	3,281,415	3,294,584	3,690,235
Atmospheric science and meteorology	429,354	481,275	476,729	493,385	501,517	573,913	626,676	623,504	608,041	590,385	612,496	624,278	668,918
Geological and earth sciences	1,083,969	1,142,630	1,168,945	1,163,446	1,159,067	1,113,536	997,666	1,084,087	1,131,923	1,121,261	1,159,394	1,241,621	1,370,650
Ocean sciences and marine sciences	1,021,857	1,049,630	1,025,472	1,051,418	1,071,370	1,049,538	1,097,963	1,098,634	1,061,402	1,100,768	1,136,721	1,035,249	1,211,130
Geosciences, atmospheric sciences, and ocean sciences nec	456,561	479,639	501,865	486,780	495,138	509,118	360,511	341,653	358,187	373,505	372,804	393,436	439,537
Life sciences	34,984,249	37,337,522	37,200,171	37,556,765	37,938,741	38,769,105	40,859,076	43,098,275	45,606,391	48,226,684	49,614,879	52,349,524	56,498,207
Agricultural sciences	3,011,150	3,116,840	3,300,098	3,347,687	3,381,853	3,479,612	3,287,685	3,274,597	3,307,251	3,426,773	3,625,348	3,552,705	3,935,731
Biological and biomedical sciences	10,946,456	11,855,468	11,611,632	11,679,165	11,699,720	11,703,939	13,027,525	13,723,154	14,517,866	15,390,991	15,766,819	16,566,463	18,161,442
Health sciences	19,268,085	20,398,377	20,330,413	20,453,217	20,707,633	21,298,214	22,387,230	23,990,079	25,773,405	27,265,024	27,991,752	29,859,263	31,869,957
Natural resources and conservation ^a	na	na	na	na	na	na	693,318	691,653	779,523	841,914	901,705	935,265	1,012,919
Life sciences nec	1,758,558	1,966,837	1,958,028	2,076,696	2,149,535	2,287,340	1,463,318	1,418,792	1,228,346	1,301,982	1,329,255	1,435,828	1,518,158
Mathematics and statistics	592,200	640,471	674,461	670,801	657,656	640,828	679,295	700,251	750,328	769,019	800,583	772,890	879,526
Physical sciences	4,621,772	4,768,816	4,710,125	4,646,791	4,613,739	4,648,566	4,876,304	5,050,084	5,232,149	5,550,678	5,672,442	5,737,169	6,167,583
Astronomy and astrophysics	573,229	583,847	706,544	558,635	566,965	626,589	621,738	648,813	668,227	734,987	780,433	740,819	813,900
Chemistry	1,748,465	1,783,604	1,748,904	1,704,070	1,723,214	1,757,480	1,773,336	1,791,492	1,866,133	1,965,378	1,928,978	1,996,074	2,126,741
Materials science ^a	na	na	na	na	na	na	172,271	227,825	254,447	259,316	252,531	285,940	286,461
Physics	1,998,732	2,108,340	1,985,954	2,097,089	2,054,772	2,037,057	2,108,936	2,155,653	2,206,576	2,327,059	2,435,368	2,463,514	2,669,076
Physical sciences nec	301,346	293,025	268,723	286,997	268,788	227,440	200,023	226,301	236,766	263,938	275,132	250,822	271,405
Psychology	1,077,655	1,159,180	1,179,323	1,128,328	1,143,065	1,183,561	1,222,998	1,246,513	1,261,399	1,328,432	1,364,798	1,329,505	1,443,894
Social sciences	1,999,942	2,063,007	2,053,656	2,172,234	2,210,266	2,315,180	2,361,414	2,554,534	2,721,668	2,805,654	2,951,369	2,827,648	3,165,440
Anthropology ^a	na	na	na	na	na	na	95,932	110,926	118,227	124,390	119,377	108,148	132,764
Economics	352,890	387,036	383,405	408,264	428,076	453,590	395,587	433,997	455,889	458,086	558,855	549,735	667,707
Political science and government	374,903	370,694	390,074	427,435	426,375	459,265	383,986	412,095	438,040	447,709	425,391	423,893	488,480
Sociology, demography, and population studies	419,895	433,484	461,011	482,284	504,735	524,200	503,290	551,845	608,697	610,104	594,076	553,001	616,142
Social sciences nec	852,254	871,793	819,166	854,251	851,080	878,125	982,619	1,045,671	1,100,815	1,165,365	1,253,670	1,192,871	1,260,347
Sciences nec	1,156,223	1,090,771	1,101,802	1,170,999	1,043,648	1,078,081	1,074,768	946,393	889,792	915,559	953,701	1,024,565	1,156,452
Engineering	9,325,722	10,032,590	10,284,111	10,733,954	10,971,498	11,062,806	11,367,127	11,911,132	12,363,204	13,214,142	13,702,434	14,291,729	15,596,634
Aerospace, aeronautical, and astronautical engineering	635,234	667,757	662,444	689,553	662,479	732,092	881,968	990,725	1,010,493	1,170,171	1,293,584	1,452,239	1,647,191
Bioengineering and biomedical engineering	745,277	817,389	871,917	884,421	951,058	1,003,096	1,085,832	1,220,680	1,343,570	1,450,833	1,469,689	1,560,170	1,726,307
Chemical engineering	821,163	913,905	903,613	910,222	906,471	914,308	884,185	934,527	931,029	977,578	1,001,519	1,024,446	1,108,245
Civil engineering	1,106,759	1,208,592	1,232,944	1,296,972	1,256,412	1,284,850	1,328,603	1,302,314	1,354,766	1,432,949	1,424,894	1,481,973	1,647,038
Electrical, electronic, and communications engineering	2,050,292	2,206,894	2,311,665	2,408,824	2,478,216	2,492,197	2,512,453	2,726,458	2,843,755	2,937,880	3,052,761	3,078,737	3,436,892

TABLE 10
Higher education R&D expenditures, by R&D field: FYs 2010–22

(Dollars in thousands)

Field	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Industrial and manufacturing engineering ^a	na	na	na	na	na	na	236,678	351,081	514,775	556,355	586,908	573,923	615,228
Mechanical engineering	1,458,382	1,556,892	1,550,151	1,647,640	1,503,710	1,513,951	1,434,664	1,535,819	1,630,521	1,704,961	1,813,657	1,881,980	2,062,508
Metallurgical and materials engineering	703,332	738,892	757,967	812,231	1,202,757	1,101,599	743,980	735,699	762,686	792,370	818,667	841,719	886,681
Engineering nec	1,805,283	1,922,269	1,993,410	2,084,091	2,010,395	2,020,713	2,258,764	2,113,829	1,971,609	2,191,045	2,240,755	2,396,542	2,466,544
Non-S&E	2,899,059	3,286,376	3,530,026	3,634,796	3,428,145	3,613,677	4,133,433	4,300,926	4,642,153	4,854,868	5,035,968	5,114,283	5,857,608
Business management and business administration	370,015	400,376	443,079	473,157	481,154	569,570	642,167	725,255	784,333	868,051	887,853	934,362	1,081,380
Communication and communications technologies	130,396	153,743	159,920	148,496	166,040	168,512	166,405	202,535	191,597	206,724	192,105	186,214	213,000
Education	993,588	1,120,766	1,233,437	1,220,888	1,243,226	1,292,178	1,340,222	1,384,259	1,503,577	1,521,635	1,607,383	1,615,608	1,740,784
Humanities	260,374	313,032	339,633	386,736	402,173	430,058	443,588	493,092	504,569	538,544	564,529	560,815	713,685
Law	98,109	124,779	131,514	173,479	149,235	174,692	184,334	223,819	266,344	255,789	267,866	282,710	358,693
Social work	177,331	194,667	199,046	212,323	225,897	214,205	211,546	235,292	245,110	285,635	306,371	319,608	363,079
Visual and performing arts	68,717	77,358	84,596	87,291	95,837	100,681	133,845	124,904	137,154	158,962	174,607	178,422	224,572
Non-S&E nec	800,529	901,655	938,801	932,426	664,583	663,781	1,011,326	911,770	1,009,469	1,019,528	1,035,254	1,036,544	1,162,415

na = not applicable; separate data for natural resources and conservation, materials science, anthropology, and industrial and manufacturing engineering were not collected prior to FY 2016.

nec = not elsewhere classified; S&E = science and engineering.

^a Prior to FY 2016, expenditures for natural resources and conservation, materials science, anthropology, and industrial and manufacturing engineering were not collected separately. See the FY 2016 Technical Notes, Appendix A (<https://ncesdata.nsf.gov/herd/2016>) for information detailing where these fields were previously reported.

Note(s):

FY 2016 R&D expenditure amounts in various fields may show increases or decreases from amounts reported in FY 2015 because of the reclassification of disciplines. See the FY 2016 Technical Notes, Appendix A (<https://ncesdata.nsf.gov/herd/2016>) for specific details about discipline changes.

Source(s):

National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.