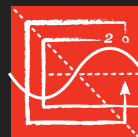




squared

2013-14



NCEES
*advancing licensure for
engineers and surveyors*



square \skwer\ *n* **1:** a plane figure with four equal sides and four right angles **2:** the product of a number multiplied by itself
vb **1:** to regulate or adjust by or to some standard or principle
adj **1:** denoting a unit of measurement equal to the area of a square whose side is of the unit specified **2:** level or parallel **3:** properly arranged, in good order **4:** just, fair, honest *adv* **1:** in a straightforward or honest manner **2:** at right angles

I'm happy to introduce the inaugural issue of *NCEES Squared*, the official NCEES source for engineering and surveying licensure statistics. The title is an apt one because “squared” has many meanings that embody the purpose of this new annual publication.

A square signifies units of measurements, numbers, and angles. One of the main purposes of *NCEES Squared* is to make licensure data available to a wide audience, including educators, employers, and the general public. Recent technology enhancements at NCEES have given us the ability to analyze the data and trends and share them with you. The information in this publication includes the number of U.S. licensees, exam volume and pass rates for NCEES exams, and much more. All of the data represent the 2013–14 fiscal year, which began October 1, 2013, and ended September 31, 2014.

To be squared also means to be direct, honest, and in good order. The mission of NCEES is to advance licensure for engineers and surveyors in order to safeguard the health, safety, and welfare of the public. This publication is one way we are doing that—by offering a straightforward account of our 2013–14 fiscal year through data that measure where licensure is today and the trends we are seeing as an organization.

We hope this information is a resource that will help you better understand licensure and its importance to our everyday lives.



Jerry T. Carter, NCEES CEO

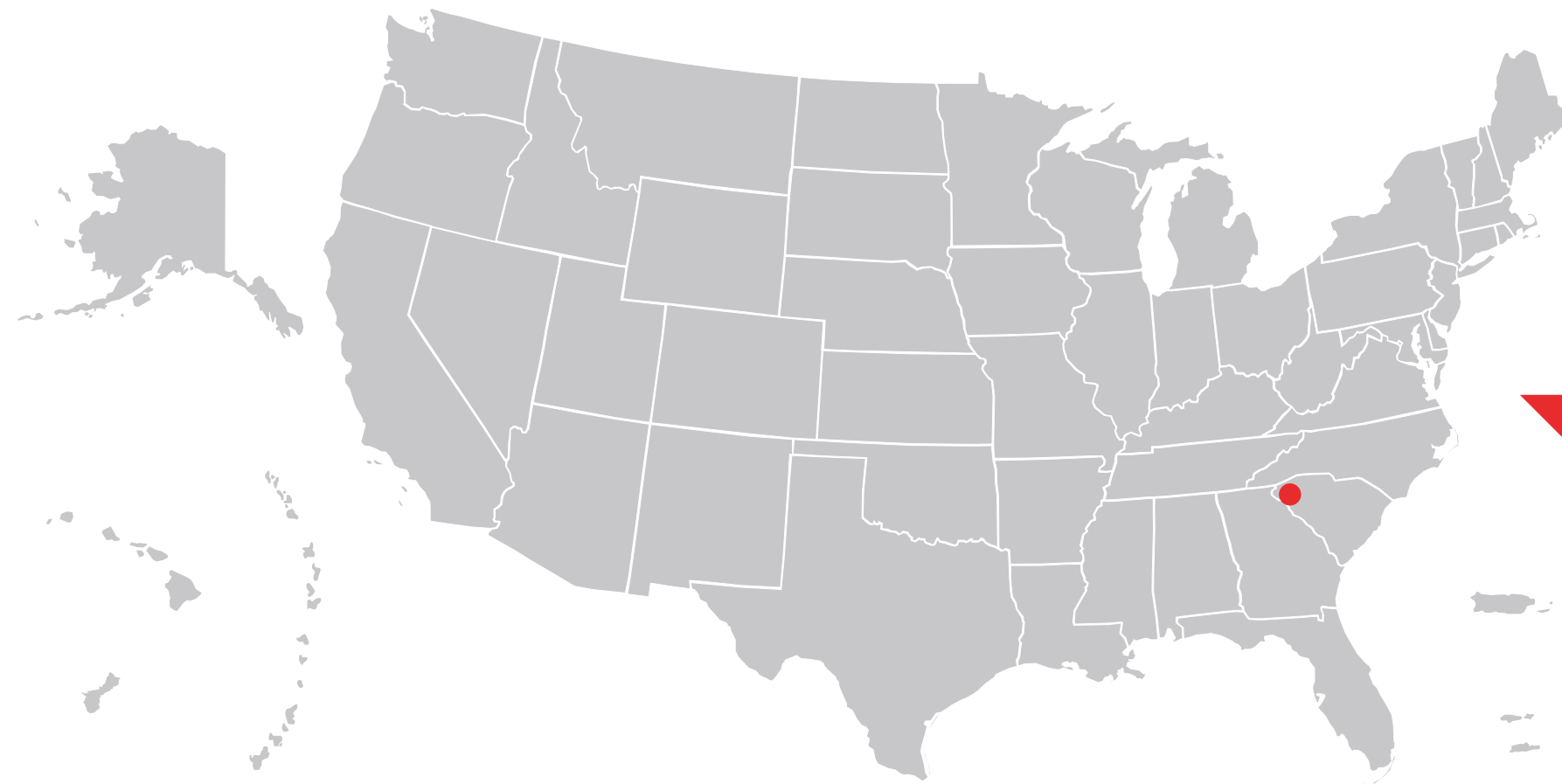
WHO WE ARE

The National Council of Examiners for Engineering and Surveying (NCEES) is a national nonprofit organization dedicated to advancing professional licensure for engineers and surveyors.

Professionally licensed engineers and surveyors have met specific qualifications in education, work experience, and exams and are obligated to work in a manner that safeguards the health, safety, and welfare of the public.

WHAT WE DO

NCEES facilitates mobility for professional engineers and surveyors in the United States by providing services to its member licensing boards and licensees. These services promote uniformity in licensure laws throughout the country, making it easier for engineers and surveyors to become licensed.



The Council's members are the engineering and surveying licensure boards from all 50 states, the District of Columbia, Guam, Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands.

NCEES headquarters is located in Clemson, S.C.

EXAM DEVELOPMENT

Licensed engineers and surveyors volunteer their time and expertise to the exam development process by coming to NCEES headquarters to write and evaluate exam questions. In 2013–14, NCEES welcomed a total of **745** volunteers at **54** exam development meetings. This represents approximately **23,056** hours spent developing exam content for **8** fundamentals exams and **26** professional exams.

745
VOLUNTEERS

54
MEETINGS

23,056
HOURS

NCEES FACT



PERCENTAGE OF
FEMALE EXAM
DEVELOPMENT
VOLUNTEERS

SNAPSHOT: PE MECHANICAL COMMITTEE

2
MEETINGS

18
STATES REPRESENTED

63
ATTENDEES

54 
9 

EXAMS

NCEES exams are a key part of the licensure process. These national exams ensure that professional engineers and surveyors throughout the country meet a uniform minimum standard of competence.

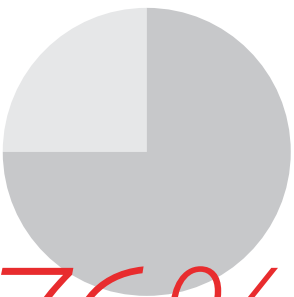
93,360



TOTAL NUMBER OF ENGINEERING BACHELOR'S DEGREES AWARDED IN 2013 AS REPORTED BY THE AMERICAN SOCIETY FOR ENGINEERING EDUCATION (ASEE)

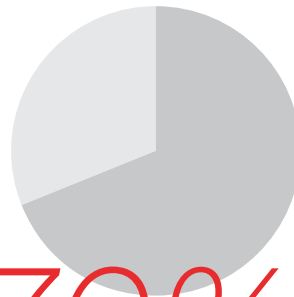


45,362 TOTAL NUMBER OF FE EXAM TAKERS



76%

PASS RATE OF
FIRST-TIME FE
EXAM TAKERS
WITH EAC/ABET
BACHELOR'S
DEGREES



70%

PASS RATE
OF ALL OTHER
FIRST-TIME FE
EXAM TAKERS

ENGINEERING

NCEES develops and scores the licensure exams used by all U.S. engineering and surveying boards as part of their licensure process. These exams play a central role in ensuring standard qualifications for licensees.

FE PASS RATES

The Fundamentals of Engineering (FE) exam is designed for recent graduates and students who are close to completing an undergraduate degree in engineering. Passing it is an important first step in the engineering licensure process.

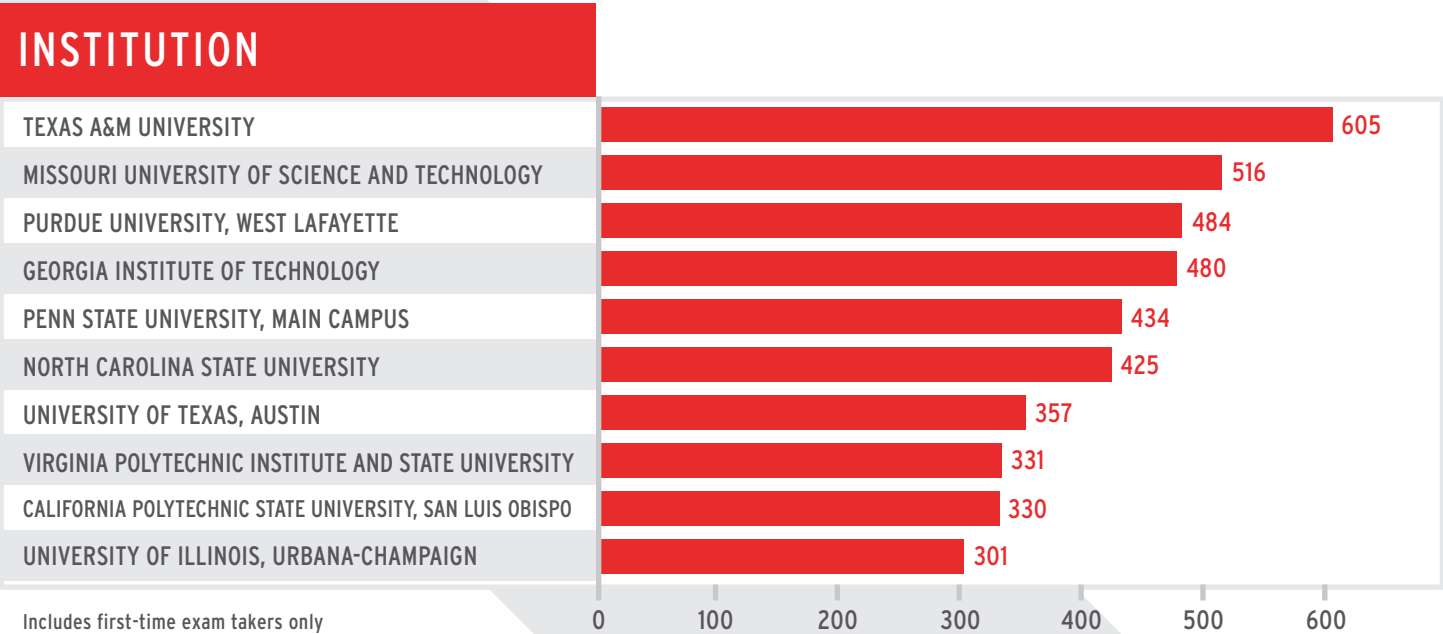
FE EXAM	OVERALL TAKERS			
	FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE
CHEMICAL	2,368	78%	169	38%
CIVIL	12,393	71%	4,156	29%
ELECTRICAL AND COMPUTER	3,889	70%	936	27%
ENVIRONMENTAL	1,734	81%	295	40%
INDUSTRIAL	595	67%	56	30%
MECHANICAL	9,379	80%	771	41%
OTHER DISCIPLINES	5,684	73%	2,937	34%

FE EXAM	TAKERS WITH EAC/ABET BACHELOR'S				OTHER TAKERS			
	FIRST TIME		REPEAT		FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE	VOLUME	PASS RATE	VOLUME	PASS RATE
CHEMICAL	2,047	79%	138	42%	321	74%	31	19%
CIVIL	9,651	72%	3,182	31%	2,742	68%	974	24%
ELECTRICAL AND COMPUTER	2,891	72%	645	29%	998	65%	291	23%
ENVIRONMENTAL	1,082	78%	196	42%	652	85%	99	36%
INDUSTRIAL	503	69%	29	45%	92	57%	27	15%
MECHANICAL	7,868	81%	557	46%	1,511	71%	214	29%
OTHER DISCIPLINES	3,746	75%	1,860	37%	1,938	68%	1,077	28%

Other Takers includes examinees who do not hold a bachelor's degree from an EAC/ABET-accredited program or who did not provide bachelor's education information during exam registration.

MANY SCHOOLS RECOGNIZE THE VALUE OF LICENSURE, PROMOTE ITS BENEFITS TO THEIR STUDENTS, AND ENCOURAGE THEM TO TAKE THE FE EXAM. THEY REALIZE THAT ENGINEERING POSITIONS AT ALL LEVELS OF INDUSTRY AND GOVERNMENT INCREASINGLY REQUIRE LICENSURE AND WANT TO MAKE SURE THEIR GRADUATES HAVE WHAT IT TAKES TO SUCCEED.

TOP 10 SCHOOLS BY FE EXAM VOLUME:



PE PASS RATES

The Principles and Practice of Engineering (PE) exam is designed for engineers who have gained at least four years of work experience in their respective discipline.

PE EXAM	OVERALL TAKERS			
	FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE
AGRICULTURAL AND BIOLOGICAL	26	69%	6	50%
ARCHITECTURAL	65	71%	12	17%
CHEMICAL	449	69%	151	32%
CIVIL: CONSTRUCTION	1,420	58%	1,437	30%
CIVIL: GEOTECHNICAL	894	69%	584	30%
CIVIL: STRUCTURAL	1,965	76%	717	47%
CIVIL: TRANSPORTATION	2,092	63%	1,992	33%
CIVIL: WATER RESOURCES AND ENVIRONMENTAL	1,717	70%	1,045	33%
CONTROL SYSTEMS	186	76%	63	52%
ELECTRICAL AND COMPUTER: COMPUTER ENGINEERING	65	72%	28	18%
ELECTRICAL AND COMPUTER: ELECTRICAL AND ELECTRONICS	198	70%	105	24%
ELECTRICAL AND COMPUTER: POWER	1,611	65%	1,210	36%
ENVIRONMENTAL	466	57%	294	31%
FIRE PROTECTION	143	69%	77	36%
INDUSTRIAL	72	69%	13	15%
MECHANICAL: HVAC AND REFRIGERATION	954	77%	362	40%
MECHANICAL: MECHANICAL SYSTEMS AND MATERIALS	988	70%	329	42%
MECHANICAL: THERMAL AND FLUIDS SYSTEMS	956	67%	445	40%
METALLURGICAL AND MATERIALS	43	63%	8	0%
MINING AND MINERAL PROCESSING	62	71%	19	37%
NAVAL ARCHITECTURE/MARINE ENGINEERING	47	81%	12	67%
NUCLEAR	38	53%	9	44%
PETROLEUM	112	75%	34	53%
SOFTWARE ENGINEERING	14	64%	2	50%

TAKERS WITH EAC/ABET BACHELOR'S			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
13	62%	3	67%
49	78%	8	25%
321	71%	106	35%
1,189	61%	1,033	33%
610	70%	367	29%
1,448	77%	422	46%
1,766	65%	1,465	35%
1,368	72%	765	32%
125	78%	29	62%
53	75%	20	15%
134	70%	70	23%
1,202	65%	884	39%
327	58%	191	32%
96	76%	46	43%
62	69%	11	18%
756	79%	241	45%
750	71%	223	44%
707	69%	307	43%
25	68%	5	0%
54	69%	16	44%
29	79%	8	75%
29	52%	7	43%
92	78%	21	71%
8	88%	N/A	N/A

OTHER TAKERS			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
13	77%	3	33%
16	50%	4	0%
128	64%	45	24%
231	41%	404	25%
284	65%	217	32%
517	72%	295	48%
326	51%	527	30%
349	59%	280	34%
61	72%	34	44%
12	58%	8	25%
64	69%	35	26%
409	64%	326	30%
139	55%	103	28%
47	53%	31	26%
10	70%	2	0%
198	70%	121	30%
238	66%	106	36%
249	61%	138	33%
18	56%	3	0%
8	88%	3	0%
18	83%	4	50%
9	56%	2	50%
20	60%	13	23%
6	33%	2	50%

Other Takers includes examinees who do not hold a bachelor's degree from an EAC/ABET-accredited program or who did not provide bachelor's education information during exam registration.

SE PASS RATES

The Structural Engineering (SE) exam is designed for engineers who practice in jurisdictions that license structural engineers separately from other professional engineers.

SE EXAM	OVERALL TAKERS			
	FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE
LATERAL FORCES: BRIDGES	84	29%	93	34%
LATERAL FORCES: BUILDINGS	523	43%	441	40%
VERTICAL FORCES: BRIDGES	87	56%	44	48%
VERTICAL FORCES: BUILDINGS	584	47%	365	28%

SE EXAM	TAKERS WITH EAC/ABET BACHELOR'S			
	FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE
LATERAL FORCES: BRIDGES	51	31%	51	39%
LATERAL FORCES: BUILDINGS	358	46%	270	45%
VERTICAL FORCES: BRIDGES	52	65%	24	63%
VERTICAL FORCES: BUILDINGS	389	52%	220	32%

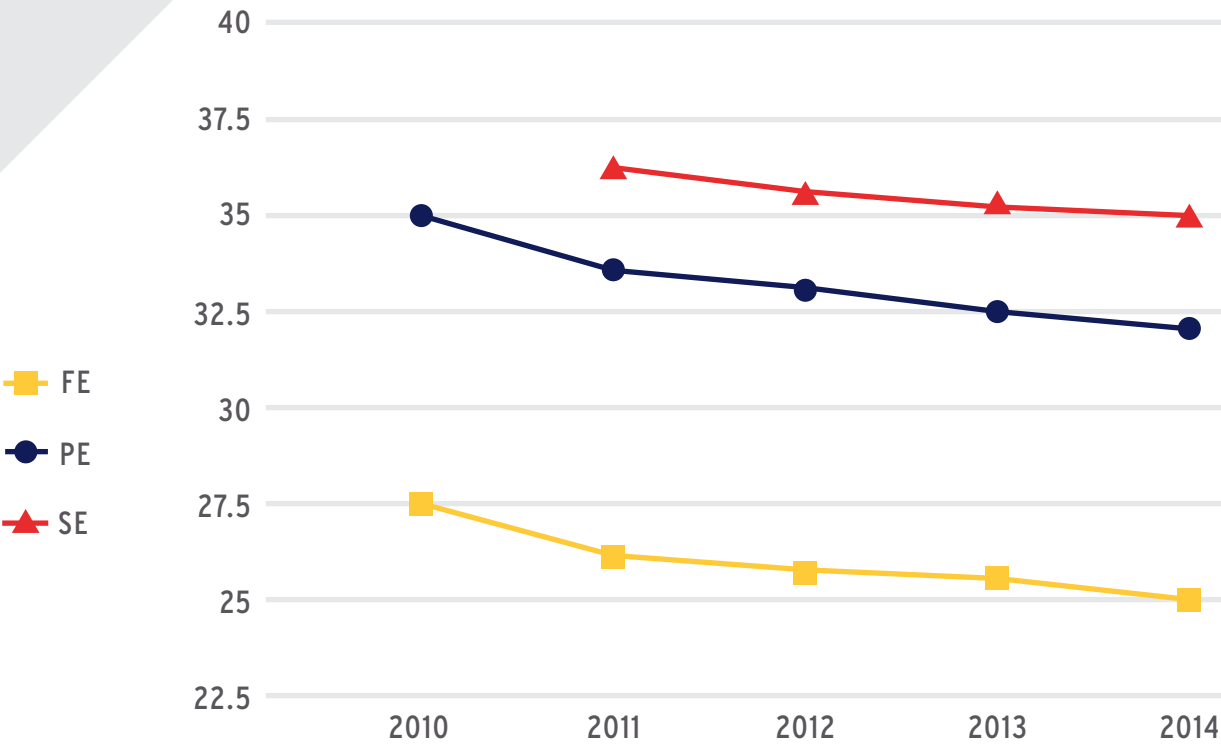
SE EXAM	OTHER TAKERS			
	FIRST TIME		REPEAT	
	VOLUME	PASS RATE	VOLUME	PASS RATE
LATERAL FORCES: BRIDGES	33	24%	42	29%
LATERAL FORCES: BUILDINGS	165	36%	171	33%
VERTICAL FORCES: BRIDGES	35	43%	20	30%
VERTICAL FORCES: BUILDINGS	195	36%	145	22%

Other Takers includes examinees who do not hold a bachelor's degree from an EAC/ABET-accredited program or who did not provide bachelor's education information during exam registration.

AVERAGE AGE OF EXAMINEES

Enhancements to the licensure process increasingly provide candidates with better access to the exams. This has resulted in a decrease in the average age of FE, PE, and SE examinees since 2010.

AVERAGE EXAMINEE AGE BY EXAM TYPE



NCEES FACT 2014

In 2014, NCEES member licensing boards voted to remove from the *Model Law* the prerequisite of four years of experience before a licensure candidate can take the PE exam.

SURVEYING

NCEES develops and scores the licensure exams used by all U.S. engineering and surveying boards as part of their licensure process. These exams play a central role in ensuring standard qualifications for licensees. The Fundamentals of Surveying (FS) exam is designed for recent graduates and students who are close to completing an undergraduate degree in surveying. Passing it is an important first step in the surveying licensure process. The Principles and Practice of Surveying (PS) exam is designed for surveyors who have gained at least four years of work experience in their respective field.

FS PASS RATES

OVERALL TAKERS			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
726	60%	308	22%
TAKERS WITH EAC/ETAC/ASAC-ABET BACHELOR'S			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
236	70%	38	37%
OTHER TAKERS			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
490	56%	270	20%

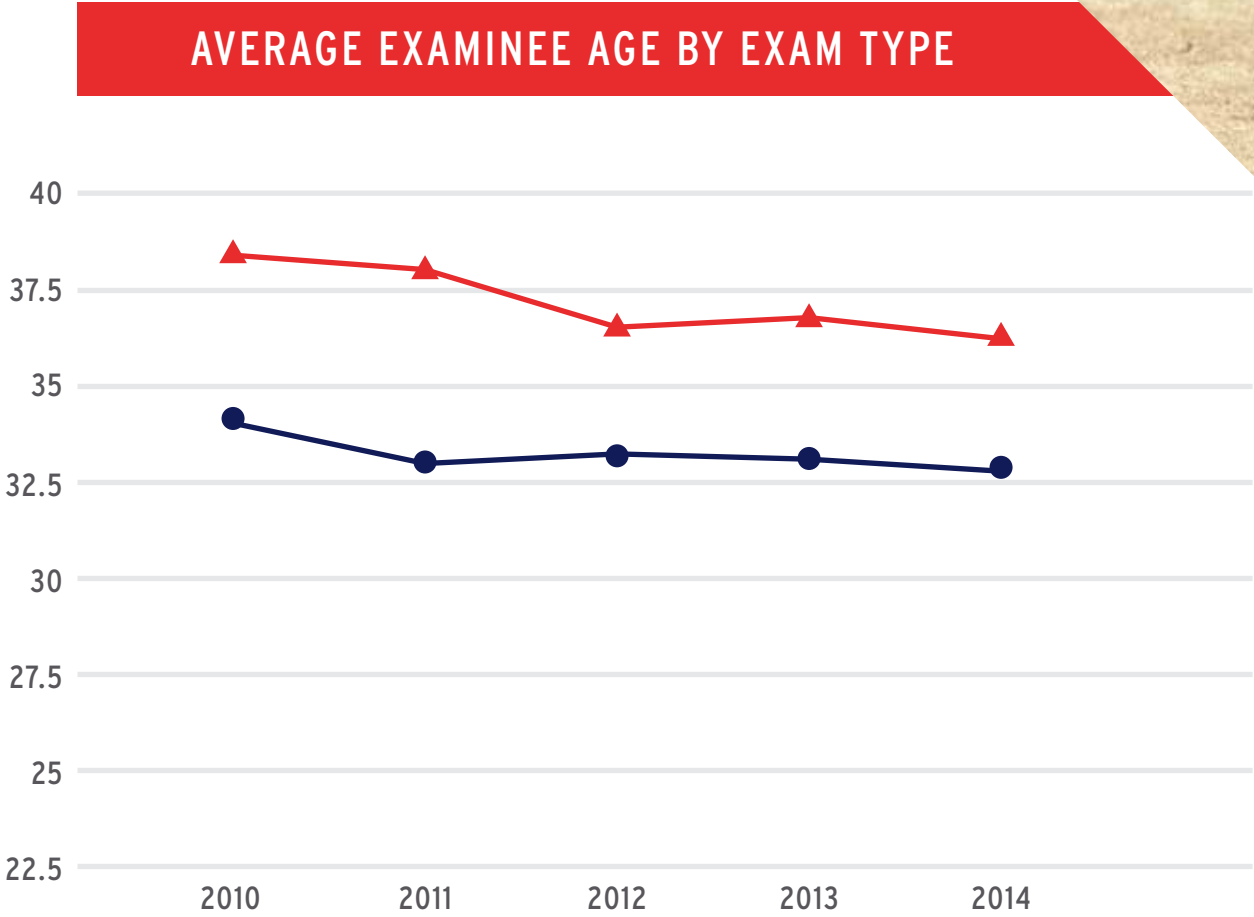
PS PASS RATES

OVERALL TAKERS			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
647	72%	366	39%
TAKERS WITH EAC/ETAC/ASAC-ABET BACHELOR'S			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
137	77%	77	38%
OTHER TAKERS			
FIRST TIME		REPEAT	
VOLUME	PASS RATE	VOLUME	PASS RATE
510	70%	289	39%

Other Takers includes examinees who do not hold a bachelor's degree from an EAC/ETAC/ASAC-ABET-accredited program or who did not provide bachelor's education information during exam registration.

AVERAGE AGE OF EXAMINEES

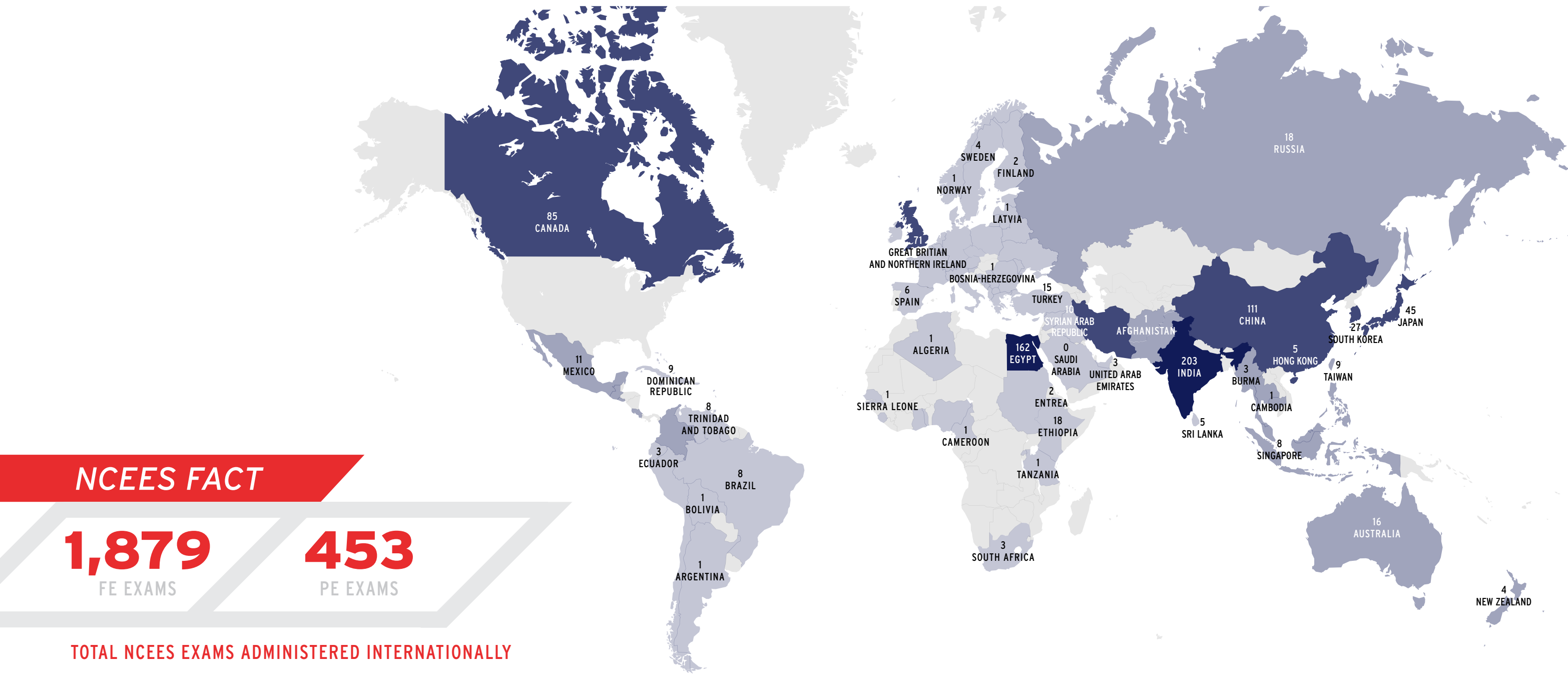
Enhancements to the licensure process increasingly provide candidates with better access to the exams. This has resulted in a decrease in the average age of FS and PS examinees since 2010.



INTERNATIONAL SNAPSHOT

Engineers throughout the world recognize the P.E. designation as a high level of distinction and seek to become licensed in the United States. As a result, NCEES has agreements to administer the FE and PE exams in Canada (Alberta), the Emirate of Sharjah, Egypt, Japan, Saudi Arabia, South Korea, and Turkey.

NCEES Credentials Evaluations is a service that evaluates a candidate’s academic transcripts and determines if his or her degree is equivalent to a degree from an EAC/ABET-accredited program. Most of these candidates earned their degree outside the United States and are seeking licensure through an NCEES member licensing board. The map below illustrates the number of international engineers in 2013–14 who sought licensure in the United States.



NCEES FACT

1,879
FE EXAMS

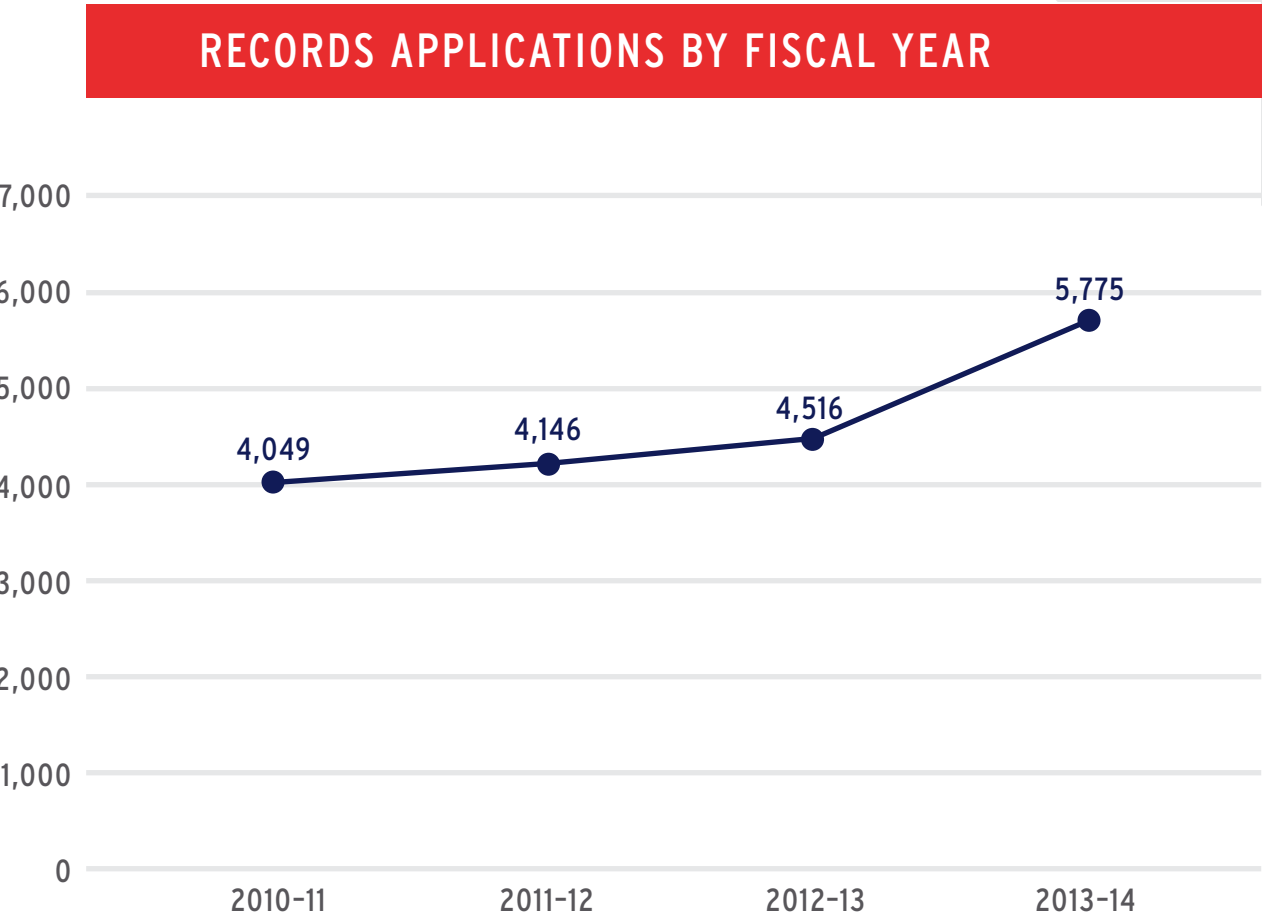
453
PE EXAMS

TOTAL NCEES EXAMS ADMINISTERED INTERNATIONALLY

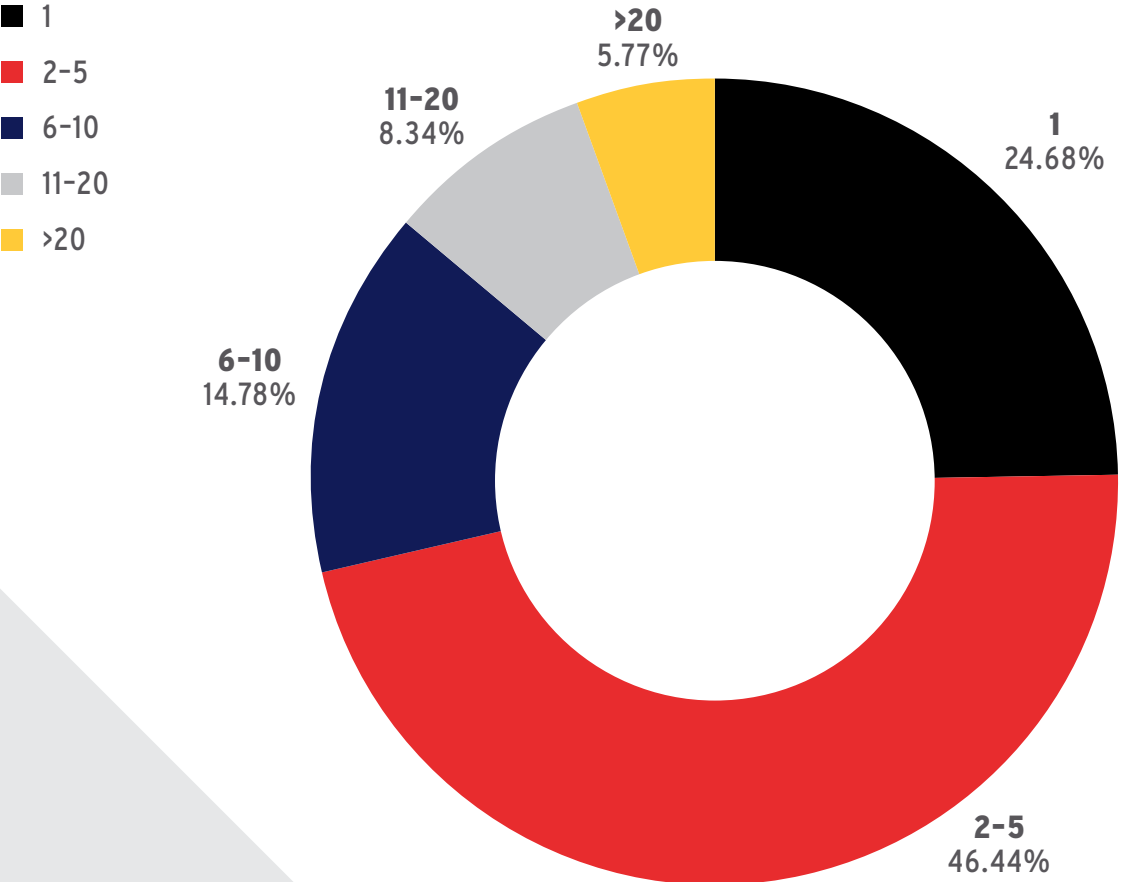
NCEES RECORDS PROGRAM

The NCEES Records program helps licensed engineers and surveyors become licensed in multiple states. An NCEES Record includes most—if not all—of the materials needed to apply for comity licensure. It is transmitted electronically each time the Record holder applies for a license, which saves time and simplifies the application process.

THE PROGRAM'S YEAR-TO-YEAR GROWTH ILLUSTRATES THE RISE IN MULTISTATE LICENSURE IN THE UNITED STATES.



NUMBER OF TRANSMITTALS PER RECORD HOLDER



NCEES FACT

NUMBER OF ACTIVE RECORD
HOLDERS AT THE END OF THE
2013-14 FISCAL YEAR

34,488

6
NUMBER OF
STATES THAT
REQUIRE A RECORD
WHEN APPLYING FOR
COMITY LICENSURE

LICENSURE

Surveying licensure was established in 1891 in California. Engineering licensure was established in 1907 in Wyoming. Today, every state, U.S. territory, and the District of Columbia regulates the practice of engineering and surveying in order to safeguard the health, safety, and welfare of the public.

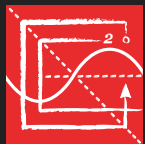
Each year, NCEES surveys its member licensing boards for the number of engineering and surveying licensees in their jurisdiction. Below are the number of engineers and surveyors per jurisdiction in 2014 as reported by the individual boards. Licensees who are licensed in multiple states are included in the numbers for each jurisdiction where they are licensed. Some states track the number of state resident licensees versus out-of-state licensees; those are reported as resident and nonresident in the charts below.

	ENGINEERS		SURVEYORS		ENGINEERS & SURVEYORS (DUAL LICENSEES)	
	RESIDENT	NONRESIDENT	RESIDENT	NONRESIDENT	RESIDENT	NONRESIDENT
AK	2,489	2,664	363	115	NOT TRACKED	
AL	5,782	9,551	783	496	NOT TRACKED	
AR	2,217	5,912	426	290	NOT TRACKED	
AZ	6,361	10,371	947	556	287	78
CA	66,527	24,081	3,557	633	NOT TRACKED	
CO	13,025	11,053	1,198	589	NOT TRACKED	
CT	3,641	6,760	406	134	153	16
DC	5,966		8	102	NOT TRACKED	
DE	992	5,583	263		NOT TRACKED	
FL	22,601	16,745	2,762		NOT TRACKED	
GA	21,077		1,362		NOT TRACKED	
GU	177	397	12	6	1	0
HI	3,183	3,159	178	30	NOT TRACKED	
IA	2,581	5,954	307	179	NOT TRACKED	
ID	2,293	4,882	276	338	33	13
IL	11,734 P.E. 1,306 S.E.	8,696 P.E. 1,777 S.E.	953	273	NOT TRACKED	
IN*	4,406	7,098	679	175	82	11
KS	4,386	7,463	426	310	98	24
KY	3,883	8,160	936	505	377	79
LA	6,056	9,836	616	207	205	22
MA*	8,278	6,685	761	208	173	33

	ENGINEERS		SURVEYORS		ENGINEERS & SURVEYORS (DUAL LICENSEES)	
	RESIDENT	NONRESIDENT	RESIDENT	NONRESIDENT	RESIDENT	NONRESIDENT
MD	6,269	11,741	479	243	72	26
ME	1,883	4,093	388	136	NOT TRACKED	
MI	21,796		1,025		141	
MN	6,932	5,774	476	121	42	14
MO	7,721	10,285	690	290	NOT TRACKED	
MS	2,387	7,906	860	461	342	66
MT	5,160		380		55	
NC	11,488	12,746	2,003	594	385	60
ND**	5,073		510		75	
NE	2,407	5,020	197	136	NOT TRACKED	
NH	1,812	4,741	265	125	NOT TRACKED	
NJ*	8,371	8,986	737	183	194	22
NM	2,638	5,873	272	215	25	6
NV	2,450	8,549	275	616	27	21
NY	14,889	12,811	1,242	278	78	
OH	12,767	13,153	1,660	395	614	87
OK	3,463	7,092	352	249	62	17
OR	5,101	6,975	758	272	175	34
PA	15,024	13,762	1,603	436	NOT TRACKED	
PR**	11,513	1,778	1,087	38	298	5
RI	811	2,259	188		NOT TRACKED	
SC	5,101	10,097	727	474	121	32
SD	973	3,053	181	289	70	16
TN	7,481	8,192	794	337	118	29
TX	34,647	13,587	2,493		NOT TRACKED	
UT	3,115	4,266	466	296	67	10
VA	11,669	15,727	968	298	157	37
VI**	618		101		29	
VT	3,928		209		NOT TRACKED	
WA*	11,452	10,354	986	338	NOT TRACKED	
WI	7,219	7,769	830	391	NOT TRACKED	
WV	1,685	6,156	538	361	216	109
WY	1,117	5,082	120	171	55	26

*Numbers last reported in 2013
**Numbers last reported in 2012

NUMBER OF U.S. LICENSES SINCE 1937 (INCLUDES MULTISTATE LICENSEES)							
YEAR	TOTAL NUMBER OF ENGINEERING LICENSES	RESIDENT LICENSES	NONRESIDENT LICENSES	YEAR	TOTAL NUMBER OF ENGINEERING LICENSES	RESIDENT LICENSES	NONRESIDENT LICENSES
1937	46,812	43,484	3,328	1985	586,000	339,000	247,000
1938	57,850	54,147	3,703	1986	596,000	343,000	253,000
1939	62,406	57,712	4,694	1987	602,000	338,000	264,000
1940	67,286	61,616	5,670	1988	622,000	360,000	262,000
1941	67,817	59,467	8,350	1989	652,516	380,989	271,527
1942	NO PROCEEDINGS ISSUED IN 1942—NO MEETING			1990	609,267	339,106	270,161
1943	72,804	63,497	9,307	1991	627,032	354,444	272,588
1944	73,532	62,154	11,378	1992	652,410	377,755	274,655
1945	NO PROCEEDINGS ISSUED IN 1942—NO MEETING			1993	641,383	360,619	280,764
1946	92,905	78,851	14,054	1994	638,238	414,275	223,963
1947	114,698	97,965	16,733	1995	641,041	414,158	226,883
1948	130,620	110,813	19,807	1996	610,153	368,885	241,268
1949	153,277	131,318	21,959	1997	656,235	383,399	272,836
1950	159,759	134,133	25,626	1998	664,840	399,319	265,521
1951	167,414	139,214	28,200	1999	656,710	373,493	238,217
1952	176,533	148,239	28,294	2000	669,627	402,267	267,360
1953	184,655	151,459	33,196	2001	613,617	384,833	228,784
1954	191,553	158,146	33,407	2002	654,370	374,344	280,026
1955	201,633	162,048	39,585	2003	703,137	391,329	311,808
1956	214,357	170,857	43,500	2004	750,596	442,578	308,018
1957	226,371	179,669	46,702	2005	617,725	371,040	246,685
1958	237,244	182,973	54,271	2006	710,619	434,582	276,037
1959	246,279	185,866	60,413	2007	719,967	461,941	258,026
1960	259,707	193,603	66,104	2008	750,927	426,222	324,705
1961	270,859	203,152	67,707	2009	765,197	456,218	308,979
1962	280,088	209,130	70,898	2010	762,280	476,230	286,050
1963	287,056	213,453	73,603	2011	807,768	469,411	338,358
1964	298,282	217,462	80,820	2012	802,267	428,976	373,291
1965	311,839	213,484	98,355	2013	804,191	422,605	381,586
1966	322,165	218,047	103,118	2014	822,575	437,921	384,654
1967	337,298	241,381	95,919				
1968	350,731	242,175	108,556	YEAR	TOTAL NUMBER OF SURVEYING LICENSES	RESIDENT LICENSES	NONRESIDENT LICENSES
1969	361,877	245,999	115,878	1997	49,966	37,805	12,161
1970	374,206	249,076	125,130	1998	51,495	39,816	11,679
1971	385,120	279,688	105,432	1999	52,622	40,303	12,319
1972	393,725	285,148	108,577	2000	51,865	40,575	11,290
1973	408,286	288,014	120,272	2001	46,813	37,968	8,845
1974	433,404	318,470	133,934	2002	47,393	36,603	10,790
1975	434,297	325,132	109,165	2003	44,614	33,418	11,196
1976	447,005	349,518	97,489	2004	50,032	38,177	11,855
1977	475,387	400,380	75,007	2005	44,253	34,468	9,785
NOTE: THE METHOD OF REPORTING FROM 1978 TO PRESENT REPRESENTS A MAJOR CHANGE FROM THAT USED DURING THE YEARS 1937-1977.				2006	49,167	38,995	10,172
				2007	53,950	43,724	10,226
				2008	56,074	43,300	12,774
1978	502,184	297,000	205,000	2009	52,719	39,632	13,087
1979	516,354	316,976	199,378	2010	55,091	44,448	10,643
1980	545,000	332,000	213,000	2011	55,441	45,581	11,860
1981	549,000	331,000	218,000	2012	55,991	41,239	14,752
1982	575,000	338,000	237,000	2013	54,946	40,735	14,211
1983	577,000	344,000	233,000	2014	53,968	41,079	12,889
1984	581,000	340,000	241,000				



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P.O. Box 1686, Clemson, S.C. 29633

864-654-6824