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ABSTRACT

This document offers a snapshot of enrollment and graduation statistics of African Americans, Latinos, and American Indians in engineering institutions in the United States. This data provides the baseline for a series that will examine institutional productivity over time and will include analyses of retention and effective university policy in addition to ongoing access. Highlights in this report include the following: (1) minority enrollment in engineering has declined 8.2 percent from its peak of 15,181 in 1992-93 to 13,929 in 1997-98; (2) in the African American community, the enrollment decline has dropped 17 percent during the past 5 years and minority engineering enrollment at historically Black colleges declined 40.2 percent since 1992; (3) 50 percent of all African American, Latino, and American Indian freshmen enrolled at just 39 institutions, 11 percent of the engineering schools; (4) 50 percent of all Bachelor of Science of Engineering degrees came from 10 percent, or 34, of the engineering schools; and (5) at 42 of the nation's engineering institutions, not a single minority student was enrolled in 1997-98, and at 46 institutions, not a single minority engineer graduated in 1996-97. (CCM)

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Keeping Score Comparative Performance of Engineering Institutions in Creating Access, 1997-98

By
Ronni Denes
Robert J. Highsmith

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Research Letter

Highlights

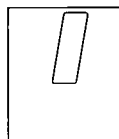
- Minority enrollment in engineering has declined 8.2 percent from its peak of 15,181 in 1992-93, to 13,929 in 1997-98, foreshadowing imminent declines in graduation.
- In the African American community, the enrollment decline has been precipitous, dropping a staggering 17 percent during the past five years. A decrease of this magnitude necessarily has taken a heavy toll on the Historically Black Colleges and Universities – traditionally providers of greatest access – where minority engineering enrollment declined 40.2 percent since 1992.
- Minority enrollment in the nation's engineering schools remains highly skewed, with 50 percent of all African American, Latino and American Indian freshmen enrolled at just 39 institutions, 11 percent of the engineering schools.
- Achievement in graduating minority engineers remains concentrated in a small set of institutions as well, with 50 percent of all BSEs conferred on minority students coming from 10 percent, or 34 engineering schools.
- Although minority students comprise only 15.7 percent of the entering freshman class in engineering, at the 50 institutions with the greatest enrollment of minority freshmen, the average share of class jumps to 26 percent.
- Of the 25 engineering institutions that are top ranked by *U.S. News and World Report*, only 5 exceeded the national average of 15.7 percent minority freshmen and only 7 exceeded the national average of 10 percent minority graduates.
- At 42 of the nation's engineering institutions, 81.0 percent of them accredited by the Accreditation Board for Engineering and Technology (ABET), not a single minority student was enrolled in 1997-98; at 46 institutions, 76.1 percent accredited by ABET, not a single minority engineer graduated in 1996-97.

Keeping Score

Comparative Performance of Engineering Institutions in Creating Access, 1997-98

by Ronni Denes and Robert J. Highsmith

Introduction



In June 1998, NACME and the National Academy of Engineering convened the Summit on the 21st Century Work Force. Structured as a highly interactive

set of problem-solving workshops, this national leadership forum brought together 140 public and private-sector decision makers to create a new action agenda for increasing diversity in engineering.

Charged with reassessing the strategies that create access and promote excellence, Summit participants addressed critical challenges in the current environment: a decade-long decline in the number of engineering graduates, growing dependence on imported talent, a significant drop in minority enrollment, persistently low retention rates, large disparities in k-12 educational opportunities and the nationwide assault on affirmative action.

Although individual working groups focused on the specific and unique problems of precollege access, university retention or workplace mobility, they nonetheless produced several outcomes that cut across all levels of inquiry and all sections of the pipeline. Chief among these was the call for accountability, for a cataloguing of the commitment and impact of employers, policy-makers, educators and advocates. In particular, NACME was called upon to inventory and compare the performance of colleges and universities – key institutions in the production pipeline – and to use the resulting data to establish benchmarks,

publicize extraordinary achievement, and call attention to serious negligence.

This NACME Research Letter, then, which offers a snapshot of enrollment and graduation of African Americans, Latinos and American Indians in the nation's engineering institutions, becomes the baseline for a series that will examine institutional productivity over time and will include analyses of retention and effective university policy in addition to ongoing access. After all, to paraphrase the legendary coach Vince Lombardi, if you aren't keeping score, you aren't really playing the game.

Enrollment and Graduation

Freshman enrollment, the gateway through which minorities enter the engineering profession, is considerably smaller today than it was five years ago. From a peak enrollment of 15,181 African American, Latino and American Indian freshmen in 1992-93, minority freshman enrollment declined 8.2 percent, dropping to 13,929 in 1997-98. As a share of the class, minority students lost ground also, falling from 16.4 percent of all freshmen who enrolled in 1992-93 to 15.7 percent in 1997-98.

As an advance indicator of graduation rates, enrollment declines foreshadow declines from the record number of minority engineering graduates in 1996-97, when underrepresented minorities constituted one of every ten new engineers. The eventual

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Tables

The tables in this report rank engineering institutions by their performance in enrolling minority students and graduating minority engineers. The information arrayed in the tables was provided by colleges and universities reporting to the Engineering Workforce Commission¹, which collects data on minorities and women under a grant from NACME. Two appendices list institutions alphabetically to permit easy identification of their relative rankings.

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impact of these declines on the number of graduates will be attenuated, in part, by the fact that the graduation rate for minorities who enroll in engineering is 35 percent.² That notwithstanding, next year the number of new minority engineers can be expected to *decline* for the first time in a decade (see Figure 1),³ reflecting the sizeable falloff in enrollment that began in 1993-94. Although ten percent remains far short of the share of graduates one would expect from a minority population that constitutes 29.7 percent of all college-aged students, the record graduating class of 6,422 that yielded this year's ten percent level will not be repeated given the erosion of minority enrollment in engineering.

Compounding and contributing to the decline in minority freshman enrollment is the fact that the set of institutions participating in developing the minority talent pool remains extremely small. Only a fraction of all engineering institutions has demonstrated achievement in enrolling minority engineering students and graduating minority engineers; the majority of the nation's engi-

Table I

50 Institutions Enrolling the Greatest Number of Minority Freshmen in Engineering, 1997-98

Institution	Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Southern University+	1	336	343	98.0	329	0	7
U Texas - El Paso++	2	333	472	70.6	7	326	0
Michigan State University	3	271	1323	20.5	230	32	9
City College of New York	4	269	455	59.1	109	160	0
Tennessee State University+	5	266	279	95.3	266	0	0
North Carolina A&T State University+	6	264	288	91.7	264	0	0
Texas A&M University	7	232	1734	13.4	54	170	8
Florida A&M University/Florida State University+	8	229	458	50.0	209	19	1
Morgan State University+	9	222	236	94.1	222	0	0
North Carolina State University - Raleigh	10	199	1273	15.6	160	29	10
U Michigan - Ann Arbor	11	192	944	20.3	120	67	5
U Oklahoma	12	189	596	31.7	101	48	40
Cal Poly-San Luis Obispo	13	183	1088	16.8	22	144	17
U Texas - Austin	14	181	1048	17.3	26	150	5
California State University - Northridge	15	180	416	43.3	53	125	2
Cal Poly - Pomona	16	173	647	26.7	22	149	2
New Mexico State University	17	170	352	48.3	4	152	14
U Florida	18	169	896	18.9	71	94	4
U Texas - Pan American++	19	168	211	79.6	0	167	1
Georgia Institute of Technology	20	157	1506	10.4	122	34	1
Tuskegee University+	21	152	154	98.7	151	1	0
California State University - Long Beach	22	148	377	39.3	47	100	1
Polytechnic University	23	143	607	23.6	67	70	6
U Illinois - Urbana Champaign	24	142	1226	11.6	67	71	4
Howard University+	25	141	181	77.9	141	0	0
U Maryland - College Park	26	140	670	20.9	104	35	1
Florida International University++	27	139	211	65.9	24	115	0
Ohio State University	28	134	1247	10.7	115	15	4
Mississippi State University	29	132	550	24.0	126	2	4
Prairie View A&M University+	30	130	136	95.6	130	0	0
U Southern California	31	128	559	22.9	28	91	9
California State University - Los Angeles++	31	128	174	73.6	9	118	1
U New Mexico++	33	127	296	42.9	12	92	23
Rutgers University	33	127	639	19.9	71	55	1
New Jersey Institute of Technology	35	126	471	26.8	64	61	1
U Arizona	36	122	561	21.7	11	94	17
U Alabama	37	120	536	22.4	117	2	1
Texas A&M University - Kingsville++	38	119	165	72.1	8	108	3
Louisiana State University	39	118	805	14.7	95	20	3
U Texas - San Antonio++	40	116	193	60.1	8	108	0
Arizona State University	40	116	493	23.5	16	70	30
Pennsylvania State University	42	112	2334	4.8	62	48	2
U South Carolina	43	111	362	30.7	102	9	0
U Miami	44	108	250	43.2	47	59	2
U Illinois - Chicago	45	107	414	25.8	33	72	2
Auburn University	46	105	993	10.6	91	6	8
U California - San Diego	47	100	651	15.4	19	76	5
San Jose State University	48	97	543	17.9	40	55	2
U New Orleans	49	92	261	35.2	57	20	15
California State University - Sacramento	50	89	342	26.0	33	50	6
Totals		8,052	30,966		4,286	3,489	277
Averages		161	619	26.0	86	70	6
++HBCUs							
++HACUs							

Figure 1
Minority Engineering Graduates
Projected Decline, National

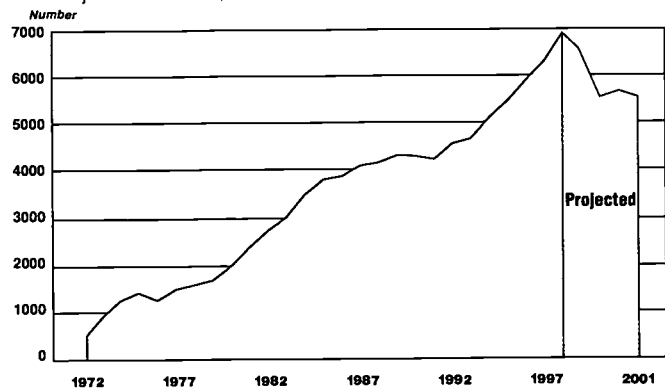
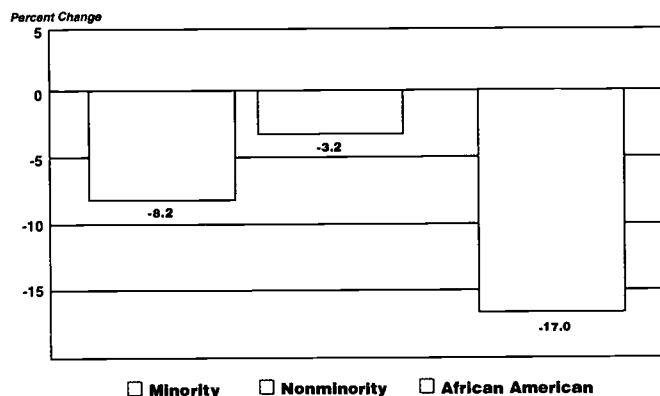


Figure 2
Decline in Freshman Engineering Enrollment
1992-93 vs. 1997-98



neering schools is paying far less attention to the imperative of demographics or the benefits of diversity. Fifty percent of all minority engineering freshmen enroll in just 39 colleges and universities, 11 percent of all institutions. Fifty percent of all minority graduates receive their BSE degrees from 34 institutions, only 10 percent of all engineering institutions. It is noteworthy that 42 institutions – 81 percent of them accredited by the Accreditation Board for Engineering and Technology (ABET) – did not enroll any minority freshman engineering students in 1997-98; 46 colleges and universities, about half of them the same institutions – 76.1 percent of them accredited by ABET – did not graduate a single minority engineer in 1996-97.

The prospects facing African Americans are particularly disturbing. Enrollment of African American freshmen in engineering has declined precipitously, dropping a staggering 17 percent from the high of 8,924 students in 1992-93, a decrease of more than 1,500 entering freshmen. Among all minority population groups, African Americans also sustained the only losses from 1996-97 to 1997-98, declining 1.1 percent, from 7,482 to 7,403 students.

50 Institutions Enrolling the Greatest Number of Minority Freshmen in Engineering, 1997-98 (see Table I)

Although nationwide, minority freshmen comprise 15.7 percent of the incoming engineering class, they are 26 percent of

the entering engineering class, on average, at the 50 institutions enrolling the greatest number of minority freshmen. As might be expected, among the 50 institutions, the Historically Black Colleges and Universities (HBCUs) and the members of Hispanic Association of Colleges and Universities (HACUs) play especially important roles in providing minority students with access to engineering.

- Forty-seven of the top 50 institutions enroll at least 100 underrepresented minorities in the freshman class;
- Eight of the 13 Historically Black Colleges and Universities (HBCUs) with accredited engineering programs are among the top 50 institutions enrolling minority freshmen in engineering.

HBCUs Among Top 50, Enrollment

Institution	Number	Rank
Southern University	336	1
Tennessee State University	266	5
North Carolina A&T State University	264	6
Florida A&M/Florida State University	229	8
Morgan State University	222	9
Tuskegee University	152	21
Howard University	141	25
Prairie View A&M University	130	30

- Seven of the ten members of the Hispanic Association of Colleges and Universities (HACUs) with accredited engineering programs are among the top 50 institutions enrolling minority freshmen in engineering.

HACUs Among Top 50, Enrollment

Institution	Number	Rank
University of Texas, El Paso	333	2
University of Texas, Pan American	168	19
Florida International University	139	27
California State University at Los Angeles	128	31
University of New Mexico	127	33
Texas A&M University, Kingsville	119	38
University of Texas, San Antonio	116	40

- Even among the top 50 institutions, 9 enrolled fewer than the national average of 15.7 percent minority students in the freshman class, and one institution in the 50, Penn State University, enrolled fewer than 5 percent.

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997 (see Table II)

Enrollment of minority freshmen in engineering dropped substantially (8.2 percent) from the peak year of 1992-93, due to decreases in African American enrollment totaling 17.0 percent (see Figure 2). It's important to note, however, that had this analysis been done just one year ago, Latino enrollment, which has been relatively flat during the full six-year study period, would have shown losses of 2.9 percent, which continue to impact distribution. Not surprisingly, for both African Americans and Latinos, losses were concentrated among engineering institutions enrolling the largest numbers of, and providing the greatest access to, minorities.

Table II

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997

Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)	Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)
Alabama A&M University+	29	17	-12	-41.4	Gonzaga University	8	0	-8	*
Alfred University/SUNY: Ceramics	10	4	-6	-60.0	Grand Valley State University	7	18	11	157.1
Arizona State University	54	116	62	114.8	Grove City College	0	0	0	0.0
Arkansas State University	0	0	0	0.0	Hampton University+	173	81	-92	-53.2
Arkansas Tech University	4	3	-1	-25.0	Harvard University**	0	0	0	0.0
Auburn University	120	105	-15	-12.5	Harvey Mudd College	8	5	-3	-37.5
Baylor University	8	14	6	75.0	Henry Cogswell College	0	0	0	0.0
Boston University	46	23	-23	-50.0	Hofstra University	5	24	19	380.0
Bradley University	5	3	-2	-40.0	Howard University+	189	141	-48	-25.4
Brigham Young University	15	28	13	86.7	Humboldt State University	9	2	-7	-77.8
Brown University	27	23	-4	-14.8	Idaho State University	3	5	2	66.7
Bucknell University	6	8	2	33.3	Illinois Institute of Technology	88	35	-53	-60.2
California Institute of Technology***	0	0	0	0.0	Indiana Institute of Technology	11	10	-1	-9.1
California Maritime Academy	7	3	-4	-57.1	Indiana University/Purdue University - Ft Wayne	8	5	-3	-37.5
Cal Poly - Pomona	85	173	88	103.5	Indiana University/Purdue University - Indianapolis	3	1	-2	-66.7
Cal Poly - San Luis Obispo	192	183	-9	-4.7	Institute of Paper Science & Technology	0	0	0	0.0
California State University - Chico	36	27	-9	-25.0	Iowa State University	59	48	-11	-18.6
California State University - Fresno	48	85	37	77.1	John Brown University	0	0	0	0.0
California State University - Fullerton	43	56	13	30.2	Johns Hopkins University	19	23	4	21.1
California State University - Long Beach	139	148	9	6.5	Kansas State University	29	47	18	62.1
California State University - Los Angeles++	109	128	19	17.4	Lafayette College	5	14	9	180.0
California State University - Northridge	142	180	38	26.8	Lamar University	52	38	-14	-26.9
California State University - Sacramento	103	89	-14	-13.6	Lawrence Technological University	46	26	-20	-43.5
Calvin College	0	0	0	0.0	Le Tourneau University	3	2	-1	-33.3
Capitol College++		17	17	*	Lehigh University	11	13	2	18.2
Carnegie Mellon University	41	44	3	7.3	Loras College	0	2	2	*
Case Western Reserve University	1	3	2	200.0	Louisiana State University	131	118	-13	-9.9
Catholic University of America	5	9	4	80.0	Louisiana Technical University	64	48	-16	-25.0
CCNY - City College of New York	335	269	-66	-19.7	Loyola College	1	2	1	100.0
Cedarville College++		2	2	*	Loyola Marymount University	22	28	6	27.3
Central State University+	28	15	-13	-46.4	Maine Maritime Academy	0	0	0	0.0
Christian Brothers University	7	18	11	157.1	Manhattan College	23	24	1	4.3
Citadel	8	7	-1	-12.5	Mankato State University	2	0	-2	*
Clarkson University	21	11	-10	-47.6	Marietta College	0	3	3	*
Clemson University	122	88	-34	-27.9	Marquette University	26	13	-13	-50.0
Cleveland State University	13	17	4	30.8	Massachusetts Institute of Technology***	0	0	0	0.0
Cogswell College	0	0	0	0.0	Massachusetts Maritime Academy	4	2	-2	-50.0
College of New Jersey**		10	10	*	McNeese State University	16	21	5	31.3
College of Staten Island	14	7	-7	-50.0	Mercer University	26	22	-4	-15.4
Colorado School of Mines	59	75	16	27.1	Merrimack College	1	0	-1	*
Colorado State University	32	18	-14	-43.8	Messiah College	0	1	1	*
Colorado Technical University**		9	9	*	Miami University	6	12	6	100.0
Columbia University	23	25	2	8.7	Michigan State University	227	271	44	19.4
Cooper Union	19	11	-8	-42.1	Michigan Technology University	34	33	-1	-2.9
Cornell University	52	46	-6	-11.5	Milwaukee School of Engineering	31	27	-4	-12.9
Dartmouth College	12	17	5	41.7	Mississippi State University	110	132	22	20.0
Dordt College	0	0	0	0.0	Monmouth University	1	0	-1	*
Drexel University	77	88	11	14.3	Montana State University	14	11	-3	-21.4
Duke University	30	14	-16	-53.3	Montana Tech of the University of Montana	10	5	-5	-50.0
Embry Riddle Aeronautical University	15	67	52	346.7	Morgan State University+	258	222	-36	-14.0
Embry Riddle University - Prescott	7	10	3	42.9	National Technical University	0	0	0	0.0
Fairfield University	2	2	0	0.0	New Jersey Institute of Technology	203	126	-77	-37.9
Fairleigh Dickinson University	9	4	-5	-55.6	New Mexico Highlands University++	43	22	-21	-48.8
Florida A&M University/Florida State University++	332	229	-103	-31.0	New Mexico Institute of Mining & Technology	44	32	-12	-27.3
Ferris State University	0	0	0	0.0	New Mexico State University++	233	170	-63	-27.0
Florida Atlantic University	41	64	23	56.1	New York Institute of Technology	14	36	22	157.1
Florida Institute of Technology	22	23	1	4.5	Norfolk State University+	41	15	-26	-63.4
Florida International University++	43	139	96	223.3	North Carolina A&T State University+	454	264	-190	-41.9
Gannon University	0	1	1	*	North Carolina State University - Raleigh	172	199	27	15.7
Geneva College	1	6	5	500.0	North Dakota State University	2	6	4	200.0
George Mason University	34	50	16	47.1	Northeastern State University	2	1	-1	-50.0
George Washington University	26	26	0	0.0	Northeastern University	23	35	12	52.2
Georgia Institute of Technology	194	157	-37	-19.1	Northern Arizona University	97	64	-33	-34.0
Engineering & Management Institute	35	50	15	42.9					

Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)	Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)
Northern Illinois University	48	59	11	22.9	Tufts University	3	6	3	100.0
Northwestern University	34	40	6	17.6	Tulane University	24	14	-10	-41.7
Norwich University	8	1	-7	-87.5	Tuskegee University+	279	152	-127	-45.5
Oakland University	34	40	6	17.6	U Akron	64	31	-33	-51.6
Ohio Northern University	4	3	-1	-25.0	U Akron - Polymer Science	0	0	0	0.0
Ohio State University	155	134	-21	-13.5	U Alabama	118	120	2	1.7
Ohio University	31	14	-17	-54.8	U Alabama - Birmingham	35	37	2	5.7
Oklahoma Christian University	3	5	2	66.7	U Alabama - Huntsville	31	42	11	35.5
Oklahoma State University	61	45	-16	-26.2	U Alaska - Anchorage	4	2	-2	-50.0
Old Dominion University	42	31	-11	-26.2	U Alaska - Fairbanks	11	7	-4	-36.4
Oral Roberts University	0	0	0	0.0	U Arizona	133	122	-11	-8.3
Oregon State University	0	0	0	0.0	U Arkansas	52	53	1	1.9
Pacific Lutheran University	0	0	0	0.0	U Bridgeport	2	4	2	100.0
Parks College - St Louis University	10	13	3	30.0	U California - Berkeley	53	64	11	20.8
Pennsylvania State University	83	112	29	34.9	U California - Davis	80	74	-6	-7.5
Philadelphia College of Textiles	1	0	-1	*	U California - Irvine	33	48	15	45.5
Polytechnic University	112	143	31	27.7	U California - Los Angeles	78	67	-11	-14.1
Portland State University	6	13	7	116.7	U California - Riverside	9	18	9	100.0
Prairie View A&M University+	474	130	-344	-72.6	U California - San Diego	93	100	7	7.5
Princeton University	29	0	-29	*	U California - Santa Barbara	31	43	12	38.7
Purdue University - Calumet	10	19	9	90.0	U California - Santa Cruz	17	25	8	47.1
Purdue University	121	81	-40	-33.1	U Central Florida	81	85	4	4.9
Rensselaer Polytechnic University	109	79	-30	-27.5	U Cincinnati	32	28	-4	-12.5
Rice University	57	42	-15	-26.3	U Colorado - Boulder	53	60	7	13.2
Rochester Institute of Technology	30	35	5	16.7	U Colorado - Colorado Springs	4	16	12	300.0
Rose - Hulman Institute of Technology	8	7	-1	-12.5	U Colorado - Denver	7	8	1	14.3
Rutgers University	112	127	15	13.4	U Connecticut	28	18	-10	-35.7
Saginaw Valley State University	5	14	9	180.0	U Dayton	17	28	11	64.7
San Diego State University	71	78	7	9.9	U Delaware	33	44	11	33.3
San Francisco State University	15	10	-5	-33.3	U Denver	3	3	0	0.0
San Jose State University	52	97	45	86.5	U Detroit Mercy	9	34	25	277.8
Santa Clara University	43	32	-11	-25.6	U District of Columbia+	91	29	-62	-68.1
South Dakota School of Mines & Technology	13	14	1	7.7	U Evansville	2	6	4	200.0
South Dakota State University	4	2	-2	-50.0	U Florida	0	169	169	*
Seattle Pacific University	0	2	2	*	U Georgia	4	3	-1	-25.0
Seattle University	6	7	1	16.7	U Hartford	9	12	3	33.3
Southern Illinois University - Carbondale	47	46	-1	-2.1	U Hawaii	0	10	10	*
Southern Illinois University - Edwardsville	1	2	1	100.0	U Houston	114	86	-28	-24.6
Southern Methodist University	49	30	-19	-38.8	U Idaho	11	5	-6	-54.5
Southern University+	573	336	-237	-41.4	U Illinois - Chicago	106	107	1	0.9
St Ambrose University	1	0	-1	*	U Illinois - Urbana Champaign	172	142	-30	-17.4
St Cloud State University	3	2	-1	-33.3	U Iowa	17	14	-3	-17.6
St Martins College	0	0	0	0.0	U Kansas	20	27	7	35.0
St Marys University++	29	29	0	0.0	U Kentucky	24	34	10	41.7
Stanford University	73	51	-22	-30.1	U Louisville	29	31	2	6.9
Stevens Institute of Technology	46	45	-1	-2.2	U Lowell	17	18	1	5.9
SUNY - Binghamton Campus	0	7	7	*	U Maine - Orono	3	7	4	133.3
SUNY - Buffalo Campus	77	85	8	10.4	U Maryland - Baltimore County	42	66	24	57.1
SUNY - Stony Brook Campus	26	16	-10	-38.5	U Maryland - College Park	53	140	87	164.2
SUNY - College at New Paltz	4	6	2	50.0	U Massachusetts - Amherst	31	24	-7	-22.6
SUNY - College of Environmental Science	6	0	-6	*	U Massachusetts - Dartmouth	2	13	11	550.0
SUNY - Maritime College	7	0	-7	*	U Memphis	17	16	-1	-5.9
Swarthmore College	4	5	1	25.0	U Miami	70	108	38	54.3
Syracuse University	40	24	-16	-40.0	U Michigan - Ann Arbor	210	192	-18	-8.6
Temple University	4	40	36	900.0	U Michigan - Dearborn	11	18	7	63.6
Tennessee State University+	249	266	17	6.8	U Minnesota	27	34	7	25.9
Tennessee Technical University	30	21	-9	-30.0	U Minnesota - Duluth	1	4	3	300.0
Texas A&M University - Galveston	8	0	-8	*	U Mississippi	24	37	13	54.2
Texas A&M University	362	232	-130	-35.9	U Missouri - Columbia & Kansas City	26	43	17	65.4
Texas A&M University - Kingsville++	205	119	-86	-42.0	U Missouri - Rolla	52	24	-28	-53.8
Texas Tech University	104	76	-28	-26.9	U Nebraska - Lincoln	6	13	7	116.7
Trinity College	4	0	-4	*	U Nevada - Las Vegas	37	38	1	2.7
Trinity University	1	0	-1	*	U Nevada - Reno	9	41	32	355.6
University	3	4	1	33.3	U Nevada - School of Mines	1	3	2	200.0

Table II

Change in Enrollment of Minority Freshmen in Engineering, 1992-1997

Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)	Institution	Minority Freshmen 1992-93 (N)	Minority Freshmen 1997-1998 (N)	Change 1992-93 to 1997-98 (N)	Change 1992-93 to 1997-98 (%)
U New Hampshire	0	1	1	*	U Wisconsin – Madison	40	39	-1	-2.5
U New Haven	11	12	1	9.1	U Wisconsin – Milwaukee	16	24	8	50.0
U New Mexico++	138	127	-11	-8.0	U Wisconsin – Platteville	13	9	-4	-30.8
U New Orleans	79	92	13	16.5	U Wyoming	12	19	7	58.3
U North Carolina – Chapel Hill	0	0	0	0.0	Union College	3	6	3	100.0
U North Carolina – Charlotte	11	13	2	18.2	US Air Force Academy	2	3	1	50.0
U North Dakota	0	0	0	0.0	US Coast Guard Academy	11	15	4	36.4
U North Florida**	0	0	0	0.0	US Merchant Marine Academy	4	7	3	75.0
U Notre Dame	54	0	-54	*	US Military Academy	0	0	0	0.0
U Oklahoma	214	189	-25	-11.7	US Naval Academy	177	0	-177	*
U Pacific	10	11	1	10.0	Utah State University	7	4	-3	-42.9
U Pennsylvania	30	31	1	3.3	Valparaiso University	3	4	1	33.3
U Pittsburgh	37	32	-5	-13.5	Vanderbilt University	33	28	-5	-15.2
U Portland	4	2	-2	-50.0	Villanova University	14	11	-3	-21.4
U Rhode Island	15	27	12	80.0	Virginia Military Institute	7	15	8	114.3
U Rochester	22	9	-13	-59.1	Virginia Polytechnic Institute	78	57	-21	-26.9
U San Diego**	0	6	6	*	Walla Walla College	7	5	-2	-28.6
U Scranton	0	0	0	0.0	Washington State University	31	30	-1	-3.2
U South Alabama	36	36	0	0.0	Washington University	9	17	8	88.9
U South Carolina	115	111	-4	-3.5	Washington & Lee University	2	1	-1	-50.0
U South Florida	33	72	39	118.2	Wayne State University	85	65	-20	-23.5
U Southern California	108	128	20	18.5	Webb Institute	1	0	-1	*
U Southern Colorado	18	14	-4	-22.2	Wentworth Institute of Technology	0	4	4	8.0
U Southern Maine	0	0	0	0.0	West Virginia Institute of Technology	3	8	5	166.7
U Southwestern Louisiana	76	77	1	1.3	West Virginia University	17	20	3	17.6
U St Thomas	0	0	0	0.0	Western Michigan University	36	41	5	13.9
U Tennessee – Chattanooga	0	15	15	*	Western New England College	8	2	-6	-75.0
U Tennessee – Knoxville	80	71	-9	-11.3	Wichita State University	13	8	-5	-38.5
U Texas – Arlington	17	66	49	288.2	Widener University	0	6	6	*
U Texas – Austin	322	181	-141	-43.8	Wilkes University	3	1	-2	-66.7
U Texas – Dallas	7	18	11	157.1	Winona State University**	0	1	1	*
U Texas – El Paso++	437	333	-104	-23.8	Worcester Polytechnic Institute	12	15	3	25.0
U Texas – Pan American++	0	168	168	*	Wright State University	48	67	19	39.6
U Texas – San Antonio++	82	116	34	41.5	Yale University	4	0	-4	*
U Toledo	35	23	-12	-34.3	Youngstown State University	1	0	-1	*
U Tulsa	13	17	4	30.8					
U Utah	15	9	-6	-40.0					
U Vermont	3	7	4	133.3					
U Virginia	47	36	-11	-23.4					
U Washington	51	40	-11	-21.6					
U West Florida	0	0	0	0.0					
					National	15,181	13,929	-1,252	-8.2

*Insufficient data to compute percent change

**Institution did not report for one of the years being compared

***Freshman do not declare major

+HBCU

++HACU

- Five HBCUs were among the 8 engineering programs, primarily in Texas and Florida, which lost in excess of 100 minority freshman engineering students.⁴

Losses > 100 Minority Freshmen

Institution	Number
Prairie View A&M University*	-344
Southern University*	-237
North Carolina A&T State University*	-190
University of Texas, Austin	-141
Texas A&M University	-130
Tuskegee University*	-127
University of Texas, El Paso**	-104
Florida A&M/Florida State University*	-103

- Only 3 universities increased their enrollments by 85 or more students.

Gains > 85 Minority Freshmen

Institution	Number
Florida International University**	+96
Cal Poly Pomona	+88
University of Maryland, College Park	+87

- American Indian freshman enrollment, which grew 5.5 percent between 1992 and 1997, remains extremely small in number with only 668 incoming students in 1997-98.

50 Institutions Graduating the Greatest Number of Minority Engineers, 1996-97 (see Table III)

Sixty-two percent of all minority engineers graduate from the 50 colleges and universities that produce the largest number of minority graduates, only 15 percent of the institutions; 26 of these institutions also graduate the largest number of nonminority engineers. Thirty-five of the institutions that graduate the largest number of minority engineers are also among the 50 institutions that enroll the largest number.

- The 50 institutions that graduate the greatest number of minority engineers graduated the majority of African Amer-

icans (59.6 percent) and Latinos (65.8 percent), but only 40.8 percent of American Indians.

- Fourteen of the 50 institutions graduating the largest numbers of minority engineers are HBCUs or HACUs, producing an average of 130 and 77 graduates, respectively.
- North Carolina A&T State University, the highest producing institution with 256 minority graduates, surpassed its nearest competitor by more than 60 engineers.
- Of the 50 institutions, 13 had graduating classes with less than the national average of 10 percent minority representation.

Top 50 Producers, < 10 Percent Minority Graduates

Institution	Percent
U California, Davis	9
U California, Los Angeles	9
U California, San Diego	9
U Michigan, Ann Arbor	9
North Carolina State University, Raleigh	8
Clemson University	8
Purdue University	8
Auburn University	7
Cornell University	6
U California, Berkeley	6
U Illinois, Urbana Champaign	6
U Washington	6
Virginia Polytechnic Institute	5

Top 25 Engineering Institutions Ranked by Minority Freshman Enrollment, 1997-98 (see Table IVa).

Although minorities constitute 29.7 percent of all college-students, and 15.7 percent of freshman engineering enrollment at all institutions, the 25 top rated institutions identified by *U.S. News and World Report*⁵ enrolled on average only 10.9 percent of these students in their freshman engineering programs.

- Underrepresented minorities constituted at least 20 percent of the freshman engineering class enrolled at three of the top institutions.

Top 25, ≥ 20 Percent Minority Freshmen

Institution	Percent
University of Southern California	23
University of Maryland, College Park	21
University of Michigan, Ann Arbor	20

- African Americans constituted the largest share of the minorities entering the Universities of Maryland and Michigan and Latinos the largest share at the University of Southern California.
- Underrepresented minorities constituted five percent or less of the enrolling freshman engineering class at four top rated institutions.

Top 25, ≤ 5 Percent Minority Freshmen

Institution	Percent
University of Wisconsin, Madison	4.6
Penn State University	4.8
Purdue University	4.9
University of Minnesota	5.0

- Nine top institutions enrolled at least 100 minority students in their freshman engineering programs.

Top 25, >100 Minority Freshmen

Institution	Number	Percent
Texas A&M University	232	13
University of Michigan, Ann Arbor	192	21
University of Texas, Austin	181	17
Georgia Institute of Technology	157	10
University of Illinois, Urbana - Champaign	142	12
University of Maryland, College Park	140	21
Ohio State University	134	11
University of Southern California	128	23
Penn State University	112	5

- Among the minority freshmen in the top 25 institutions, 45.2 percent were African American, 51.0 percent were Latino and 3.8 percent were American Indian.

Top 25 Engineering Institutions Ranked by Number of Minority Graduates, 1996-97 (see Table IVb).

The top 25 engineering institutions identified by *U.S. News and World Report* included on average only 8.6 percent minorities among their graduates, compared with 10 percent minority graduates produced on average by all institutions.

- Among the top 25 colleges and universities, 8 are among the largest

producers of minority engineering graduates.

- Stanford University had the greatest minority representation in its 1996-97 graduating class at 21 percent.
- Georgia Institute of Technology graduated more minority engineers in 1997 than any other top ranked institution in absolute numbers (194).
- Three additional institutions among the top group also graduated more than 100 minority engineers.

Top 25, > 100 Minority Graduates

Institution	Number	Percent
Georgia Institute of Technology	194	16
Texas A&M University	118	11
University of Texas, Austin	118	15
Massachusetts Institute of Technology	101	16

- Although the average number of minority graduates from the top ranked institutions was 52, seven institutions graduated 15 or fewer minority engineers, far short of the average.

Top 25, ≤ 15 Minority Graduates

Institution	Number	Percent
Carnegie Mellon University	15	5
University of Minnesota	15	3
University of California, Santa Barbara	12	6
Harvard University	8	7
University of Wisconsin, Madison	8	1
California Institute of Technology	7	6
Johns Hopkins University	7	3

Institutions Graduating the Most African American, Latino and American Indian Engineers, 1996-97 (see Tables V-VII)

Of the institutions that produced the largest number of graduates from the individual underrepresented communities, two were among the institutions producing the largest number of graduates from all three minority groups and seven others were among the institutions producing the largest number of minority graduates from two underrepresented minority groups.

- Purdue University and the Massachusetts Institute of Technology were the only schools to be among the institutions producing the largest number of African American, Latino and American Indian engineers.

Table III
**50 Institutions Graduating the Greatest
 Number of Minority Engineers, 1996-97**

Institution	Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
North Carolina A&T State University*+	1	256	298	85.9	256	0	0
Georgia Institute of Technology*	2	194	1230	15.8	149	42	3
Prairie View A&M University*+	3	165	185	89.2	163	2	0
Florida International University*++	4	155	274	56.6	14	141	0
Tuskegee University*+	5	131	135	97.0	130	1	0
Texas A&M University*	6	118	1118	10.6	27	90	1
U Texas - Austin*	6	118	806	14.6	28	88	2
Cal Poly - San Luis Obispo*	8	117	666	17.6	6	109	2
Florida A&M University/Florida State University*+	9	115	254	45.3	98	17	0
U Texas - El Paso*++	10	106	178	59.6	0	105	1
CCNY - City College of New York*	11	103	256	40.2	68	35	0
Massachusetts Institute of Technology	12	101	622	16.2	38	58	5
Purdue University	13	96	1273	7.5	45	45	6
U Florida*	14	93	713	13.0	27	64	2
Southern University*+	15	92	98	93.9	92	0	0
U Michigan - Ann Arbor*	16	91	964	9.4	52	37	2
Howard University*+	17	86	90	95.6	86	0	0
New Mexico State University*++	18	79	232	34.1	3	70	6
New Jersey Institute of Technology*	19	77	372	20.7	28	49	0
Cal Poly - Pomona*	20	75	447	16.8	10	63	2
California State University - Long Beach*	20	75	369	20.4	24	49	2
North Carolina State University - Raleigh*	20	75	1000	7.5	57	12	6
U Illinois - Urbana Champaign*	23	70	1163	6.0	28	41	1
Morgan State University*+	24	66	73	90.4	66	0	0
Stanford University	25	63	298	21.1	24	35	4
Texas A&M University - Kingsville*++	25	63	113	56.8	0	63	0
U South Florida	27	58	363	16.0	24	34	0
Rensselaer Polytechnic Institute	28	57	583	9.8	26	29	2
U Southern California*	29	56	334	16.8	19	37	0
U New Mexico*++	29	56	191	29.3	2	48	6
U Maryland - College Park*	31	54	535	10.1	38	15	1
U California - Berkeley	32	50	841	5.9	12	37	1
Polytechnic University*	33	49	267	18.4	28	21	0
U Arizona*	34	48	441	10.9	2	41	5
San Jose State University*	34	48	448	10.8	13	34	1
U Central Florida	36	47	332	14.2	9	36	2
U Oklahoma*	37	46	445	10.3	23	10	13
Cornell University	38	45	764	5.9	17	27	1
U Texas - Pan American*++	38	45	54	83.3	0	44	1
Clemson University	40	44	527	8.3	41	3	0
U Washington	41	43	676	6.4	18	17	8
Arizona State University*	42	42	376	11.2	6	32	4
U Houston	43	41	242	16.9	6	34	1
San Diego State University	44	40	216	18.5	6	33	1
U California - Los Angeles	44	40	445	9.0	4	35	1
Auburn University*	46	39	579	6.7	31	4	4
California State University - Sacramento*	47	39	277	14.1	5	29	5
U California - San Diego*	47	39	417	9.4	7	30	2
U Illinois - Chicago*	47	39	314	12.4	19	20	0
U California - Davis	50	38	439	8.7	7	28	3
U Texas - San Antonio*++	50	38	115	33.0	5	33	0
Virginia Polytechnic Institute	50	38	819	4.6	21	16	1
Totals		3,959	24,267		1,908	1,943	108
Averages		76	467	16.3	37	37	2

*Institution was one of the top 50 both in enrolling minority freshmen in engineering and graduating minority engineers.
 +HBCU

- The top institutions graduating African American and Latino engineers were: Georgia Institute of Technology, University of Illinois, Urbana-Champaign and University of Michigan, Ann Arbor.
- The top institutions graduating Latino and American Indian engineers were: New Mexico State University, University of Arizona and University of New Mexico.
- The top institution graduating African American and American Indian engineers was North Carolina State University, Raleigh.
- Nine of the top 20 institutions graduating African American engineers are HBCUs.
- Seven of the top 20 institutions that graduate Latino engineers are HACUs.

Conclusions

It is ironic that, at the same time as the nation's leading industries aggressively advocate for a significant rise in the visa ceiling for skilled engineering professionals, our engineering institutions are largely failing to tap the talent of groups that are almost one-third of the college-age population. With African Americans, Latinos and American Indians comprising only 10 percent of the engineering graduates, production remains concentrated in just 10 percent of the engineering institutions. Even more ominous, minority enrollments - decreasing since 1992-93 - foreshadow imminent declines in graduations, even at colleges and universities well noted for providing access.

Despite the gloomy overall picture, however, success in enrollment, retention and graduation of minority students in engineering is being achieved by all types of institutions in all parts of the country, and success stories exist at top research institutions, at large public institutions and small private ones, at institutions that serve primarily minority populations and those that are predominantly white. If their achievements are to be replicated on a broad scale, a much more extensive set of institutions will have to mobilize the leadership and resources to examine best practices and emulate key determinants of success. This means developing an understanding

Table IVa
Top 25 Engineering Institutions*
Ranked by Minority Freshman Enrollment, 1997-98

Institution	U.S. News Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Texas A&M University	21	232	1734	13.4	54	170	8
U Michigan - Ann Arbor	4	192	944	20.3	120	67	5
U Texas - Austin	11	181	1048	17.3	26	150	5
Georgia Institute of Technology	4	157	1506	10.4	122	34	1
U Illinois - Urbana Champaign	4	142	1226	11.6	67	71	4
U Maryland - College Park	13	140	670	20.9	104	35	1
Ohio State University	25	134	1247	10.7	115	15	4
U Southern California	16	128	559	22.9	28	91	9
Pennsylvania State University	18	112	2334	4.8	62	48	2
U California - San Diego	21	100	651	15.4	19	76	5
Purdue University	8	81	1656	4.9	38	33	10
U California - Los Angeles	16	67	550	12.2	20	44	3
U California - Berkeley	2	64	713	9.0	17	44	3
Stanford University	2	51	298	17.1	21	29	1
Cornell University	8	46	735	6.3	16	25	5
Carnegie Mellon University	4	44	361	12.2	17	25	2
U California - Santa Barbara	24	43	417	10.3	4	37	2
Northwestern University	13	40	350	11.4	26	12	2
U Wisconsin - Madison	12	39	843	4.6	19	16	4
U Minnesota	18	34	681	5.0	15	18	1
Johns Hopkins University	21	23	310	7.4	17	6	0
California Institute of Technology**	8						
Harvard University**	25						
MIT**	1						
Princeton University**	13						
Totals		2,050	18,833	10.9	927	1,046	77
Averages		98	897	10.9	44	50	4

*Institutions identified by U.S. News and World Report, "America's Best Graduate Schools," 1998

**Freshmen do not declare major

Table IVb
Top 25 Engineering Institutions*
Ranked by Number of Minority Graduates, 1996-97

Institution	U.S. News Rank	Total Minority (N)	Total (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Georgia Institute of Technology	4	194	1230	15.8	149	42	3
Texas A&M University	21	118	1118	10.6	27	90	1
U Texas - Austin	11	118	806	14.6	28	88	2
MIT	1	101	622	16.2	38	58	5
Purdue University	8	96	1273	7.5	45	45	6
U Michigan - Ann Arbor	4	91	964	9.4	52	37	2
U Illinois - Urbana Champaign	4	70	1163	6.0	28	41	1
Stanford University	2	63	298	21.1	24	35	4
U Southern California	16	56	334	16.8	19	37	0
U Maryland - College Park	13	54	535	10.1	38	15	1
U California - Berkeley	2	50	841	5.9	12	37	1
Cornell University	8	45	764	5.9	17	27	1
U California - Los Angeles	16	40	445	9.0	4	35	1
U California - San Diego	21	39	417	9.4	7	30	2
Pennsylvania State University	18	30	1157	2.3	9	21	0
Ohio State University	25	28	697	4.0	21	6	1
Princeton University	13	24	185	13.0	17	5	2
Northwestern University	13	20	317	6.3	12	8	0
Carnegie Mellon University	4	15	279	5.4	9	6	0
U Minnesota	18	15	573	2.6	9	5	1
U California - Santa Barbara	24	12	190	6.3	2	10	0
Harvard University	25	8	114	7.0	5	3	0
U Wisconsin - Madison	12	8	615	1.3	4	3	1
California Institute of Technology	8	7	113	6.2	0	7	0
Johns Hopkins University	21	7	234	3.0	5	2	0
Totals		1,309	15,284		581	693	35
Averages		52	611	8.6	23	28	1

*Institutions identified by U.S. News and World Report, "America's Best Graduate Schools," 1998

of how schools that create access work with the precollege community to build the pool of minority candidates for recruitment. It means learning what policies and expectations can be put in place to impact the number and potential success of incoming freshmen. It means recognizing that institutional commitment, reflected in plans and budget for the sophomore class, enhances the likelihood of minority student retention. And, given the lack of correlation between minority student performance and standardized test scores,⁶ it means appreciating that the most successful institutions are using alternative assessment techniques to deepen the talent pool.

NACME's *Engineering Vanguard Program*, for example, is assisting growing numbers of engineering institutions in addressing several of these issues. *Vanguard*

increases the number of minority students who pursue engineering by providing new kinds of opportunities to demonstrate engineering promise. Working at target high schools in areas that are largely bypassed by traditional college recruiting activities, NACME uses a highly interactive performance-based process to assess content knowledge, mathematics problem-solving behaviors and critical thinking skills. To bridge the gap between the coursework that is available in inner-city schools and the content students are presumed to know on entering an engineering institution, identified students are immersed in rigorous, intensely focused academic workshops during their senior year in high school. By the program's end, students coalesce into high functioning, academic teams with whom they matriculate as a unit in engineer-

ing schools with scholarships covering full tuition and housing. Now in its sixth year, *Vanguard* has not lost a single scholar, and many are earning academic honors. Programs like *Vanguard* provide solid evidence of existing practices that are capable of injecting large numbers of minority freshmen who have a high probability of success into the nation's engineering institutions.

Even as we catalog a set of best practices, however, we must recognize that access is driven by the organizations that set the standard for engineering education. Today's engineers, the high performers that industry and government are seeking to recruit, are not only skilled technically. They are also expected to be top producing team players experienced in working and communicating across racial, ethnic and gender boundaries and able to represent their com-

Table V
Institutions Graduating
the Most African American Engineers, 1996-97

Institution	Rank	African American (N)
North Carolina A&T State University+	1	256
Prairie View A&M University+	2	163
Georgia Institute of Technology	3	149
Tuskegee University+	4	130
Florida A&M University/Florida State University+	5	98
Southern University+	6	92
Howard University+	7	86
CCNY - City College of New York	8	68
Morgan State University+	9	66
North Carolina State University - Raleigh	10	57
U Michigan - Ann Arbor	11	52
Purdue University	12	45
Clemson University	13	41
U Maryland - College Park	14	38
Massachusetts Institute of Technology	14	38
Tennessee State University+	16	37
Auburn University	17	31
U South Carolina	17	31
U Virginia	19	29
U District of Columbia+	20	28
U Illinois - Urbana Champaign	20	28
New Jersey Institute of Technology	20	28
Polytechnic University	20	28
U Texas - Austin	20	28
+HBCU		

Table VI
Institutions Graduating
the Most Latino Engineers, 1996-97

Institution	Rank	Latino (N)
Florida International University++	1	141
Cal Poly - San Luis Obispo	2	109
U Texas - El Paso++	3	105
Texas A&M University	4	90
U Texas - Austin	5	88
New Mexico State University++	6	70
U Florida	7	64
Cal Poly - Pomona	8	63
Texas A&M University - Kingsville++	8	63
Massachusetts Institute of Technology	10	58
California State University - Long Beach	11	49
New Jersey Institute of Technology	11	49
U New Mexico++	13	48
Purdue University	14	45
U Texas - Pan American++	15	44
Georgia Institute of Technology	16	42
U Arizona	17	41
U Illinois - Urbana Champaign	17	41
U California - Berkeley	19	37
U Southern California	19	37
U Michigan - Ann Arbor	19	37
++HACU		

panies in the global workplace. These are skills that cannot be learned in homogeneous institutions. As the Accreditation Board for Engineering and Technology (ABET), and the engineering societies that support it, test and finalize the ABET Engineering 2000 criteria, they must recognize explicitly that engineering students trained in institutions without significant diversity will be unprepared to compete and contribute effectively in today's engineering environment. Diversity on campus is critical to the production of a high-achieving engineering work force - minority and nonminority.

Similarly, organizations like *U.S. News and World Report* that seek to set the national standard in defining world class academic institutions must take into account that colleges and universities ignoring a third of the population cannot continue to be ranked among the nation's best.

Organizations that develop rankings, however, are not alone in their ability to shape institutional policies. The colleges and universities that are among the top ranked aca-

demically are also among the top ranked in dollars received for private and federal research. As significant recipients of taxpayer dollars, these institutions must be held accountable by contracting and grant-making agencies for educating a population reflective of the American people. This can be accomplished by linking their substantial tax-supported funding to achievements in diversifying their graduating classes and tenure-track faculties, and by including clearly defined human resources outcomes among the criteria for evaluating funding proposals.

In the longer term, however, capitalizing on all the nation's human resources, will require a sea change in our legislators' policy stance on national education standards. Right now, only six percent of minority students and 15 percent of all students take mathematics through calculus and science through physics in high school. These are the basic tools needed by high school graduates in the 21st century economy, not only for science and engineering but for landing

a job in a modern factory. In Eastern Europe and the Pacific Rim, our competitor nations which provide rigorous academic training as a matter of course will surely draw jobs away from this country if we cannot field a competitive work force. Absent a greater national commitment to mandate precollege mathematics and science, more and more college and university departments will compete for the limited pool of minority college students with advanced training, at the expense of throughput in the nation's engineering pipeline. Already, we're seeing the impact at the HBCUs, where enrollment overall has remained relatively stable while enrollment in engineering has undergone a structural decline. The issue is one of national economic development and requires policy solutions that embrace the need for a human resources strategy for science and technology in the global market.

Finally, in the current anti-affirmative action climate, policy makers in government as well as in colleges and universities must learn from the experiences of Texas and

California that they will certainly damage the economic viability of their communities and the intellectual vitality of their educational institutions if they do not assure ongoing access in the face of current challenges. This means meticulously reviewing all existing programs to ensure that they are structured to achieve diversity within legal guidelines and therefore outside the sights of such organizations as the Center for Individual Rights, which seek out legally flawed programs as targets.⁷ More importantly, however, it means educators and employers must band together in taking a strong vocal stand in support of policies that benefit work force potential, economic competitiveness and social justice.

Engineering, the major engine of wealth creation and economic development in the United States, continues to be unavailable to large numbers of Americans. That only 10

percent of our engineering institutions provide significant access to African Americans, Latinos and American Indians – and the vast majority of these remain far short of achieving parity – is a national embarrassment on the verge of becoming an economic disaster. Engineering needs the fuel of all, not merely some, of our people to propel the country to the frontiers of innovation, production and distribution, hallmarks of a world class economy. A quick look at the data offers a strong set of models for institutions willing to benchmark engineering programs that have proven effective in enrolling minority students, maximizing their retention and graduating growing numbers of minority engineers. Our challenge on the eve of the new millennium is to vigorously expand the number of institutions accountable for providing access and rigorously keep score of the number of students they serve.

Endnotes

1. Engineering Workforce Commission, *Engineering & Technology Degrees 1997*, Washington, DC, 1997.
2. Engineering Workforce Commission, *Engineering & Technology Enrollments, Fall, 1997*, Washington, DC, 1998.
3. Morrison, C., Griffin, K., Marcotullio, P. "Retention of Minority Students in Engineering: Institutional Variability and Success." *NACME Research Letter*, Vol. 5, No. 2, NACME, New York, NY, December, 1995, p.3.
4. NACME, Inc., *Crisis & Commitment*. Annual Report, 1997, p.4.
5. + identifies institution as a Historically Black College or University (HBCU)
++ identifies institution as a member of Hispanic Association of Colleges and Universities (HACU).
6. *U.S. News and World Report*, "America's Best Graduate Schools," 1998.
7. Derek Bok and William G. Bowen, *The Shape of the River: Long-Term Consequences of Considering Race in College and University Admissions*, Princeton University Press, 1998.
8. George Campbell Jr., "Engineering and Affirmative Action: Crisis in the Making," *NACME Research Letter*, Special Edition, NACME, New York, November 1997, pp. 12, 13.

Table VII
**Institutions Graduating
the Most American Indian Engineers, 1996-97**

Institution	Rank	American Indian (N)
U Oklahoma	1	13
Northern Arizona University	2	12
Oklahoma State University	3	8
U Washington	3	8
Colorado School of Mines	5	7
Purdue University	6	6
New Mexico State University++	6	6
U New Mexico++	6	6
North Carolina State University – Raleigh	6	6
U Arizona	10	5
California State University – Sacramento	10	5
Massachusetts Institute of Technology	10	5
Auburn University	13	4
U Alaska – Anchorage	13	4
U Alaska – Fairbanks	13	4
Arizona State University	13	4
Stanford University	13	4
US Air Force Academy	13	4
US Naval Academy	13	4
Michigan Technological University	13	4
U Tulsa	13	4
Washington State University	13	4

Table VIII, Appendix A

Enrollment of Minority Freshmen in Engineering, All Institutions, 1997-98

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Alabama A&M University+	169	17	17	100.0	17	0	0	Embry Riddle University - Prescott	208	10	187	5.3	3	6	1
Alfred University/SUNY:Ceramics	247	4	111	3.6	1	3	0	Fairfield University	265	2	12	16.7	1	1	0
Arizona State University	40	116	493	23.5	16	70	30	Fairleigh Dickinson University	247	4	9	44.4	3	1	0
Arkansas State University	288	0	106	0.0	0	0	0	Florida A&M University/Florida State University+	8	229	458	50.0	209	19	1
Arkansas Tech University	255	3	51	5.9	3	0	0	Ferris State University	288	0	5	0.0	0	0	0
Auburn University	46	105	993	10.6	91	6	8	Florida Atlantic University	73	64	191	33.5	40	24	0
Baylor University	184	14	61	23.0	4	9	1	Florida Institute of Technology	149	23	243	9.5	8	15	0
Boston University	149	23	294	7.8	5	18	0	Florida International University++	27	139	211	65.9	24	115	0
Bradley University	255	3	135	2.2	2	1	0	Gannon University	279	1	28	3.6	1	0	0
Brigham Young University	130	28	577	4.9	3	20	5	Geneva College	231	6	46	13.0	3	2	1
Brown University	149	23	132	17.4	14	9	0	George Mason University	82	50	256	19.5	29	20	1
Bucknell University	218	8	199	4.0	8	0	0	George Washington University	139	26	163	16.0	17	9	0
California Institute of Technology**	288							Georgia Institute of Technology	20	157	1506	10.4	122	34	1
California Maritime Academy	255	3	30	10.0	0	3	0	GMI Engineering & Management Institute	82	50	581	8.6	38	11	1
Cal Poly - Pomona	16	173	647	26.7	22	149	2	Gonzaga University	288	0	62	0.0	0	0	0
Cal Poly - San Luis Obispo	13	183	1088	16.8	22	144	17	Grand Valley State University	161	18	137	13.1	15	3	0
California State University - Chico	135	27	146	18.5	10	15	2	Grove City College	288	0	92	0.0	0	0	0
California State University - Fresno	54	85	206	41.3	12	70	3	Hampton University+	57	81	81	100.0	81	0	0
California State University - Fullerton	79	56	118	47.5	12	42	2	Harvard University**	288						
California State University - Long Beach	22	148	377	39.3	47	100	1	Harvey Mudd College	239	5	75	6.7	0	3	2
California State University - Los Angeles++	31	128	174	73.6	9	118	1	Henry Cogswell College	288	0	3	0.0	0	0	0
California State University - Northridge	15	180	416	43.3	53	125	2	Hofstra University	143	24	77	31.2	11	13	0
California State University - Sacramento	50	89	342	26.0	33	50	6	Howard University+	25	141	181	77.9	141	0	0
Calvin College	288	0	91	0.0	0	0	0	Humboldt State University	265	2	24	8.3	0	2	0
Capitol College	169	17	24	70.8	16	1	0	Idaho State University	239	5	75	6.7	0	3	2
Carnegie Mellon University	92	44	361	12.2	17	25	2	Illinois Institute of Technology	112	35	222	15.8	20	14	1
Case Western Reserve University	255	3	17	17.6	2	1	0	Indiana Institute of Technology	208	10	59	16.9	8	2	0
Catholic University of America	213	9	58	15.5	6	2	1	Indiana University/Purdue University - Ft Wayne	239	5	87	5.7	1	4	0
CCNY - City College of New York	4	269	455	59.1	109	160	0	Indiana University/Purdue University - Indianapolis	279	1	27	3.7	1	0	0
Cedarville College	265	2	69	2.9	2	0	0	Institute of Paper Science & Technology	288	0	0	0.0	0	0	0
Central State University+	178	15	15	100.0	15	0	0	Iowa State University	84	48	1274	3.8	27	20	1
Christian Brothers University	161	18	85	21.2	18	0	0	John Brown University	288	0	30	0.0	0	0	0
Citadel	222	7	82	8.5	4	3	0	Johns Hopkins University	149	23	310	7.4	17	6	0
Clarkson University	203	11	363	3.0	8	3	0	Kansas State University	87	47	731	6.4	24	14	9
Clemson University	51	88	747	11.8	80	7	1	Lafayette College	184	14	136	10.3	8	6	0
Cleveland State University	169	17	154	11.0	11	6	0	Lamar University	105	38	187	20.3	28	7	3
Cogswell College	288	0	23	0.0	0	0	0	Lawrence Technological University	139	26	235	11.1	26	0	0
College of New Jersey	208	10	101	9.9	5	5	0	Le Tourneau University	265	2	60	3.3	0	2	0
College of Staten Island	222	7	37	18.9	3	4	0	Lehigh University	193	13	366	3.6	6	7	0
Colorado School of Mines	63	75	657	11.4	12	56	7	Loras College	265	2	14	14.3	0	2	0
Colorado State University	161	18	287	6.3	5	10	3	Louisiana State University	39	118	805	14.7	95	20	3
Colorado Technical University	213	9	56	16.1	3	6	0	Louisiana Technical University	84	48	372	12.9	42	3	3
Columbia University	141	25	310	8.1	17	8	0	Loyola College	265	2	17	11.8	2	0	0
Cooper Union	203	11	118	9.3	4	7	0	Loyola Marymount University	130	28	90	31.1	8	19	1
Cornell University	88	46	735	6.3	16	25	5	Maine Maritime Academy	288	0	12	0.0	0	0	0
Dartmouth College	169	17	133	12.8	5	6	6	Manhattan College	143	24	109	22.0	6	18	0
Dordt College	288	0	34	0.0	0	0	0	Mankato State University	288	0	99	0.0	0	0	0
Drexel University	51	88	738	11.9	70	16	2	Marietta College	255	3	19	15.8	3	0	0
Duke University	184	14	277	5.1	9	5	0	Marquette University	193	13	291	4.5	5	8	0
Florida Aeronautical University	67	67	431	15.5	26	40	1								

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Massachusetts Institute of Technology**	288							Rensselaer Polytechnic University	59	49	737	6.6	30	45	4
Massachusetts Maritime Academy	265	2	63	3.2	1	1	0	Rice University	96	42	234	17.9	14	26	2
McNeese State University	156	21	134	15.7	19	2	0	Rochester Institute of Technology	112	35	383	9.1	20	12	3
Mercer University	154	22	125	17.6	21	1	0	Rose - Hulman Institute of Technology	222	7	324	2.2	4	2	1
Merrimack College	288	0	37	0.0	0	0	0	Rutgers University	33	127	639	19.9	71	55	1
Messiah College	279	1	39	2.6	1	0	0	Saginaw Valley State University	184	14	52	26.9	11	0	3
Miami University	200	12	123	9.8	8	3	1	San Diego State University	60	78	266	29.3	21	57	0
Michigan State University	3	271	1323	20.5	230	32	9	San Francisco State University	208	10	84	11.9	2	8	0
Michigan Technological University	118	33	1007	3.3	15	7	11	San Jose State University	48	97	543	17.9	40	55	2
Milwaukee School of Engineering	135	27	385	7.0	14	11	2	Santa Clara University	119	32	204	15.7	3	26	3
Mississippi State University	29	132	550	24.0	126	2	4	South Dakota School of Mines & Technology	184	14	373	3.8	1	5	8
Monmouth University	288	0	0	0.0	0	0	0	South Dakota State University	265	2	331	0.6	0	1	1
Montana State University	203	11	446	2.5	0	0	11	Seattle Pacific University	265	2	34	5.9	1	1	0
Montana Tech of the University of Montana	239	5	208	2.4	0	1	4	Seattle University	222	7	65	10.8	3	2	2
Morgan State University+	9	222	236	94.1	222	0	0	Southern Illinois University - Carbondale	88	46	212	21.7	43	2	1
National Technical University	288	0	0	0.0	0	0	0	Southern Illinois University - Edwardsville	265	2	35	5.7	1	1	0
New Jersey Institute of Technology	35	126	471	26.8	64	61	1	Southern Methodist University	126	30	138	21.7	13	17	0
New Mexico Highlands University++	154	22	28	78.6	2	20	0	Southern University+	1	336	343	98.0	329	0	7
New Mexico Institute of Mining & Technology	119	32	113	28.3	1	24	7	St Ambrose University	288	0	3	0.0	0	0	0
New Mexico State University++	17	170	352	48.3	4	152	14	St Cloud State University	265	2	48	4.2	2	0	0
New York Institute of Technology	109	36	105	34.3	21	15	0	St Martins College	288	0	7	0.0	0	0	0
Norfolk State University+	178	15	15	100.0	15	0	0	St Marys University++	128	29	46	63.0	1	28	0
North Carolina A&T State University+	6	264	288	91.7	264	0	0	Stanford University	81	51	298	17.1	21	29	1
North Carolina State University - Raleigh	10	199	1273	15.6	160	29	10	Stevens Institute of Technology	90	45	231	19.5	10	34	1
North Dakota State University	231	6	323	1.9	2	1	3	SUNY - Binghamton Campus	222	7	122	5.7	2	5	0
Northeastern State University	279	1	2	50.0	0	0	1	SUNY - Buffalo Campus	54	85	556	15.3	49	28	8
Northeastern University	112	35	367	9.5	20	14	1	SUNY - Stony Brook Campus	175	16	69	23.2	9	7	0
Northern Arizona University	73	64	265	24.2	2	22	40	SUNY - College at New Paltz	231	6	22	27.3	2	4	0
Northern Illinois University	77	59	250	23.6	43	15	1	SUNY - College of Environmental Science	288	0	21	0.0	0	0	0
Northwestern University	100	40	350	11.4	26	12	2	SUNY - Maritime College	288	0	76	0.0	0	0	0
Norwich University	279	1	80	1.3	1	0	0	Swarthmore College	239	5	31	16.1	3	2	0
Oakland University	100	40	309	12.9	34	6	0	Syracuse University	143	24	226	10.6	16	8	0
Ohio Northern University	255	3	129	2.3	3	0	0	Temple University	100	40	72	55.6	33	6	1
Ohio State University	28	134	1247	10.7	115	15	4	Tennessee State University+	5	266	279	95.3	266	0	0
Ohio University	184	4	284	1.4	10	4	0	Tennessee Technical University	156	21	325	6.5	17	1	3
Oklahoma Christian University	239	5	42	11.9	3	0	2	Texas A&M University - Galveston	288	0	23	0.0	0	0	0
Oklahoma State University	90	45	415	10.8	13	5	27	Texas A&M University	7	232	1734	13.4	54	170	8
Old Dominion University	122	31	169	18.3	26	4	1	Texas A&M University - Kingsville++	38	119	165	72.1	8	108	3
Oral Roberts University	288	0	29	0.0	0	0	0	Texas Tech University	62	76	596	12.8	24	50	2
Oregon State University	288	0	572	0.0	0	0	0	Trinity College	288	0	1	0.0	0	0	0
Pacific Lutheran University*	288	0	0	0.0	0	0	0	Trinity University*	288	0	0	0.0	0	0	0
Parks College - St Louis University	193	13	82	15.9	7	6	0	Tri - State University	247	4	157	2.5	1	2	1
Pennsylvania State University	42	112	2334	4.8	62	48	2	Tufts University	231	6	207	2.9	5	1	0
Philadelphia College of Textiles	288	0	6	0.0	0	0	0	Tulane University	184	14	210	6.7	11	3	0
Polytechnic University	23	143	607	23.6	67	70	6	Tuskegee University+	21	152	154	98.7	151	1	0
Portland State University	193	13	144	9.0	1	9	3	U Akron	122	31	362	8.6	25	6	0
Prairie View A&M University+	30	130	136	95.6	130	0	0	U Akron - Polymer Science*	288	0	0	0.0	0	0	0
Princeton University**	288							U Alabama	37	120	536	22.4	117	2	1
Purdue University - Calumet	159	19	85	22.4	4	15	0	U Alabama - Birmingham	107	37	115	32.2	37	0	0
Purdue University	57	81	1656	4.9	38	33	10								

Table VIII, Appendix A

Enrollment of Minority Freshmen in Engineering, All Institutions, 1997-98*Continued*

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Alabama – Huntsville	96	42	241	17.4	33	2	7	U Miami	44	108	250	43.2	47	59	2
U Alaska – Anchorage	265	2	26	7.7	0	0	2	U Michigan – Ann Arbor	11	192	944	20.3	120	67	5
U Alaska – Fairbanks	222	7	63	11.1	2	2	3	U Michigan – Dearborn	161	18	277	6.5	8	5	5
U Arizona	36	122	561	21.7	11	94	17	U Minnesota	115	34	681	5.0	15	18	1
U Arkansas	80	53	367	14.4	36	9	8	U Minnesota – Duluth	247	4	105	3.8	2	0	2
U Bridgeport	247	4	25	16.0	2	2	0	U Mississippi	107	37	212	17.5	35	2	0
U California – Berkeley	73	64	713	9.0	17	44	3	U Missouri – Columbia & Kansas City	94	43	431	10.0	37	5	1
U California – Davis	64	74	645	11.5	17	52	5	U Missouri – Rolla	143	24	613	3.9	16	4	4
U California – Irvine	84	48	390	12.3	8	40	0	U Nebraska – Lincoln	193	13	393	3.3	7	4	2
U California – Los Angeles	67	67	550	12.2	20	44	3	U Nevada – Las Vegas	105	38	174	21.8	18	19	1
U California – Riverside	161	18	95	18.9	0	16	2	U Nevada – Reno	98	41	260	15.8	9	28	4
U California – San Diego	47	100	651	15.4	19	76	5	U Nevada – School of Mines	255	3	28	10.7	0	2	1
U California – Santa Barbara	94	43	417	10.3	4	37	2	U New Hampshire	279	1	152	0.7	0	1	0
U California – Santa Cruz	141	25	105	23.8	4	21	0	U New Haven	200	12	78	15.4	9	3	0
U Central Florida	54	85	404	21.0	40	45	0	U New Mexico++	33	127	296	42.9	12	92	23
U Cincinnati	130	28	467	6.0	24	3	1	U New Orleans	49	92	261	35.2	57	20	15
U Colorado – Boulder	76	60	623	9.6	9	47	4	U North Carolina – Chapel Hill*	288	0	0	0.0	0	0	0
U Colorado – Colorado Springs	175	16	145	11.0	5	10	1	U North Carolina – Charlotte	193	13	194	6.7	10	2	1
U Colorado – Denver	218	8	48	16.7	0	7	1	U North Dakota	288	0	98	0.0	0	0	0
U Connecticut	161	18	179	10.1	8	9	1	U North Florida	288	0	0	0.0	0	0	0
U Dayton	130	28	310	9.0	17	8	3	U Oklahoma	12	189	596	31.7	101	48	40
U Delaware	92	44	320	13.8	29	12	3	U Pacific	203	11	49	22.4	2	8	1
U Denver	255	3	50	6.0	2	1	0	U Pennsylvania	122	31	319	9.7	14	17	0
U Detroit Mercy	115	34	112	30.4	20	13	1	U Pittsburgh	119	32	396	8.1	27	5	0
U District of Columbia+	128	29	34	85.3	25	4	0	U Portland	265	2	84	2.4	1	1	0
U Evansville	231	6	85	7.1	5	1	0	U Rhode Island	135	27	219	12.3	11	15	1
U Florida	18	169	896	18.9	71	94	4	U Rochester	213	9	108	8.3	4	5	0
U Georgia	255	3	27	11.1	3	0	0	U San Diego**	231	6	38	15.8	1	5	0
U Hartford	200	12	119	10.1	9	3	0	U Scranton	288	0	9	0.0	0	0	0
U Hawaii	208	10	139	7.2	0	2	8	U South Alabama	109	36	186	19.4	32	4	0
U Houston	53	86	245	35.1	34	50	2	U South Carolina	43	111	362	30.7	102	9	0
U Idaho	239	5	231	2.2	1	3	1	U South Florida	65	72	314	22.9	27	44	1
U Illinois – Chicago	45	107	414	25.8	33	72	2	U Southern California	31	128	559	22.9	28	91	9
U Illinois – Urbana Champaign	24	142	1226	11.6	67	71	4	U Southern Colorado	184	14	33	42.4	0	14	0
U Iowa	184	14	377	3.7	2	10	2	U Southern Maine	288	0	5	0.0	0	0	0
U Kansas	135	27	480	5.6	12	11	4	U Southwestern Louisiana	61	77	386	19.9	66	8	3
U Kentucky	115	34	441	7.7	31	3	0	U St Thomas*	288	0	0	0.0	0	0	0
U Louisville	122	31	297	10.4	26	4	1	U Tennessee – Chattanooga	178	15	62	24.2	14	1	0
U Lowell	161	18	210	8.6	8	10	0	U Tennessee – Knoxville	66	71	540	13.1	58	10	3
U Maine – Orono	222	7	197	3.6	1	1	5	U Texas – Arlington	70	66	344	19.2	24	38	4
U Maryland – Baltimore County	70	66	322	20.5	62	2	2	U Texas – Austin	14	181	1048	17.3	26	150	5
U Maryland – College Park	26	140	670	20.9	104	35	1	U Texas – Dallas	161	18	197	9.1	8	9	1
U Massachusetts – Amherst	143	24	287	8.4	14	10	0	U Texas – El Paso++	2	333	472	70.6	7	326	0
U Massachusetts – Dartmouth	193	13	208	6.3	6	3	4	U Texas – Pan American++	19	168	211	79.6	0	167	1
U Memphis	175	16	69	23.2	15	0	1	U Texas – San Antonio++	40	116	193	60.1	8	108	0

Institution	Rank	Total Minority (N)	Total Freshmen (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Toledo	149	23	530	4.3	16	6	1
U Tulsa	169	17	146	11.6	7	4	6
U Utah	213	9	275	3.3	0	9	0
U Vermont	222	7	137	5.1	2	5	0
U Virginia	109	36	541	6.7	24	12	0
U Washington	100	40	366	10.9	19	18	3
U West Florida*	288	0	0	0.0	0	0	0
U Wisconsin – Madison	104	39	843	4.6	19	16	4
U Wisconsin – Milwaukee	143	24	269	8.9	13	9	2
U Wisconsin – Platteville	213	9	453	2.0	2	4	3
U Wyoming	159	19	248	7.7	4	14	1
Union College	231	6	62	9.7	3	3	0
US Air Force Academy	255	3	14	21.4	0	3	0
US Coast Guard Academy	178	15	124	12.1	6	9	0
US Merchant Marine Academy	222	7	153	4.6	3	4	0
US Military Academy*	288	0	0	0.0	0	0	0
US Naval Academy*	288	0	0	0.0	0	0	0
Utah State University	247	4	163	2.5	0	4	0
Valparaiso University	247	4	84	4.8	1	2	1
Vanderbilt University	130	28	339	8.3	14	14	0
Villanova University	203	11	227	4.8	4	7	0
Virginia Military Institute	178	15	113	13.3	11	4	0
Virginia Polytechnic Institute	78	57	1057	5.4	39	16	2
Walla Walla College	239	5	56	8.9	2	3	0
Washington State University	126	30	537	5.6	8	14	8
Washington University	169	17	239	7.1	12	5	0
Washington & Lee University	279	1	10	10.0	1	0	0
Wayne State University	72	65	156	41.7	56	9	0
Webb Institute	288	0	24	0.0	0	0	0
Wentworth Institute of Technology	247	4	59	6.8	2	2	0
West Virginia Institute of Technology	218	8	168	4.8	6	0	2
West Virginia University	158	20	475	4.2	14	5	1
Western Michigan University	98	41	275	14.9	31	9	1
Western New England College	265	2	78	2.6	0	2	0
Wichita State University	218	8	160	5.0	4	3	1
Widener University	231	6	53	11.3	6	0	0
Wilkes University	279	1	52	1.9	0	1	0
Winona State University	279	1	56	1.8	1	0	0
Worcester Polytechnic Institute	178	15	409	3.7	4	11	0
Wright State University	67	67	442	15.2	64	3	0
Yale University	288	0	1	0.0	0	0	0
Youngstown State University	288	0	241	0.0	0	0	0
National		13,929	88,972	15.7	7,403	5,858	668
*Institution did not report 1997 freshman engineering enrollment							
**Freshman do not declare major							
+HBCU							
++HACU							

Table IX, Appendix B

Production of Minority Engineering Graduates, All Institutions, 1996-97

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Alabama A&M University+	220	3	5	60.0	3	0	0	Dordt College	286	0	20	0.0	0	0	0
Alfred University/SUNY:Ceramics	175	7	84	8.3	5	2	0	Drexel University	91	20	396	5.1	13	7	0
Arizona State University	42	42	376	11.2	6	32	4	Duke University	95	19	200	9.5	13	6	0
Arkansas State University	262	1	26	3.8	1	0	0	Embry Riddle Aeronautical University	175	7	96	7.3	1	6	0
Arkansas Technical University	286	0	25	0.0	0	0	0	Embry Riddle University - Prescott	220	3	70	4.3	0	2	1
Auburn University	46	39	579	6.7	31	4	4	Fairfield University	211	4	30	13.3	4	0	0
Baylor University	220	3	23	13.0	0	3	0	Fairleigh Dickinson University	262	1	6	16.7	0	1	0
Boston University	87	21	271	7.7	4	17	0	Florida A&M University/Florida State University+	9	115	254	45.3	98	17	0
Bradley University	220	3	150	2.0	1	2	0	Ferris State University	286	0	20	0.0	0	0	0
Brigham Young University	123	12	408	2.9	0	9	3	Florida Atlantic University	54	35	167	21.0	20	13	2
Brown University	199	5	78	6.4	3	2	0	Florida Institute of Technology	134	11	122	9.0	3	8	0
Bucknell University	239	2	117	1.7	2	0	0	Florida International University++	4	155	274	56.6	14	141	0
California Institute of Technology	175	7	113	6.2	0	7	0	Gannon University	262	1	30	3.3	1	0	0
California Maritime Academy	286	0	13	0.0	0	0	0	Geneva College	262	1	17	5.9	1	0	0
Cal Poly - Pomona	20	75	447	16.8	10	63	2	George Mason University	87	21	206	10.2	13	8	0
Cal Poly - San Luis Obispo	8	117	666	17.6	6	109	2	George Washington University	123	12	70	17.1	7	5	0
California State University - Chico	145	10	91	11.0	2	7	1	Georgia Institute of Technology	2	194	1230	15.8	149	42	3
California State University - Fresno	77	24	128	18.8	2	21	1	GMI Engineering and Management Institute	74	25	423	5.9	16	8	1
California State University - Fullerton	123	12	79	15.2	1	10	1	Gonzaga University	239	2	53	3.8	0	0	2
California State University - Long Beach	20	75	369	20.3	24	49	2	Grand Valley State University	220	3	33	9.1	1	1	1
California State University - Los Angeles++	60	32	93	34.4	3	29	0	Grove City College	286	0	55	0.0	0	0	0
California State University - Northridge	57	34	184	18.5	11	23	0	Hampton University+	95	19	20	95.0	19	0	0
California State University - Sacramento	46	39	277	14.1	5	29	5	Harvard University	163	8	114	7.0	5	3	0
Calvin College	286	0	53	0.0	0	0	0	Harvey Mudd College	188	6	63	9.5	1	5	0
Capitol College	199	5	29	17.2	4	1	0	Henry Cogswell College	286	0	8	0.0	0	0	0
Carnegie Mellon University	106	15	279	5.4	9	6	0	Hofstra University	199	5	38	13.2	0	5	0
Case Western Reserve University	104	17	289	5.9	12	4	1	Howard University+	17	86	90	95.6	86	0	0
Catholic University of America	220	3	50	6.0	2	1	0	Humboldt State University	239	2	49	4.1	0	1	1
CCNY--City College of New York	11	103	256	40.2	68	35	0	Idaho State University	262	1	26	3.8	0	0	1
Cedarville College	286	0	37	0.0	0	0	0	Illinois Institute of Technology	60	32	245	13.1	22	10	0
Central State University+	239	2	6	33.3	2	0	0	Indiana Institute of Technology	239	2	13	15.4	2	0	0
Christian Brothers University	239	2	38	5.3	2	0	0	Indiana University/Purdue University - Ft Wayne	262	1	32	3.1	1	0	0
Citadel	199	5	67	7.5	5	0	0	Indiana University/Purdue University - Indianapolis	220	3	70	4.3	1	1	1
Clarkson University	175	7	302	2.3	1	3	3	Institute of Paper Science & Technology*	286	0	0	0.0	0	0	0
Clemson University	40	44	527	8.3	41	3	0	Iowa State University	114	14	692	2.0	10	4	0
Cleveland State University	163	8	136	5.9	4	2	2	John Brown University	286	0	18	0.0	0	0	0
Cogswell College	262	1	18	5.6	0	1	0	Johns Hopkins University	175	7	234	3.0	5	2	0
College of New Jersey	220	3	21	14.3	1	2	0	Kansas State University	163	8	296	2.7	2	6	0
College of Staten Island	286	0	1	0.0	0	0	0	Lafayette College	220	3	102	2.9	2	1	0
Colorado School of Mines	66	29	460	6.3	2	20	7	Lamar University	118	13	96	13.5	8	5	0
Colorado State University	145	10	238	4.2	0	9	1	Lawrence Technological University	118	13	260	5.0	7	5	1
Colorado Technical University	262	1	30	3.3	1	0	0	Le Tourneau University	262	1	45	2.2	0	0	1
Columbia University	106	15	237	6.3	6	9	0	Lehigh University	118	13	321	4.0	6	6	1
Cooper Union	134	11	127	8.7	5	6	0	Loras College	286	0	2	0.0	0	0	0
Cornell University	38	45	764	5.9	17	27	1	Louisiana State University	66	29	326	8.9	17	10	2
South College	188	6	120	5.0	2	1	3	Louisiana Tech University	83	22	166	13.3	19	3	0

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Loyola College	262	1	7	14.3	1	0	0	Oral Roberts University	286	0	9	0.0	0	0	0
Loyola Marymount University	123	12	51	23.5	0	12	0	Oregon State University	286	0	345	0.0	0	0	0
Maine Maritime Academy	286	0	9	0.0	0	0	0	Pacific Lutheran University	286	0	11	0.0	0	0	0
Manhattan College	77	24	147	16.3	8	16	0	Parks College – St Louis University	239	2	49	4.1	2	0	0
Mankato State University	262	1	37	2.7	0	0	1	Pennsylvania State University	64	30	1157	2.6	9	21	0
Marietta College	286	0	7	0.0	0	0	0	Philadelphia College of Textiles	286	0	6	0.0	0	0	0
Marquette University	163	8	261	3.1	4	4	0	Polytechnic University	33	49	267	18.4	28	21	0
Massachusetts Institute of Technology	12	101	622	16.2	38	58	5	Portland State University	188	6	162	3.7	5	0	1
Massachusetts Maritime Academy	239	2	95	2.1	1	0	1	Prairie View A&M University+	3	165	185	89.2	163	2	0
McNeese State University	220	3	35	8.6	3	0	0	Princeton University	77	24	185	13.0	17	5	2
Mercer University	145	10	85	11.8	9	1	0	Purdue University – Calumet	211	4	33	12.1	2	2	0
Merrimack College	262	1	23	4.3	0	1	0	Purdue University	13	96	1273	7.5	45	45	6
Messiah College	286	0	24	0.0	0	0	0	Rensselaer Polytechnic Institute	28	57	583	9.8	26	29	2
Miami University	211	4	94	4.3	3	1	0	Rice University	106	15	172	8.7	2	13	0
Michigan State University	54	35	563	6.2	27	6	2	Rochester Institute of Technology	145	10	241	4.1	8	2	0
Michigan Technological University	106	15	798	1.9	7	4	4	Roger Williams University	286	0	15	0.0	0	0	0
Milwaukee School of Engineering	156	9	241	3.7	4	3	2	Rose – Hulman Institute of Technology	211	4	225	1.8	2	2	0
Mississippi State University	74	25	303	8.3	22	3	0	Rutgers University	66	29	417	7.0	15	14	0
Monmouth College	286	0	4	0.0	0	0	0	Saginaw Valley State University	239	2	41	4.9	2	0	0
Montana State University	220	3	229	1.3	0	3	0	San Diego State University	44	40	216	18.5	6	33	1
Montana Technical Institute of U Montana	239	2	160	1.3	0	2	0	San Francisco State University	134	11	77	14.3	4	7	0
Morgan State University+	24	66	73	90.4	66	0	0	San Jose State University	34	48	448	10.7	13	34	1
National Technical University*	286	0	0	0.0	0	0	0	Santa Clara University	83	22	57	38.6	4	18	0
New England College	286	0	1	0.0	0	0	0	South Dakota School of Mines & Technology	239	2	189	1.1	0	0	2
New Jersey Institute of Technology	19	77	372	20.7	28	49	0	South Dakota State University	262	1	148	0.7	0	1	0
New Mexico Highlands University++	220	3	3	100.0	0	2	1	Seattle Pacific University	286	0	15	0.0	0	0	0
New Mexico Institute of Mining & Technology	106	15	65	23.1	0	14	1	Seattle University	199	5	78	6.4	2	3	0
New Mexico State University++	18	79	232	34.1	3	70	6	Southern Illinois University – Carbondale	175	7	153	4.6	4	3	0
New York Institute of Technology	87	21	89	23.6	12	8	1	Southern Illinois University – Edwardsville	106	15	149	10.1	14	1	0
Norfolk State University+	188	6	6	100.0	6	0	0	Southern Methodist University	106	15	85	17.6	4	11	0
North Carolina A&T State University+	1	256	298	85.9	256	0	0	Southern University+	15	92	98	93.9	92	0	0
North Carolina State University – Raleigh	20	75	1000	7.5	57	12	6	St Ambrose University	286	0	4	0.0	0	0	0
North Dakota State University	199	5	277	1.8	1	1	3	St Cloud State University	286	0	33	0.0	0	0	0
Northeastern State University	262	1	3	33.3	0	0	1	St Martins College	220	3	24	12.5	2	1	0
Northeastern University	118	13	238	5.5	10	3	0	St Marys University++	163	8	14	57.1	0	8	0
Northern Arizona University	98	18	131	13.7	1	5	12	Stanford University	25	63	298	21.1	24	35	4
Northern Illinois University	239	2	62	3.2	1	1	0	Stevens Institute of Technology	71	27	173	15.6	14	12	1
Northwestern University	91	20	317	6.3	12	8	0	SUNY – Binghamton Campus	188	6	68	8.8	4	2	0
Norwich University	262	1	24	4.2	0	1	0	SUNY – Buffalo Campus	83	22	379	5.8	15	6	1
Oakland University	199	5	169	3.0	4	1	0	SUNY – Stony Brook Campus	87	21	118	17.8	10	11	0
Ohio Northern University	286	0	79	0.0	0	0	0	SUNY – College at New Paltz	239	2	21	9.5	1	0	1
Ohio State University	70	28	697	4.0	21	6	1	SUNY – College of Environmental Science	239	2	59	3.4	0	2	0
Ohio University	145	10	211	4.7	9	1	0	SUNY – Maritime College	286	0	58	0.0	0	0	0
Oklahoma Christian University	286	0	18	0.0	0	0	0	Swarthmore College	220	3	32	9.4	0	2	1
Oklahoma State University	98	18	292	6.2	6	4	8	Syracuse University	145	10	150	6.7	7	3	0
Union University	123	12	175	6.9	6	5	1	Temple University	145	10	50	20.0	6	4	0
								Tennessee State University+	53	37	57	64.9	37	0	0

Table X, Appendix B

Production of Minority Engineering Graduates, All Institutions, 1996-97*Continued*

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)	Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
Tennessee Technical University	134	11	289	3.8	11	0	0	U Kansas	156	9	267	3.4	3	4	2
Texas A&M University – Galveston	286	0	19	0.0	0	0	0	U Kentucky	134	11	392	2.8	8	3	0
Texas A&M University	6	118	1118	10.6	27	90	1	U Louisville	175	7	194	3.6	4	2	1
Texas A&M University – Kingsville++	25	63	113	55.8	0	63	0	U Lowell	239	2	174	1.1	2	0	0
Texas Technical University	59	33	253	13.0	4	28	1	U Maine – Orono	286	0	154	0.0	0	0	0
Trinity College	262	1	10	10.0	1	0	0	U Maryland Baltimore County	72	26	175	14.9	21	2	3
Trinity University*	286	0	0	0.0	0	0	0	U Maryland – College Park	31	54	535	10.1	38	15	1
Tri – State University	286	0	116	0.0	0	0	0	U Massachusetts – Amherst	77	24	230	10.4	9	15	0
Tufts University	199	5	158	3.2	5	0	0	U Massachusetts – Dartmouth	175	7	71	9.9	3	4	0
Tulane University	114	14	158	8.9	8	5	1	U Memphis	156	9	78	11.5	8	1	0
Tuskegee University+	5	131	135	97.0	130	1	0	U Miami	83	22	113	19.5	4	18	0
U Akron	163	8	202	4.0	6	2	0	U Michigan – Ann Arbor	16	91	964	9.4	52	37	2
U Akron – Polymer Science	286	0	0	0.0	0	0	0	U Michigan – Dearborn	163	8	191	4.2	5	2	1
U Alabama	72	26	211	12.3	22	3	1	U Minnesota	106	15	573	2.6	9	5	1
U Alabama – Birmingham	134	11	85	12.9	11	0	0	U Minnesota – Duluth	262	1	93	1.1	1	0	0
U Alabama – Huntsville	123	12	169	7.1	10	1	1	U Mississippi	134	11	57	19.3	11	0	0
U Alaska – Anchorage	188	6	32	18.8	0	2	4	U Missouri – Columbia & Kansas City	123	12	358	3.4	10	2	0
U Alaska – Fairbanks	156	9	77	11.7	0	5	4	U Missouri – Rolla	64	30	660	4.5	21	6	3
U Arizona	34	48	441	10.9	2	41	5	U Nebraska – Lincoln	211	4	280	1.4	1	3	0
U Arkansas	134	11	259	4.2	9	0	2	U Nevada – Las Vegas	123	12	92	13.0	4	8	0
U Bridgeport	286	0	6	0.0	0	0	0	U Nevada – Reno	188	6	121	5.0	1	3	2
U California – Berkeley	32	50	841	5.9	12	37	1	U Nevada – School of Mines	286	0	27	0.0	0	0	0
U California – Davis	50	38	439	8.7	7	28	3	U New Hampshire	239	2	122	1.6	0	2	0
U California – Irvine	74	25	205	12.2	3	20	2	U New Haven	199	5	80	6.3	2	3	0
U California – Los Angeles	44	40	445	9.0	4	35	1	U New Mexico++	29	56	191	29.3	2	48	6
U California – Riverside	199	5	45	11.1	1	4	0	U New Orleans	145	10	105	9.5	6	3	1
U California – San Diego	46	39	417	9.4	7	30	2	U North Carolina – Chapel Hill*	286	0	0	0.0	0	0	0
U California – Santa Barbara	123	12	190	6.3	2	10	0	U North Carolina – Charlotte	123	12	144	8.3	9	2	1
U California – Santa Cruz	188	6	53	11.3	2	3	1	U North Dakota	286	0	110	0.0	0	0	0
U Central Florida	36	47	332	14.2	9	36	2	U North Florida	239	2	17	11.8	0	1	1
U Cincinnati	175	7	311	2.3	6	1	0	U Notre Dame	95	19	236	8.1	5	13	1
U Colorado – Boulder	91	20	436	4.6	2	17	1	U Oklahoma	37	46	445	10.3	23	10	13
U Colorado – Colorado Springs	199	5	57	8.8	1	4	0	U Pacific	156	9	72	12.5	0	9	0
U Colorado – Denver	105	16	163	9.8	3	13	0	U Pennsylvania	145	10	286	3.5	5	5	0
U Connecticut	118	13	168	7.7	4	9	0	U Pittsburgh	98	18	290	6.2	15	3	0
U Dayton	163	8	132	6.1	6	2	0	U Portland	220	3	57	5.3	0	2	1
U Delaware	134	11	131	8.4	10	1	0	U Rhode Island	220	3	127	2.4	3	0	0
U Denver	262	1	15	6.7	1	0	0	U Rochester	163	8	117	6.8	7	1	0
U Detroit Mercy	114	14	55	25.5	11	3	0	U San Diego	239	2	7	28.6	0	2	0
U District of Columbia+	63	31	49	63.3	28	3	0	U Scranton	286	0	13	0.0	0	0	0
U Evansville	286	0	66	0.0	0	0	0	U South Alabama	175	7	104	6.7	6	1	0
U Florida	14	93	713	13.0	27	64	2	U South Carolina	60	32	195	16.4	31	1	0
U Georgia	239	2	26	7.7	1	0	1	U South Florida	27	58	363	16.0	24	34	0
U Hartford	156	9	76	11.8	9	0	0	U Southern California	29	56	334	16.8	19	37	0
U Hawaii	262	1	148	0.7	0	1	0	U Southern Colorado	220	3	7	42.9	0	3	0
U Houston	43	41	242	16.9	6	34	1	U Southern Maine	262	1	12	8.3	0	1	0
U Idaho	175	7	212	3.3	1	5	1	U Southwestern Louisiana	175	7	105	6.7	7	0	0
U Illinois – Chicago	46	39	314	12.4	19	20	0	U St Thomas*	286	0	0	0.0	0	0	0
U Illinois – Urbana Champaign	23	70	1163	6.0	28	41	1	U Tennessee – Chattanooga	286	0	123	0.0	0	0	0
	188	6	219	2.7	4	1	1	U Tennessee – Knoxville	81	23	339	6.8	23	0	0
								U Texas – Arlington	98	18	253	7.1	6	12	0

Institution	Rank	Total Minority (N)	Total Graduates (N)	Percent Minority (%)	African American (N)	Latino (N)	American Indian (N)
U Texas - Austin	6	118	806	14.6	28	88	2
U Texas - Dallas	134	11	153	7.2	5	5	1
U Texas - El Paso++	10	106	178	59.6	0	105	1
U Texas - Pan American++	38	45	54	83.3	0	44	1
U Texas - San Antonio++	50	38	115	33.0	5	33	0
U Toledo	163	8	221	3.6	3	3	2
U Tulsa	145	10	132	7.6	1	5	4
U Utah	211	4	264	1.5	0	4	0
U Vermont	262	1	99	1.0	1	0	0
U Virginia	54	35	331	10.6	29	6	0
U Washington	41	43	676	6.4	18	17	8
U West Florida	286	0	6	0.0	0	0	0
U Wisconsin - Madison	163	8	615	1.3	4	3	1
U Wisconsin - Milwaukee	134	11	165	6.7	4	6	1
U Wisconsin - Platteville	286	0	186	0.0	0	0	0
U Wyoming	188	6	178	3.4	0	5	1
Union College	239	2	62	3.2	1	1	0
US Air Force Academy	91	20	249	8.0	7	9	4
US Coast Guard Academy	211	4	46	8.7	3	1	0
US Merchant Marine Academy	220	3	115	2.6	1	2	0
US Military Academy	57	34	318	10.7	23	10	1
US Naval Academy	66	29	370	7.8	12	13	4
Utah State University	262	1	181	0.6	0	1	0
Valparaiso University	262	1	68	1.5	0	1	0
Vanderbilt University	98	18	254	7.1	11	5	2
Villanova University	188	6	161	3.7	4	2	0
Virginia Military Institute	239	2	62	3.2	2	0	0
Virginia Polytechnic Institute	50	38	819	4.6	21	16	1
Walla Walla College	239	2	58	3.4	1	1	0
Washington State University	81	23	440	5.2	2	17	4
Washington University	199	5	199	2.5	4	1	0
Washington & Lee University	286	0	4	0.0	0	0	0
Wayne State University	98	18	157	11.5	16	0	2
Webb Institute	286	0	16	0.0	0	0	0
West Coast University	211	4	16	25.0	2	2	0
West Virginia Institute of Technology	220	3	119	2.5	2	0	1
West Virginia University	145	10	234	4.3	5	5	0
Western Michigan University	156	9	222	4.1	6	3	0
Western New England College	286	0	47	0.0	0	0	0
Wichita State University	239	2	158	1.3	1	1	0
Widener University	163	8	71	11.3	4	1	3
Wilkes University	262	1	54	1.9	1	0	0
Winona State University	286	0	18	0.0	0	0	0
Worcester Polytechnic Institute	123	12	413	2.9	6	6	0
Wright State University	175	7	135	5.2	6	1	0
Yale University	114	14	86	16.3	10	3	1
Youngstown State University	211	4	95	4.2	0	4	0
National		6,422	64,032	10.0	3,203	2,954	265

*Institution did not report 1997 graduation data

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Research Letter

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