Cohorts, Community & Commencement

by

Keith J Bowman *(He Him His)*

Dean of Engineering & Information Technology

UMBC (est 1966)

University of Maryland, Baltimore County

ASEE Data 2013-2017
UMBC College of Engineering and IT

Program (total #)	Degree Total	# African Americans	# Women
Computer Science (91)	28th	8th	28th
Computer Eng (101)	25th	6th	23rd
Chemical Eng (93)	70th	7th	64th
Mechanical Eng (117)	74th	7th	40th

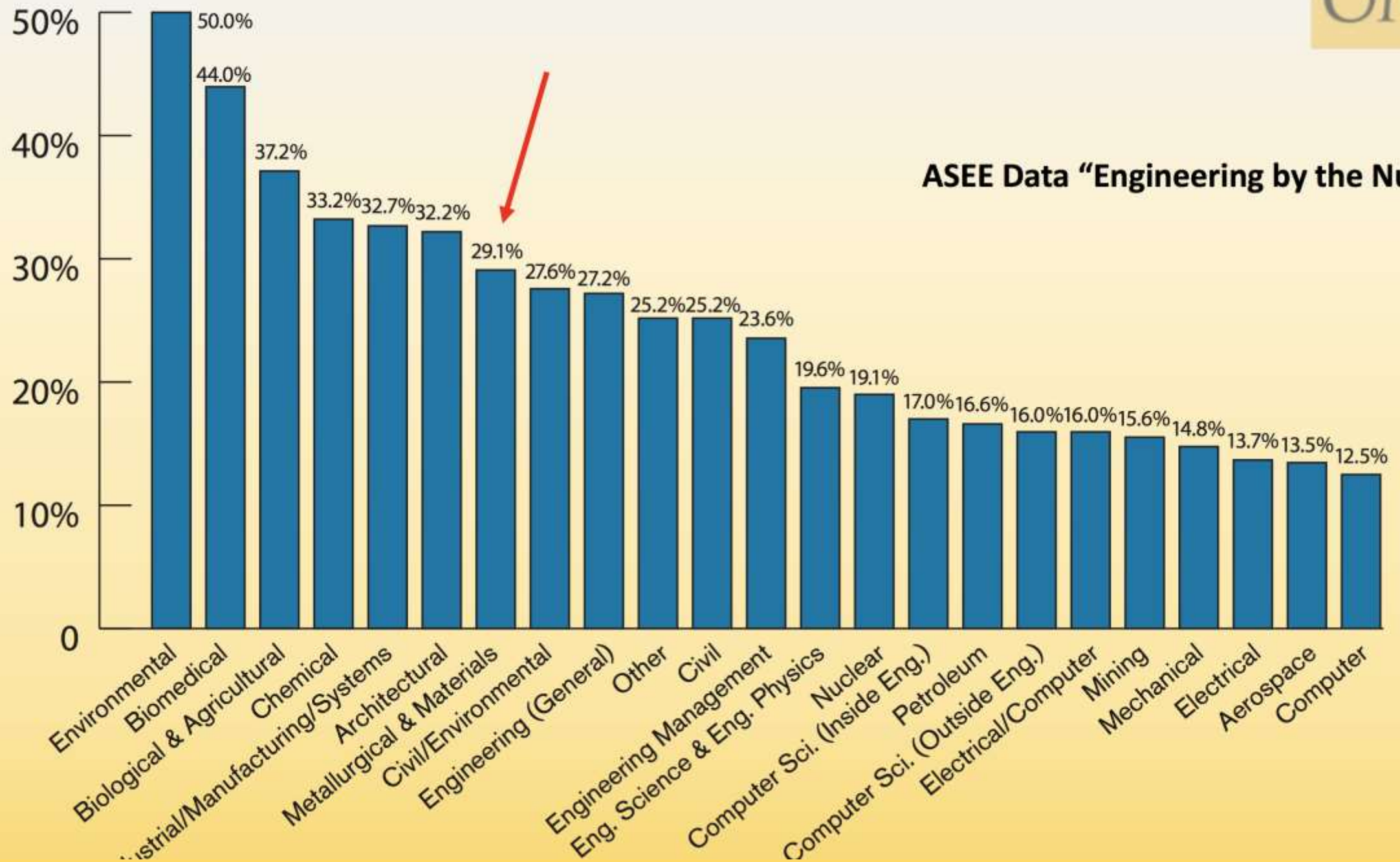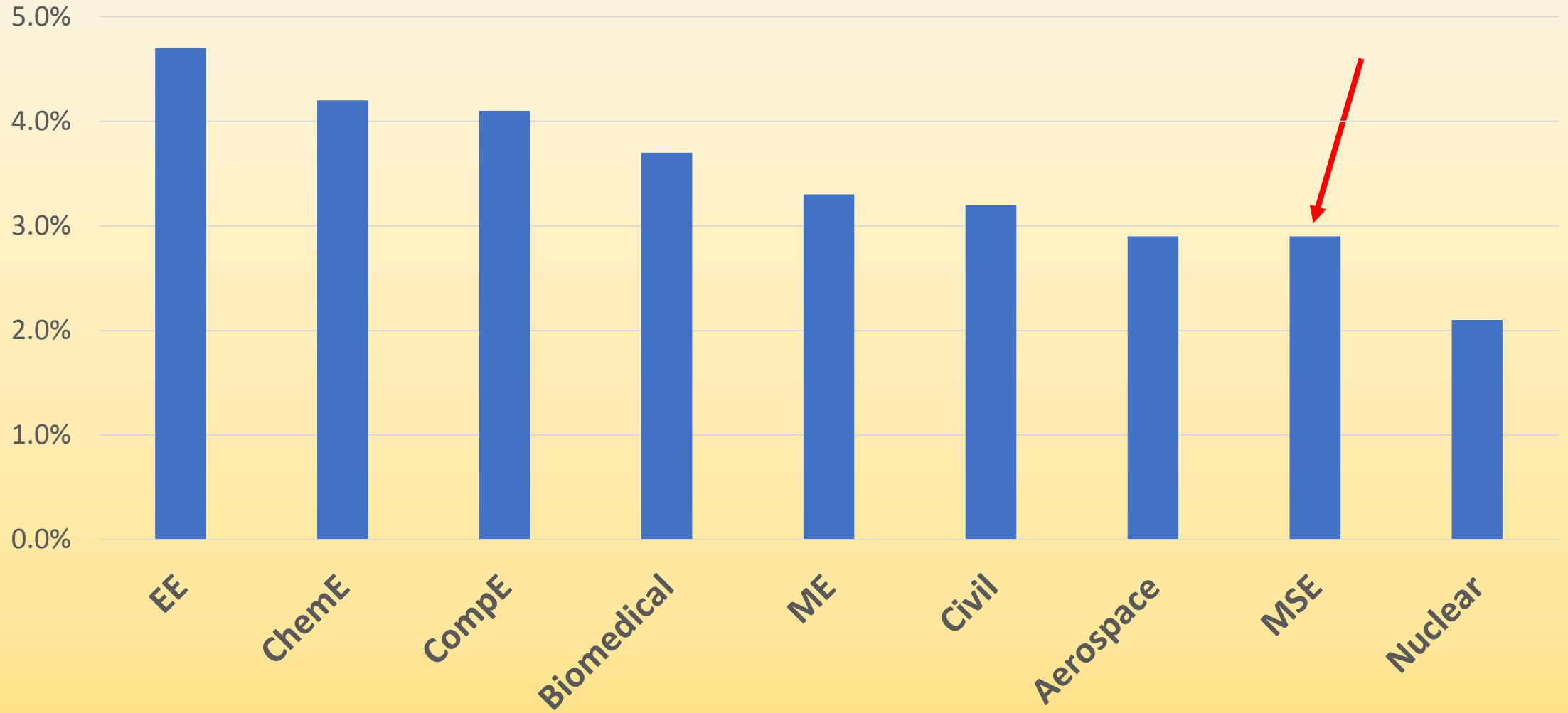*Public doctoral universities*

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PERCENTAGE OF BACHELOR'S DEGREES AWARDED TO WOMEN BY DISCIPLINE: 21.3% OF TOTAL

UMBC

ASEE Data "Engineering by the Numbers"

Discipline	Percentage
Environmental	50.0%
Biomedical	44.0%
Biological & Agricultural	37.2%
Chemical	33.2%
Industrial/Manufacturing/Systems	32.7%
Architectural	32.2%
Metallurgical & Materials	29.1%
Civil/Environmental	27.6%
Engineering (General)	27.2%
Other	25.2%
Civil	25.2%
Engineering Management	23.6%
Eng. Science & Eng. Physics	19.6%
Nuclear	19.1%
Computer Sci. (Inside Eng.)	17.0%
Petroleum	16.6%
Computer Sci. (Outside Eng.)	16.0%
Electrical/Computer	16.0%
Mining	15.6%
Mechanical	14.8%
Electrical	13.7%
Aerospace	13.5%
Computer	12.5%

African American Fraction

ASEE Data for MSE Programs

62 MSE programs reported BS degrees 2013-2017
87 MSE programs reported MS degrees 2013-2017
86 MSE programs reported PhD degrees 2013-2017

2017 – 59 ABET-accredited MSE BS Degrees

ASEE Data for MSE Programs

BS Degrees

Year	African American Total	All	International	Female	*African American*	*Female*
2008	28	1095	42	271	*2.7%*	*24.7%*
2017	49	1933	235	564	*2.9%*	*29.2%*
	75.0%	76.5%	459.5%	108.1%		

MS Degrees

Year	African American Total	All	International	Female	*African American*	*Female*
2008	14	715	297	205	*3.3%*	*28.7%*
2017	20	1229	649	370	*3.4%*	*30.1%*
	42.9%	71.9%	118.5%	80.5%		

PhD Degrees

Year	African American Total	All	International	Female	*African American*	*Female*
2008	8	617	352	148	*3.0%*	*24.0%*
2017	7	811	425	207	*1.8%*	*25.5%*
	-12.5%	31.4%	20.7%	39.9%		

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ASEE Data for MSE Programs Five Year Total 2013-2017

School	African American Male	African American Female	Total African American	All
Alabama at Birmingha	6	11	17	95
Georgia Tech	7	9	16	311
Clemson	10	4	14	269
Michigan	6	5	11	292
Alabama	6	4	10	67
Florida	6	3	9	186
MIT	4	4	8	192
Purdue	5	3	8	232
North Texas	4	2	6	68
Ohio State	4	2	6	406
Stanford	5	1	6	57
Virginia Tech	4	2	6	247

49 Programs averaged one or fewer African American Degrees per year
10 Programs had zero African American Degrees in a given year

Sparseness – state of few and scattered

ASEE Data for MSE Programs 2013-2017

School	African American Fraction	State Fraction African American
Alabama at Birmingham	18.1%	26.4%
Alabama	15.4%	26.4%
Columbia	11.1%	15.2%
Stanford	10.7%	6.7%
Pittsburgh	9.3%	10.8%
North Texas	9.2%	11.9%
Tennessee-Knoxville	6.1%	16.8%
Georgia Tech	5.8%	31.4%
Cincinnati	5.3%	12.0%
Clemson	5.2%	28.5%
Florida	4.9%	15.9%
Michigan	4.6%	14.2%
Wisconsin	4.5%	6.1%

State	Fraction
Mississippi	37.3%
Louisiana	32.4%
Georgia	31.4%
Maryland	30.1%
South Carolina	28.5%
Alabama	26.4%
North Carolina	21.6%
Delaware	21.0%
Virginia	19.9%
Tennessee	16.8%

Cohort-Based "Scholar" STEM Programs

My Experiences

Preparing for Grad School

Meyerhoff Scholars at UMBC*

MARC/RISE/BRIDGES Programs at San Francisco State University*

Preparing to Graduate

Metro College Success Program at San Francisco State University

Meyerhoff Scholars

- Since 1993 – Over 1100 students as of October 2017:
- Alumni -> 273 PhDs-   76 MD-PhDs, 1 DDS/PhD and 1 DVM/Ph.D, 107 MDs
- Over 300 alumni are currently enrolled in graduate and professional deg programs.
- 260 students enrolled 2017-2018 academic year 63% are African American,
   15% Caucasian, 11% Asian, 10% Hispanic, 1% Native American.

Students are 5.3 times more likely to have graduated from or be currently attending a STEM Ph.D. or M.D./Ph.D. program than those students who were invited to join the program but declined and attended another university.

Meyerhoff Scholars

1. Recruitment 2,000 nominations & enrolls approximately 50 new students each year. The top 100-150 applicants and their families are invited to attend an on-campus selection weekend

2. Financial Aid   **3. Summer Bridge** Mandatory pre-freshman 6-week Summer Bridge

4. Program Values   **5. Study Groups**   **6. Program Community**

7. Personal Advising and Counseling   **8. Tutoring**   **9. Summer Research Internships**   **10. Mentors**   **11. Faculty Involvement**   **12. Administrative Involvement and Public Support**

13. Family Involvement

Meyerhoff program has been used to *study* UMBC campus culture
Being replicated at Penn State, UNorthCarolina
"We Care"

Commencement

Alicia Garza, MS, Co-Founder Black Lives Matter
SF State Commencement, Spring 2017

Commencement

UMBC

Discomfort
Diversity
Gratitude

Eudorah Vital

Meyerhoff Scholar
HHMI Scholar
MARC U-STAR Scholar
Biochemistry & Molecular
Biology

will attend Emory U for
MD/PhD Program

UMBC May 2018 CNMS COEIT Grad
@33 minutes in

https://www.youtube.com/watch?v=neKFFyTHeBU

Cohort-Based "Scholar" STEM Programs
My Experiences

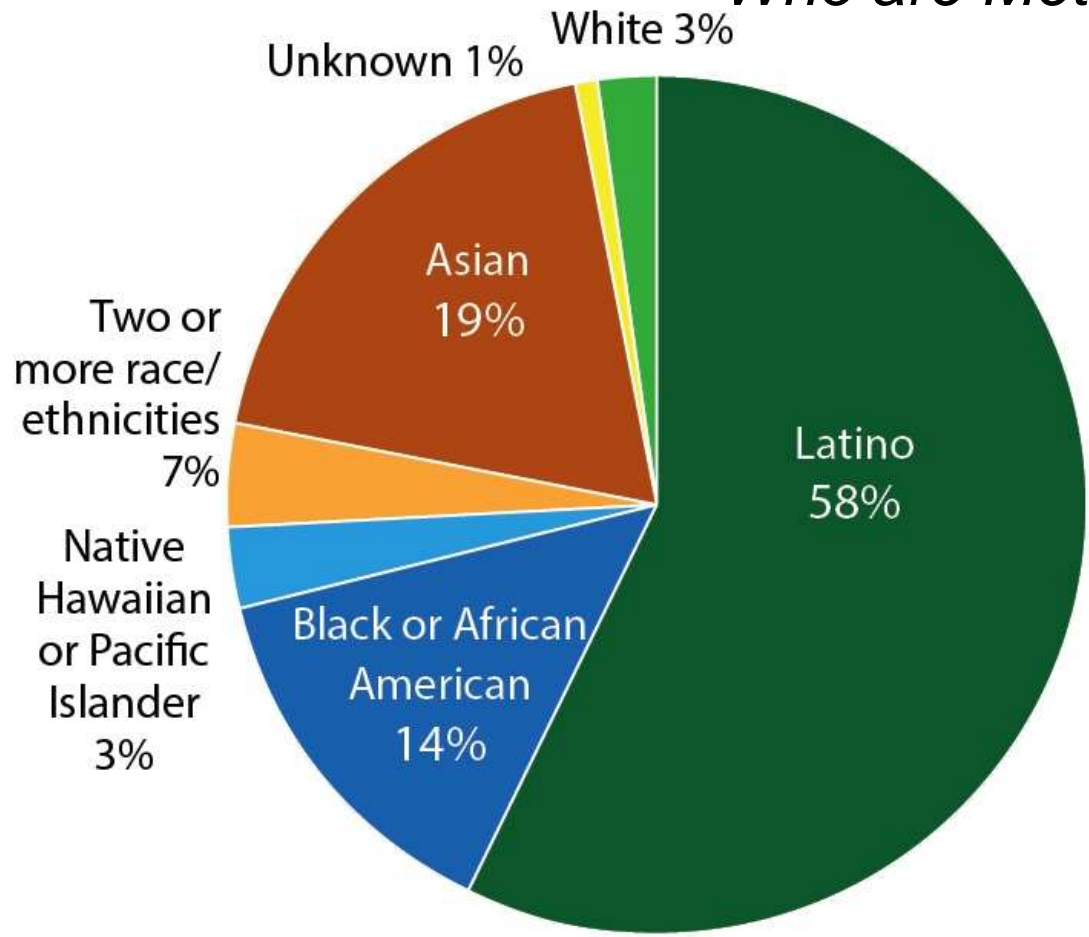**Preparing for Grad School**
Meyerhoff Scholars at UMBC*

MARC/RISE/BRIDGES Programs at San Francisco State University*

Preparing to Graduate
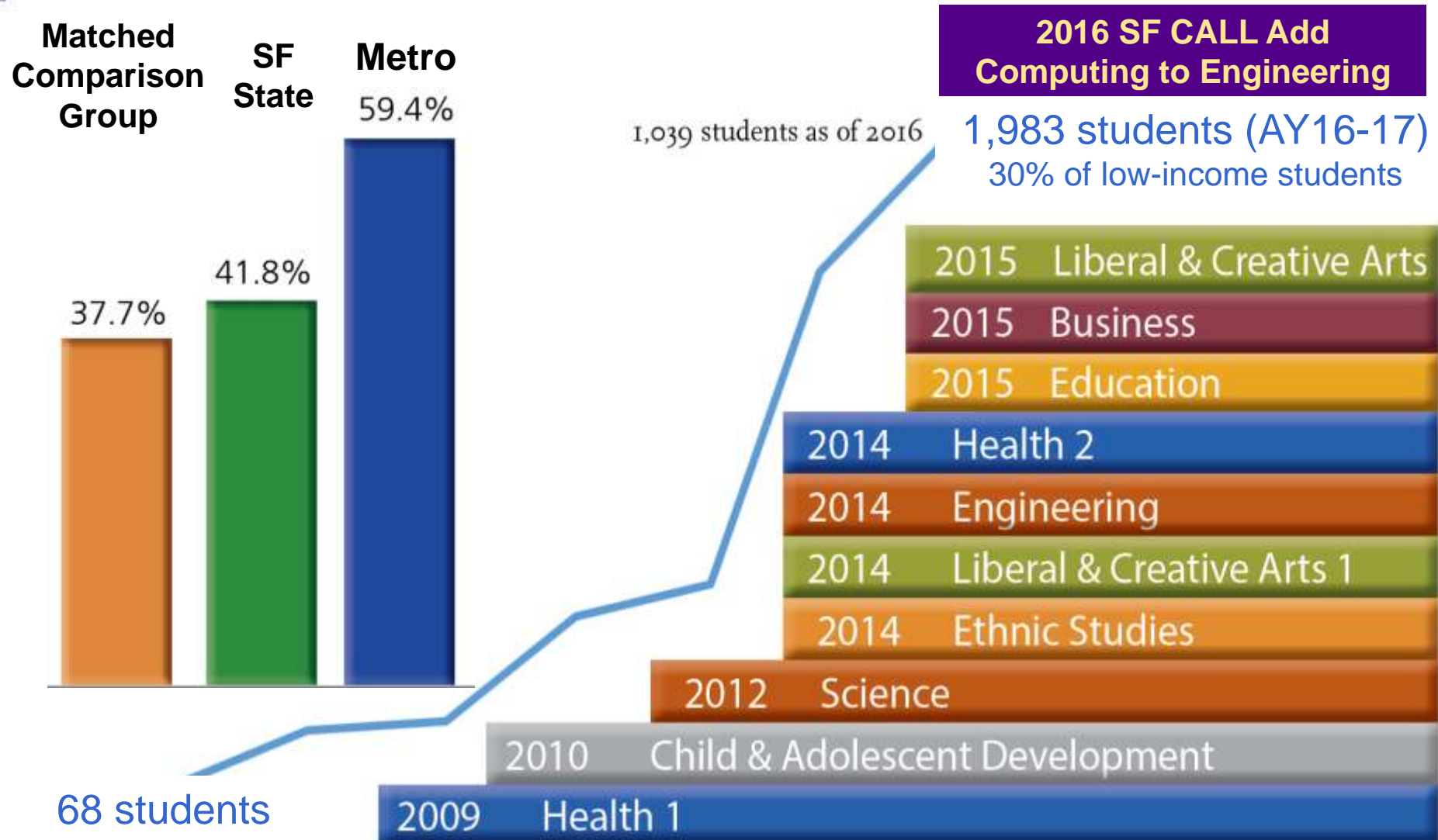Metro College Success Program at San Francisco State University

Who are Metro students at SF State?
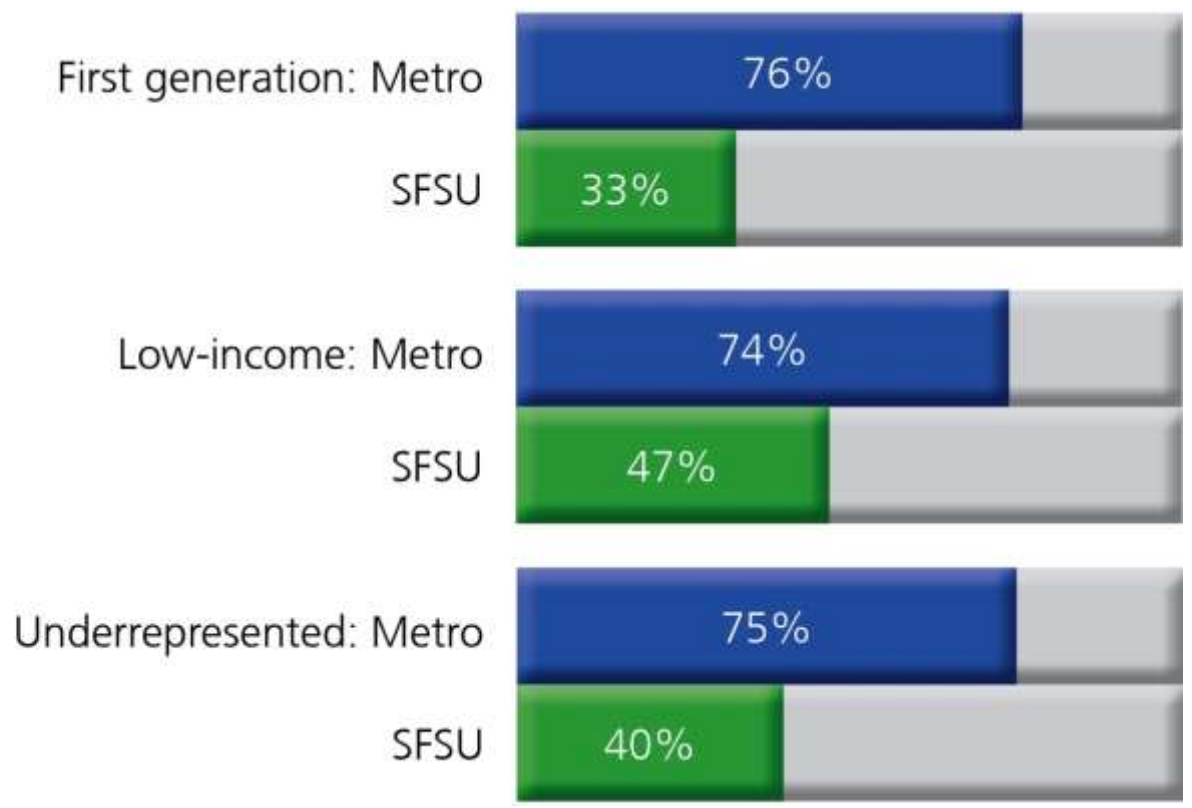
Professor and Director Mary Beth Love

Metro students graduate in 5 years at a rate almost **22 percentage points higher** than the matched comparison group.

UMBC

Matched Comparison Group 37.7%

SF State 41.8%

Metro 59.4%

1,039 students as of 2016

2016 SF CALL Add Computing to Engineering

1,983 students (AY16-17)
30% of low-income students

2015 Liberal & Creative Arts
2015 Business
2015 Education
2014 Health 2
2014 Engineering
2014 Liberal & Creative Arts 1
2014 Ethnic Studies
2012 Science
2010 Child & Adolescent Development
2009 Health 1

68 students

Professor and Director Mary Beth Love

A Community of Students and Faculty Each Metro academy is a "school within a school," serving as a personalized educational **home** for students. Faculty, advisors and students in Metro work together in a learning **community**.

Advising and Tutoring Metro students receive one-on-one support from a dedicated academic advisor. Metro advisors help students stay on track with their course selection for speedy graduation. Metro **tutors** are readily available for extra support, particularly in math and English. *(Supplemental Instruction – Peer Taught Tutorials)*

Classes You Need to Graduate Quickly All Metro classes satisfy graduation requirements in general education for all 78 majors offered at SF State. Real-World and Engaging Courses Metro courses share a common theme of *social justice and relevant real-world issues. Metro students learn how to give back to their **community** and make a difference in the world.*

Early Exposure to a Variety of Majors Metro students are grouped in **communities** to prepare for a variety of majors and fields of interest. For the latest listing of current Metro Academy themes, visit metro.sfsu.edu

Cohorts, Community & Commencement

Focus

Themes

Relevant

Family

Community

Give Back – Change the World

$

MSE Programs

- MSE BS Degrees comprise ~1.6% of all engineering BS Degrees

- MSE Faculty comprise ~3.6% of all engineering tenure-track faculty

- Class sizes for majors are small compared to other engineering majors – Average ~26

- Undergrad Student-Faculty ratios are small compared to other engineering majors -

    ~9:1 (vs 24:1)

- We have capacity for undergrad research

- We have a manageable context to foster community and connectivity

USNEWS Undergrad Ranking	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
Top 15	26	26	28	51	39	44	37	60	44	47	
	0	0	1	1	3	4	0	3	0	1	3.2%
Top 10	36	26	23	29	23	30	48	41	69	91	
	1	2	1	1	0	1	2	2	4	4	4.3%
Top 10	25	26	34	25	30	28	27	29	21	36	
	0	0	1	0	0	0	0	0	0	0	0.4%
Top 10	47	37	74	56	63	84	88	107	102	101	
	1	1	0	1	1	1	0	0	0	2	0.9%
Top 10	35	48	34	54	48	56	50	68	56	62	
	1	1	2	5	1	1	2	2	3	3	4.1%
Top 10	18	21	21	20	9	17	17	17	28	27	
	0	0	0	0	0	0	0	0	1	0	0.5%

UMBC

What does it mean if the programs we consider
top-ranked and excellent are also among our least diverse?

MSE Programs

-We can do better- just one more African American degree per program per year would double the number produced

-Connect with NSBE, SHPE, SACNAS chapters on your campus

-Support your university's diversity leaders & programs

-Work with your student orgs on collaborative events

-Engage your department community

-Consider your department culture – and how it does or does not welcome all

-How have you and all of your colleagues worked to be informed on implicit bias, stereotype threat . . .?

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My commitment:

Be courageous in sharing information, asking questions and fostering change to advance inclusion