Why is it a great time to put your interest in science or math towards a degree in engineering?

✓ Starting salaries in engineering are far higher than the U.S. average.*

✓ There is solid growth outlook for jobs in engineering fields through 2024, especially in areas like biomedical and computer science engineering.**

Students who build a strong foundation in math and science in high school will have the opportunity to major in engineering, and eventually build a career where creativity, innovative thinking, and a wish to make a tangible difference in the world can be applied.

** TOP 5 SCHOOLS AWARDING THE MOST BACHELOR’S DEGREES IN ENGINEERING **

1 University of Illinois, Urbana-Champaign†
2 Georgia Institute of Technology†
3 Virginia Tech†
4 Purdue University†
5 The Pennsylvania State University

Source: American Society for Engineering Management, ASEE.org, "Engineering By the Numbers" (2015) by Brian L. Yoder, Ph.D.
† NACME Partner Institution

(Continued on page 2)
Opportunities for Innovation (Continued)

Bioengineers at UCLA are pioneering uses for the ‘handblade,’ an engineering solution that allows scientists to slice through a cell’s membrane and insert mitochondria. This procedure can help researchers, particularly with infectious diseases.

CHEMICAL ENGINEERING: Chemical engineers discover and manufacture products like plastics, paints, fuels, medicines, fertilizers, semiconductors, paper, and all other kinds of chemicals. One of the hot issues for chemical engineers in the U.S. is the advancement of solar power as an alternative energy source. The U.S. Department of Energy’s SunShot Initiative is working with college campuses and universities to make it easier to convert to solar energy and ease the financial burden of powering their campuses.

COMPUTER ENGINEERING: Computer engineers design, construct, implement, and maintain computers and computer-controlled equipment. MIT researchers are working towards a hack-proof RFID chip, which could help prevent identity theft and increase credit card security. Texas Instruments is working to produce prototypes of the technology.

MECHANICAL ENGINEERING: Mechanical engineers work in nearly every area of technology, developing anything that involves a mechanical process, from cars and snowmobiles, to rockets and nuclear reactors. Used in 16 labs around the world, the surgical robot Raven continues to evolve. Surgical robots are designed to be minimally invasive to the body, using a laparoscopic approach.

There are many resources available to help you research which college to attend, but students interested in engineering have some unique factors to take into consideration.

ACCREDITATION
ABET is the accreditation organization for applied science, computing, engineering, and technology. Accredited engineering programs offer proof to employers—and to you, as a student—that graduates of these programs are prepared to enter their professions.

Because employers recognize that ABET-accredited programs provide students with a solid educational foundation, companies looking to hire engineers prefer graduates from these programs.

Once you have matched up your interests to a concentration, you can focus your search on the schools offering that specific program.

Other benefits of attending an accredited engineering program include:

• Assurance that the program considers the students’ perspective as part of its continual quality improvement process
• Eligibility for federal student loans, grants, and scholarships
• Qualification for many professional licenses, registrations, and certifications
• Opportunities to practice engineering in international locations

To see the entire list of ABET-accredited engineering colleges, visit http://main.abet.org/apis/AccreditedProgramsSearch.aspx.

AREA OF STUDY
Whether you want to work on computers or spacecraft, develop new medicines or recycling equipment, or find solutions for pollution, communication, or transportation problems, there is an area of engineering to fit your career goals.

The National Action Council for Minorities in Engineering, Inc. (NACME) provides detailed descriptions of the different areas of study in the NACME Guide to Engineering Colleges at www.nacme.org/middle-high-school-programs. Or contact webmaster@nacme.org for a hardcopy.

Discover Engineering at FDU

EARN A COMPETITIVE DEGREE
Do you want to develop new methods of harnessing green energy? Protect against cyber attack? Create the next breakthrough in telecommunications? A Fairleigh Dickinson University education will take your innovative skills to the next level and prepare you for a future at the frontier of engineering.

Located in Teaneck, NJ, FDU offers an exceptional array of programs. With an emphasis on practical learning, our students engage in cutting-edge research using the latest technologies in our professional labs. It’s no surprise that they shine in top regional competitions and are sought out by leading employers in their fields.

Visit our Metropolitan campus to explore all that our engineering programs have to offer. Our Fall Open House is on Sunday, November 13.

fdu.edu/visit
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(Continued on page 5)
A Tradition of Innovation

Founded in 1754, Columbia University is at once a small college and a major research university: an Ivy League education on a human scale. Columbia Engineering offers professional-level courses, hands-on design projects, and research and internships both in New York City and around the world. Our students also get access to experiences on and off campus—like working in teams to solve engineering challenges for real companies—that complement classroom learning.

It’s a combination you can’t find anywhere else.

Engineering at Johns Hopkins

Small community, big resources.

As America’s first research institution, Hopkins emphasizes the importance of exploration across disciplines. The Hopkins global research network provides unparalleled resources for innovative discovery.

Academic freedom.

With no core curriculum, Hopkins students can combine academic passions and find influential and interesting ways to meaningfully contribute to society’s ever-evolving issues. As a part of this community, undergraduates run with projects of their own design and work alongside experts who share their passions.

Learn to lead.

With its full-time engineering programs in nine academic departments, students have many options to explore engineering and beyond. This tight-knit team of students and faculty, along with strong university support, allows students to construct new academic paths with double majors, minors, and pre-professional programs.

Quick Stats:

3rd oldest engineering school in the US

50+ engineering majors and minors, including liberal arts options

$1 billion in sponsored research projects each year

50% self-identify as students of color

$140 million in scholarships and grants awarded annually to undergraduates

200+ research centers and facilities across Columbia

Learn more: apply.jhu.edu

Get your hands dirty.

Hands-on learning is a hallmark of a Hopkins education. Students have access to experiences on and off campus—like working in teams to solve engineering challenges for real companies—that complement classroom learning.

U.S. POPULATION... AND STEM

30% Current U.S. population of African Americans, American Indians/Alaska Natives, and Latinos

40% Estimated U.S. population of these groups by 2050

Groups like NACME are working with partners everywhere to increase the number of URMs in STEM fields.

NACME Scholar Professional Raymond C. Dempsey, Jr. says…

“As a NACME Scholar and beneficiary… I understand the need and the challenge we face to shape an engineering workforce that looks like America.”

— Raymond C. Dempsey, Jr., Vice President and Head of External Affairs, BP Americas; President, BP Foundation; Board Director and Vice Chairman, NACME, Inc.

Learn more about NACME on page 8.
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COMMUNITY COLLEGE

Low tuition, convenient locations, open admissions, and comprehensive course offerings are among the reasons many students choose to begin at community colleges. These colleges also play an important role in producing engineers. Transfer and articulation agreements permit students to complete math, science, and introduction to engineering courses at community colleges before transferring as juniors to four-year schools of engineering.

The landmark 2010 NACME Community College Transfer Study found that 21% of NACME Scholars had transferred from a two-year community college to a four-year NACME Partner Institution; NACME transfer students achieved higher grade point averages than traditional, four-year NACME Scholars; and transfer students were more likely than those who had started at four-year schools to be retained (enrolled or graduated) as of the 2008–2009 academic year. Learn more about NACME on page 8.

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Learn to lead.

With 19 full-time engineering programs in nine academic departments, students have many options to explore engineering and beyond: This tight-knit team aligning with strong university support, allows students to construct novel academic paths with double majors, minors, and pre-professional programs. They have developed business plans around novel technologies, become entrepreneurs, invested, and invented—all as Hopkins undergraduates.

Get your hands dirty.

Hands-on learning is a hallmark of a Hopkins education. Students have access to experiences on and off campus—like working on teams to solve engineering challenges for real companies—that complement classroom learning.

RANKINGS

While you ultimately want to find your best fit, examining college rankings is one way to compare prospective schools. To see school rankings for engineering, you can look at the U.S. News & World Report list, found at http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/engineering. Or, to view schools based on student ratings, such as “best professors,” “fits of race/class interaction,” or “best career services,” you can explore The Princeton Review’s Best 381 Colleges, or view the ratings online at www.princetonreview.com/college-rankings.

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Quick Stats:

- WHITING SCHOOL OF ENGINEERING

- 0.1 ENGINEERING UNDERGRADUATE-FACULTY

- 113.2 MILLION IN RESEARCH FUNDING (FY16)

- 70%+ UNDERGRADS PARTICIPATE IN RESEARCH

Learn more: apply.jhu.edu

“no one place in the world will you find so many interesting individuals that are not only incredibly smart but are also extremely passionate about the things they are doing.”– Jorge J., ’18

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While much of the preparation for a career in engineering takes place during college, the earlier you start preparing, the more confident you will feel about your future.

Preparation for Your Major

HIGH SCHOOL ACADEMICS
The courses you take in high school will help prepare you for a college engineering program. Check with the college or university you’re interested in for exact requirements, but the typical standards are:

- **English:** 4 Years
- **Math:** 4 Years, including algebra, geometry, and calculus
- **Science:** 3–4 Years, including physics if possible
- **Social Sciences:** 2–4 Years
- **Foreign Language:** 2–4 Years

IMPROVING SAT AND ACT QUANTITATIVE SCORES
Standardized test scores are just one part of the application package. Still, for students who want to go into engineering, doing well on the quantitative sections of either test indicates to admissions representatives that you can handle the math necessary for your major.

Whether you want to improve your scores on the SAT and/or ACT or you’re getting ready to take the test for the first time, there are several things you can do to prepare for the quantitative sections.

- **Familiarize yourself with question types.** While you cannot predict every question on the test, you can prepare for the types of questions you will encounter. Having a problem-solving strategy for various question types will allow you to identify an approach to use for each question, even when you come across one that looks particularly challenging.

- **Look for multiple ways to solve problems.** Often, the questions on the math portions of the ACT and SAT may look difficult at first glance. However, if you take a few seconds to evaluate them, it may save you time overall. For example, a question appearing to require repeated division and multiplication of large numbers may actually be simplified using factoring.

- **Write down your work and draw diagrams.** Writing down your thought process may help you get to the answer faster than if you try to perform calculations in your head. It also allows you to easily go back and check your work. Finally, showing your work or drawing diagrams can help you avoid careless mistakes and give you a clearer picture of what the question is asking.

- **Use the process of elimination.** There is no penalty for wrong answers on the ACT, and while you will be penalized a quarter of a point for each wrong answer on the SAT, your score may still be improved by guessing. For example, if you can eliminate one answer choice (out of the five options) for each of eight questions, statistically, you will answer 25%, or two, of the questions correctly. Even accounting for the penalties, you will have gained half a point.

- **Identify the areas that need improvement.** After taking a practice test, decide whether you need to improve your time management, decrease the number of careless mistakes you make, or simply review math content. Then, focus your practice on improving those specific areas.

For more tips on preparing for the ACT and SAT, free practice tests, or tutoring options for improving your scores, visit [http://www.princetonreview.com](http://www.princetonreview.com) and click on Test Prep.

American Society for Engineering Education (ASEE)

The American Society for Engineering Education brings together engineering instructors from all engineering fields to promote excellence in instruction, research, public service, and practice.

ASEE’s Diversity Committee partners with other organizations to increase diversity in the profession. The committee provides models and guides for engineering colleges on attracting minority students, encourages schools to work with successful programs for diversity promotion, and offers a prestigious award for colleges achieving key diversity goals.

For more on ASEE’s commitment to diversity, visit [www.asee.org/about-us/policy/diversity](http://www.asee.org/about-us/policy/diversity).

ENGINEERING RESOURCES

FOR MORE INFORMATION ON THE FIELD OF ENGINEERING, AND TO KEEP UP WITH THE LATEST NEWS AND TRENDS IN SPECIFIC AREAS, VISIT THE RESOURCES BELOW.

- American Academy of Environmental Engineers (AAEAE) [AAAE.org](http://www.aaae.org)
- American Indian Science and Engineering Society (AISES) [AISES.org](http://www.aises.org)
- American Institute of Aeronautics and Astronautics (AIAA) [AIAA.org](http://www.aiaa.org)
- American Institute of Chemical Engineers (AIChE) [AIChE.org](http://www.aiche.org)
- American Society of Agricultural and Biological Engineers (ASABE) [ASABE.org](http://www.asabe.org)
- American Society of Civil Engineers (ASCE) [ASCE.org](http://www.asce.org)
- American Society for Engineering Education (ASEE) [ASEE.org](http://www.asee.org)
- American Society of Mechanical Engineers (ASME) [ASME.org](http://www.asme.org)
- American Society for Metals (ASM) [ASInternational.org](http://www.asme.org)
- Architectural Engineering Institute (AEI) [AEI.org](http://www.aei.org)
- Biomedical Engineering Society (BMES) [BMES.org](http://www.bmes.org)
- Engineering Technology Education (ETE) [ETEeducation.org](http://www.etteeducation.org)
- Institute of Biological Engineering (IBE) [IBE.org](http://www.ibe.org)
- Institute of Electrical and Electronics Engineers (IEEE) [IEEE.org](http://www.ieee.org)
- Institute of Industrial & Systems Engineers (IISE) [iiense.org](http://www.iiense.org)
- International Council on Systems Engineering (INCOSE) [INCOSE.org](http://www.incose.org)
- Latinos in Science and Engineering (Mexican American Engineering Society - NAMEPA) [NAMEPA.org](http://www.namepa.org)
- National Action Council for Minorities in Engineering, Inc. (NACME) [NACME.org](http://www.nacme.org)
- National Association of Multicultural Engineering Program Advocates (NAMEPA) [NAMEPA.org](http://www.namepa.org)
- The National Society of Black Engineers (NSBE) [NSBE.org](http://www.nsbe.org)
- National Society of Hispanic Professional Engineers (SHPE) [SHPE.org](http://www.shpe.org)
- Society of Mining, Metallurgy and Exploration (SME) [SMENET.org](http://www.smenet.org)
- Society of Petroleum Engineers (SPE) [SPE.org](http://www.spe.org)
- Society of Women Engineers (SWE) [SWE.org](http://www.swe.org)
- Women in Engineering ProActive Network (WEPAN) [WEPAN.org](http://www.wepan.org)

FAQ

Common questions students have about preparing for college.

- **A:** What is the first step I should take if I want to attend college?  
  **Q:** You should meet with your high school guidance counselor to get some basic information, as well as visit college websites to find out about admissions requirements.

- **A:** What can I do to improve my chances of being admitted to college?  
  **Q:** Colleges consider a wide range of factors when looking at your application, so your best bet is to focus on making yourself an exceptional candidate. Make sure to keep your high school GPA up and take challenging courses; Work hard to get a good score on standardized tests, such as the SAT and ACT; Become involved in community service and extracurricular activities; Take time crafting your personal statement and give teachers plenty of advance notice if you would like them to write a letter of recommendation for you.

- **A:** Can I afford to attend college?  
  **Q:** There are many sources of financial aid available to help you pay for college. See page 16 for more details about resources specifically for engineering students.
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- American Society of Agricultural and Biological Engineers (ASABE) ASABE.org
- American Society of Civil Engineers (ASCE) ASCE.org
- American Society for Engineering Education (ASEE) ASEE.org
- American Society of Engineering Education (ASEE) ASEE.org
- American Society of Mechanical Engineers (ASME) ASME.org
- American Society for Metals (ASM) ASMInternational.org
- Architectural Engineering Institute (AEI) ASEE.org/AEI
- Biomedical Engineering Society (BMES) BMES.org
- Engineering Technology Education (ETE) ETEducation.org
- Institute of Biological Engineering (IBE) IBE.org
- Institute of Electrical and Electronics Engineers (IEEE) IEEE.org
- Institute of Industrial & Systems Engineers (IISE) Iisieet.org
- International Council on Systems Engineering (INCOSE) INCOSE.org
- Latinos in Science and Engineering (MEXAS) LS&E.org
- The National Society of Black Engineers (NSBE) NSBE.org
- National Association of Multicultural Engineering Program Advocates (NAMEPA) NAMEPA.org
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- Society of Mining, Metallurgy and Exploration (SME) SME.NET
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- Society of Women Engineers (SWE) SWE.org
- Women in Engineering ProActive Network (WEPAN) WEPAN.org

For more information about ASEE’s Diversity Initiative, visit www.asee.org/diversity.
Engineering: Current Trends

(Continued from page 1)

This growth translates to degrees conferred as well. There were 106,658 engineering bachelor’s degrees awarded in 2015, a 7.5% increase from 2014.

While both college enrollment rates and degrees conferred have trended upwards in the past 30 years, underrepresented minority (URM) groups still lag behind in their representation in the field of engineering. While URMs make up more than 31% of the U.S. population and 36% of all college-aged students, we still see lower numbers in engineering enrollment and degrees conferred. In 2015, all URM groups inched up a few tenths, but as you can see, there is still work to do to grow the field among these groups.

PERCENTAGE OF ENGINEERING DEGREES CONFERRED, BY GROUP

<table>
<thead>
<tr>
<th>URM Group</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>Black/African American</td>
<td>4.0%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>10.7%</td>
<td>10.1%</td>
</tr>
<tr>
<td>Other*</td>
<td>3.1%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Asian</td>
<td>13.4%</td>
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*Other includes: American Indian, Hawaiian/Pacific Islander, and two or more ethnicities.

With the need for American engineers growing, college engineering departments are working to improve these figures. Attracting bright, eligible minority applicants into engineering programs is a top priority for many schools. In order to improve the numbers, organizations like NACME look to both increase the number of enrollees from URMs, as well as provide support for retention programs, so students can stay enrolled and be successful on campus.

“The need for talented individuals in science, technology, engineering and mathematics fields has never been greater. Diversity drives innovation and its absence imperils our designs, our products, and, most of all, our creativity—all components of competitiveness. Increasing diversity in STEM opens the doors for new approaches to solving problems, driving bottom line results, and allows for new ways of thinking and, therefore, the potential for greatness.”

—Dr. Irving Pressley McPhail, NACME President and Chief Executive Officer

JOB GROWTH

Engineering continues to be an in-demand profession, growing fast and providing higher than average starting salaries than many other professions that require a bachelor’s degree. The U.S. projects 4% growth in engineering jobs through 2024.


Particularly strong areas for job growth are predicted in biomedical engineering (23% through 2024). The greater demand for biomedical engineers is a result of a growing aging population (baby-boomers) who will require more medical care. Engineering students looking to improve the quality of patient care will be well suited to find a job in the booming health care industry as well as make a difference in people’s lives.
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*Other includes: American Indian, Hawaiian/Pacific Islander, and two or more ethnicities.

With the need for American engineers growing, college engineering departments are working to improve these figures.

Attracting bright, eligible minority applicants into engineering programs is a top priority for many schools. In order to improve the numbers, organizations like NACME look to both increase the number of enrollees from URMs, as well as provide support for retention programs, so students can stay enrolled and be successful on campus.

“...the need for talented individuals in science, technology, engineering and mathematics fields has never been greater. Diversity drives innovation and its absence imperils our designs, our products, and, most of all, our creativity—all components of competitiveness. Increasing diversity in STEM opens the doors for new approaches to solving problems, driving bottom line results, and allows for new ways of thinking and, therefore, the potential for greatness.”

—Dr. Irving Pressley McPhail, NACME President and Chief Executive Officer

INCLUSION SPARKS INNOVATION. IT FLAMES THE PASSION THAT DRIVES US TO SUCCEED. IT CREATES THE SPACE WHERE IDEAS CAN GROW. AND THE OPPORTUNITY FOR NEW VOICES TO BE HEARD. BECAUSE THE BEST IDEAS AREN’T FORMED IN A BUBBLE.
### Starting Salary

<table>
<thead>
<tr>
<th>Field</th>
<th>Starting Salary 2016</th>
<th>Median Salary 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum Engineering</td>
<td>$98,250</td>
<td>$129,990</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>$65,000</td>
<td>$111,730</td>
</tr>
<tr>
<td>Aerospace/Aeronautical</td>
<td>$64,000</td>
<td>$107,830</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>$68,000</td>
<td>$97,360</td>
</tr>
<tr>
<td>Materials Engineering/Science</td>
<td>$65,000</td>
<td>$91,310</td>
</tr>
<tr>
<td>Mechanical Engineer</td>
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</tr>
<tr>
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</tr>
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### National Action Council for Minorities in Engineering, Inc. (NACME)

(Continued from page 8)

Another high-growth area for engineering is environmental engineering, with a 12% projected job growth through 2024. As the U.S. looks to diversify energy sources, reduce its carbon footprint and increase energy efficiency, creative minds will be needed in the field of environmental engineering.


### Engineering Fields with High Job Growth

- Biomedical Engineering - 23%
- Environmental Engineering - 12%
- Civil Engineering - 8%
- Mechanical Engineering - 5%

Another high-growth area for engineering is environmental engineering, with a 12% projected job growth through 2024. As the U.S. looks to diversify energy sources, reduce its carbon footprint and increase energy efficiency, creative minds will be needed in the field of environmental engineering.


### Top 3 Fields of Engineering Employment, By Underrepresented Minority Group

**Black or African American**
1. Computer Hardware Engineers
2. Electrical and Electronics Engineers
3. Mechanical Engineers

**Hispanic or Latino**
1. Aerospace Engineers
2. Computer Hardware Engineers
3. Industrial Engineers

### SALARY

While salaries always vary by region and sector (public or private), many engineers in the U.S. tend to see median salaries that well above the national median wage of $36,200.


The figures below show the starting salary in 2016 and the median pay in 2014 for engineering occupations, as reported by the National Association of Colleges and Employers (NACE) and the U.S. Bureau of Labor and Statistics Occupational Outlook Handbook.

### NACME 2016 Facts:

- NACME Scholars graduate at 2X the rate of other URMs and nearly 1.5X the rate of non-minority students. 79.1 percent graduate in six years, compared to 39.3 percent of non-NACME Scholar URMs and 60.3 percent of non-minority students, at NACME Partner Institutions.
- One-third of NACME Scholars are first-generation college students.

Learn More about NACME Visit [www.nacme.org](http://www.nacme.org)

Connect with peers and build your engineering network on social media…

Facebook.com/NACME.org
twitter.com/NACME

Speak Spanish? Habla español?
In The NACME Guide to Engineering Colleges, you can find information on choosing a college, as well as a timeline for applying, all in Spanish.

Visit [www.nacme.org/middle-high-school-programs](http://www.nacme.org/middle-high-school-programs) to view the guide online. Or contact webmaster@nacme.org for a hardcopy.
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(Source: BLS, Occupational Outlook Handbook)

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Gearing Up for Success

In order for the U.S. to maintain the scientific leadership it has exhibited over the years, minority participation in the STEM fields (science, technology, engineering, and mathematics) is crucial.

Many organizations across the country are already implementing initiatives to prepare and motivate minority students to enter science and engineering professions. Their efforts range from encouraging students to become interested in science to expanding reforms in undergraduate education so more students in underrepresented minority groups graduate.

Underrepresented minorities “represent a largely untapped pool of American talent that could help fill the coming wave of STEM jobs.” (Convergence: Diversity and Inclusion, March 2012, report by NAS, NAE, and the Institute of Medicine). African Americans, American Indians, and Latinos make up 34% of the American population, yet they account for less than 15% of the engineering degrees conferred in 2015.

PROVIDING THE RIGHT FOUNDATION FOR COLLEGE

A rigorous high school curriculum is essential for students intending to study engineering in college. Do you love math? Interested in science? Excited about new technology? Then engineering is worth investigating.

What high school classes pave the way for success in college engineering?

- Geometry
- Calculus
- Chemistry
- Trigonometry
- Physics
- Biology

When possible, take honors or AP courses in math and the sciences. If you are interested in biomedical engineering, then biology is important. And if chemical engineering is in your future, then chemistry is a must.

All engineers need to be strong communicators, so don’t neglect classes in English or areas like history, which can help strengthen your oral and written communication skills.

Scholars of Excellence in Engineering and Computer Science (SEECS) Scholarship Program

- Receive a scholarship of up to $8,000
- Engage in one-in-one faculty expert mentoring and research
- Participate in professional and personal enrichment courses
- Apply engineering to real-world community service projects
- Experience hands-on learning while using emerging technology, such as robotics, 3D printing and motion analysis

A rigorous math and science foundation can help students succeed in college.

Find Out More!

CALL | 1-800-GANNON-U
ONLINE | gannon.edu/seeecs
EMAIL | seeecs@gannon.edu
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Students applying to these programs at Gannon are automatically reviewed for this NSF scholarship program.

Find Out More!

CALL | 1-800-GANNON-U
ONLINE | gannon.edu/seeecs
EMAIL | seeecs@gannon.edu

Gearing Up for Success

The National Science Foundation is a federal agency promoting the progress of science by funding research at America’s colleges and universities. For engineering majors, research funding is an important consideration. Schools receiving the largest amount of Science & Engineering funding for fiscal year 2014:

Top 5 Colleges with S & E Funding:
1. Johns Hopkins University
2. University of Michigan
3. University of Washington
4. University of California, San Diego
5. University of Pennsylvania

Highest S & E funding among historically black colleges:
1. Morehouse School of Medicine
2. North Carolina A&T State University
3. Howard University
4. Tennessee State University
5. Tuskegee University

Highest funding among schools with high enrollment of Hispanics (> 25%):
1. University of New Mexico
2. New Mexico State University
3. University of California, Santa Cruz
4. University of Texas, Health Science Center at San Antonio
5. University of California, Riverside

For more information visit http://nsf.gov

Wei Look at Things Differently.

In Marquette University’s Opus College of Engineering, we don’t just solve problems. We challenge ourselves to ask tough questions and find solutions that lead to change. We are diverse thinkers from different backgrounds with unique experiences and talents. Here, you’ll learn the impact you can have through service opportunities in the community and across the globe. You’ll discover possibilities you didn’t know existed, be encouraged to dream, create and explore. Here, you’ll understand what it means to Be The Difference.

marquette.edu/engineering

find your Possibility

Are you interested in majoring in one of the following programs?

- Biomedical Engineering
- Computer Science
- Electrical Engineering
- Environmental Engineering
- Industrial Engineering
- Information Systems
- Mechanical Engineering
- Software Engineering

You may qualify for a scholarship!

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| POSSIBILITIES |
| Biomedical Engineering | Computer Science |
| Electrical Engineering | Information Systems |
| Environmental Engineering | Mechanical Engineering |
| Industrial Engineering | Software Engineering |

You may qualify for a scholarship!
When everything New York City holds lies just outside a quintessential college campus, the opportunities are endless.

CHOSE AN AREA OF ENGINEERING

Current NACME Scholars choose the following areas of engineering (2015-2016):

- Mechanical - 20%
- Electrical - 14%
- Other Engineering (Aerospace, Petroleum, etc.) - 14%
- Computer - 12%
- Civil/Environmental - 11%
- Chemical - 10%
- Biomedical/Bioengineering - 6%
- Industrial and Operations Research - 5%
- Computer Science/Information/Systems/Tech - 5%
- Other (Engineering Mgt., Manufacturing Tech, Materials Science, etc.) - 3%

PARTNERING WITH INDUSTRY LEADERS

NACME is committed to partnering with colleges and universities, as well as industry leaders looking to diversity and grow the field of engineering. Looking ahead, NACME will continue to support scholars going to college, and will extend that commitment with a focus on College-to-Career success. To support this, the new NACME Career Center (careers.nacme.org) connects NACME Scholars with NACME Corporate Supporters to provide internship positions, as well as job opportunities.

For a complete list of NACME Corporate Supporters visit www.nacme.org/about-us/corporate-supporters.

STUDENT SPOTLIGHT:

AlRitia Gore
NACME Scholar, University of Akron, Biomedical Engineering

AlRitia’s foremost advice to incoming freshmen is to get involved on campus. “It will make or break your college experience. The more involved you are on campus the better, but don’t overdo yourself. Also, do not wait to get help if you feel yourself struggling in a class. Talk to your professors—they are there to help.”

AlRitia adds, “I did two co-op rotations during school at Baxter Healthcare. I learned a great deal and interacting with patients made me feel like I was making a difference. It also made me think of how happy I was to have chosen engineering. If you have the opportunity of interning or co-opering, do it. It will be time well spent.”

The National Academy of Engineering (NAE) provides engineering leadership in service to the nation. NAE’s many projects focus on the relationship between engineering, technology, and the quality of life.

One of NAE’s programs is the Diversity of the Engineering Workforce program, which aims to develop a strong domestic talent pool. The Committee on Capitalizing on the Diversity of the Science and Engineering Workforce in Industry is currently researching the best ways to guide industry policy makers toward recruitment, retention, and advancement policies for underrepresented minorities.

To learn more about the program and committee, visit www.nae.edu/Activities/Projects/Diversity.aspx.
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Funding Your Degree

To find out what you need to know about financial aid, including information about completing the FAFSA and searching for scholarships, visit www.princetonreview.com/college-advice.

There are also multiple funding opportunities offered specifically to engineering students.

NACME SCHOLARS PROGRAM

NACME provides more than $4 million in scholarships each year to underrepresented minority engineering students. The NACME Scholars Program gives grants to colleges and universities that then give money to African American, American Indian, and Latino students in engineering.

Students who wish to be eligible for these awards must be enrolled in an engineering program at one of NACME's Partner Institutions and maintain a minimum GPA of 2.5.

To learn more about available NACME scholarships and fellowships, visit the NACME Scholarship page at www.nacme.org/scholarships.

SCIENCE, MATHEMATICS AND RESEARCH FOR TRANSFORMATION (SMART) SCHOLARSHIP FOR SERVICE PROGRAM

Established by the Department of Defense (DoD), the SMART Scholarship provides full college tuition, paid summer internships, and employment after graduation in a DoD lab. Intended to increase the number of civilian scientists working in the DoD, the SMART Program offers students valuable hands-on experience while they complete their degree and guaranteed employment placement after graduation that puts them on the right track to a successful engineering career.

Learn more about SMART at smart.asee.org.

NASA AERONAUTICS SCHOLARSHIP PROGRAM (ASP)

For students in aeronautical engineering or related fields, ASP provides two years of financial support, as well as a paid summer internship at a NASA Research Center. NASA's Aeronautics Research Mission Directorate encourages new generations of motivated students to become part of the aeronautical community as highly skilled scientists or engineers.

Additional scholarship information can be found on page 23.

**YOU AS A KID?**

Where your inner-kid can play and your future self can change the world.

- Unlock your future with a degree from Oral Roberts University — a 2015 STEM Jobs Approved College.
- Test it, build it, design it, code it and calculate it with 20+ bachelor’s degrees across all STEM interests!
- Invent and discover innovative solutions through a Christian worldview built on ORU’s unique Whole Person Education — mind, body and spirit.

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oru.edu/stemkid | 800.678.8876

**I’M PREPARED. I AM A DAUGHTER OF MARSHALL**

I’m so many of my experiences in engineering at Marshall went beyond being engaging. I did not want them to end! I never felt like I was doing something because I had to; instead, I enjoyed every aspect of what was going on.”

Micheale Morgan
Marshall University Class of 2015

**DEGREES OFFERED**

- BSE, Civil Emphasis
- BS in Mechanical Engineering
- BS in Electrical and Computer Engineering

Marshall University | Huntington, WV | www.marshall.edu
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NACME Partner Institutions make a commitment to underrepresented minority engineering student success by working toward raising the aggregate GPAs of these students.

Students who wish to be eligible for these awards must be enrolled in an engineering program at one of NACME’s Partner Institutions and maintain a minimum GPA of 2.5.

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oru.edu/stemkid | 800.678.8876

**Marshall University | Huntington, WV | www.marshall.edu**

**DEGREES OFFERED**

- BSE, Civil Emphasis
- BS in Mechanical Engineering
- BS in Electrical and Computer Engineering

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Students and staff attend a National Grid Foundation event at NYU-Poly

I’M PREPARED.

I AM A DAUGHTER OF MARSHALL
Student Profile: Ley Nezifort

Ley Nezifort serves as the NACME Scholar Ambassador at the University of Central Florida (UCF) and has a summer internship with the Intel Corporation. As a NACME Scholar Ambassador, Ley serves as a point of contact between NACME, the other NACME Scholars at UCF, and the campus administration. He coordinates student participation in webinars, conferences, special NACME events, and makes sure NACME Scholars take advantage of the other opportunities available through NACME.

Ley secured a 2016 summer internship with the Intel Corporation, a NACME Board Company. Ley says, “Interning at Intel has always been one of my goals. Working as a Product Development Engineer within the Test Class team has allowed me the opportunity to work with, and learn from, some of Intel’s best engineers. Coding on a daily basis, working in the test lab, and networking with senior managers, have given me invaluable experience and helped me to focus more clearly in my professional career.”

The Next Step for Success: Retaining Engineering Talent

Raising awareness and encouraging more underrepresented minorities to consider the engineering field is just one piece of the puzzle. Retaining that talent is a critical part of the solution to grow the number of minorities in engineering to better reflect the U.S. population. As an example, more programs and support are needed to bridge the gap between the 21% of African Americans who enter college majoring in a STEM discipline and the 16% who actually graduate with one.

Partnerships from organizations like NACME, corporate partnerships, colleges and universities, and government funding all help make this happen. One example is the University of Michigan College of Engineering, which joined forces with the NACME Scholars Program to increase the representation of African American, American Indian, and Latino young women and men who are successful in engineering education and careers. There are currently 25 NACME Scholars enrolled in this program, actively seeking internships to apply their knowledge through hands-on experiences. Despite the recent ban on affirmative action in the state of Michigan, programs like this one try to rise to the challenge of enrolling and retaining top minority talent in STEM fields.

79.1%
NACME Scholars have a 79% six-year graduation rate and an average GPA of 3.3.

“The engineering curriculum can be difficult. Seek out mentors, tutors, and role models who can help and support you as I did. Don’t be afraid to ask for help in achieving your dreams.”

— Sandra Begay-Campbell is a NACME Scholar Professional with a B.S. in Civil Engineering, University of New Mexico; a M.S. in Structural Engineering from Stanford University; and is a Principal Member of the Technical Staff at Sandia National Laboratories.
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The rigor of completing an engineering degree is known. So, how do students stick it out? Mentors and role models are a huge help, as Sandra Begay-Campbell, a member of the Navajo nation, knows well from her days as a student. Sandra’s problem-solving skills and love of math steered her toward engineering, and despite a challenging undergraduate curriculum at the University of New Mexico, she wasn’t afraid to ask for help.

“The engineering curriculum can be difficult. Seek out mentors, tutors, and role models who can help and support you as I did. Don’t be afraid to ask for help in achieving your dreams.”

—Sandra Begay-Campbell is a NACME Scholar Professional with a B.S. in Civil Engineering, University of New Mexico; a M.S. in Structural Engineering from Stanford University; and is a Principal Member of the Technical Staff at Sandia National Laboratories.
Each year, DiscoverE (discovere.org) honors a select few candidates in the field of engineering. Among DiscoverE’s 2016 New Faces of Engineering was Eulises Valdovinos, a NACME Scholar at San Jose State University, who has been presented with the DiscoverE College Edition Award. Eulises is an Industrial and Systems Engineering major and is the first in his family to attend college. Eulises is paying it forward as he mentors his younger brother and is a peer advisor to more than 35 students in the MESA Engineering Program.

DiscoverE presents this College Edition Award to 13 of the nation’s most promising engineering professionals of tomorrow. These students exemplify the vision, innovation, and leadership skills that form the foundational elements of a successful engineering career.

Colleges and Universities that Award the Most Engineering Bachelor’s Degrees to...

Black or African Americans
North Carolina A&T State University
Georgia Institute of Technology
Morgan State University
Prairie View A&M University
North Carolina State University
Florida International University
Alabama A&M University
University of Central Florida
University of Florida
Southern University and A&M College
Howard University
University of Maryland, College Park

Hispanics
CSU Long Beach
University of California, San Diego
University of Puerto Rico
Florida International University
Polytechnic University of Puerto Rico
University of Texas at El Paso
California State Polytechnic University, Pomona
Texas A&M University
University of Central Florida
University of Florida
Arizona State University
University of Texas, Austin

NACME Partner Institutions are in bold
Source: ASEE.org, "Engineering by the Numbers" by Brian L. Yoder, Ph.D., 2013.

Wentworth’s Five Factors of Career Success

Wentworth offers a unique combination of five factors that help ensure career success through a seamlessly integrated program of learning, building, and doing. Yesterday’s credentials are no match for the challenges of the future—only at Wentworth do all these factors converge and prepare you for the career you envision.

Wentworth’s academic offerings are rigorous, relevant, and experiential. Our programs emphasize both curricular and extra curricular learning, enabling students from different majors to collaborate on complex projects—just as they would in the workplace.

Wentworth provides opportunities for students to identify and fulfill technical, societal, and economic needs with innovative ideas and solutions that the world has never seen before.

The Wentworth campus is conveniently located within a world-class center of technology, business, and culture. Some of the most respected institutions of higher learning, medicine, and finance are based in Boston.

Focused Academics
Innovation & Entrepreneurship
Collaboration & Partnerships
Ideal Location
Cooperative Learning

Wentworth requires two semesters of cooperative learning experiences (co-ops), where students apply classroom knowledge in real-world environments. Through co-ops, students learn to produce in actual, unpredictable work situations.

Wentworth collaborates with a host of universities, corporations, and community partners on a wide range of projects. These opportunities provide students with hands-on experience as well as important professional connections.
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- Morgan State University
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- North Carolina State University
- Florida International University
- Alabama A&M University
- University of Central Florida
- University of Florida
- Southern University and A&M College
- Howard University
- University of Maryland, College Park

Hispanics
- CSU Long Beach
- University of California, San Diego
- University of Puerto Rico
- Florida International University
- Polytechnic University of Puerto Rico
- University of Texas at El Paso
- California State Polytechnic University, Pomona
- Texas A&M University
- University of Central Florida
- University of Florida
- Arizona State University
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**Bucknell University**

**COLLEGE OF ENGINEERING**

**MAJORS**
- Biomedical engineering
- Chemical engineering
- Civil engineering
- Computer engineering
- Computer science & engineering
- Electrical engineering
- Environmental engineering
- Mechanical engineering

**FIVE-YEAR, DUAL DEGREE PROGRAMS**
- Engineering & Bachelor of Arts in Business Administration
- Bachelor of Science & Master of Science

**BUCKNELL’S COLLEGE OF ENGINEERING** is consistently ranked among the best in the country. Why? Our students receive a personal education and go on to become leaders in their careers and their communities.

**AS A BUCKNELL ENGINEERING STUDENT, YOU COULD:**
- Do undergraduate research in collaboration with a faculty mentor
- Present your work at professional conferences
- Volunteer locally, nationally or abroad
- Explore your interests outside engineering
- Become a campus leader
- Gain career experience through internships
- Join a close-knit and supportive campus community

**TELL US about yourself:**

BUCKNELL.EDU/NACME

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**Additional Scholarships**

Many other concentration-focused scholarships are available through specific organizations, including:

- **Aerospace:** SAE
  students.sae.org/scholarships/freshman/

- **Chemical:** AIChE
  www.aiche.org/students/scholarships/index.aspx

- **Electrical:** IEEE
  www.see-scholarship.org

- **Industrial:** IIE
  www.iienet2.org/Details.aspx?id=857

- **Marine:** SNAME
  www.sname.org/sname/educationoptions/scholarships/

- **Materials Science:** ASM
  www.asminternational.org/foundation/students/undergraduate

- **Mechanical Engineering:** ASME
  www.asme.org/about-asme/scholarship-and-loans

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**Engineering Workforce**

Of the many fields of engineering, some of the largest fields include mechanical, civil, and electrical engineering. The chart on the right shows the number of Black or African American, Hispanic or Latino people employed in these larger fields.

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YOU’LL GRADUATE READY FOR A SUCCESSFUL CAREER AND A FULFILLING LIFE.
- 96 percent of engineering graduates in the Class of 2015 reported being employed, in graduate school, both employed and in graduate school or volunteering within nine months of graduation.*
- Mean starting salary for Class of 2015 engineering graduates — $63,644

TELL US about yourself: BUCKNELL.EDU/NACME

* Bucknell University Class of 2015 PostGraduate Survey. One hundred percent of engineering graduates responded to the survey, fifty-eight percent of the 99 percent of the class responding to the survey supplied salary information.

Additional Scholarships

Many other concentration-focused scholarships are available through specific organizations, including:

- Aerospace: SAE
  students.sae.org/scholarships/freshman/
- Chemical: AIChE
  www.aiche.org/students/scholarships/index.aspx
- Electrical: IEEE
  www.ese-scholarship.org
- Industrial: IIE
  www.iienet2.org/Details.aspx?id=857
- Marine: SNAME
  www.sname.org/sname/educationoptions/scholarships/
- Materials Science: ASM
  www.asminternational.org/foundation/students/undergraduate
- Mechanical Engineering: ASME
  www.asme.org/about-asme/scholarship-and-loans

Engineering Workforce

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<table>
<thead>
<tr>
<th>Field</th>
<th>Black or African American</th>
<th>Hispanic or Latino</th>
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<tbody>
<tr>
<td>Aerospace Engineering</td>
<td></td>
<td></td>
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<tr>
<td>Chemical Engineering</td>
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<tr>
<td>Civil Engineering</td>
<td></td>
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<tr>
<td>Drafting and Related Occupations</td>
<td></td>
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<tr>
<td>Industrial Engineering</td>
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<tr>
<td>Mechanical Engineering</td>
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<tr>
<td>Engineering Technicians</td>
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<tr>
<td>Architects, Except Naval</td>
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<tr>
<td>Electrical and Electronics Engineering</td>
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<tr>
<td>Engineers, All Other</td>
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<tr>
<td>Computer Hardware Engineering</td>
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</tbody>
</table>
Extracurricular Opportunities
- Keydets Without Borders – engineering service learning opportunities in the developing world
- Timber Framers – pre-19th-century building techniques
- National Society of Black Engineers
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Institute of Electrical & Electronics Engineers
- Environmental Studies
- Engineering
- Mathematics
- Chemistry
- Biology
- Computer Science
- Physics

Engineering at VMI

Concentrations in Civil and Environmental Engineering
- Construction management
- Environmental engineering
- Fluid mechanics/hydraulic engineering
- Geotechnical engineering
- Hydrology
- Structural engineering
- Transportation and planning

Career paths in Mechanical Engineering
- Bioengineering
- Energy Conversion
- Manufacturing
- Industrial Engineering
- HVAC

Concentrations in Mechanical Engineering
- Aerospace Engineering
- Nuclear Engineering

Specialization and collaborative research in Electrical and Computer Engineering
- Biomedicine
- Microelectronics
- Robotics
- Novel Internet technologies

All VMI engineering departments are accredited by ABET. Class sizes are small. Opportunities to interact with faculty both inside and outside of the classroom abound, as do opportunities for undergraduate research.

Internship placements include:
- Air Force Institute of Technology, Wright-Patterson Air Force Base
- NASA/Langley Air Force Base
- Lawrence Livermore National Laboratory
- Ingalls Shipbuilding
- General Dynamics Electric Boat
- Ruger Firearms

At Swarthmore, you’ll work with the best.
Our small classes and labs will give you lots of opportunity to ask questions, investigate ideas, and push experiments to the limits. Even as a first-year student, you’ll work closely with the brilliant engineers and scientists who make up our faculty. They are experts who obtained their doctorates at the top research institutions in the country and do fascinating, cutting-edge research. Yet their first calling and commitment is teaching undergraduates.

You’ll learn from lab experience.
At Swarthmore, all engineering and science courses have lab sections. You may explore quantum electronics with a state-of-the-art titanium-sapphire laser or the origins of life using a DNA amplification chamber.
In addition to classes and labs, you will have the opportunity to collaborate with professors on their research. Each year, many Swarthmore faculty members hire student researchers to work with them during the school year and for summer projects.
Swarthmore graduates obtain excellent jobs and are welcomed at the most rigorous graduate programs in the country because they have a solid academic foundation and are accustomed to conducting research.

You’ll benefit from studying Engineering in a Liberal Arts Environment.
At Swarthmore your musical, linguistic, political science, and philosophy interests will be valued and respected as much as your excitement for engineering and science. We don’t require you to commit to an engineering major before arrival; indeed, you won’t have to declare a major until spring of your sophomore year.
It is our belief that exploring a wide range of academic areas at Swarthmore will make you a better engineer or scientist. Professional engineers and scientists need to have the vision to seize new opportunities, understand the larger context, overcome political hurdles, write successful grant proposals, and explore the ethics of their research. That’s what a liberal arts education is all about. And in an increasingly technological and globally oriented economy, liberal arts trained engineers and scientists have a deep understanding of the challenges facing our world, and the preparation to generate solutions to better our future.

Swarthmore College
Programs of study in engineering and the sciences:
- Astronomy
- Biology
- Chemistry
- Computer Science
- Engineering
- Environmental Studies
- Mathematics
- Physics
- Psychology
- Statistics

Interdisciplinary opportunities such as astrophysics, bioengineering, biochemistry, cognitive science, and neuroscience are also available.

SWARTHMORE FACTS
- Six Nobel laureates are Swarthmore alumni.
- Swarthmore is also extraordinarily well represented in the membership of the National Academy of Engineering, and the National Academy of Sciences.
Extracurricular Opportunities

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Always Innovating. Always ON.
“A Top National University” - U.S. News & World Report

- A leading producer of STEM and design graduates
- Over 125 undergraduate and graduate degree programs
- Thousands of highly paid internships and co-op opportunities
- 19 NCAA Division I sports as well as club and intramural programs

njit.edu/moreinfo

Always ON TOP of Academic Excellence
MATHEMATICS, BUSINESS, STEM, ARCHITECTURE, TECHNOLOGY, PHYSICS

So You’re Interested in Engineering – What Can You Do About It?
Taking STEM-related courses is a great start, but there are other ways to feed your interest and passion.

Find clubs or groups that share an interest in math and the sciences, like Science Club, Math Bowl teams, etc. Many high schools offer an array of extracurricular activities in these areas. This could be a good way to meet other students, teachers, and potential mentors who have a common interest in science, math, or engineering.

Here are some additional resources you can seek out online and/or through your local library.

**Try Science**
tryscience.org
A fun website that explores hands-on science, including experiments, field trip ideas, and adventures. Click on ‘Kids Try Science’.

**Try Engineering**
tryengineering.org/students
Everything from information about colleges, to engineering games, camps, projects, and scholarship searches.

**ALICE**
Alice.org
An educational software that teaches students computer programming in a 3D environment.

**Engineer Your Life**
engineeryourlife.org
This website is a guide to engineering for high school girls, including information and links on preparing to ‘make it happen’ in college and beyond.

**The Online Guide to Engineering Schools**
findengineeringschools.org
This free non-commercial site provides a bit more in-depth information on the engineering programs at any particular college or university. There is also access to information relevant to pre-college students interested in engineering.

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**UNIVERSITY HEIGHTS**
**NEWARK, NJ 07102-1982**

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B.S., Computer Science, University of Illinois at Urbana-Champaign
Minority Engineering Student Groups

In addition to supporting college chapters of nation-wide societies, engineering departments also host programs and groups devoted to helping minority students succeed in their college careers and beyond, such as:

- **Georgia Institute of Technology**: Minority Undergraduate Scholars Engineering Research Program (MUSERP)
- **Kansas State University**: Multicultural Engineering Program (MEP)
- **North Carolina State University**: Student Advancement and Retention Teams (START)
- **Syracuse University**: LCS PRIDE (Programs Rooted In Developing Excellence)
- **The University of Akron**: Increasing Diversity in Engineering Academics (IDEA) Program
- **University of Central Florida**: Florida Georgia Louis Stokes Alliance (FGLSAMP)
- **University of Colorado at Boulder**: Summer Multicultural Access to Research Training (SMART Program)
- **University of Houston**: Program for Mastery in Engineering Studies (PROMES)
- **University of Michigan, Ann Arbor**: ScholarPOWER
- **University of Maryland**: Center for Minolties in Science and Engineering
- **Virginia Polytechnic Institute and State University**: Virginia-North Carolina Alliance for Minority Participation (VT-AMP)

Many colleges and universities also have a Minority Engineering Program dedicated to creating a supportive learning environment, including:

- **Colorado School of Mines**
- **Florida International University**
- **Louisiana State University**
- **Milwaukee School of Engineering**
- **Northern Arizona State University**
- **Oklahoma State University**
- **Purdue University**
- **Rochester Institute of Technology**
- **University of Arkansas, Main Campus**
- **University of Dayton**
- **University of Illinois at Urbana-Champaign**
- **University of Kentucky**
- **University of Texas, El Paso**
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- Milwaukee School of Engineering
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- Oklahoma State University
- Purdue University
- Rochester Institute of Technology
- University of Arkansas, Main Campus
- University of Dayton
- University of Illinois at Urbana-Champaign
- University of Kentucky
- University of Texas, El Paso
Challenging and supportive environment that encourages innovation, creativity and collaboration

cooper.edu/admissions

THE COOPER UNION FOR THE ADVANCEMENT OF SCIENCE AND ART