REACH NEW HEIGHTS | THE COOPER UNION

Albert Nerken
School of Engineering

ENGINEERING FOR THE BENEFIT OF SOCIETY AND HUMANITY
Students come to the Albert Nerken School of Engineering not only because it’s a small and prestigious program that consistently ranks within the top ten undergraduate engineering programs nationwide. They also come here out of a desire to discover, to build and innovate, and ultimately to apply their skills toward making a positive impact. That desire is reflected throughout The Cooper Union’s historic legacy as a place where education is accessible to all and where technical knowledge is bound to a sense of civic responsibility.

Some of the most brilliant and inventive minds of the last 160 years have been drawn to Cooper’s rigorous preparation in mathematics and natural sciences, as well as its emphasis on creative project-based learning and rich opportunities for research and advanced coursework. Our engineering graduates are known for revolutionizing their disciplines and transforming society, with achievements ranging from the Nobel Prize-winning discovery of a binary pulsar, to developing the first Global Positioning System, to engineering the infrastructures that support everyday life in New York City.

Faculty in the school of engineering are committed to preparing students to succeed in an increasingly complex world shaped by emerging technologies and global challenges. Experimentation and leading-edge pedagogies encourage students to collaborate at the intersections of art, architecture, engineering, humanities, and social sciences. Passionate students explore interdisciplinary applications through electives and research, creating innovative solutions to societal problems. The school of engineering is also committed to instilling a sense of social justice that translates into action, inspiring students to apply their expertise and leadership for the benefit of society and humanity. Outside of the classroom, students are involved in a wide range of extracurricular activities and have the chance to explore New York City as their extended campus. The city’s vibrant culture, rich history, and unique social and professional opportunities are all integral parts of the Cooper experience.
Chemical Engineering is the field of engineering primarily focused on the design and development of products and processes across a range of multiple industries and scales. By having a strong foundation in mathematics, the physical and natural sciences, and fundamental engineering sciences, chemical engineers are uniquely skilled to work on projects that involve the atomic/molecular level all the way up to technologies that are designed for the larger industrial scale. The depth and breadth of the chemical engineering curriculum at The Cooper Union provides students with the ability to solve some of the world’s most pressing problems, as well as successfully obtain future careers in areas such as the chemical, pharmaceutical, biomedical, nanotechnology, and renewable energy industries. Recent and past graduates are currently working on exciting problems at the cutting-edge of chemical engineering; examples include novel sustainable energy and pollution prevention systems, 3D printing and additive manufacturing of pharmaceuticals, and computational design of catalysts and specialty materials.
Civil Engineering

Though Civil Engineering is commonly regarded as the oldest of the engineering professions, the Civil Engineering department at Cooper is positioned to address today’s most pressing societal issues. Cooper students are at the forefront of addressing the impacts of climate change and finding sustainable solutions to infrastructural challenges. They learn to implement their knowledge of science, mathematics, mechanics, computer applications, and resource management to everything from the application of augmented and virtual reality to 3D-printed structures to green roof sustainable structures and developing strategies for infrastructure resilience. Civil Engineering at Cooper not only embraces a breadth of specialties—structural, geotechnical, hydraulic, environmental, transportation, urban planning, and construction management—but also prepares engineers to work to build a smarter and more equitable environment for all.
Cooper’s Electrical Engineering program focuses on the devices and processes that form the backbone of modern technology. Students engage with dedicated faculty in an innovative and nurturing learning environment. Project-based learning and rigorous coursework emphasize connections across disparate applications and instill the ability to generalize concepts and apply them creatively to new contexts. This is reflected in the breadth of recent student projects, from artificial sensory systems, to machine-learning enhanced MRI, to efficient hardware implementation of neural networks. Projects in autonomous technologies reimagine societies and systems to make them more economically, environmentally, and socially sustainable. Projects in machine learning and data science allow students to solve real-world, data-oriented problems related to equity, justice, health, and economic development.
Creativity, problem-solving, and design are all at the heart of Cooper’s Mechanical Engineering program, which is the broadest of the engineering disciplines. Students have the flexibility to study a variety of theoretical and technological interests, including solid mechanics, materials, fluid mechanics, vibrations and acoustics, heat transfer and thermodynamics, combustion, control systems, manufacturing, CAD/CAM, and robotics. Mechanical Engineering is an ideal foundation for careers in the aerospace industry, ocean engineering, marine engineering, biomedicine, the automobile industry, the power and utility industries, and virtually anything that requires analytical abilities combined with a strong background in design practice.
GENERAL ENGINEERING

The Bachelor of Science degree in General Engineering is designed for students who have a clear idea of their educational goals but require a more flexible, interdisciplinary course of study. Students who enter the General Engineering program at Cooper desire a strong, broad-based, and rigorous engineering background as preparation for fields such as biomedical engineering, business, chemistry, computer science, entrepreneurship, law, mathematics, or medicine. General Engineering majors may take engineering courses along with relevant courses from Cooper’s other professional schools, to tailor their studies to a specific career path.
Further Learning Opportunities

MINORS. In addition to the undergraduate degree programs, engineering students in the Albert Nerken School of Engineering can also pursue minors in Mathematics, Computer Science, and Humanities and Social Science. Minors provide an opportunity for students to study a secondary concentration of courses that complements their major.

INTEGRATED BACHELOR/MASTER PROGRAM. The Cooper Union offers Master of Engineering degrees in chemical engineering, civil engineering, electrical engineering, and mechanical engineering. The integrated bachelor/master of engineering program is intended to integrate work at the undergraduate and graduate levels and prepare graduates for entry into the engineering profession at an advanced level or for further graduate study.

RESEARCH. Undergraduate research is strongly encouraged at Cooper, and the Albert Nerken School of Engineering supports close collaboration between students and dedicated faculty through a variety of research clusters, labs, and interdisciplinary project-based learning. Opportunities also exist for students to conduct joint research with partnering institutions and for graduate students to take courses through an educational exchange with the Graduate School of Biomedical Sciences at the Icahn School of Medicine at Mount Sinai.

FACILITIES. The Albert Nerken School of Engineering has state-of-the-art laboratory facilities supporting each of the engineering disciplines and also offers the same digital fabrication capabilities found in modern makerspaces. The new Art, Architecture, Construction, and Engineering (AACE) Lab will serve as a catalyst for integration across the institution, with equipment supporting projects that involve “making”—from 3-D printers to robotic arms to virtual-reality technologies.
PROFESSIONAL EXTRACURRICULAR ACTIVITIES, COMPETITIVE CLUBS, AND TEAMS

MOTORSPORTS. Using state-of-the-art materials and aerodynamics packages, the Motorsports team builds open-wheeled racing vehicles similar to Formula 1 and competes annually.

STEEL BRIDGE. The Steel Bridge team competes in the American Institute of Steel Construction Student Steel Bridge Competition, which challenges students to develop a scale-model steel bridge.

HYPERLOOP. The Hyperloop team works across disciplines to innovate and develop functional, high-speed pod prototypes as part of the SpaceX Hyperloop Competition.

CHEM-E CAR. The Chem-E-Car team competes in an annual college competition for students majoring in Chemical Engineering. Students design small-scale automobiles that operate by chemical means and must give a technical poster presentation describing their research.

CREATE@COOPER. Create@Cooper is dedicated to empowering students to create their best work. One of the major events sponsored annually is Hack Cooper, a hackathon aimed at inspiring the inventions of tomorrow.

INVENTION FACTORY

Invention Factory is a rigorous summer program in which undergraduate engineering students compete to invent a tangible product that meets a significant need. Students work in teams of two and in a six-week period they conceive an invention, research prior art (patents and products), build a prototype, present their invention weekly to guest evaluators, file a provisional patent application, and participate in a competition at which a panel of distinguished designers, inventors, engineers, and patent attorneys select the top inventions.

SUMMER STUDY ABROAD

As the practice of engineering has become increasingly globalized, the study abroad program provides students with the opportunity to conduct research or work on engineering-related projects at other institutions around the world for the purpose of experiential engineering practice, cultural immersion and experience working on multicultural and interdisciplinary teams. Students have traveled to Iceland, Ireland, The United Kingdom, Belgium, Germany, Spain, Greece, Egypt, Ghana, Israel, Singapore, South Korea, and Japan.
By the Numbers

• 2019 Freshman engineering class is 40% female
• 1,489 median SAT with median Math SAT of 778 for 2019’s admitted students
• 2018 Freshman retention rate of 91%
• 86% four-year graduation rate
• Student faculty ratio of 7:1 provides small class size
• Ranked within the top ten undergraduate engineering programs in the nation by U.S. News and World Report (2019):
  #10 Engineering (without doctorate degree)
  #6 Mechanical Engineering
  #8 Civil Engineering
  #10 Electrical Engineering
  2019 Regional Colleges North
  #1 in Regional Colleges North
  #1 in Most Innovative School
  #1 in Best Value Schools
  #3 in Best Undergraduate Teaching
• Ranked within the 20 Top Colleges that Produce Highest-Earning Grads by Forbes

Affording Cooper

As an all-honors college, every admitted student receives a half-tuition scholarship currently valued at $22,275 per year. Applicants will automatically be considered for additional merit-based scholarships. To be considered for need-based financial aid, students must submit the FAFSA.

Deadlines

FALL 2020 APPLICANTS

UNDERGRADUATE/EARLY DECISION
Application due: Monday, December 2, 2019
Notification: February 1, 2020

UNDERGRADUATE/REGULAR DECISION
Application due: Monday, January 6, 2020
Notification: April 1, 2020

TO APPLY:
https://cooper.edu/admissions/applying-to-cu/engineering

GRADUATE/MASTER OF ENGINEERING
Rolling admissions applications accepted through March 30, 2020.

THE CLASS OF 2024

We will admit close to 125 exceptionally talented students for the Class of 2024. We seek a diverse student body, representing a broad range of cultural, economic and geographic backgrounds. We look for high achieving candidates who have demonstrated course rigor, academic mastery and strong test scores, but we also seek individual characteristics that will produce a rich and diverse class including teamwork, creativity, initiative, empathy, passion, integrity and determination.

For More Information: https://cooper.edu/engineering

Visit

• The Office of Admissions hosts tours throughout the year to give visitors a look at The Cooper Union’s campus and facilities.
  cooper.edu/admissions/visit
• The Cooper Union maintains its dedication to free education and civic discourse through a variety of public events, talks, and exhibitions.
  cooper.edu/events-and-exhibitions
MISSION  The Albert Nerken School of Engineering is a learning community committed to educational excellence that fosters creativity, critical thinking, innovation, and civic engagement through experiential, project-based and interdisciplinary learning. We bring together talented and diverse students and engage them in a modern math, science, and engineering curriculum that is rigorous, dynamic, and supportive. We inspire our students to achieve their full potential and apply their expertise and leadership for the benefit of society and humanity.