FIRST YEAR STUDENTS: 410
WOMEN: 48%
BLACK: 9%
LATINX: 20%
NATIVE AMERICAN: 1.1%
INT’L STUDENTS: 17%
FROM OUTSIDE CALIFORNIA: 65%

Percentages and demographics relative to our First Year Incoming Class for fall 2020.
DON’T JUST STUDY ENGINEERING
Do More With Engineering+

140 INCOMING TRANSFER STUDENTS
300+ FACULTY
20+ BUILDINGS
$207+ MILLION IN ANNUAL RESEARCH
40+ RESEARCH CENTERS & INSTITUTES
Faculty, Teaching, & Research

Your engineering classes will be taught by some of the most renowned experts in the field. Our faculty not only conduct over $207 million in research each year, they also teach classes. The path you are about to take on won't be easy. In fact, it is supposed to be hard. Our faculty are invested in your success. They are here to challenge you while also providing mentorship and guidance as you begin to build your foundation in problem solving skills.

Make An Impact

We believe the whole point of your engineering degree is to make an impact on the world around you. Whether you are focused on the problems affecting your immediate community or the larger global society - engineering education should be focused on making a difference. We have structured our curriculum to get you started early with flexibility. Your flexibility will not only allow you to find success, it will allow you to determine where you might make the biggest impact based on your interests.
Your Grand Challenges

What is the largest problem facing the world today? It’s a tough question. Thankfully, the National Academy of Engineering rose to the challenge and identified 14 Grand Challenges for engineers in the 21st century. We wholeheartedly embrace these challenges and have woven these real-world problems into the curriculum and experience of our undergraduates. These game-changing goals for improving life on the planet fall into four cross-cutting themes: sustainability, health, security, and the joy of living.

Engineering Plus...

...Dance?! You bet. Business? Sounds like a great combination. Music Recording? We can’t wait to see what type of technology you will revolutionize. We want to enhance your engineering education by encouraging you to explore additional academic opportunities. It’s what we call “Engineering +.” It’s the first part of an equation where you fill your parts to define what makes your version of a holistic education. Engineering is the enabling discipline of our time. An interdisciplinary education gets you started on the right foot towards problem solving in a world that doesn’t define its problems by a singular discipline.

Diverse Students & Ideas

Diversity means much more than what one looks like. Your individual background, experiences, thoughts, and ideas shape who you are. We need your unique outlook to combine with others to create powerful teams in which you work to solve the world’s most complex and nuanced problems. While you may be brilliant, a highly collaborative team of distinct personalities working toward a common purpose is much more brilliant. We celebrate the fact that we are one of the most diverse undergraduate engineering programs in the country. What can you bring to the table?
Faculty, Teaching, & Research

GET YOUR HANDS DIRTY ALONGSIDE THE EXPERTS

Our faculty and their research are some of the many reasons to choose USC Viterbi for the pursuit of your engineering degree. We are consistently among the top universities for the number of faculty members who have been elected to the National Academy of Engineering. Many of our junior faculty members have received the prestigious National Science Foundation Early Career Award. You can participate in research that addresses many of tomorrow’s problems in topics such as biomimetic microelectronic systems, alternative energy, laser and lightwave technologies, biotechnology, structural safety, software engineering, robotics, nanostructures, extreme events, transportation systems, and many others. Below are just a few highlighted faculty members.

STACEY FINLEY, BIOMEDICAL ENGINEERING

Dr. Finley is an Assistant professor in the Department of Biomedical Engineering. Her current research applies a systems biology approach to develop molecular-detailed computational models of biological processes related to human disease. In the spring of 2019, Dr. Finley received a $3.1 million grant to use cutting edge techniques in computational biology to model treatments of colorectal cancer.

MAJA MATARIC, COMPUTER SCIENCE

Maja Mataric is the founding director of the USC Robotics and Autonomous Systems Center. She is an associate editor of three major journals and has published extensively in various areas of robotics. Her Interaction Lab’s research into socially assistive robotics is aimed at endowing robots with the ability to help people through individual assistance (for convalescence, rehabilitation, training, and education) and team cooperation (for habitat monitoring and emergency response).

BURCIN BECERIK-GERBER, CIVIL & ENVIRONMENTAL ENGINEERING

Dr. Becerik-Gerber is the Founding Director of the Innovation in Integrated Informatics Lab (iLab). Her research focuses on the acquisition, modeling, and analysis of the data needed for user-centered built environments, and the development of novel frameworks and visualization techniques to improve built-environment efficiency, while increasing user satisfaction.

DAN MCCURRY, ENVIRONMENTAL ENGINEERING

Dr. McCurry’s research focuses on protecting public health by improving the long-term safety of engineered water sources. He applies the tools of environmental organic chemistry to water quality problems arising from chemical and ultraviolet disinfection of wastewater and drinking water. His research will expand in the field of direct potable reuse of wastewater, collaborating closely with water reuse utilities in Southern California and colleagues in the Astani Department.
NOAH Malmstadt, Chemical Engineering

Dr. Malmstadt’s research focuses on engineered interfaces in terms of the central interface in biology—the cell membrane—and in microfluidic systems, where fluid-fluid and fluid-solid interfaces play key roles in system performance. His lab builds synthetic systems for studying how lipid composition and oxidative processes change the medically relevant properties of cell membranes. He also builds systems for studying how neurobiologically important receptor proteins are altered by their local lipid environment, with the long-term goal of tuning this environment to address health issues. Malmstadt has pioneered the use of 3D printing to build microfluidic systems, and applies these systems to the sustainable manufacturing of nanomaterials and to biomedical diagnoses.

Phoebe Vayanos is the Associate Director of the Center for Artificial Intelligence in Society. Her research addresses fundamental questions in data-driven optimization (aka prescriptive analytics) with an aim to tackle real-world decision- and policy-making problems in uncertain and adversarial environments.

Satyandra K. Gupta, Aerospace & Mechanical Engineering

Dr. Satyandra K. Gupta is the Director of the Center for Advanced Manufacturing. Dr. Gupta has authored or co-authored more than three hundred articles in journals, conference proceedings, and book chapters. His current research is focused on making fundamental advances in robotics to enable deployment of robots on non-repetitive tasks in manufacturing. Additionally, he is exploiting advances in manufacturing processes to design and manufacture novel robots, including robotic birds which use independent wing control to perform aerobatics.

Mahta Moghaddam, Electrical & Computer Engineering

Dr. Moghaddam’s research interests include innovative approaches and algorithms for quantitative interpretation of multichannel radar imagery, advancing quantitative approaches for multisensor data fusion, and developing new radar instrument and measurement technologies. In February of 2019, Dr. Moghaddam was elected to the National Academy of Engineering, one of the most prestigious and exclusive engineering honors in the world.
Our PreK-12 Outreach programs work to increase the number of educationally disadvantaged and underrepresented K-12 students who matriculate to four-year universities and graduate with degrees in science, technology, engineering, and mathematics (STEM). The annual Robotics Open House is always a favorite of visiting elementary school children.
Education With an Impact

MAKE THE WORLD A BETTER PLACE

Engineering is creative problem solving for society. You will start the process of solving real-world problems right away. You will take engineering classes in your first semester at USC with a curriculum designed to give you depth and breadth for success in your future. Outside the classroom, you will have opportunities to scale your ideas, collaborate with other passionate students, and continue a legacy of USC Viterbi engineers making a difference.

START ENGINEERING RIGHT AWAY

You will be part of our engineering community in your very first semester. You can start in one of our 30 different majors across ten different disciplines, or you can apply as an Undeclared Engineering major. As a first-year engineering student, you will take an introductory course in your major as well as the freshman academy course. You will be working on real-world problems, getting hands-on experience, and exploring your future as an engineer in your first year. Not sure what you want to study? Don’t worry, you are not locked into a program; when you are admitted to an engineering degree program, you are admitted to all of engineering majors.

THEORY & HANDS-ON: YOU DON'T HAVE TO CHOOSE

You can’t study engineering without making stuff. Viterbi engineers make a lot of stuff. Our curriculum combines learning theory with “getting your hands dirty” by practicing real-world solutions in and out of the classroom. You won’t have to choose between conceptual and application-based learning. You will build, design, and engineer in hands-on projects for classes throughout your four years.

Beyond classes, you will have the opportunity to engage in a variety of academic and applied settings. Volunteer or work in a lab to help develop cutting edge technology and expand upon existing knowledge. Join a design team and compete against other schools in building challenges. Work in one of our maker spaces to bring your passion project to life. Assist faculty with research through a variety of volunteer opportunities, formal programs, and research awards. Regardless of your path after graduation, our balanced approach to theory and hands-on education will prepare you for success wherever you choose to apply your engineering degree.

SERVICE & SOCIAL ENTREPRENEURSHIP

We can’t make the world a better place without innovative ideas that require technology, services or systems at their core. Most of the time, it’s engineering that turns an idea into a reality... whether you start in our vibrant student community focused on entrepreneurial efforts, compete in the Min Family Challenge for Social Entrepreneurship, try to win the Maseeh Entrepreneurship Prize Competition, or focus your time on service and giving back... you will have an impact here. If you aren’t interested in making an impact, is there really any reason to study engineering?

The Sweet Spot

This is where we live. This intersection creates more innovative engineers. We foster a collaborative, non-competitive environment. You won’t compete to stay in a class, or worry about the grading curve. Group projects will be present throughout your curriculum because it never takes just one engineer to solve a problem.

Like your technical skills, your skills in communication are important. We believe you need great ideas, and the ability to communicate those ideas to others. You will write papers, give oral presentations and learn how to communicate through your projects. You will learn how to respond to RFPs, and write those proposals as preparation for your future. The sweet spot creates new products, new companies, and new solutions for all of us.

LEARN MORE AT:
viterbiadmission.usc.edu/handson
Undergraduate students regularly participate in research alongside faculty and graduate students. Undergraduates in Dr. Andrea Armani's Lab (pictured here) help to develop advanced materials and integrated optical devices that can be used in portable disease diagnostics and telecommunications.
Solutions For The Grand Challenges

WHERE DO WE NEED YOU MOST?

Engineers make good things happen. You want to solve the pressing challenges facing society - today and in the future. Problems in health and medicine, security, environment, and many others are multidisciplinary areas where you can help. You will be part of the generation to rise to the challenge and advance society.

THE BIGGEST CHALLENGES FACING HUMANITY

An international group of leading technological thinkers identified the Grand Challenges for Engineering in the 21st century. These game-changing goals for improving life on the planet fall into four cross-cutting themes. In each of these broad realms of human concern — sustainability, health, security, and joy of living — specific grand challenges await your engineering solutions. From the energy crisis to security to simply enriching life, we have dedicated ourselves to empowering engineers to create solutions.

The 14 Grand Challenges are inherently interdisciplinary, and there is no one right approach (or undergraduate degree) to solving them.

- Make Solar Energy Economical
- Provide Energy From Fusion
- Develop Carbon Sequestration Methods
- Manage the Nitrogen Cycle
- Provide Access to Clean Water
- Restore and Improve Urban Infrastructure
- Advance Health Informatics
- Engineer Better Medicines
- Reverse-Engineer the Brain
- Prevent Nuclear Terror
- Secure Cyberspace
- Enhance Virtual Reality
- Advance Personalized Learning
- Engineer the Tools of Scientific Discovery

YOUR VITERBI EXPERIENCE

You will seek ways to put knowledge into practice to meet these grand challenges. Your undergraduate experience is designed to capitalize on a technical education applying the rules of reason, the findings of science, the aesthetics of art, and the spark of creative imagination. Your time in and out of the classroom will continue the tradition of forging a better future.

Viterbi students are building water filtration systems in developing countries, coding software for nonprofits and shelters, 3D-printing prosthetic hands for low-income youth, and so much more through student organizations, internships, and even classes. You will engineer with a purpose towards making the world a better place, both inside and outside your classes.

UNDERGRADUATE RESEARCH

Due to the volume of research conducted here, you will have more opportunities to be a part of it starting as early as your first year. The university offers several programs and awards for research funding and placement, and Viterbi offers our own ways for students to get involved as well. In addition to our formal and selective programs, you can get involved in research through participating in competition and design teams, volunteering in faculty labs, and taking directed research coursework.

Our Grand Challenge Scholars

We encourage you to participate and compete in the National Academy of Engineering (NAE) Grand Challenge Scholars Program (GCSP). Via GCSP, students create their own educational experiences through discovering, exploring, and working on potential solutions to one of the challenges. The GCSP provides a framework across five core competencies to enhance your experience both in and out of the classroom. We hope the vision of the Grand Challenges will inspire your undergraduate experience.

We are proud to have named more Grand Challenge Scholars than any other university in the country with our 2020 class being the largest ever for any university.

LEARN MORE AT:
\texttt{viterbiadmission.usc.edu/challenges}
USC Rocket Propulsion Lab (RPL) is a student-run organization focused on designing, building, and testing of experimental rocketry and propulsion hardware. In the spring of 2019 USC RPL became the world’s first student group to successfully launch and recover an entirely student-designed and student-fabricated rocket (Traveler IV, pictured here) past the Karman line, the recognized boundary of space at 100 km (328,084 ft).
YOU ARE MORE THAN AN ENGINEER

We know you want more than engineering. That’s why our philosophy is “Engineering Plus.” The Viterbi School strongly supports the University’s commitment to providing students with interdisciplinary educational opportunities, and we believe these experiences help make our students better engineers. Our degree programs will prepare you to work as an engineer immediately after graduation, develop your own start-up, or pursue a variety of other disciplines such as law, medicine, business, film, or government. Qualified students also have the option to participate in our combined BS/MS Progressive Degree engineering program, which is another great way to incorporate another discipline into your curriculum.

DOUBLE MAJOR, MINOR, OR JUST FUN CLASSES!

Beyond our traditional engineering degree programs, we encourage students to consider a minor or even double major in non-engineering fields. Each of our degree programs include optional electives for you to pursue courses from across the university with no additional effort or planning. Take a tennis class one semester and that comedy improv class you’ve heard so much about the next.

Advanced planning and continued work with your advisor can help you combine an additional curricular program in your time at USC. Popular options include: Music, Business, International Relations, Cinematic Arts, Theatre, a foreign language, Public Policy, and Neuroscience.

INTERNATIONAL EXPERIENCES

You may have heard engineers can’t study abroad in college. That’s not true at USC Viterbi.

Engineering is a global profession, and global opportunities allow you to learn more about other cultures and specifically gain perspective on technology issues around the world. The opportunity to go abroad in some capacity gives meaningful exposure that will prepare you to enter the workforce. Whether you want to spend the summer with our Viterbi faculty in another country, conduct sponsored research at an international university, provide service through USC Alternative Breaks or Engineers Without Borders, or a traditional semester exchange program… you will have several ways to get overseas. With the proper planning, the only question you need to ask is where do you want to go!

IT ALL BUILDS TO YOUR FUTURE

Your engineering undergraduate degree will be strengthened by a broad range of experiences in which you will engage. Your level of engagement will prepare you for many more future opportunities. Whether you have always known what you "want to do when you grow up," or are hoping to find out, we are here to help you plan your next steps beyond USC. We provide dedicated career services starting in your first year to help you find internships, co-ops, and full time positions post-graduation. Many of our students also choose to go into graduate programs in engineering, law, medicine, or even business at graduate schools across the country, including USC. If you wish to stay, our accelerated master’s degree program allows you to complete your BS and MS engineering degrees in reduced time, typically five years.

There’s A Podcast?!

Yup! "Viterbi Voices: The Podcast" is so much more than this booklet. In-depth discussions with faculty about their backgrounds, teaching and research. Student Organizations get real with us on how they aren’t anything like clubs in high school. And current students talk about their experiences as they explore passions, overcome challenges, and understand their identity. There may even be a joke or two...

LEARN MORE AT: viterbiadmission.usc.edu/plus
Diverse Experiences, Stronger Ideas

**TEAMMATES WITH DIFFERENCES CREATE BETTER SOLUTIONS**

Diversity is crucial to the future of engineering because of its link to creative ideas. Your classmates will define diversity. Not only from the way they look, but by the way they think. Each of your peers will have different goals, different skills, different passions; you (and your engineering solutions) will be all the better for it. Your future will be shaped by those you meet and work with - we want your classes and study groups to prepare you for tomorrow’s world.

**GETTING STARTED**

Making connections with faculty and other students is a top priority for our Viterbi students. Our First Year Excellence (FYE) program helps all first-year students connect to the University and the Viterbi School through opportunities such as the Freshmen Academies, hands-on, collaborative intro courses, the Viterbi Spotlight Series, and individualized academic advisement. We support your academic success with free peer-tutoring and access to a wide range of academic support throughout the University, help you build community and develop leadership skills with our Women in Engineering program, Center for Engineering Diversity and Klein Institute for Undergraduate Engineering Life, and enhance your global perspective with our overseas opportunities for engineering students.

**YOU ARE MORE THAN AN ENGINEER**

You will not be restricted to one corner of campus and we do not house students based on major. You will be a part of the greater USC community from your first day on campus. College is about making connections and joining a community of dedicated students, faculty, staff, and alumni, regardless of academic discipline. We want you to be able to take full advantage of all the opportunities open to you by being a part of the USC community.

There are more than 1,000 student organizations to get involved with on campus. No matter what your interests are, you can find a group of like-minded students and continue engaging in your passions. This includes professional organizations like Associated Students of Biomedical Engineering, design teams like USC Rocket Propulsion Lab, outdoors groups such as SC Outfitters and Ski & Snowboard Club, dance groups like Ballroom & Latin Dance Team, and so much more. If you can’t find a group that already supports your interests, find a group of students who share your thoughts and start your own!

**WOMEN IN ENGINEERING**

Your generation is going to even out the engineering experience, and we are leading the way. Women make up over 48% of our incoming, first-year class, more than doubling the national average. Through our Women in Engineering (WiE) program, we have dedicated services and programs to promote and support women in engineering such as alumni mentoring, faculty luncheons, research programs, corporate networking, and more. WiE is also home to our chapter of the Society of Women Engineers.

**CENTER FOR ENGINEERING DIVERSITY (CED)**

Over 40 years ago, USC was the first private university in California to support an engineering diversity center. Today, CED is home to the National Society of Black Engineers, Queers in Science and Technology, and the Society of Hispanic Professional Engineers. CED fosters a community of success through corporate partnerships, academic support, mentorship programs, and a summer institute prior to enrolling.

**Don’t Believe Any Of This**

It’s all true, of course, but we don’t want you to take our word for what life as an engineering student is like. Go straight to the source: our current engineering students.

Viterbi Voices is a website designed and curated by our current students. They are sharing their lives through blogs, videos, social media accounts and more on a regular basis. Ask questions and get a better sense of what life will be like for you.

Visit [viterbivoices.usc.edu](http://viterbivoices.usc.edu) for more information.

**LEARN MORE AT:**

[viterbiadmission.usc.edu/about](http://viterbiadmission.usc.edu/about)
Aerospace & Mechanical Engineering

Majors & Areas Of Emphasis
- Aerospace Engineering
- Mechanical Engineering
- Mechanical (Petroleum) Engineering

Research Highlights

Aerospace and Mechanical Engineering (AME) students conduct basic and applied research within and across the usual disciplinary boundaries. AME students develop core and valuable problem-solving skills in the areas of aerodynamics, mechanics, thermodynamics, fluid mechanics, heat transfer, materials and design. Our graduates are at the leading edge of academia and industry, tackling innovative, important, and exciting challenges.

AME students have the opportunity to work with world-renowned faculty on research projects including turbulence control, emerging fuel cell technologies, computational fluid mechanics, combustion, heat transfer, automatic control systems, biomechanics, robotics, nonlinear dynamics, and advanced manufacturing. Recent undergraduate research and student projects include the design of fixed and flapping wing systems for small unmanned aircraft, the search for low drag solutions for the global cargo shipping industry, sports injury and helmet design for shock reduction, and optimal control of wheelchairs for humans and hovering flight for animals. As an example, John Hochschild (B.S. AE ’19) was an undergraduate research assistant in the aerodynamics lab, engaging in hands-on work alongside doctoral students on fascinating projects ranging from a bio-inspired morphing aircraft to a novel wing design that could significantly reduce aircraft drag.

Research
We advance and define research frontiers that shape the future of our life in the air, on the ground, and in space. We push forward the understanding of environments, both natural (oceans, atmosphere) and engineered (internal combustion, pulsed ignition). Other efforts advance our understanding of control and dynamics of autonomous systems and robotics, advanced manufacturing technology, aircraft design and flight mechanics of very small and very fast flying machines, and biodynamical systems in medical devices, natural propulsion, and evolutionary system dynamics.

Companies Hiring You
Aerospace Corporation, Aerovironment, Aerotek, Boeing, Honeywell, Jet Propulsion Laboratory, Lockheed Martin, NASA Facilities, Scaled Composites, SpaceX, US National Labs (Livermore, Sandia), Northrop Grumman, Tesla, U.S. government agencies, Virgin Orbit, Microsoft, Google X ... And many more

Career Options
- Design and build piloted or autonomous craft for land, air, sea, and space
- Develop entirely new devices including satellites, robots, micro-scale measurement and monitoring platforms
- Develop control and planning systems for robots, automated machinery and fleets of devices

GET MORE AT:
viterbiadmission.usc.edu/ame
Aerospace and Mechanical Engineers design complex mechanical, thermal, fluidic, acoustical, optical, and electronic systems, with characteristic sizes ranging from microns to tens of kilometers. Such systems are used everywhere, from the depths of the ocean and far underground, to near-earth, planetary, interplanetary and galactic space.
The Astronautical Engineering (ASTE) program provides the fundamentals of science and engineering, specialized courses in astronautics, and technical electives to broaden as well as deepen the coursework. ASTE students learn spacecraft and launch vehicle design and operations, propulsion, orbital mechanics, spacecraft dynamics and control, navigation, instrumentation and sensors, and much more.

### Research

The Department of Astronautical Engineering (ASTE) is at the center of exciting and innovative research in spacecraft and space exploration, from basic science to new ways of designing and integrating spacecraft. ASTE operates world-class research facilities such as the Collaborative High Altitude Flow Facility (CHAFF) space simulation chamber, a six-meter cryogenically cooled chamber capable of testing propulsion systems in high vacuum.

Astronautical engineering students can engage in research under faculty guidance as early as their first year. In addition, ASTE has several ongoing hands-on student projects. The Microsatellite Project designs and builds CubeSats, small spacecraft approximately the size of a loaf of bread. The Liquid Propulsion Laboratory is focused on designing liquid-propellant rocket engines. The Rocket Propulsion Laboratory designs and builds solid-fueled rockets. In April, 2019, it became the first student group ever to send a rocket into space.

### Companies Hiring You

Aerospace Corporation, The Boeing Company, Defense Advanced Research Projects Agency (DARPA), Lockheed Martin, Northrop Grumman, various government agencies, Jet Propulsion Laboratory (JPL), NASA Research Centers (Glenn, Marshall, Johnson), Raytheon, SpaceX, Virgin Galactic... and many more!

### Career Options

- Design rocket vehicles
- Design, build, and test satellites
- Operate unmanned spacecrafts and probes
- Build space instrumentation and sensors
- Conduct government research
- Lead space operations
- Become a researcher at a university or government research center
Astronautical engineers design, build, and operate space vehicles for exploration and applications beyond the earth’s atmosphere. This program prepares students for engineering careers in the space and defense industries, space research, development, and operations in industry and government centers and laboratories, as well as for graduate study.
Biomedical Engineering

Majors & Areas Of Emphasis
- Biomedical Engineering
- Biomedical (Molecular-Cellular) Engr
- Biomedical (Electrical) Engr.
- Biomedical (Mechanical) Engr.

Research Highlights
System Modeling and Simulation, Systems Biology, Systems Pharmacology, Microphysiological Systems, Tissue Engineering, Biomaterials, Nanomedicine, Cancer Microenvironment, Sensory Neurophysiology, Sensorimotor Control, Cardio-Respiratory Control And Dynamics, Computational Neurobiology, Mechanisms Of Memory And Learning, Ultrasonic Imaging, Laser Scanning and Light Sheet Imaging, Medical Imaging, Multimodal Imaging, Biomedical Photonics, Implantable And Wearable Biomedical Devices, Neural Prostheses, Retinal Prostheses, Cortical Prostheses.

Students choose this branch of engineering for the excitement of working with people and living systems, and for the opportunity to apply advanced technology to the complex problems of medical care.

Students can participate in a variety of directed study courses or classroom projects at facilities such as the Los Angeles County+USC Medical Center, the Biomedical Simulations Resource Center, the Medical Ultrasonic Transducer Resource Center, Rancho Los Amigos National Rehabilitation Center and Children’s Hospital-Los Angeles (CHLA).

Emphases & Options

While many students choose a primary degree in Biomedical Engineering with no added specialization, we do offer the opportunity to deepen your education in three separate emphasis programs: Molecular-Cellular (BMCE), Electrical (BMEN), and Mechanical (BMEL).

Biomedical (Molecular-Cellular) Engineering (BMCE) harnesses aspects on the nano, molecular, cellular, tissue, and organism level in order to explore biological and disease systems, often towards a healthcare need. As a BMCE student, you will take additional coursework in areas like Nanomedicine and Drug Delivery, Tissue Engineering, and Systems Biology.

Biomedical (Electrical) Engineering (BMEN) is for students interested in the building of electronic biomedical devices and the effects of electrical stimulation. As a BMEN student, you’ll take additional coursework in areas like Linear Circuits, Digital Logic, Electromagnetics and Digital Electronic Circuit Design.

Biomedical (Mechanical) Engineering (BMEL) is for students interested in the mechanics and dynamics of medical devices and biological systems. As a BMEL student, you will take additional coursework in areas like Mechanics, Thermodynamics, Biomechanics, Materials Behavior and Processing, and Fluid Mechanics.

Prep for Medical School

The BME programs are easily adapted to include the prerequisites for most medical schools, while also providing applied technical training beyond the basic life sciences. USC Pre-Med students are supported throughout the medical school application process by the Pre-Health Advisement office. Graduates go on to attend top medical, dental and pharmacy schools around the country, including the USC Keck School of Medicine.

Companies Hiring You

Abbott Laboratories, Advanced Bionics, Alfred E. Mann Institute, Amgen, Applied Medical, Biosense Webster, Edwards Lifesciences, Lifescan, Medtronic, Neutrogena, Nike... And many more!

Career Options

- Build advanced therapeutic & surgical devices
- Create safe implantable artificial materials
- Become physicians or pharmacists
- Conduct biomedical research
- Develop artificial organs
- Design prosthetics
- Improve medical imaging devices

GET MORE AT:

viterbiadmission.usc.edu/bme
The interdisciplinary field of Biomedical Engineering (BME) combines elements of Engineering (electronics, systems analysis, mechanics) with the life sciences (biology, physiology, biochemistry) to define and solve problems in biology and medicine.
Chemical Engineering
THE MORK FAMILY DEPARTMENT OF CHEMICAL ENGINEERING & MATERIALS SCIENCE

Majors & Areas Of Emphasis
- Chemical Engr.
- Chemical (Biochemical) Engr.
- Chemical (Petroleum) Engr.
- Chemical (Nanotechnology) Engr.
- Chemical (Polymers/Materials Sci.) Engr.
- Chemical (Environmental) Engr.
- Chemical (Sustainable Energy) Engr.

Research Highlights

Chemical Engineers are employed in areas as diverse as the chemical, pharmaceutical, energy, materials, and environmental industries. Emerging fields in chemical engineering include biotechnology, the design of environmentally benign processes and the synthesis of new materials (including bio- and nanomaterials).

Emphases & Options
While many students choose a primary degree in chemical engineering with no added specialization, we also offer the opportunity to deepen your education in six emphasis programs.

The Biochemical option (CHEB) is a great option for students considering going on to Medical, Dental or Pharmacy Schools; and for students who wish to enter the growing biochemical industry. The Petroleum option (CHPE) is most appropriate for students interested in the exploration and production aspects of the energy industry. The Nanotechnology option (CHEN) is for students who are interested in learning the properties of materials on the nanometer scale, and will study specialized probes capable of visualizing matter on these length scales. The Polymers/Materials Science option (CHPM) is most appropriate for students interested in the polymer industry, and for students interested in electronic materials, for example, in microelectronics fabrication. The Environmental option (CHEE) is for students interested in protecting the environment either through pollution control (by changing manufacturing processes) or in environmental remediation. The Sustainable Energy option (CHSE) provides additional education where a variety of energy sources are being developed, including biofuels, solar, geothermal, and clean hydrocarbons.

Research
Research areas include technologies that impact oil and gas performance and maximize the world’s fossil fuel supply, the latest polymers and composites, and ways to remediate contaminated soils. In addition, researchers are creating new technologies for a more efficient, environmentally sensitive future.

The Mork Family Department is well-equipped for experimental research with modern instrumentation including NMR spectrometers, electron microscopes, surface analysis instrumentation, and nanofabrication tools located in clean room spaces.

Companies Hiring You
Amgen, Baxter, CH2M-Hill, Chevron, Dow Chemical, DuPont, Environ, ExxonMobil, Genentech, Halliburton, Intel, Merck, Proctor & Gamble... And many more!

Career Options
- Design and optimize cost-effective ways to produce energy, drugs, plastics and chemicals
- Develop new biological and therapeutic agents
- Establish new methods for chemical processing
- Find solutions for environmental problems
- Streamline petroleum exploration and refining
- Create new consumer products and manufacturing systems
- Regulate environmental health and safety standards

GET MORE AT:
viterbiadmission.usc.edu/che
Chemical engineers design, control and optimize large-scale chemical, physiochemical and biochemical processes. They are also involved in the development and design of new materials ranging from advanced composites used in automotive and space-related industries to materials used in the biomedical and electronics fields.
Civil and Environmental Engineers create, construct, and manage the infrastructure systems we use in our everyday lives: transportation, water, power distribution, waste disposal, environment, as well as residential, industrial, and commercial structures. Civil and Environmental Engineers support the global economy, secure the health and security of diverse communities, and enhance environmental quality worldwide. They design, build and operate our nation’s infrastructure – highways, bridges, wharf and harbor structures, industrial facilities – and address the challenges of ground water and air pollution as well as industrial and hazardous waste management. They monitor the quality of the air, water and land, and enhance the protection of our environment.

**Research Highlights**

**Sustainable Development:** Long-term viability of natural resources and engineered civil systems. Water quality, access, and distribution: providing an adequate supply of potable water, considering population growth and climate variability. **Disasters and Extreme Events:** Both natural (e.g., earthquakes, tsunamis, floods, climate change) and man-made (e.g., terrorist attacks, engineering failures, industrial accidents) disasters. Research includes all aspects of an event, from a fundamental understanding of the physical processes controlling its evolution to the resulting environmental and social reaction. **Coupling of Complex Systems:** Most natural and engineered systems are known to be complex, defined as systems characterized by their display of patterns of structure or behavior at one level of system organization that are diagnostic of interactions among parts of the system at other levels.

**Emphases & Options**

The Bachelor’s degree in Civil Engineering provides a broad base of core civil engineering courses to explore structural engineering, geotechnical engineering, construction, transportation, environmental engineering, and water resources.

The Construction Engineering & Management emphasis provides students with additional courses in design and construction. Students can further hone their understanding of structural design, sustainable construction, methods and equipment, and other elements of construction.

The Structural Engineering emphasis focuses on the design of safe and efficient structural systems. Students will be prepared to design structures such as bridges, buildings, and offshore structures that can resist a variety of forces such as earthquakes and wind loadings.

The Building Science emphasis is a joint architecture/engineering program. Students will learn all aspects of building technology from site selection to building construction, in addition to gaining a holistic perspective of building design from architectural design to structural design, and from the artistic to the functional.

The Water Resources Engineering emphasis offers students the opportunity to specialize in the design of systems related to water supply, water treatment, and hydraulics.

The Bachelor’s degree in Environmental Engineering covers engineering approaches required to provide safe drinking water, maintain air quality, and protect the environment.

**Companies Hiring You**

Campbell Concrete, CH2M Hill, Chevron. City/County of Los Angeles, Kiewit Pacific Company, Leighton Group, PPG Industries, Rudolph & Sletten, The Reynolds Group... And many more!

**Career Options**

- Become a structural engineer and build sustainable buildings
- Develop land and mitigate risks of natural and manmade disasters
- Manage civil infrastructure
- Design and build roads, bridges, dams, tunnels, and airports
- Develop environmental public policy
- Create waste removal systems and treatment processes
- Design transportation systems
Civil and Environmental Engineers address many of the vital needs of our modern society. They improve quality of life, promote economic growth, and protect people from hazards of natural and human origins.
Majors & Areas Of Emphasis

- Computer Science
- Computer Science (Games)
- Computer Science / Business Administration
- Computer Engineering & Computer Science (jointly administered by the Computer Science and Electrical & Computer Engineering Departments)

Research Highlights

Artificial intelligence, machine learning and deep learning, robotics, mobile and cloud computing, multimedia and immersive technology networks and distributed systems, security, data science and analytics, theoretical computer science, software engineering and applications.

Emphases & Options

The Computer Science (CSCI) program prepares students to work in the areas of software design, development, application and maintenance. It provides intensive study in algorithmic design and analysis as well as the theory of computing.

The Computer Science (Games) degree (CSGM) offers technical and creative training for the Video Game industry. The curriculum brings numerous core areas of advanced computer science - including artificial intelligence, graphic interfaces, modeling, and algorithm design - together with creative and artistic training from the School of Cinematic Arts and the Roski School of Fine Arts and Design. The combination of the creative and technical training along with industry exposure prepares students for key leadership positions in this dynamic field.

The Computer Science / Business Administration program (CSBA) is a combined degree program that allows students to study both Computer Science and Business in four years. In addition to the core computer science courses, students take courses from the Marshall School of Business such as Organizational Behavior, Marketing Fundamentals, Business Finance, and Strategic Management.

The Computer Engineering & Computer Science program (CECS) trains students to integrate hardware and software processes to design solutions to problems arising in complex domains such as atomic reactors, guidance systems and manufacturing systems. These students graduate ready to design and build complex systems of hardware, software, and networks.

Companies Hiring You

Amazon, Apple, Blizzard, Cisco, Conexant, DIRECTV, Disney Interactive, eBay, Electronic Arts, Facebook, Garmin, Google, Heavy Iron Studios, Hewlett-Packard, IBM, Intel Corporation, Lockheed Martin, Microsoft, NASA-JPL, NBCUniversal, Raytheon, Samsung, Sony Online Entertainment, SpaceX, Square, Yahoo!, Zynga... and many more!

Career Options

- Build new computer circuits, microchips, and other electronic components
- Launch high tech entrepreneurial projects and ventures
- Conduct research on artificial intelligence capabilities
- Create new computer and operating systems
- Design logic devices for everyday appliances
- Improve video game consoles and devices
- Integrate hardware and software processes
- Invent intelligent robots
- Develop advanced data analytics

GET MORE AT:

viterbiadmission.usc.edu/cs
Computer Scientists and Computer Engineers design and implement efficient software and hardware solutions to computer-solvable problems. They are involved in the development of areas such as high-speed networks, multimedia and creative technologies, systems design, virtual reality, data science, artificial intelligence, machine learning, and robotics.
Major & Areas Of Specialization

Electrical Engineering
- Areas: Circuits, Systems, and Signals, Computer Engineering, Energy & Electrical Sciences

Computer Engineering & Computer Science (jointly administered by the Computer Science and Electrical & Computer Engineering Departments)

Research Highlights


Areas Of Specialization

The department offers a diverse curriculum that prepares students with significant breadth and depth. Core sets of classes prepare students for one of three areas of emphasis: Circuit, Signals, and Systems; Computer Engineering; and Energy and Electrical Sciences. In your first two years you will be introduced to the concepts of digital and analog electronics, computer programming, embedded systems, and the internet of things. You will then choose courses that pertain to a chosen area of specialization.

Circuits, Signals, and Systems covers areas in signal processing, media and audio systems, wireless communications, adaptive control, and mixed-signal integrated circuits. Computer Engineering contains courses that focus on digital hardware, embedded systems, and VLSI design. Courses in the Energy and Electrical Sciences area cover nanoelectronics, integrated-circuit technology, energy sources and management, mixed-signal integrated circuits, and communications hardware.

The Computer Engineering & Computer Science program (CECS) trains students to integrate hardware and software processes to design solutions to problems arising in complex domains such as atomic reactors, guidance systems and manufacturing systems. These students graduate ready to design and build complex systems of hardware, software and networks.

Design courses permeate the class schedule allowing students to apply the knowledge they have gained as well as prepare them to address the specific needs of industry when they graduate. One EE senior design course recently challenged students to design “smart” surfing equipment. Design options included a new “sustainable surfboard,” a “wireless lifejacket” and a programmable “interactivesurfboard.”

Research

Our research is revolutionizing nanoelectronics, information processing, telecommunications, medical diagnosis and treatment, energy and green initiatives, computer systems, and new media, among other areas. Partnerships with the Information Sciences Institute (ISI) and the Institute for Creative Technologies (ICT) create unparalleled opportunities for students to work at the cutting-edge of technology.

Companies Hiring You

3Com Corporation, Accenture, Apple, BAE Systems, The Boeing Co., CapGemini, Disney, Edwards Lifesciences, Garmin, General Electric, Google, HP, IBM, Intel Corporation, Microsoft, Nvidia, Qualcomm, Raytheon, SpaceX, Teradata, Teradyne, TI, Verizon... And many more!

Career Options

- Develop alternative energy and green power sources
- Develop semiconductors, consumer electronics, and wireless communication systems
- Design new media and imaging systems (HDTV, satellite radio, etc.)
- Design robots and other embedded systems
- Build lasers used for medical, manufacturing and military purposes
- Develop airborne and satellite electronic systems
- Develop new biomedical imaging devices
Electrical and Computer Engineers are inventing the technology that powers the modern world - from computing and mobile communications platforms through biomedical devices and solar energy conversion. Our graduates are a diverse group of engineers who design hardware from nanodevices through embedded computing systems and develop innovative approaches to imaging, communications, control and network design problems, and much more.
Industrial & Systems Engineering

Majors & Areas Of Emphasis
- Industrial & Systems Engineering
- Industrial & Systems Engineering (Information Systems)

Research Highlights

Industrial & Systems engineers are consummate economic competitors who focus on developing and controlling manufacturing, production, inventory, distribution, service, and management information systems to ensure their companies’ success in the global marketplace.

On the job, these engineering professionals optimize the use of scarce resources by integrating people and technology to maximize productivity, minimize cost, improve processes, and maintain high standards of quality.

The Epstein Department’s Information Systems Engineering option gives extra emphasis to enterprise resource planning, software, and data mining techniques. USC’s undergraduate ISE curricula prepare students for careers in a wide-range of industries, consulting, or professional engineering practice, and are also an excellent intellectual foundation for advanced degrees in fields as diverse as Engineering, Logistics, Business Administration, Finance, Medicine, Law, or Public Policy.

Companies Hiring You
Accenture, Amazon, Boeing, Capgemini, Cisco Systems, Ernst & Young, The Disneyland Resort, Honeywell, Kaiser Permanente, KPMG, Microsoft, Northrop Grumman, Oracle, Pandora Media, PepsiCo, PriceWaterhouse Coopers, Protiviti, SpaceX, Uber, United Airlines... And many more!

Career Options
- Implement enterprise resource planning systems
- Consult on business practices
- Design efficient manufacturing and service systems
- Optimize assembly and distribution systems
- Develop ergonomically correct systems and interfaces
- Improve hospital operations and schedules
- Make systems safe by reducing errors and accidents
- Manage business operations
- Develop quality control and assurance systems

Research
We advance and define research frontiers that shape the future of our life in the air, on the ground, and in space. We push forward the understanding of environments both natural (oceans, atmosphere) and engineered (internal combustion, pulsed ignition). Other efforts advance our understanding of control and dynamics of autonomous systems and robotics, advanced manufacturing technology, aircraft design and flight mechanics of very small and very fast flying machines, and biodynamical systems in medical devices, natural propulsion, and evolutionary system dynamics.

GET MORE AT:
viterbiadmission.usc.edu/ise
Industrial & Systems Engineers (ISE) work to improve processes, systems, and organizations. An industrial and systems engineering education provides the skills and foundations to design, analyze, and optimize complex systems. They are productivity catalysts, managing the combination of physical, capital, and human resources needed to produce and deliver valuable goods and services.
How To Apply to USC Viterbi

COMMON APP + USC WRITING SUPPLEMENT

Applying to the engineering school is no different and no more difficult than applying to USC. There are no absolute “cutoffs” for grades, class ranking, or test scores. We are interested in each of these elements as well as your personal accomplishments and other factors in our comprehensive application review process.

APPLICANT CHECKLIST

Applicants need to complete the Common Application and USC Writing Supplement at admission.usc.edu/commonapp by the stated deadlines.

- There are no additional applications, test scores, or extra materials you need to submit to apply to engineering.
- You must list one of the engineering programs as your first choice major to be considered for the Viterbi School. If you are unsure, please list "Undeclared Engineering".

FIRST-YEAR APPLICANTS

You are a first-year applicant if you are currently enrolled in high school, even if you have completed some college credits. Please see viterbiadmission.usc.edu/apply for more information on this year’s application deadlines as well as minimum qualifications for admission. Application deadlines are as follows:

- **December 1**: First-Year Application Deadline for Merit Scholarship Consideration
- **January 15**: Final First-Year Application Deadline

TRANSFER APPLICANTS

You are a transfer applicant if you have completed any college level courses since graduating high school. Transfer candidates are evaluated on their achievement in specific engineering pre-requisite coursework at their prior college or university. Please see viterbiadmission.usc.edu/transfer to determine which specific courses at your college or university will best prepare you for a successful transfer process. The Transfer Application deadline is:

- **February 1**: Final Application Deadline for Transfer Admission including Merit Scholarship Consideration.
WE ARE HERE TO HELP YOU

USC is committed to helping students finance their education through need-based financial assistance, merit-based scholarships, and affordable financing programs as part of one of the largest financial aid programs in the United States. The University works with families to meet 100 percent of the USC-determined financial need for students who meet all deadlines and eligibility requirements.

MERIT BASED SCHOLARSHIPS

In order to compete for the wide range of awards we offer, simply complete the Common Application and USC Writing Supplement by the scholarship consideration deadline (Dec. 1st for First-Year, Feb. 1 for Transfers). There is no separate scholarship application for these university-wide awards which range from $3,000 per year to four-year, full-tuition awards.

In addition to university-wide scholarships, we recommend seeking scholarships from as many sources as possible. Visit our financial aid website for a list of scholarship search services and more information.

FINANCIAL AID

USC is need-blind in its admission process. Ability to pay, or a student’s interest in financial aid has no bearing on admission decisions. USC administers one of the largest financial aid programs in the United States and works with families to meet 100% of the USC-determined financial need for students who meet all deadlines and eligibility requirements. USC is committed to helping students finance their education through need-based financial assistance, merit-based scholarships, and affordable financing programs. Learn more about all of your options at viterbiadmission.usc.edu/finaid.

APPLYING FOR NEED-BASED AID

Applying for need-based aid is a separate process from admission and should be started soon after completing your application for admission.

- **CSS PROFILE:** between Oct 1 - Early Feb.
- **FAFSA:** between Oct 1 - Early Feb.
- Additional information may be necessary in the spring

Please see financialaid.usc.edu for the details of how to apply.
Virtual Events For You & Your Family

THREE EVENTS PER WEEK!

We want you to get to know us first-hand. For the time being, that means doing things virtually, but don’t worry; the programs below will answer your questions about USC and the Viterbi School of Engineering and help you decide if you want to apply to join us next fall. Make sure to reserve your spot early! These programs are popular, and sessions tend to fill up quickly.

FIRST-YEAR ADMISSION INFORMATION SESSIONS
TUESDAYS, THURSDAYS, SELECT SATURDAYS

A presentation by a representative from the USC Viterbi undergraduate admission office for prospective First-Year applicants.

This hour-long virtual program is designed for prospective first-year students (especially high school juniors and seniors prior to applying), and their family members to learn more about the USC Viterbi undergraduate experience. These presentations are live, online sessions led by representatives from the Viterbi undergraduate admission office. The sessions will cover our undergraduate engineering programs, the application process, and more on student life. Guests will be able to ask questions and engage in further discussion toward the end of the session. The Virtual Information Sessions take place on Tuesdays, Thursdays, and select Saturdays. Be sure to reserve your spot in advance.

TRANSFER INFORMATION SESSIONS
FRIDAYS

A presentation by a representative from the USC Viterbi undergraduate admission office for prospective transfer applicants

If you have questions about engineering and the transfer process from another college or university, our virtual transfer info sessions are for you. Led by a USC admission counselor, this one-hour session is designed to help students prepare to transfer to USC. These sessions cover general information about transferring to USC, along with more specific information about the engineering school. Students will have the opportunity to ask questions at the end of the presentation. Be sure to reserve your spot in advance.

STUDENT-LED LIVE CHATS
SUNDAYS (DATES VARY)

One-hour virtual live chats with a panel of current students to help you get to know our student communities.

Want to know what it’s like to be an engineering student at USC? Tune in to one of our USC Viterbi Virtual Live Chats! In each live chat, a panel of current USC Viterbi engineering students will share their experiences and answer your questions about majors, classes, student organizations, internships, their favorite things to do in Los Angeles, and more. Be sure to reserve your spot in advance.

FACULTY ROUNDTABLE EVENTS
SELECT DATES IN OCTOBER & NOVEMBER

One-hour panel discussions with faculty from each of our engineering discipines.

Do you want to learn more about your chosen academic program? Join a panel from each of our engineering areas of study to learn more about them, their research, their classes, and the discipline as a whole. Time will be reserved for an interactive question & answer session and all sessions will be recorded and available for later viewing.
The University of Southern California admits students of any race, color, national origin, ancestry, religion, gender, sexual orientation, age, physical disability or mental disability to all the rights, privileges, programs, and activities generally accorded or made available to students at the school. It does not discriminate on the basis of race, color, national origin, ancestry, religion, gender, sexual orientation, age, physical disability or mental disability in the administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs. The University's full nondiscrimination policy can be found on the Web at policies.usc.edu.
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