how will you engineer a better world for all humanity?


USC
Viterbi
School of Engineering

The 21st Century continues to be filled with challenges affecting every one of us. We believe your role as an engineer is to help solve those problems and have a positive impact on the world around you.

Engineering and Computer Science degree programs may be rooted in technical skills. We think your skillset in the future should be far greater. You will be a collaborative teammate who can effectively communicate with people at the core of each challenge.

INCOMING STUDENT ENROLLMENT

410
FIRST YEAR STUDENTS

140
TRANSFER STUDENTS

GENDER PARITY

50/50 Men & Women in every incoming first-year class since Fall 2019.

DIVERSE & FROM AROUND THE GLOBE

Approx. 18% international and 37% from California. 12% identified as Black, 26% Latine, and 2% Native American.

$200M
ANNUAL RESEARCH EXPENDITURES

300+
FACULTY TEACHING YOUR CLASSES

40+
RESEARCH CENTERS & INSTITUTES

35
AVG. INTRO ENGR. CLASS SIZE

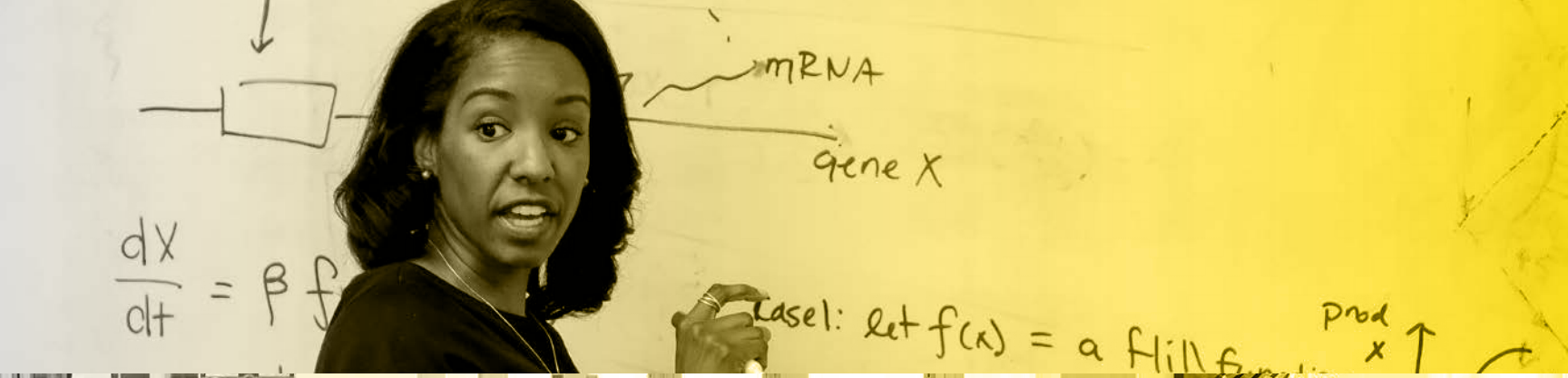
10
ENGINEERING & COMPUTER SCIENCE DISCIPLINES

20+
BUILDINGS

** demographic data represents the incoming first-year classes of 2021-2023*

The USC Viterbi School of Engineering offers a broad spectrum of academic programs in a small, flexible atmosphere.

You will start in engineering or computer science courses right away while also engaging in a full, traditional university experience. We want to see you pursue a minor or double major outside of engineering. If you want to study abroad, we have many programs designed around your curriculum in addition to getting involved and having a social life!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gene X
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Case1: let f(x) = a
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EXPERIENCE
USC VITERBI

Faculty, Teaching, & Research

Your engineering classes will be taught by some of the most renowned experts in the field. Our faculty not only conduct approx. $200 million in research each year, they also teach your classes. The path on which you are about to embark won't be easy. In fact, it is supposed to be hard. Our faculty are invested in your success despite the built-in rigor of an engineering program. 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 positive 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 in your variable to define your version of a holistic education. Engineering is the enabling discipline of our time. An interdisciplinary education gets you started on the right foot toward problem solving in a world that doesn't define it’s 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. 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 Associate Professor in the Alfred E. Mann 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

Dr. 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 Chair of the Astani Department of Civil & Environmental Engineering as well as 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.

FACULTY FACTS

- All Your Classes Will Be Taught By Faculty
- 99 are National Science Foundation Career Grant Recipients
- 39 are National Academy of Engineering Members (16 Full Time)
- 10 named Top 35 Innovators Under The Age of 35 (MIT TR-35)
- 23 are National Academy of Inventors (NAI) Members
- 2 are National Academy of Medicine Members
- 2 are NAE Gordon Prize Winners
- 2 have received Emmy Awards, and 3 are Oscar Winners

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.

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.

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.

PHEBE VAYANOS, INDUSTRIAL & SYSTEMS ENGINEERING & COMPUTER SCIENCE

Dr. 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.

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 nearly 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 and likely the first-year 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 never need to apply to another - just let us know you want to switch.

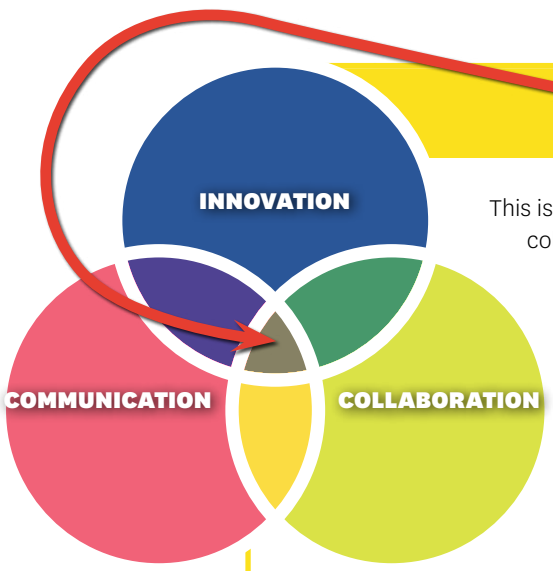
THEORY & HANDS-ON: YOU DON'T HAVE TO CHOOSE

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 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.

Our K-12 STEM 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.

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, such as the Center for Undergraduate Research in Viterbi Engineering (CURVE) Fellowship program. CURVE, in addition to other USC research opportunities, is designed specifically for USC Viterbi students. As early as your first semester, you can get help in matching you with a research project, provide research training, a competitive stipend, and professional development seminars. 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.

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.

Engineering + You Choose = Your Future

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, Dance, 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 part of your summer with our Viterbi facullty 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. Your level of engagement in these experiences 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?!

LISTEN NOW

Yup! "Viterbi Voices: The Podcast" is so much more than this booklet. In-depth discussions with faculty about their backgrounds, teaching and research. Alumni conversations explore life after college. 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!

Scan the code or go to ***viterbiadmission.usc.edu/podcast*** to start listening on all major podcast platforms.

** No promises can be made in regard to the quality of said joke(s)*

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).

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 curriculum 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, student organization involvement activities, and individualized academic advisement. Your academic success will be supported with free peer-tutoring and access to a wide range of academic support starting with our Viterbi Learning Program and other university-wide programs such as the Kortschak Learning Center. We will 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 engineering overseas opportunities.

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 such as the 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

You will create parity in engineering, and we are leading the way. Our percentage of women has been more than double the national average for the last decade and 50% of each incoming, first-year class since fall 2019. 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 Engineering, 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 and computer science students.

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

viterbivoices.usc.edu

@viterbistudent




Ashley
Rachel
Gianna

USC

A World of Opportunity Awaits

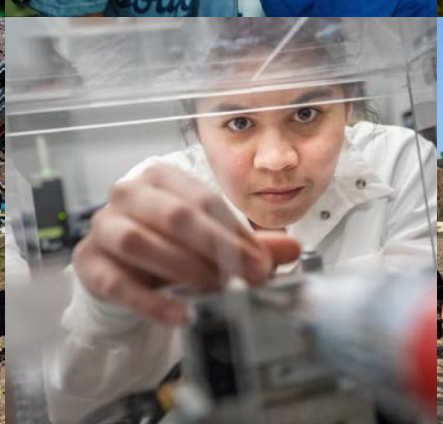









HOLLYWOOD

Aerospace & Mechanical Engineering

Majors

- Aerospace Engineering
- Mechanical Engineering

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.

Aerospace and Mechanical Engineering (AME) students develop core and valuable problem-solving skills in the areas of aerodynamics, mechanics, thermodynamics, fluid mechanics, heat transfer, materials and design.

Aerospace engineering students learn what makes flight possible, how flight is controlled, and the principles of propulsion, structures, and materials. Courses include integrated aircraft design, experimental methods, and computer-aided design and simulation. Our graduates use their diverse skill sets to work on a wide range of projects including manned aircraft, drones, and autonomous vehicles.

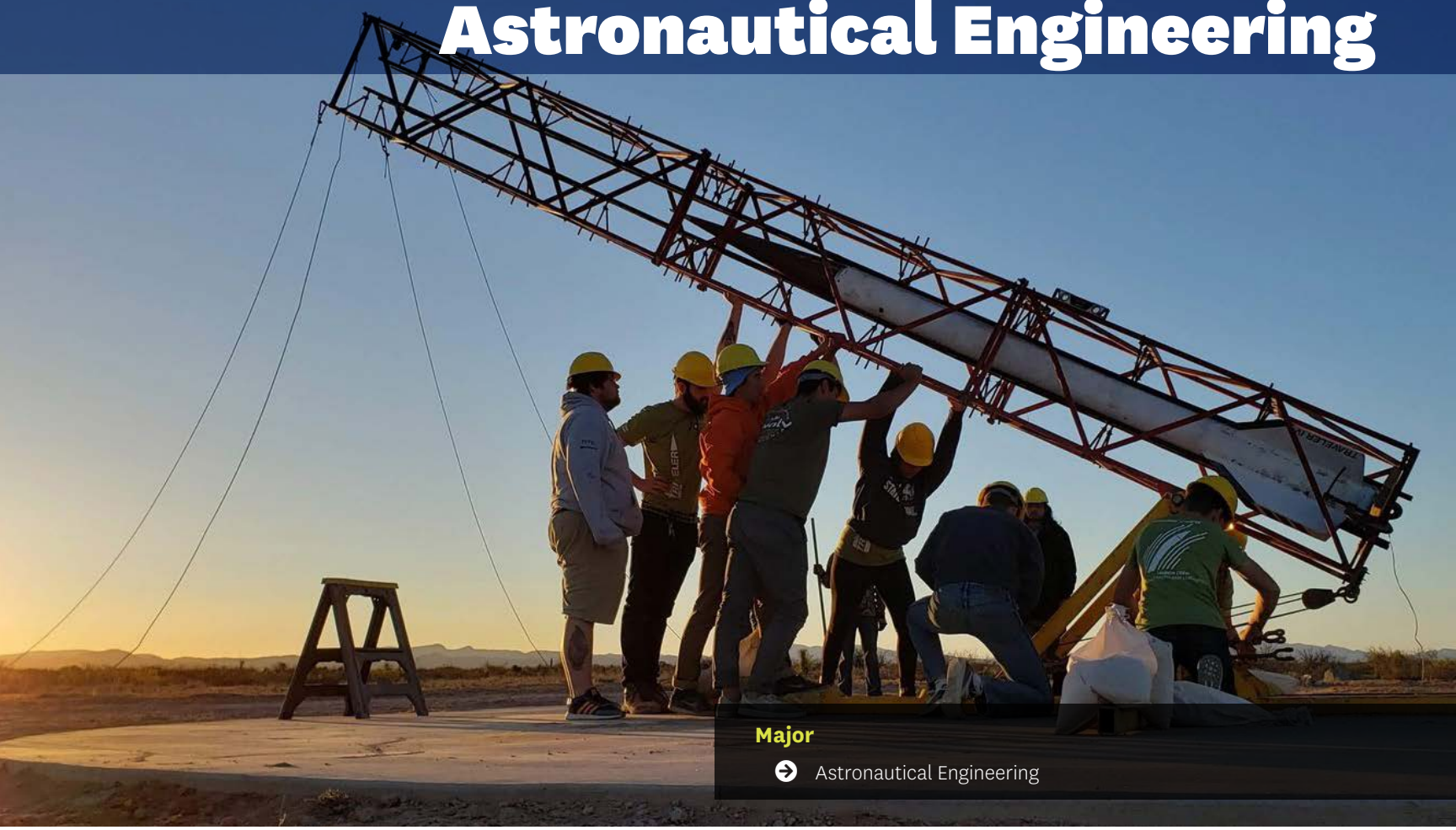
LEARN MORE

viterbi.link/ame

Mechanical engineering students learn the principles of structures, dynamics of motion, materials, fluid and thermal systems and measurement and control. Our graduates are employed in a wide variety of industries including automotive, biomedical, construction, computers, electric power production, and robotic systems.

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.

Astronautical Engineering



Major

Astronautical Engineering

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.

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.

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.

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-propelled 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.

LEARN MORE

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Biomedical Engineering

THE ALFRED E. MANN DEPARTMENT OF BIOMEDICAL ENGINEERING

Majors & Areas Of Emphasis

- Biomedical Engineering
- Biomedical (Molecular-Cellular) Engineering
- Biomedical (Electrical) Engineering
- Biomedical (Mechanical) Engineering

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.

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.

While many students choose a primary degree in Biomedical Engineering with no added specialization, we do offer the opportunity to deepen to your education in three separate emphasis programs. 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.

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.

LEARN MORE

viterbi.link/bme

Chemical Engineering

THE MORK FAMILY DEPARTMENT OF CHEMICAL ENGINEERING & MATERIALS SCIENCE

Majors & Areas Of Emphasis

- Chemical Engineering
- Chemical (Biological & Pharmaceutical) Engineering
- Chemical (Materials) Engineering
- Chemical (Energy & Sustainability) Engineering
- Chemical (Petroleum & Subsurface) Engineering

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.

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

The Biological & Pharmaceutical Engineering emphasis prepares students to apply their education to the needs of the biotechnology, biomanufacturing, and pharmaceutical industries. Students will learn how to design bioreactors for natural product manufacturing, how to develop nanopharmaceuticals, and how to apply their process control expertise to pharmaceutical manufacturing.

The Materials Engineering emphasis introduces students to the concepts necessary to apply their training to problems in materials selection, design, and manufacturing. Students will learn about polymer chemistry and physics, machine learning approaches to material design, and materials nanotechnology.

The Energy & Sustainability emphasis explores critical issues in the transition of chemical and energy systems to a sustainable future. Students will learn about emerging sustainable energy technologies, the interplay between chemical processes and the environment, and the fundamental tools for geothermal energy generation and carbon sequestration.

The Petroleum & Subsurface Engineering emphasis trains students in concepts necessary to access natural resources below the surface of the earth including petroleum, natural gas, and geothermal energy. It explores topics such as subsurface flow, modeling reservoirs and aquifers beneath the surface, and accessing subsurface resources.

LEARN MORE

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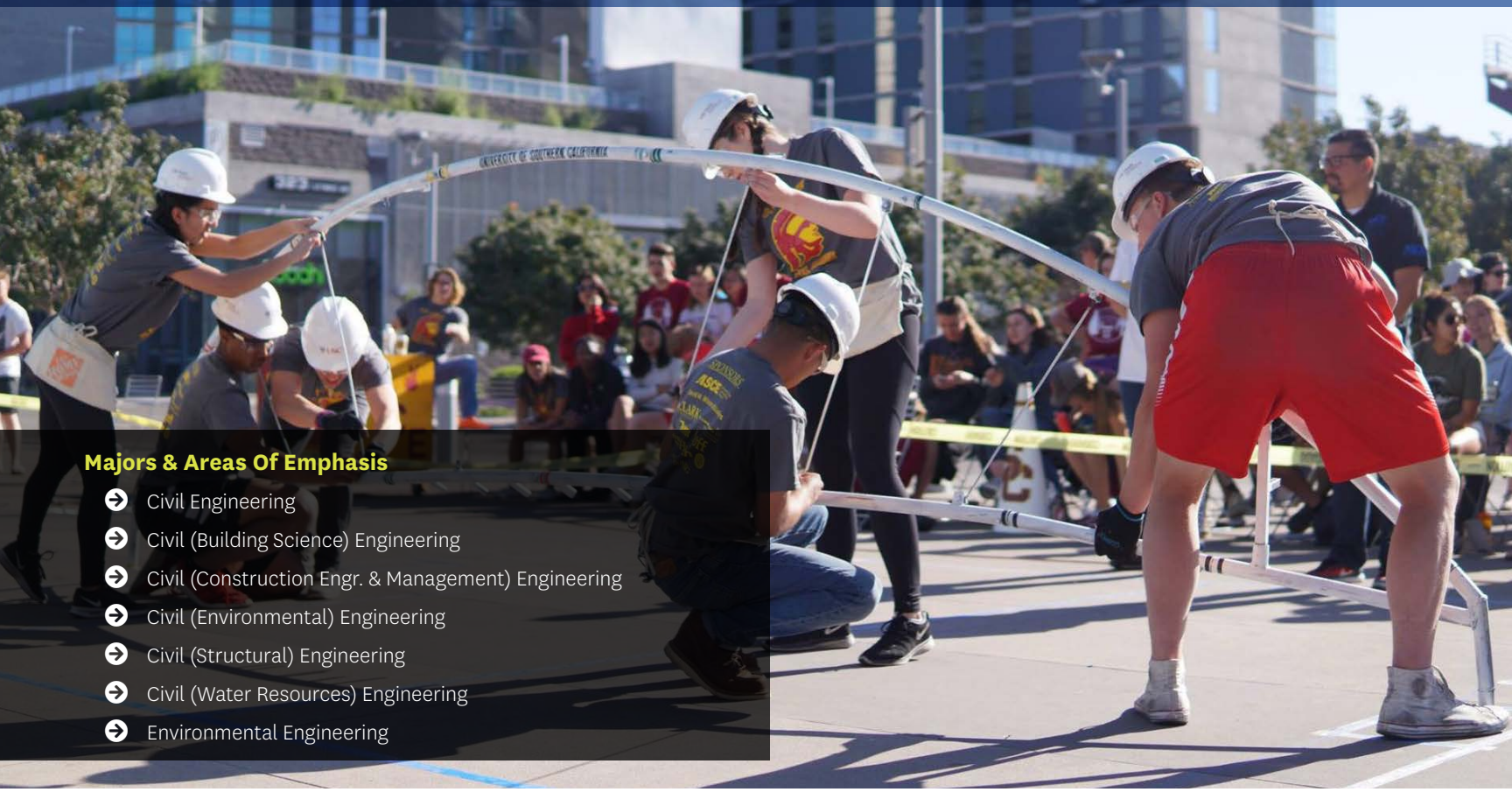
Civil & Environmental Engineering

THE SONNY ASTANI DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING



Majors & Areas Of Emphasis

- Civil Engineering
- Civil (Building Science) Engineering
- Civil (Construction Engr. & Management) Engineering
- Civil (Environmental) Engineering
- Civil (Structural) Engineering
- Civil (Water Resources) Engineering
- Environmental Engineering

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.

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. They design, build and operate our nation's infrastructure – highways, bridges, wharf and harbor structures, industrial facilities – and address the challenges of ground water, air pollution, and industrial and hazardous waste management. They monitor the quality of the air, water and land, and enhance the protection of our environment.

LEARN MORE

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The Civil Engineering degree provides a broad base of core 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 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 Environmental Engineering degree covers engineering approaches to issues related to air quality, water pollution, and sites contaminated due to spills or improper disposal of hazardous substances. Our students are broadly educated and technically trained to address the spectrum of issues facing the environment.

Computer Science

THE THOMAS LORD DEPARTMENT OF COMPUTER SCIENCE

Majors & Areas Of Emphasis

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

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.

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 / 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 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 Art & 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 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.

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Electrical & Computer Engineering

THE MING HSIEH DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

Majors & Areas Of Specialization

- Electrical & Computer Engineering
  Areas: Circuits, Signals, & Systems; Computer Engineering; Energy & Electrical Sciences
- Computer Engineering & Computer Science
  (jointly administered by the Computer Science and Electrical & Computer Engineering Departments)

Electrical & Computer Engineers are inventing the technology that powers the modern world - from computing and mobile communications platforms through biomedical devices and solar energy conversion. They design hardware from nanodevices through embedded computing systems and develop innovative approaches to imaging, communications, control & network design problems, and much more.

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 aswell as prepare them to address the specific needs of industry when they graduate.

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Industrial & Systems Engineering

THE DANIEL J. EPSTEIN DEPARTMENT OF INDUSTRIAL & SYSTEMS ENGINEERING

Majors & Areas Of Emphasis

- Industrial & Systems Engineering
- Industrial & Systems Engineering (Information Systems)

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.

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 ISE curriculum 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.

We advance and define research frontiers that benefit society through innovation of systems, algorithms, and advanced quantitative methods. Our research focuses on decision-making and design methods for complex and uncertain environments such as manufacturing, health systems, transportation and logistics among others.

Highlighted areas of research include: data-driven decision making under uncertainty, health systems improvement, supply chain management, transportation and logistics, large scale optimization, stochastic programming, computer-aided design, 3d printing, risk analysis, information theory, financial engineering, health informatics, and human-computer interaction.

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Visit With Us

IN-PERSON & VIRTUAL OPTIONS

We have a number of opportunities for you to get to know us better! Our on-campus events run year-round and on most Mondays, Wednesdays, and Fridays. In the fall we travel around the world as part of USC admission receptions. And our virtual information sessions and workshops can help you if none of the above are convenient.

No matter where you are, we want to meet you. Check our website for up to date event information as well as dates and scheduling.

viterbiadmission.usc.edu/events

Apply

Applying to the Viterbi School is no different and no more difficult than applying to USC. There are no absolute “cutoffs” for grades or class ranking. We are interested in your entire story as a student as well as your personal accomplishments and other factors in our comprehensive application review process.

All applicants must complete the Common Application and USC Questions therein at **admission.usc.edu/commonapp** by the deadlines for the intended term of enrollment.

You must list one of the Viterbi School programs (indicated as “VSE” in the Common App) as your first choice major to be considered for the Viterbi School.

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.

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 successul transfer process.

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USC Viterbi School of Engineering
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