The problems facing our planet today have never been more challenging. Solutions for such massive global needs will depend upon and require major contributions by all engineering disciplines. Paradigm shifts are taking place in all disciplines due to the great technological advances that are moving at the fastest rate in human history; engineering is no different. Fueled by the disappearance of traditional approaches and boundaries of disciplines, researchers and educators realize that the greatest advancements are occurring at the interfaces between engineering and other disciplines. True interdisciplinary activity among engineers and scientists is more than just bringing different backgrounds together to collaborate on projects or exchange information. There is a convergence of disciplines: methods from one discipline are becoming part of and enabling other disciplines. For instance, recovering and understanding the information from large data sets by engineers and life scientists are revolutionizing the way we understand biological systems, while physical scientists and engineers are looking to the life sciences for examples that can be mimicked synthetically, which could yield new leads for energy and medical applications. Given this revolution, how are we making the most of the evolving convergence of disciplines in our education and research programs?

First and foremost, we are continuing to improve our research infrastructure and facilities, while attracting and increasing the most outstanding students and faculty.

» Recent additions to our faculty, who chose us over other engineering schools because they see our strengths and their opportunities, have captured some of the most prestigious national awards.

» We enrolled the largest, most diverse and academically talented undergraduate student population in the history of the school and now have one of the best and most selective undergraduate programs in the country.

» We continue to improve and grow our graduate student cohort, an essential component for the research enterprise, with a goal of increasing their support through endowed fellowships and training grants.

» State-of-the-art buildings, housing 350,000 square feet of high-quality teaching and research space, constitute more than a $150 million investment that has transformed our ability to conduct cutting-edge research and innovative teaching.

Yet, even with this strong foundation, and given our school’s size and resources, we must be strategic and focus our intellectual efforts, build on strengths and leverage the existing partnerships throughout Washington University and around the world.
As an engineering school, we aspire to discover the unknown, educate students and serve society. Our strategy focuses intellectual efforts through a new convergence paradigm and builds on strengths, particularly as applied to medicine and health, energy and environment, and security. Through innovative partnerships with academic and industry partners — across disciplines and across the world — we will contribute to solving the greatest global challenges of the 21st century.

In order to achieve our vision, we will work over the next decade:

† To be recognized as a premier engineering school contributing world-class scholarship across disciplines;
† To improve the global quality of life through innovative discoveries in the areas of medicine and health, energy and the environment, and security;
† To prepare the leaders of tomorrow through relevant, creative and exciting undergraduate, graduate and nondegree programs;
† To enhance the culture of entrepreneurship and innovation among our faculty and students, and throughout the region;
† To recruit and retain a diverse community of the world’s leading engineering faculty, talented students and dedicated staff.

Planning Guidelines:
† What are the major national and global challenges?
† How can our school contribute toward developing the most effective and efficient solutions?
† How should we prepare the next generation of engineers and leaders?

This document is our vision — not a detailed plan or a checklist — but a framework that is meant to inspire and spark creativity in those who will adopt and implement it. Yes, these are very exciting times, and the future is bright. With the continued dedication, hard work and generous support of our alumni and entire engineering community, I am convinced that we will achieve our vision — improving quality of life and becoming one of the best engineering schools in the world.

Join us on this journey!
WASHINGTON UNIVERSITY IN ST. LOUIS (WUSTL) is a global leader in research and education with nearly 12,000 full-time students, more than 3,000 full- and part-time faculty members and more than half a billion dollars in annual research expenditures. Nearly 60 of the university’s graduate and undergraduate programs currently hold a top 25 ranking by U.S. News & World Report, including the School of Medicine’s No. 6 ranking and the Brown School of Social Work’s No. 1 ranking. The university’s undergraduate program is currently ranked at 14 overall and seventh in admissions selectivity. WUSTL also offers the nation’s largest medical scientist training program through a combined MD/PhD program dedicated to educating the next generation of physician-scientists. In addition, the university has an exceptional global network of universities made possible through the McDonnell International Scholars Academy.

Through the convergence of the university’s strengths in medicine, the life and physical sciences, architecture, engineering and international partnerships, the School of Engineering & Applied Science is positioned to become one of the world’s best private, research-intensive engineering schools. By discovering knowledge and preparing students for leadership roles, our school has the potential to make a profound and significant difference in the world.

What are the major national and global challenges?

Diagnosing and treating complex diseases are among the world’s most significant long-term challenges. Yet, these present some of the greatest possibilities for improving global quality of life. Historically, physicians have approached diseases with standardized treatments, but recently, through a convergence of disciplines, physicians, scientists and engineers are beginning to understand the medical and health potential of cutting-edge research in areas such as: genome and imaging sciences, novel medical devices, and new drugs and delivery methods.

Ensuring affordable energy, while preserving the environment and our natural resources, is one of the greatest global challenges of the 21st century. Concerns about global climate change, increased pollution of air and water, and the depletion of natural resources have led to a growing awareness of how our energy needs are met and the potentially adverse consequences for the environment and public health.

As technologies have enabled unprecedented positive advancements during the past two decades, the same technologies have created unexpected, and sometimes negative, opportunities. From computers that control our nation’s utilities, transportation and financial systems to mobile devices, health-care records and military systems — the need for new holistic approaches to security has created one of the greatest engineering challenges of the 21st century.
How can our school contribute toward developing innovative solutions?

Advanced Materials & Nanotechnology

Engineered and sustainable materials for devices, regenerative medicine and drug/gene delivery; cell/tissue biomechanics, materials for batteries and photovoltaics; materials for optoelectronic devices with unique optical and electronic properties; polymers/nanocomposites; organic/inorganic hybrid molecules

Materials science and engineering is an interdisciplinary field focusing on the development of new materials and nanostructures with desirable properties. Traditional disciplines, such as chemistry, physics and biology, play a central role in developing fundamental knowledge that underlies materials studies. In turn, materials science and engineering fuels progress in traditional engineering disciplines, such as mechanical, electrical and biomedical engineering. Through the convergence of disciplines, advances in materials are providing new solutions for some of the most significant challenges we face, especially for developing new sources of energy and finding ways to use energy more efficiently, while addressing environmental concerns. The design of new materials also is transforming the medical field with engineered materials for regenerative medicine, drug delivery and cell and tissue biomechanics for development, injury and healing.

Biological & Medical Engineering

Control of biological networks in treating and diagnosing disease and in aging processes; engineering of new metabolic pathways for fuel and useful chemicals; design and construction of new biological entities, such as enzymes, genetic circuits and cells or the redesign of existing biological systems

Biological systems engineering leverages systems science approaches to understand and modulate spatiotemporal responses of biomolecular and cellular networks that control the onset and progression of complex diseases. Cancer, Alzheimer’s disease and cardiovascular disorders are complex diseases that present the most severe health-care challenges for modern society. In addition, protein engineering, metabolic engineering, synthetic biology and chemical biology can be used to engineer systems — for example, microbes to produce advanced biofuels — and for bioremediation of toxic compounds from water sources.

Environmental Engineering & Sustainable Technologies

Alternative energy sources; harvesting, storage and distribution of energy from sustainable alternative sources; air quality and clean water; sequestration, treatment and remediation technologies; combustion, particle emission control; power electronics; environmental monitoring

The rapid pace of globalization provides unprecedented opportunity for developed and developing countries to restructure and grow their economies. However, society must meet the heightened demand for energy and goods through responsible, sustainable sources and with technologies that will have limited environmental impact, such as materials and devices for solar photovoltaics and new pathways for biofuel and biochemical production. We must create and improve the infrastructure required to ensure the highest quality of environmental and human health, which will require both fundamental and applied research in order to address environmental challenges comprehensively. Through the cross-disciplinary research of physical, chemical and biological processes in engineered systems, we can achieve cleaner air and water worldwide.

Imaging Technologies & Signal Processing

Multiscale and multimodal imaging; nanomaterials for imaging and therapy; image processing and understanding; imaging informatics; biologically inspired systems; sensor networks; systems and control; smart grid monitoring; computer vision

Vast growth in the amount of data obtained from modern sensor systems requires the development of advanced data processing techniques. Innovative imaging and signal processing techniques are needed to efficiently perform automated inference and decision making. Sensing systems often contain multiple kinds of sensors, necessitating the proper integration of multiple modalities of data. Modern security and defense systems based on sensing technologies require sophisticated methods to automatically monitor the environment and detect and track targets. In medicine, the development of novel biomedical imaging modalities provides a great deal of functional and anatomical information on different resolution scales. These modalities greatly increase the challenge of accurately analyzing the measured information in the presence of noise. Diagnostic medicine can be significantly improved by providing tools to automatically and systematically process this data.

Networking & Communications

Wireless and mobile networking; sensor networks; high-performance networking; ubiquitous and secure data networks applied to smart energy and health; cyber-physical systems; machine learning and artificial intelligence; security; human-computer interaction; data handling architectures; parallel computing

Ubiquitous and secure data networks will lead to breakthrough advances in areas related to medicine and health, energy and the environment, and security. For example, home-area networks connect seamlessly to meters, generators, sensors and appliances to enable intelligent control of energy; body sensors and smartphones to continuously collect and feed physiological data to electronic medical records and automatically identify early signs of health problems; and in order to achieve success in these areas, tomorrow’s networks must be fundamentally more scalable and secure than today’s Internet, and must be able to handle hundreds of billions of devices, while preserving the confidentiality, integrity and accessibility of data and critical services.
RESEARCH CENTERS

Cardiac Bioelectricity & Arrhythmia Center (CBAC)

An interdisciplinary center housed within the engineering school, CBAC works to develop new tools for diagnosis and treatment of cardiac arrhythmias—a major cause of death and disability. Through an interdisciplinary effort, CBAC investigators apply molecular biology, ion-channel and cell electrophysiology, optical mapping of membrane potential and calcium, multi-electrode cardiac electrophysiological mapping, electrocardiographic imaging (ECGI) and other noninvasive imaging modalities, and computational biology (mathematical modeling), to study mechanisms of arrhythmias at all levels of the cardiac system. cbac.wustl.edu

Center for Biological Systems Engineering (CBSE)

Established in December 2008, the CBB is a center for research in advanced coal and carbon capture technologies. The consortium’s goal is to foster the utilization of coal as a safe and affordable source of energy, and as a chemical feedstock, with minimal impact on the environment. The consortium operates under the umbrella of I-CARES, and the establishment was made possible through financial commitments from the lead sponsors: Arch Coal, Peabody Energy and Ameren. Funding goes to support a variety of research projects, advanced research facilities in the engineering school and outreach activities relating to the clean utilization of coal. The research projects are led by faculty at Washington University and performed in collaboration with faculty from international partner universities. cccu.wustl.edu

Center for Sensor Signal & Information Processing

Vast growth in the amount and complexity of data obtained from modern, diverse sensor systems requires the development of advanced data processing techniques. Innovative imaging and signal processing techniques are needed to efficiently perform automated inference and make quick decisions. Researchers in this center focus on statistical signal processing and imaging to solve problems in security, defense, biomedicine, energy and the environment. They develop physically or biologically based models, statistical hypothesis tests, detection and estimation algorithms, performance analyses, bounds and optimal designs. Applications include remote sensing, radar, sonar, biologically inspired sensing, genomics, biomedical imaging and monitoring power systems using advanced sensors.

Institute of Materials Science & Engineering (IMSE)

The schools of Engineering & Applied Science and Arts & Sciences jointly established IMSE in 2012 to integrate and leverage the full potential of interdisciplinary materials research by bringing together more than 50 researchers from engineering, physics, chemistry, and earth and planetary sciences. While advances in materials science and engineering research depend on knowledge from traditional disciplines, a new, integrated, dynamic and diverse approach through a convergence of disciplines provides the greatest opportunities for unprecedented discoveries—new knowledge that cannot be achieved by a single discipline or department. IMSE also educates the next generation of materials sciences and engineers through a new, novel inter disciplinary doctoral program. ime.wustl.edu

International Center for Advanced Renewable Energy & Sustainability (I-CARES)

I-CARES was created in June 2007 to encourage and coordinate university-wide and external collaborative research on energy, environment and sustainability that cannot be done by single investigators or by single disciplines alone. icares.wustl.edu

The Nano Research Facility (NRF)

The NRF is positioned among the physical science and engineering departments and cultivates an open and shared research and education environment that brings researchers across disciplines together, particularly in the emerging area of nanomaterials with applications in the energy, environment and biomedical fields. Scanning and transmission microscopes as well as a micro- and nano-fabrication lab (clean room class 100/1,000) surface characterization lab, particle technology lab and bio-imaging lab represent the core of capabilities. The NRF services and equipment, supported by NSF’s National Nanotechnology Infrastructure Network, are available for both university and industry users. nano.wustl.edu

McDonnell Academy Global Energy & Environment Partnership (MAGEEP)

MAGEEP is a consortium of J.B. McDonnell Academy universities and global corporate partners that supports the development of innovative ideas in energy, environmental and sustainability research, education and operations.

Photosynthetic Antenna Research Center (PARC)

In August 2009, the U.S. Department of Energy awarded WUSTL an Energy Frontier Research Center (EFRC) grant to focus on laying the scientific groundwork needed to meet global demands for abundant, clean and economical energy. WUSTL used the $20 million, five-year award to establish the Photosynthetic Antenna Research Center (PARC), which aims to understand the basic scientific principles that govern solar energy collection by photosynthetic organisms. This knowledge will be used to enhance natural antenna systems and to fabricate bio-hybrid and bio-inspired systems for light harvesting. Key user facilities such as bioreactors for growing photosynthetic organisms and lasers are housed in the engineering school. parc.wustl.edu

U.S.-India Joint Clean Energy Research & Development Center

In May 2012, the U.S. Department of Energy announced WUSTL would be part of a $25 million solar energy consortium that brings together experts from national laboratories, universities and industry in both the U.S. and India. The consortium’s research focuses on sustainable photovoltaics, multiscale concentrated solar power and solar energy integration. solarstorage.wustl.edu

For updates and information about additional centers: engineering.wustl.edu/research

Facility & Research
**Faculty & Research**

**Investing in the discovery of knowledge to meet global challenges**

With the greatest advances in research emerging at the interfaces between engineering and other disciplines, the school’s top priority is to build a more robust, multidisciplinary research enterprise now, as an investment to meet society’s challenges today and in the future. In fiscal year 2012, the faculty produced approximately $25 million in research expenditures, with an average of approximately $435,000 per active researcher, similar to many of our target peer schools. By expanding the size of the faculty, mentoring junior faculty members, partnering with industry, securing larger schoolwide and center grants, and developing additional research space, the faculty has the potential to achieve $50 million in expenditures by 2020.

**Annual Research Expenditures**

- $25 million in 2012
- $50 million by 2020

**Research Administration**

**Initiatives:**
- Appoint a director of research development & administration to coordinate schoolwide research activities
- Complete the engineering complex with additional space for research activities (see pp. 22-23)
- Create research space for interdisciplinary centers that include faculty from other disciplines, especially medicine and the sciences
- Encourage corporate-sponsored research projects and develop additional master research agreements with key corporate partners (see p. 25)
- Maintain an aggressive faculty and doctoral student recruitment plan to drive increased research activities

**Initiatives:**
- Raise funds to enable faculty recruitment, especially new endowed professorships for career development of young faculty and for the dean and department heads to fund new initiatives
- Focus on increasing the diversity of our faculty
- Recruit visiting professors and encourage joint appointments between engineering departments and other schools at WUSTL to help build centers in strategic research areas
- Develop new mentoring systems and create unique opportunities for leadership development at all ranks
- Encourage all faculty to be more active and visible within professional societies and granting agencies

**Faculty**

Recruiting faculty to build critical mass in strategic areas

Within the next decade, the school plans to increase the number of engineering students from approximately 2,000 to 2,500; coupled with the desire to grow research programs to similar sizes of our target peer schools, we need to expand the size of our faculty to at least 100. Currently, the school has 80 tenured/tenure-track faculty members, but with more than 10 retirements expected during the next decade, the school needs to recruit an estimated 30 new faculty members to reach 100. In addition to offering competitive salaries, recruiting one professor requires startup and laboratory/office preparation costs in excess of $500,000, depending on the discipline, level of the faculty and condition of the space. Based on these current numbers and projections, the school estimates it will need to invest at least $30 million to $40 million for faculty recruitment, in order to achieve a size of 100.

**Initiatives:**
- Raise funds to enable faculty recruitment, especially new endowed professorships for career development of young faculty and for the dean and department heads to fund new initiatives
- Focus on increasing the diversity of our faculty
- Recruit visiting professors and encourage joint appointments between engineering departments and other schools at WUSTL to help build centers in strategic research areas
- Develop new mentoring systems and create unique opportunities for leadership development at all ranks
- Encourage all faculty to be more active and visible within professional societies and granting agencies
Health-care problems posed by complex diseases present the most daunting challenges for modern society. These diseases include cancer, injuries to physiological systems, and disorders associated with embryonic development, aging and the adaptive immune system. Our vision is that advances in the diagnosis and treatment of complex diseases will require integrative and multiscale engineering approaches to biology and biomedical sciences. The BME department faculty will produce advances in basic science, enabling technologies and multiscale systems science approaches that will provide a more holistic understanding of the spatiotemporal responses of biomolecular and cellular networks that give rise to the onset and progression of such diseases and the propagation of injuries. This will involve an integrative approach with a synergistic focus on development, regeneration and degeneration of cells and tissues, and will be leveraged to transform the development of novel biomaterials, drugs and biomedical devices for diagnosis and treatment.

Established in 1997, the Department of Biomedical Engineering seeks to provide (1) a first-class undergraduate engineering education that prepares students for a variety of careers and (2) a cutting-edge graduate teaching program that advances basic science with the hope of improving the diagnoses and treatment of human diseases.

FACTS:
- 20 tenured/tenure-track faculty
- $12.9M in research expenditures (FY12)
- 121 doctoral students
- 408 undergraduate students
- Among U.S. News & World Report’s top 30 biomedical engineering programs: No. 1 for per capita core faculty citations from 2001 to 2011, No. 2 for per capita core faculty publications from 2001 to 2011 and No. 1 for per capita core faculty NIH funding (FY10)
- No. 15 graduate program in U.S. News ranking (2012)
- No. 15 undergraduate program in U.S. News ranking (2011)

Professor Lihong Wang’s research is dedicated to the development of novel imaging technologies. The photoacoustic microscopy image shows a melanoma tumor (above). Such an imaging capability is expected to play an important role in both preclinical and clinical applications.

The Department of Computer Science & Engineering conducts high-impact research and trains future researchers, engineers and educators in both the fundamental properties of computing systems and how computation can benefit a wide range of disciplines. Key themes include designing computing systems that interact with humans and the physical world, using computation to interpret large data sets from science and engineering, and creating safe, secure infrastructure to connect millions of people to their data and to each other.

FACTS:
- 18 tenured/tenure-track faculty
- $4.9M in research expenditures (FY12)
- 72 doctoral students
- 109 master’s students
- 149 undergraduate students
- Among U.S. News & World Report’s top 30 computer science & engineering programs: No. 15 graduate program (2012)
- No. 13 undergraduate program (2011)

Associate Professor Tao Ju has created a new interactive modeling tool kit called Gorgon, targeted at intermediate-to-near-atomic resolution density maps (above).
The Department of Electrical & Systems Engineering has a unique and long tradition of excellence in advancing basic science and solving cutting-edge engineering problems relevant to society. The second-oldest electrical engineering department in the country, it is dedicated to providing high-quality education and research, with a focus on applied physics and devices; signal and image analysis; and systems science and applied mathematics.

**Electricity & Systems Engineering**

**Medicine:**
- Sensors
- Imaging
- Genomics
- Proteomics

**Energy:**
- Smart grid monitoring & efficiency
- Sensor networks
- Storage
- Photovoltaic cells
- Power electronics

**Security & Defense:**
- Sensing
- Data analysis
- Forensics technologies
- Environmental monitoring
- Automatic decision making

**Systems Analysis:**
- Operations research
- Management & finance
- Biology

**Robotics:**
- Control
- Mechatronics
- Surgery

**Academic Departments**
- Applied physics
  - Advanced materials
  - Integrated photonics
  - Nano-fabrication devices
- Information
  - Imaging
  - Signal processing
  - Information theory
  - Communications
- Systems
  - Applied math & stat
  - Computational math
  - Optimization
  - Control
  - Information imaging
  - Signal processing
  - Information theory
  - Communications

**Facts:**
- 12 tenured/tenure-track faculty
- $4.2M in research expenditures (FY12)
- 74 doctoral students
- 21 master’s students
- 200 undergraduate students
- $20 million from the Department of Energy for an Energy Frontier Research Center
- $12 million from Peabody Energy, Arch Coal and Ameren to support the Consortium for Clean Coal Utilization, including support for an innovative Advanced Coal and Energy Research Facility
- Member of the $25M Solar Energy Joint Clean Energy Research and Development Center through the U.S.-India Partnership to Advance Clean Energy

**Academic Departments**
- Electrical & Systems Engineering
- Applied Physics
- Information
- Systems
- Medicine
- Engineering
- Security & Defense
- Systems Analysis
- Robotics

**Energy, Environmental & Chemical Engineering**

**Aerosols:**
- Combustion
- Nanoparticle technology
- Instrumentation
- Particle emission control
- Air quality & environmental informatics

**Engineered Aquatic Processes:**
- Aquatic chemistry
- Water treatment
- Quantum & molecular-level modeling of interfaces
- Environmental restoration

**Metabolic Engineering & Systems Biology:**
- Cellular pathways for chemical transformation
- Biological routes to chemical/energy production

**Multiscale Engineering:**
- Nanoscale & mesoscale phenomena
- Catalysis & reaction engineering
- Electrochemical engineering

**Collaborative Research Areas:**
- Energy
- Environmental engineering science
- Advanced materials
- Global outreach

**Facts:**
- 18 tenured/tenure-track faculty
- $1.7M in research expenditures (FY12)
- 47 doctoral students
- 34 master’s students
- 200 undergraduate students
- $20 million from the Department of Energy for an Energy Frontier Research Center
- $12 million from Peabody Energy, Arch Coal and Ameren to support the Consortium for Clean Coal Utilization, including support for an innovative Advanced Coal and Energy Research Facility
- Member of the $25M Solar Energy Joint Clean Energy Research and Development Center through the U.S.-India Partnership to Advance Clean Energy

**Academic Departments**
- Electrical & Systems Engineering
- Applied Physics
- Information
- Systems
- Medicine
- Engineering
- Security & Defense
- Systems Analysis
- Robotics

**Energy Systems**
- Multiscale engineering
- Aerosols
- Engineered aquatic processes
- Metabolic engineering & systems biology

**Convergence > Strategic Plan >>**

14 >> engineering.wustl.edu

> eece.wustl.edu

As one of the first departments of energy, environmental & chemical engineering in the world, EECE uses leading interdisciplinary approaches in aerosols, engineered aquatic processes, metabolic engineering & systems biology, and multiscale engineering to address global challenges related to energy and the environment.

**Facts:**
- 18 tenured/tenure-track faculty
- $4.2M in research expenditures (FY12)
- 74 doctoral students
- 21 master’s students
- 200 undergraduate students
- $20 million from the Department of Energy for an Energy Frontier Research Center
- $12 million from Peabody Energy, Arch Coal and Ameren to support the Consortium for Clean Coal Utilization, including support for an innovative Advanced Coal and Energy Research Facility
- Member of the $25M Solar Energy Joint Clean Energy Research and Development Center through the U.S.-India Partnership to Advance Clean Energy
Mechanical engineers and materials scientists are addressing the most pressing challenges of the 21st century: providing a plentiful supply of clean energy; ensuring high-quality, affordable health care; and maintaining the security of nations and communities. The principles of mechanics are embedded in each of these challenges, determining the behavior of man-made and natural systems as diverse as wind turbines, crawling cells and fighter jets. New materials — nanostructured, multifunctional, energy-harvesting, light, strong and environmentally friendly — will disruptively change the way these systems are designed. MEMS faculty and students, defined by their expertise in fundamental mechanical engineering and materials science, will exploit the interfaces between disciplines: where mechanics converges with biology, where materials science converges with nanotechnology, and where aerospace engineering converges with the science of energy. These areas of convergence take advantage of WUSTL’s traditional strengths and culture of collaboration. At these interfaces, deep understanding, creativity and boldness will be rewarded by innovations with great impact in biotechnology, advanced materials and energy conversion.

**AEROSPACE SYSTEMS:**
- Computational fluid dynamics
- Flow physics & flow control
- Rotorcraft modeling & analysis
- Aeroelasticity
- Design & optimization

**ENERGY & SUSTAINABILITY:**
- Renewable energy
- Efficient vehicles & buildings
- Sustainable materials & devices
- Energy harvesting
- Energy conversion & storage

**ADVANCED MATERIALS:**
- Nanostructured materials
- Metallic glasses
- Polymers & nanocomposites
- Biomaterials
- Adaptive multifunctional materials
- Organic/inorganic hybrid materials

**BIOMECHANICS & BIOTECHNOLOGY:**
- Subcellular & cellular mechanics
- Tissue biomechanics
- Biomaterials
- Medical devices

How should we prepare the next generation of engineers and leaders?

**UNDERGRADUATES**

**Universal degree to solve global challenges**

Today’s engineering students understand the connection between studying engineering and benefiting society, and they are innovative thinkers who want to use their quantitative and analytical skills to solve problems. In recent years, engineering has become a universal degree for those who enjoy and are successful in math and science, independent of what career path they ultimately choose. So, to prepare the next generation of engineers and leaders, the school’s faculty has developed a set of hallmarks that has come to characterize the WUSTL undergraduate engineering experience:

- Educating students to be innovative with their quantitative and analytical skills and be able to adapt to change
- Promoting lifelong learning
- Preparing students for citizenship in a global society
- Preparing students for leadership roles
- Educating students so they are prepared to enter programs of graduate study in engineering, medicine, law, business and policy or to become professional engineers

**CURRENT MAJORS:**
- Biomedical Engineering
- Computer Engineering
- Computer Science
- Electrical Engineering
- Chemical Engineering
- Mechanical Engineering
- Systems Science & Engineering

**FACTS:**
- 13 tenured/tenure-track faculty
- $5.2M in research expenditures (FY12)
- 256 undergraduate students
- 67 master’s students
- 26 doctoral students

**CURRENT MAJORS:**
- Biomedical Engineering
- Computer Engineering
- Computer Science
- Electrical Engineering
- Chemical Engineering
- Mechanical Engineering
- Systems Science & Engineering

**STUDENTS**

**UNDERGRADUATES FALL 2011**

<table>
<thead>
<tr>
<th>Test</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT math</td>
<td>95th</td>
</tr>
<tr>
<td>SAT verbal</td>
<td>96th</td>
</tr>
</tbody>
</table>

- Applications: 5,162 for 272 slots
- No. 7 ranking for undergraduate student selectivity by U.S. News & World Report (universitywide)
- Approximately 60 percent of Engineering students pursue an academic interest beyond their first engineering major
- 98 percent job placement by graduation for BS engineering graduates
- Of those students who go on to graduate school, 40 percent went to graduate school. Starting salaries for WUSTL BS engineering graduates are 10 percent higher than the national average.

**FACULTY:**
- Assistant Professor Srikanth Singamaneni conducts research involving scanning probe microscopy to understand polymer structure and properties that have applications in chemical and biological sensors (above).
Need for more engineers

Over the past two decades, the number of students graduating each year with engineering degrees from U.S. colleges has remained flat — approximately 120,000 — even though the overall number at U.S. colleges during the same time frame has increased by more than 50 percent. Compare this alarming statistic to the number of engineers that India and China are graduating — more than 1 million annually. At current rates, the U.S. is not producing enough engineers to meet the domestic technological demands of industry, academia and society, and our position as a global leader in scientific innovation continues to be threatened.

In order to increase the number of engineers graduating from U.S. colleges, the school has outlined the following initiatives:

- Increase the size of the undergraduate population from approximately 1,500 to 1,900 by the year 2020 through additional freshmen, dual degree and transfer students.
- Improve retention from approximately 75 percent to 90 percent by creating more opportunities for international experiences, undergraduate research and internships; improving faculty advising; and offering new courses and academic programs, such as in environmental engineering, applied science and engineering policy.
- Create more opportunities for hands-on design projects — especially with companies, and during freshman and sophomore years.
- Support a new schoolwide director of undergraduate studies to lead the School of Engineering & Applied Science to national prominence in undergraduate education.
- Raise additional need-based scholarship funds to support the additional number of students and to ensure that WUSTL remains a destination for the most academically gifted, creative and imaginative students, regardless of economic backgrounds.
- Raise additional Langsdorf merit-based scholarship funds to attract the best students and to be competitive with the best engineering schools; develop a family of Langsdorf scholars by connecting Langsdorf alumni with current students.
- Enhance the culture of entrepreneurship through new courses and a new competition with financial incentives (see p. 29).
- Promote master’s programs through new tuition assistance (see p. 19).

Academic Department Master’s Programs

As the national trend has shown that many engineering fields are now requiring a master’s degree for entry-level professional practice, the school is encouraging undergraduate students to enroll in the bachelor’s/master’s program. In addition to allowing six units that can be counted both for the bachelor’s and master’s degrees, the school offers new financial aid for current WUSTL Engineering undergraduate students based on GPA. Most students can complete both degrees in five years.

The school has also recently developed Master of Engineering (MEng) programs, which are primarily coursework-based, and they are specially designed for professional students seeking advanced credentials for industrial careers, but who are not interested in pursuing doctoral degrees.

The school continues to offer several Master of Science (MS) programs, which are typically research-based and are good preparation for entry into a doctoral program. To increase the number of master’s students by more than 45 percent over the next decade, the school will work to enhance current programs and develop new programs, especially interdisciplinary professional master’s programs. The school is also working with the Olin Business School to develop additional joint master’s programs.

Well-rounded Engineers

More than 40 years ago, the School of Engineering & Applied Science established agreements with a select group of affiliated colleges and universities to offer students the opportunity to earn an undergraduate liberal arts or science degree and undergraduate engineering degree. Students typically follow a 3-2 or 4-2 schedule, entering WUSTL their junior or senior year for their engineering education. With more than 1,500 alumni from this program, this special opportunity has prepared outstanding, diverse and “well-rounded engineers” — with strong communication and problem-solving skills, a broad background in the humanities and social sciences, and a high-quality technical education. The school plans to increase the number of dual degree students and raise new scholarships to support them.
Doctoral students (PhD and DSc) are the foundation and lifeblood of the school’s research programs, and the school’s goal is to continue making graduate education attractive to the most talented students. Our doctoral graduates pursue primarily academic careers and industry research careers, and they will be responsible for driving future innovation, improving quality of life, strengthening the economy, securing our homeland, and preparing the future workforce and future engineers.

In engineering, doctoral students take approximately five years on average to complete their studies, and most doctoral students receive a stipend to support their living expenses. The school provides the stipend for the first year so students can explore laboratories to find the best fit for their research interests without causing financial drains on faculty research projects. After the first year, the doctoral student stipends are fully supported by research grants. In addition, the school does not charge tuition for full-time doctoral students, which is not typical among engineering schools. By doing this, however, the school allows the faculty to spend approximately $1 million additionally each year on research.

Since the school plans to grow the faculty size to 100 and double research expenditures to $50 million annually by the year 2020, the school will need to increase the number of doctoral students to approximately 500 (or five per tenured/tenure-track faculty on average) to support the research programs, attract and retain the best faculty, and increase productivity and results.

With the greatest advancements in research and graduate education existing at the interfaces between engineering and other disciplines, especially the sciences, the school proposes a Division of Physical Sciences & Engineering (DPSE), similar to the successful model of the Division of Biology & Biomedical Sciences (dbbs.wustl.edu). The DPSE would develop and administer PhD programs in interdisciplinary fields primarily (but not exclusively) among engineering, chemistry, physics, mathematics, and earth and planetary sciences. Examples of possible interdisciplinary PhD programs include: materials science and engineering, environmental science and engineering, statistics, and imaging science.

In addition, DPSE could include “pathways.” DBBS has successfully administered programs such as the Cognitive, Computational and Systems Neuroscience Curriculum (CCSN) Pathway, which allows doctoral students to earn a degree from one department but offers courses, thesis committee members and other opportunities from more than one department.
Building the school of tomorrow — today

Realizing the need for new research laboratories and specialized facilities that would support the school's intellectual vision and plans, Chancellor Mark Wrighton committed the site at the northeast corner of WUSTL’s Danforth Campus for the School of Engineering & Applied Science. In 2007, the school developed a master plan for a new engineering complex that would complement and connect to the existing Uncas A. Whitaker Hall for Biomedical Engineering. The proposed approximately 700,000-square-foot complex would provide modern research and instructional facilities equipped with state-of-the-art technology needed to enable collaboration across disciplines.

Over the past decade, WUSTL, the School of Engineering & Applied Science and several generous donors have invested more than $150 million in new and renovated engineering space. With about half of the new engineering complex complete, the school plans to build another 350,000 square feet of space distributed through two or three new buildings that will house the Department of Mechanical Engineering & Materials Science, the Department of Computer Science & Engineering, additional classrooms and student services, interdisciplinary centers and institutes, and administrative offices. The additional buildings will provide the necessary research and instructional space to expand the size of the faculty, increase the number of students, encourage and enable interdisciplinary activities, help smaller departments grow and improve rankings, and house most of the engineering school within one complex.

In Support of a Bold Vision

Master Plan Progress

Uncas A. Whitaker Hall opened in December 2002 with approximately 110,000 square feet of space for the Department of Biomedical Engineering.

Stephen F. & Camilla T. Brauer Hall opened in June 2010 with approximately 155,000 square feet of space for the Department of Energy, Environmental & Chemical Engineering and the Department of Biomedical Engineering.

Preston M. Green Hall opened in August 2011 with approximately 84,000 square feet of space for the Department of Electrical & Systems Engineering and the Department of Energy, Environmental & Chemical Engineering.

More information about the master plan:
engineering.wustl.edu/masterplan
The School of Engineering & Applied Science interacts with more than 300 companies annually, mostly through professional education in the Henry Edwin Sever Institute and the Center for the Application of Information Technology. As technology alters the business landscape at an unprecedented rate, the school’s professional education programs meet the training and professional development needs of industries and individuals through innovative degree and nondegree programs. From short training courses and industry collaboration events to certificate and professional degree programs, the school equips technical professionals with the relevant skills needed to lead in a complex environment.

As a long-term strategy, the school’s professional education initiative will focus on enhancing existing programs, developing new opportunities and expanding education delivery methods — including online education — to better serve the needs of working professionals.

**Current Offerings**
- Eight graduate programs
- More than 200 short courses and seminars
- More than 25 industry collaboration programs and events held annually

**Program Areas**
- Project management
- Information management
- Engineering management
- System integration
- Construction management

>> sever.wustl.edu

>> cait.wustl.edu

**Initiatives**

**Professional Education**

**Part-Time Classes. Full-Time Results.**

**Corporate Outreach**

**Building Awareness About the School within the Business Community**
- Identify liaisons at key companies
- Coordinate corporate outreach within the school and with university partners, including Olin Business School, the Skandalaris Center for Entrepreneurial Studies, the Career Center, and Alumni & Development Programs
- Develop a database to track contacts and connect research interests
- Develop a corporate communications plan that includes company-specific annual reports, advertisements in business-related publications and websites, and presentations to professional and community organizations
- Hold alumni events and information sessions at companies
- Create a "Visiting Executives" program
- Appoint more corporate representatives to the school's advisory boards

**Supporting the Business Community's Needs for Research and Development**
- Recruit more "Professor of Practice" and adjunct faculty for teaching positions
- Hold joint seminars to understand research interests and needs
- Increase corporate-sponsored research projects
- Develop master research agreements with key corporate partners to standardize and simplify terms and agreements, so companies and faculty members do not have to negotiate for each project; also helps accelerate the transfer of new knowledge from laboratory to market
- Create an "Engineering Clinic" to offer services for short-term consulting and analysis projects
- Promote research facilities available to corporate partners, including the school's Nano Research Facility
The School of Engineering & Applied Science will increase efforts to serve as a catalyst for bringing together colleges/universities and companies to develop a diverse and well-educated workforce with STEM backgrounds.

In partnership with the Business-Higher Education Forum (BHEF), the school will work with local community colleges to build a pipeline of Science, Technology, Engineering and Mathematics (STEM) graduates, beginning with high school students participating in Missouri’s A+ Program, which provides public support for scholarship funds to eligible graduates of A+ designated high schools to attend public community colleges. After completing “pre-engineering” courses at community colleges, students would receive private scholarship support to enroll in the UMSL/WUSTL Joint Undergraduate Engineering Program or other partnering regional four-year colleges. If students continue to maintain academic excellence, they will receive additional tuition assistance to attend WUSTL for a master’s degree. This five-year plan will support local high school students who may not necessarily have the financial resources or ability to attend WUSTL as an undergraduate student with a path to receiving a master’s degree from WUSTL.

In addition, working with WUSTL’s Institute for School Partnerships, the engineering school will continue to raise awareness and interest among K-12 students in STEM fields.

Educating Engineers for St. Louis

Twenty years ago, WUSTL and the University of Missouri-St. Louis (UMSL) established a unique public-private partnership through a joint undergraduate engineering program, which combines the strengths of the two universities to provide a flexible engineering program for the St. Louis region. Students take pre-engineering core courses in mathematics, physics, chemistry, humanities and social sciences at UMSL, or a community college, and then take engineering courses at WUSTL. The program offers ABET-accredited Bachelor of Science degrees in civil, electrical and mechanical engineering. Students pay UMSL tuition rates and receive a University of Missouri degree.

The approximately 500 graduates of this joint program are primarily from St. Louis, and they typically stay in the region and in engineering careers. The school hopes to expand this program through its initiative with the Business-Higher Education Forum (BHEF) to develop a diverse and well-educated workforce for St. Louis (see p. 26).
Recruit and retain a diverse community of the world’s leading engineering faculty, students and staff

The School of Engineering & Applied Science at WUSTL is committed to an open, inclusive environment for all members of our community. The students, faculty, staff and administration believe in creating and maintaining a culture that embraces and appreciates the strength and value of differences in gender, race, ethnicity, geography, socioeconomic status, age, politics, philosophy, disability and sexual orientation. We seek to attract and invest in students, faculty, staff and administrators who have the talent and desire to make a difference, with special attention given to advancing the representation of traditionally underrepresented groups.

DIVERSITY GOALS:

» Create and maintain a culture that integrates and advances diversity throughout all levels of the school—from people, initiatives and ideas to policies, curriculum and beyond.

» Become a national higher education leader in embracing and supporting a diverse, open and inclusive environment.

» Ensure that all members of our community are able to achieve their full professional and academic potential.

Throughout the rich history of the School of Engineering & Applied Science, our faculty, students and alumni have developed new concepts and implemented them. While the school continues to emphasize advances in theoretical knowledge, we are more actively promoting the application of new discoveries by enhancing the climate of entrepreneurship.

NEW INITIATIVES:

» Annual Undergraduate Discovery Competition: This new entrepreneurship competition will be held annually for engineering undergraduate students who can submit proposals for innovative ideas and inventions; through generous alumni donations, at least $25,000 will be awarded each year (engineering.wustl.edu/discovery)

» Schoolwide course on entrepreneurism for undergraduate engineering students

ONGOING INITIATIVES & PARTNERSHIPS:

» Mentorships through Innovate St. Louis, a 501(c)3 organization that matches volunteer mentors with individuals starting and growing companies at no cost

» Partnership with the Skandalaris Center for Entrepreneurial Studies, including the Olin Cup competition for all WUSTL alumni and students

» Entrepreneurship minor for undergraduate students through the Olin Business School

» Computer science course on technology entrepreneurship

» Office of Technology Management’s “Bear Cub” faculty grants in support of innovative research that has shown commercial potential

SELECT FACULTY, STUDENT & ALUMNI COMPANIES:

» 825 Basics

» A1 Entertainment Service

» Answers® (Announce Media)

» Appistry

» Cardialen

» Ettus Research

» Exergy

» Gateway EDI

» GeoVerify

» Global Velocity

» Green Bean Restaurant

» Kwame Building Group

» Retectix

» Salesforce.com

» Sanergy

» Saturnis

» Say

» Square, Inc.

» Third Rock Ventures

» Venrock Capital Ventures

» Whoshare

» Willow Garage

» Xtend Energy

» Yerdle
Expanding Engineering Education Globally

With a goal of educating undergraduate students for leadership roles in an increasingly global and technological society, our engineering school was among the first to develop engineering-specific study-abroad programs, offering our students the opportunity to have an international experience through summer, semester or yearlong programs. Students can also study abroad through the College of Arts & Sciences Overseas Programs. To ensure that all students have the ability to travel abroad during their undergraduate years, regardless of financial circumstances, the school is raising funds to support its International Scholars Travel Award.

Engineering students can also gain a global perspective without traveling abroad. Many courses within the engineering curricula include topics relevant to worldwide audiences, such as global climate change. Engineering students can also participate in the university’s Global Certificate Program, an opportunity to develop global competence and learn practical skills through a diverse, interdisciplinary education.

The school believes strongly that recruiting international students to WUSTL brings new opportunities for different contributions, including raising global awareness in classroom discussions, research projects and social interactions, and it expands the university’s global reach through those who return to their home countries after receiving their education. In addition to recruitment through the McDonnell Academy, the engineering school actively recruits international students for undergraduate, master’s and doctoral programs; international students comprised 60 percent of the engineering school’s entering doctoral students in the 2011-12 academic year.

“Engineering students have long been left out, because their more rigorous curricula are laden with required classes that keep them in the States. That’s beginning to change at schools like Washington University in St. Louis, where deans are identifying overseas programs that won’t derail science and math focused majors.”
— Newsweek magazine, Sept. 19, 2011

PARTNER UNIVERSITIES:

- Bogazici University
- Budapest University of Technology and Economics
- China Agricultural University (Ralph Quatrano)*
- Chinese University of Hong Kong
- Chulalongkorn University
- Fudan University
- Indian Institute of Technology Bombay (Pratim Biswas)*
- Interdisciplinary Center Herzliya
- Jawaharlal Nehru University (Pramod Lakra)*
- Korea University
- Middle East Technical University
- National Taiwan University
- National University of Singapore
- Peking University (Ralph Quatrano)*
- Seoul National University
- State University of Campinas
- Tata Institute of Social Sciences
- Technion - Israel Institute of Technology (Yoram Rudy)*
- Tsinghua University (Frank Yin)
- University of Chile
- University of Hong Kong
- University of Indonesia
- University of Melbourne
- University of Queensland
- University of Tokyo
- Utrecht University
- Yonsei University

* Engineering professors serving as McDonnell International Scholars Academy Ambassadors

www.mcdonnell.wustl.edu  www.magep.wustl.edu
www.engineering.wustl.edu/global
What will the school need in order to achieve excellence by 2020?

1. Build on strengths in medicine and health, energy and environment, and security by focusing intellectual efforts in advanced materials and nanotechnology, medical and biological engineering, environmental engineering and sustainable technologies, imaging and signal processing, and networking and communications

2. Expand the tenured/tenure-track faculty by 25 percent to approximately 100

3. Double research expenditures to approximately $50 million annually

4. Increase the number of doctoral students by 50 percent to approximately 500

5. Increase the number of master’s students, especially professional students, by 45 percent to approximately 500

6. Increase the number of undergraduate students by approximately 20 percent to 1,500

7. Implement undergraduate and graduate curricular and programmatic initiatives

8. Complete the engineering complex with an additional 350,000 square feet and improve supporting infrastructure, such as Information Technology

9. Create innovative partnerships across disciplines at WUSTL, with industry and with other universities, both locally and internationally

10. Enhance the school’s marketing and communication initiatives to continue raising visibility nationally and internationally

11. Raise funds to implement the plan and create financial stability

$300 million over the next eight years*

**STUDENTS:**
- New graduate fellowships
- New need-based scholarships
- New merit-based scholarships
- Entrepreneurship competition
- STEM initiative
- Design projects & curricular initiatives
- International programs
- Undergraduate research

**FACULTY SUPPORT:**
- New endowed deanship & professorships
- Recruiting 30 new faculty members

**FACILITIES:**
- 350,000 square feet of new space & endowed funds to support facility operations

**INTERDISCIPLINARY RESEARCH CENTERS**

**UNRESTRICTED ANNUAL FUND**

* From multiple sources, including gifts from individuals, corporations and foundations, as well as school and university funds
Our vision for the School of Engineering & Applied Science is bold and unique, but we believe that these are the right steps that will allow us to seize on the opportunity of converging disciplines and to build on the strengths within the school, across the university and with external partners. We are confident that our collective work will propel our school to excellence and will change the world — but we need your help.

In 2004, WUSTL concluded the $1.55 billion Campaign for Washington University, which included significant investments for two new initiatives — the Biomedical Engineering department and the Environmental Engineering Science graduate program. With the financial support for endowed professorships, scholarships and facilities, we attracted the best faculty and students for these initiatives. Today, both are recognized as national leaders.

With your support, we can do it again. We can grow our research productivity and will change the world — but we need your help. Our record proves that with the right vision and resources, we can achieve excellence. Join us as we turn this vision into reality. Together, we will lead.

**Summary**

- Allen Atkins, Vice President, Phantom Works (retired), The Boeing Company
- Vincent Belusko, Partner, Morrison & Foerster LLP
- Joseph Boston, President (retired), Aspen Technology, Inc.
- Gregory Boyce, Chairman & CEO, Peabody Energy
- Jerome Brash, President & CEO, Brash Manufacturing Company
- Stephen Brauer (National Council Chair), Chairman, Hunter Engineering Company
- Charles Busch, Jr., Executive Vice President (retired), Continental Water Company
- Christopher Chivetta, President/CEO, Hastings & Chivetta Architects, Inc.
- C. Baker Cunningham, CEO (retired), Belden CDT Inc.
- Santamu Das, Founder, TranSwitch Corporation
- Carl Deutsch, Chairman of the Board (retired), Standard Machine & Manufacturing Co.
- Arnold Donald, President & CEO, Executive Leadership Council
- Michael Gibbons, Director/Program Manager FA-18 E/F, The Boeing Company
- Sunil Hirani, Founder, trueEX LLC, Say
- Janet Holloway, Senior Vice President & Chief of Staff, Monsanto Company
- Dennis Houston, Executive Vice President (retired), ExxonMobil Refining & Supply Co.
- Donald Jubel, President, Spartan Light Metal Products
- Dennis Kessler, President, Kessler Management Consulting
- Harald Law, President (retired), Chinese American Forum
- Peter Leemputte, Senior Vice President & CFO, Mead Johnson Nutrition
- Mark Levin, Partner, Third Rock Ventures
- Richard Mattiace, Head of International Active Equity, Grantham Mayo Van Otterloo Co.
- John McDonnell, Chairman of the Board (retired), McDonnell Douglas Corporation
- Brenda Newberry, Founder & Chairman (retired), The Newberry Group
- Frederick (Rick) Dertli, President & CEO, Guarantee Electric Company
- Anna Patterson, Director of Engineering, Android, Google, Inc.
- Michael Perlmutter (ex-officio), Manager of Business Intelligence, Unigroup, Inc.
- Richard Pinckert, Director, Environmental Assurance (retired), The Boeing Company
- Stanley Proctor, President, Proctor Consulting Services
- Richard Rolloff, Special Assistant to the Chancellor, Washington University in St. Louis
- Dave Rossetti, Vice President (retired), Cisco Systems, Inc.
- Stephen Sands, Vice Chair, U.S. Investment Banking & Global Co-Head, Healthcare Group, Lazard Freres & Co., LLC
- Gregory Sullivan, CEO, Global Velocity
- Anthony Thompson, President & CEO, Kwame Building Group, Inc.
- Susan Mary Welsh, Head of Therapeutic Area-Cardiovascular, Endocrine & Metabolic Areas, Pfizer, Inc.
- Gary Wendlendant, Vice Chairman of the Board & Chief Investment Officer (retired), New York Life Insurance Company
- Mark Welsey-Paige, Advisor, Apollo Global Management
- Peter Young, CEO, The Chemcentral Group, Hong Kong

**National Council**

**School Leadership**

- Ralph Quatrano, Dean
- Nick Benassi, Associate Dean
- Jill Totten, Associate Dean, Administration & Finance
- Eldar Causzewic, Associate Dean, Professional Programs
- Chris Krager, Associate Dean, Student Services
- Joseph O’Sullivan, Professor and Dean of the UMSL/WUSTL Joint Undergraduate Engineering Program

**Department Chairs**

- Frank Yin, Professor and Biomedical Engineering Department Chair
- Jeremy Bublar, Professor and Computer Science & Engineering Interim Department Chair
- Arya Nehrari, Professor and Electrical & Systems Engineering Department Chair
- Pratim Biswas, Professor and Energy, Environmental & Chemical Engineering Department Chair
- Philip Bayly, Professor and Mechanical Engineering & Materials Science Department Chair

**Facts**

- In 2004, WUSTL concluded the $1.55 billion Campaign for Washington University, which included significant investments for two new initiatives — the Biomedical Engineering department and the Environmental Engineering Science graduate program.
- With the financial support for endowed professorships, scholarships and facilities, we attracted the best faculty and students for these initiatives. Today, both are recognized as national leaders.
- With your support, we can do it again. We can grow our research productivity and will change the world — but we need your help.
- Our record proves that with the right vision and resources, we can achieve excellence. Join us as we turn this vision into reality. Together, we will lead.
THE SCHOOL TODAY

1,283 Undergraduate students
353 Master’s students
340 Doctoral students
200 UMSL/WUSTL Joint Program upper-division students
19,000 Alumni
80 Tenured and tenure-track faculty
40 Other full-time faculty
115 Part-time faculty
105 Staff (FTE)

$25 million Total research expenditures (FY'12)
$435,400 Average research expenditure per research-active faculty (FY'11)
$150 million Invested since 2001 in engineering space
7 Buildings totaling 595,000 square feet
$78 million Annual operating budget (FY'13)
$220 million Total endowment market value (June 30, 2012)

Dean Ralph Quatrano and Associate Dean Nick Benassi developed the strategic vision, working closely with the school’s National Council, faculty, staff, students, alumni/leaders and external partners.
Design by E. Brook Haley
Photos by Devon Hill, Ben Klein, Geoff Story, Chad Williams and WUSTL Photo Services

CONTACT US
School of Engineering & Applied Science
Washington University in St. Louis
CB 1163
One Brookings Drive
St. Louis, MO 63130-4899
engineeringdean@wustl.edu
(314) 935-6390
engineering.wustl.edu

facebook.com/WUSTLengineering
twitter.com/WUSTLengineers
youtube.com/WUSTLEngineering