

McKelvey School of Engineering

Mission Statement

The mission of the McKelvey School of Engineering at Washington University in St. Louis is to promote independent inquiry in engineering research and education with an emphasis on scientific excellence, innovation and collaboration without boundaries.

WashU Engineers produce new knowledge that changes the world, and our faculty are educating students to explore and create in a world we cannot yet imagine. Through research and education, we are making a positive impact on the local community, the country and the world.

Undergraduate Degree Programs

The McKelvey School of Engineering offers four-year, full-time programs of instruction leading to bachelor of science degrees in the following fields: biomedical engineering, chemical engineering, electrical engineering, environmental engineering, mechanical engineering, and systems science and engineering.

In addition, the Department of Computer Science and Engineering offers bachelor of science degrees in computer engineering, computer science, computer science + math, computer science + economics, data science, and business and computer science. The Bachelor of Science in Business and Computer Science (<http://bulletin.wustl.edu/undergrad/engineering/computerscience/bs-business-computer-science/>) is an integrated joint-degree program offered through the Olin Business School and the McKelvey School of Engineering. Students in this program will be equipped with the fundamental knowledge and perspectives of computer science and business and will have unique opportunities to converge these two disciplines.

If a student is interested in an academic program broadly based on the engineering sciences, the McKelvey School of Engineering offers the Bachelor of Science (BS) Major in Applied Science degree with several options, including chemical engineering, electrical engineering, mechanical engineering, and systems science & engineering. These degree options provide more flexibility for students who do not intend to become licensed engineers and want to select their course work according to their personal educational objectives. For example, some students use this flexibility to gain technical background and training while pursuing or preparing for professional training in medicine, business or law. Although the flexibility exists to do so, it is not necessary to combine an applied science degree program with another major or degree. Students may also use this added flexibility to achieve a well-rounded undergraduate education by selecting courses from across the university while pursuing a degree in the McKelvey School of Engineering.

BS in Engineering (Individually Designed Major)

The requirements to be admitted to an individually designed major (IDM) are more stringent than those for our other engineering degree programs. The IDM will not be available to students when they first enter Washington University, so it will not be listed on the admissions application as an option.

Students applying for an IDM should meet the following requirements:

- Have already completed at least one semester at Washington University
- Apply before the beginning of the junior year
- Have at least a 3.5 cumulative grade-point average at Washington University and be maintaining good standing in the McKelvey School of Engineering
- Find an Engineering faculty member who will agree to serve as their IDM advisor (The student and advisor will design a plan of study that lists the courses that must be successfully completed to earn the IDM. That plan must include at least 42 engineering units of credit.)
- Satisfy all other general engineering degree requirements
- Present (with the help of their advisor) the plan to a standing engineering committee (normally the Engineering Undergraduate Studies Committee), which will then assess the proposed plan and approve or deny the request

Combined Majors and/or Multiple Degrees

Multiple Majors in Engineering

All undergraduate divisions at Washington University allow students to pursue majors and degrees in more than one division. The following options are available:

Second Degrees

A student in any undergraduate division of the university may be allowed by another division to pursue a second bachelor's degree. For this, the student must satisfactorily complete all of the degree requirements for *both* degrees in order to earn two diplomas. These requirements may include a residency requirement. For engineering majors, this residency requirement is described elsewhere on this page. In addition, the College of Arts & Sciences requires any student earning an AB degree and a bachelor's degree from another division to earn a minimum of 150 total units. If the additional residency and units requirement for a second degree are incompatible with a student's plan, then the student should consider a second major as a more convenient and equally viable alternative.

Second Majors

A student pursuing a bachelor's degree in engineering may also pursue second majors offered by other undergraduate divisions. There are six second majors offered by the McKelvey School of Engineering: computer science, computer science + mathematics, data science, electrical engineering science, financial engineering and systems science. In addition, there are second majors offered by the College of Arts & Sciences and Olin Business School. Students may declare a second major online via WebSTAC (<https://acadinfo.wustl.edu/WebSTAC.asp>) up until the time they have filed an Intent to Graduate. Upon completion of the requirements, the student's transcript will show an engineering degree and all earned second majors. Only one diploma is granted; no reference to the second major is noted on the diploma.

Minors

Undergraduate students are allowed to pursue minors offered by any undergraduate division of the university. A minor usually requires five to six courses. The minor program's home division sets the requirements for admission to and completion of the minor program. Students may declare a minor online via WebSTAC (<https://acadinfo.wustl.edu/WebSTAC.asp>) up until the time they have filed an Intent to Graduate. An engineering student who completes all of the requirements will have the award of the minor noted on the official transcript; no reference to the minor is noted on the diploma.

Residency Rule for Engineering Minors: No more than 6 units of credit transferred from another institution (outside of Washington University) can be used to meet the requirements of any minor offered by the McKelvey School of Engineering. The remaining units (up to the amount required for the minor) must be applicable units from Washington University. The review committee that oversees a minor has the authority to establish a more stringent residency rule.

Interdivision Transfers

Washington University embraces a student's opportunity to change academic majors, even across different undergraduate divisions on campus. Exploration and flexibility are attributes of an excellent undergraduate experience.

In order to ensure a proper background for success in the James McKelvey School of Engineering, prior to an interdivision transfer request being accepted, students must do the following:

1. Complete at least one non-summer semester in residence at the Washington University Danforth Campus immediately prior to the requested semester of transfer.
2. Successfully complete an L59 CWP College Writing course or an equivalent approved transfer course (<https://engineering.wustl.edu/offices-services/student-services/undergraduate-student-services/transfer-course-database.html>).
3. Complete at minimum Math 132 Calculus II with a grade of B or better.

4. Complete at least one 3-credit course within the intended major being pursued with a grade of B or better. (Additional requirements for majors in the Department of Computer Science & Engineering are given below.)
5. Achieve a cumulative grade-point average of 3.0 or higher and grades of B or better in math and science courses and courses taken in the McKelvey School of Engineering (some departments may require a higher GPA), with no outstanding incomplete (I) grades.
6. Demonstrate a high regard for academic integrity. (Students found to be in violation of the Academic Integrity Policy (<https://engineering.wustl.edu/offices-services/student-services/academic-integrity-policy.html>) may be required to delay their entry for a specified time as determined by the transfer dean.)
7. Meet with the transfer dean or a four-year advisor in Engineering Undergraduate Student Services (303 Lopata Hall) to ensure that the curriculum plan is on track for progress toward graduation.
8. Understand that undergraduate McKelvey Engineering students may only enroll in a limited number of School of Continuing & Professional Studies courses that have been preapproved by the Engineering Undergraduate Studies Committee. (Refer to our policy on School of Continuing & Professional Studies courses (<http://bulletin.wustl.edu/undergrad/engineering/policies/#caps>) for more information.)
9. Be aware that changing majors may result in the need to complete one or more additional semesters to graduate.

These are the minimum requirements. Each student is evaluated on a case-by-case basis.

There are additional minimum requirements to complete for the following degree programs:

- **BS in Data Science, CS+Math, CS+Econ, and Computer Engineering**
 - Complete CSE 247 Data Structures and Algorithms with a grade of B or better.
- **BS in Computer Science**
 - Complete CSE 132 Introduction to Computer Engineering, CSE 240 Logic and Discrete Mathematics, and CSE 247 Data Structures and Algorithms with grades of B or better.
- **BS in Business and Computer Science**
 - Maintain a minimum GPA of 3.5 overall and in all business and computer science courses.
 - Complete a minimum of two business and two computer science core courses that are required as part of the BS in Business and Computer Science curriculum.
 - Demonstrate the ability to complete the degree in a timely manner.

Bachelor's/Master's Program in Engineering

This program provides students who enter Washington University as undergraduates in day-school programs the opportunity to earn McKelvey School of Engineering master's degrees; this includes Henry Edwin Sever Institute master's degrees. Interested students are encouraged to discuss the program with faculty advisors by the end of their junior year in order to best develop a plan for their master's study.

Students must meet the admission requirements and application deadlines stipulated by McKelvey School of Engineering and the department of interest. A minimum 3.0 GPA is required for admission, but some programs may have higher GPA requirements. Each McKelvey School of Engineering department has the option to participate as well as to decide which master's programs to offer students. Students must be admitted to a degree program in Engineering at least one semester prior to their anticipated graduation semester.

Scholarship support may be available to students during their master's year of study. Full-time student status is typically required to be eligible for scholarship support. For more information regarding scholarships and financial aid during the final master's year of study, please visit the Bachelor's/Master's Program (<https://engineering.wustl.edu/prospective-students/graduate-admissions/Pages/bs-ms.aspx>) website.

Engineering Undergraduates

The Bachelor's/Master's Program for current McKelvey School of Engineering undergraduate students normally takes one additional year to complete. When approved by the department, up to 6 units can be used to satisfy requirements for both degrees. However, at least 144 units must still be completed, and all stipulated degree requirements for both programs must be satisfied.

To satisfy residency for both degrees, all participants must complete a minimum of 84 applicable Washington University units, which includes a combination of at least 60 in-residence units counted for the engineering undergraduate degree and at least 30 in-residence units counted for the engineering master's degree, with a total of 6 units from undergraduate course work double-counting toward the requirements for both degrees.

The cumulative GPA used to determine undergraduate final Latin honors will include all undergraduate and graduate course work completed up until the time Latin honors are officially determined. This means that master's courses will also be included in the calculations if a student defers earning the BS degree until the master's degree is also earned.

Non-Engineering Undergraduates

Students from other undergraduate divisions at Washington University are also eligible to participate in the Bachelor's/Master's Program. These students must complete their undergraduate degrees before they are designated as being primary McKelvey School of Engineering master's students. Admitted students may take longer than one year to complete the requirements for a master's degree. Part-time graduate

enrollment might be possible with prior permission, but students will be required to maintain satisfactory academic progress (SAP) standards connected to financial aid in order to maintain scholarship and financial aid support. Scholarship support can be applied to "E" courses taken at Washington University during the summer if those courses count toward fulfilling the requirements of the master's degree. Scholarship support used during a summer session will count as one of the total semesters of scholarship support available to the student.

A reasonable number of required prerequisite courses as defined by the department may be taken while the student is admitted to the master's program, but these courses will not be counted toward the McKelvey School of Engineering master's degree if they are courses not normally counted toward its requirements. Prerequisite courses will count in the student's GPA when determining probation/suspension eligibility and SAP standards. Poor performance (i.e., earning less than B- grades) in these courses can be grounds for removal from the program by the department.

A minimum of 24 units of residency counted for the Engineering master's degree is required for all students. When approved by the department, up to 6 units can be used to satisfy requirements for both the non-Engineering undergraduate degree and the Engineering master's degree.

Other Bachelor's/Master's Programs

These programs allow engineering undergraduates to earn master's degrees outside of the McKelvey School of Engineering. Students in these 3/2 programs will pay the standard full-time undergraduate tuition rate for the fourth year, except for those in the MBA program, which charges a premium above the undergraduate tuition rate. Students will receive financial aid for the fourth year based on their eligibility for undergraduate financial aid awards, including Pell grants.

There is no commitment for undergraduate financial aid beyond the fourth year of study; students in 3/2 programs may apply to the professional programs for graduate student financial aid for study in the professional program beyond the fourth year.

This policy applies to the current 3/2 programs involving bachelor's/master's programs in engineering, social work and business and to any future Washington University 3/2 programs.

BS/MBA Program

The McKelvey School of Engineering and the Olin Business School offer a five-year program leading to the Bachelor of Science engineering degree and the Master of Business Administration degree. The purpose of the program is to provide students with the opportunity to develop an educational background particularly in demand by industry.

Students should apply to this joint program by April 1 of their junior year. They must complete the application for admission to the Olin Business School, which is available through the business school. There is no GPA requirement, but students must take the Graduate

Management Admission Test (GMAT). Registration materials for the test may be obtained through the business school. Applicants are judged on undergraduate performance, GMAT scores, summer and/or co-op work experience, recommendations and personal interviews.

The BS/MBA student's fourth-year curriculum is composed largely of business courses. The fifth-year curriculum is divided almost evenly between business and engineering courses. Because the merging of the two curricula results in very tight scheduling, it is possible that course overloads may be necessary to complete both programs in 10 semesters. Students are strongly urged to meet with their advisors to plan the remaining years of the program.

Dual Degree Program

The McKelvey School of Engineering offers a dual degree program with numerous affiliated liberal arts colleges and universities (<http://engineering.wustl.edu/prospective-students/dual-degree/Pages/affiliated-schools.aspx>). Qualified students earn both a non-engineering baccalaureate from the first school and a Washington University bachelor's degree in engineering by attending the affiliated institution for three or four years, then completing the program with two years of concentrated engineering study at Washington University.

If students are enrolled at an affiliated institution, they may apply for admission to dual degree study under this program, provided they are recommended by an official representative of their college or university and will receive or have received the non-engineering baccalaureate. For more information, please visit the Dual Degree Program website (<http://engineering.wustl.edu/DualDegreeProgram.aspx>).

Engineering Undergraduate Degree (Undergraduate Two-Year Option)

Students enter as undergraduate students and complete a liberal arts degree from their current school and an engineering undergraduate degree from Washington University. Participants are undergraduate students who commonly follow a 3/2 or a 4/2 schedule, entering Washington University after their junior or senior year. Please note that all students earning an undergraduate engineering degree are required to complete a minimum of 60 course units at Washington University.

Engineering Undergraduate and Graduate Degrees (Graduate Three-Year Option)

Students enter as graduate students and complete both a liberal arts degree from their current school and then an engineering undergraduate degree and engineering master's degree in three years at Washington University. The engineering master's degree and the undergraduate degree can be in different areas. Participants commonly follow a 3/3 or 4/3 schedule, entering Washington University after their junior or senior year. Please note that all students earning both an undergraduate and graduate degree are required to complete a minimum of 84 course units at Washington University. The GRE is not required for admission.

Study Abroad and International Experiences

Students in the McKelvey School of Engineering can study abroad in a number of countries and participate in several global experiences to help broaden their educational experience. These opportunities enable students to become global citizens who are better able to address current issues.

For information about these programs, please visit the McKelvey School of Engineering website (<https://engineering.wustl.edu/current-students/outside-classroom/Pages/study-abroad.aspx>).

Cooperative Education and Internships

The Engineering Cooperative (Co-op) Program is coordinated through the Career Center and available to students with an open McKelvey Engineering degree program or second major. It offers students a unique opportunity to gain in-depth engineering experience prior to graduation. Co-op students learn about a field of engineering by working alongside practicing engineers on extensive projects of the sort that are typically undertaken by entry-level engineers. This type of experience gives students a chance to preview a career path and employment options, to gain career clarification, to improve communication and team project skills, and to enhance their marketability with future employers. The cooperative education experience is typically completed over the course of a semester and a summer term, but it may be extended for a maximum of one year with faculty advisor approval.

In addition, the Career Center provides resources for students searching for summer internships and/or part-time fall or spring internships with local companies while enrolled in courses.

For more information about co-ops and internships, please visit the Career Center website (<http://careercenter.wustl.edu/>) or call 314-935-5930.

Pre-Medical Education

The McKelvey School of Engineering makes available, as options within its undergraduate degree programs, curricula that prepare students for entry into medical, dental or veterinary school while they pursue the undergraduate degree.

These curricula were formulated in recognition of the increasing importance in medicine of the methods and subject matter of the basic engineering sciences. The student who successfully completes one of the curricula will be well prepared for the study of medicine and will have, in addition, a solid background in engineering. Moreover, the student who decides not to go on to medical school will have an exceptionally wide selection of options, including not only those commonly open to the graduate in engineering but also those usually

undertaken after graduate study in the life sciences. In accordance with the recommendations of the school's Pre-Medicine Committee, all curricula include — in addition to the normal degree requirements — the following courses:

- **Biology:** Biol 2960, Biol 2970
- **Biochemistry:** Biol 451
- **General Chemistry:** two semesters with lab
- **Organic Chemistry:** two semesters with lab
- **General Physics:** two semesters with lab
- **Psychology:** Psych 100B
- **Social Sciences:** one course related to health care access and disparities

Many medical schools have other assorted prerequisites, which can be found in the AMCAS Instruction Manual. Students may download the manual from the Association of American Medical Colleges (AAMC) website (<http://www.aamc.org/>).

If students are interested in attending medical or dental school, they must consult and register with the Engineering Pre-Medicine Advisor before the end of their sophomore year. Engineering students should contact the pre-medical advisor in Engineering Undergraduate Student Services (<https://engineering.wustl.edu/current-students/student-services/Pages/premedicine.aspx>), Lopata Hall, Room 303.

There is extensive detailed information concerning the Medical College Admission Test, the choice of advanced biology or chemistry courses, and the choice of medical school that should be discussed prior to the beginning of the junior year. Students requesting a cover letter from the Pre-Medicine Committee must complete the Pre-Health Application Institutional Review (PIR) by April of the year in which they apply.

Engineering Summer School

The McKelvey School of Engineering offers a variety of engineering courses each summer. Class times are varied to accommodate both traditional daytime students and those with full- or part-time employment. The engineering summer school calendar comprises one full eight-week evening session as well as several accelerated sessions of shorter duration.

If students are interested in enrolling in an engineering summer course, they can obtain further information in Lopata Hall, Room 303, or by phone at 314-935-6100.

Student Services

Engineering Undergraduate Student Services

Engineering Undergraduate Student Services, which is located in Lopata Hall, Room 303, has three main areas: Admissions, Advising Support, and Registrar. Our admissions officers work closely with the university Admissions Office to provide current and useful information to students and parents who are learning about our university, our community, and the opportunities available in the McKelvey School of Engineering. The advising staff has a comprehensive knowledge

of all campus resources and can help with such items as tutoring, international studies, assistance with the registration process, and general advising. The registrar handles class scheduling, transfer and AP credit, course registration, graduation eligibility, and other student-records-related processes. Engineering Undergraduate Student Services (<https://engineering.wustl.edu/current-students/student-services/Pages/default.aspx>) serves all students, faculty and staff. For an appointment, call 314-935-6100.

Engineering Communication Center

The Engineering Communication Center offers all engineering students, faculty and postdocs free help with their engineering communication needs. The faculty who staff the center work with individuals to define audiences and purposes, develop and organize ideas, create effective graphics and page design, and sharpen self-editing skills. Help is offered for résumés and employment correspondence, proposals, formal reports, lab reports, graduate program application statements, and presentations. For an appointment, call 314-935-4902 or email the Engineering Communication Center (ecc@seas.wustl.edu).

The Career Center

The Career Center helps engineering students prepare for a lifetime of career management by offering innovative approaches to help prepare them for a successful co-op experience, internship and job search. The Career Center offers a variety of services and resources for engineering undergraduate and graduate students.

Whether students are looking for a summer internship, a co-op experience, or a full-time job, the center is here to help with in-person and virtual advising, email coaching, drop-in hours and live chat. The Career Center offers a breadth of resources, including an online job, co-op and internship database; mentoring programs; special events; professional development workshops; résumé reviews; career fairs and on-campus interviews.

The Career Center offers one-on-one career guidance to students at any stage of their career-planning process. Students are encouraged to meet with a career advisor early in their academic career and at least once each year to build a relationship. To schedule an advising appointment, please visit the Career Center website (<http://careercenter.wustl.edu/>).

Contact:	Engineering Undergraduate Student Services
Phone:	314-935-6100
Website:	http://engineering.wustl.edu