

# Opus College of Engineering

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## From the Dean

Opus College of Engineering website (<http://www.marquette.edu/engineering/>)

Welcome!

For over a century, the Opus College of Engineering at Marquette University has pursued excellence and leadership in engineering education, research, and service to others. To address today's global challenges and create a better world for the future, engineers must be grounded in engineering and science principles underpinned by a strong foundation in the humanities, ethics, leadership, and a desire for lifelong learning. The Opus College of Engineering strives to provide a student-centered, active learning environment, fostering curiosity, creativity, and a quest for discovery and innovation. We are recognized and renowned for our commitment to *cura personalis*, the Ignatian concept of "care for the whole person," as we seek to educate well-rounded servant leaders.

State-of-the-art engineering facilities allow students to explore and address global challenges in advanced manufacturing, clean water, health and human performance, secure and renewable energy, safe and efficient infrastructure, and many other important areas. Additionally, engineering students participate in a variety of valuable co-curricular opportunities, including co-ops, internships, undergraduate research, service-learning experiences, and more.

Join us as we strive to ignite curiosity and creativity for bold change!

Kristina M. Ropella, Ph.D.

Opus Dean, Opus College of Engineering

## College Vision Statement

We are world-class engineers who will lead bold, innovative change to serve the world in the Jesuit tradition.

## College Mission Statement

Our diverse community of engineering scholars collaborates in transformative learning environments to lead change for the benefit of humanity. We prepare students for fulfilling careers by providing a strong technical and ethical foundation.

We ignite curiosity, encourage student-centered learning and foster critical thinking by:

- Educating engineering leaders who thrive in innovative, entrepreneurial and dynamic environments.
- Exploring and discovering new knowledge, putting research in action.
- Engaging professional and technical communities worldwide.

These statements reflect the essential nature of the college. The motivation of the college centers about its desire to emphasize to the engineering community the intrinsic value of humankind and of the individuals who comprise it. This motivation flows directly from the fact that the college is an integral part of a Catholic, Jesuit university.

The Opus College of Engineering is a member of the American Society for Engineering Education.

## College of Engineering Departments

- Biomedical Engineering (<https://bulletin.marquette.edu/engineering/biomedical-engineering/>)
- Civil, Construction and Environmental Engineering (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/>)
- Electrical and Computer Engineering (<https://bulletin.marquette.edu/engineering/electrical-computer-engineering/>)
- Mechanical Engineering (<https://bulletin.marquette.edu/engineering/mechanical-engineering/>)

## Undergraduate College Programs

- Biocomputing, BBE (<https://bulletin.marquette.edu/engineering/biomedical-engineering/biocomputing-bs/>)
- Bioelectronics, BBE (<https://bulletin.marquette.edu/engineering/biomedical-engineering/bioelectronics-bs/>)
- Biomechanics, BBE (<https://bulletin.marquette.edu/engineering/biomedical-engineering/biomechanics-bs/>)
- Biomedical Engineering, Minor (<https://bulletin.marquette.edu/engineering/biomedical-engineering/biomedical-minor/>)
- Civil Engineering, BCE (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/civil-engineering-bs/>)
- Civil Engineering, Minor (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/civil-engineering-minor/>)
- Computer Engineering, BCO (<https://bulletin.marquette.edu/engineering/electrical-computer-engineering/computer-engineering-bs/>)

- Computer Engineering, Minor (<https://bulletin.marquette.edu/engineering/electrical-computer-engineering/computer-engineering-minor/>)
- Construction Engineering, BCN (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/construction-engineering-bs/>)
- E-Lead Program Innovation Leadership, Concentration (<https://bulletin.marquette.edu/engineering/e-lead-program-innovation-leadership-concentration/>)
- Electrical Engineering, BEE (<https://bulletin.marquette.edu/engineering/electrical-computer-engineering/electrical-engineering-bs/>)
- Electrical Engineering, Minor (<https://bulletin.marquette.edu/engineering/electrical-computer-engineering/electrical-engineering-minor/>)
- Environmental Engineering, BCE (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/enviromental-engineering-bs/>)
- Environmental Engineering, Minor (<https://bulletin.marquette.edu/engineering/civil-construction-environmental-engineering/environmental-engineering-minor/>)
- Mechanical Engineering, BME (<https://bulletin.marquette.edu/engineering/mechanical-engineering/mechanical-engineering-bs/>)
- Mechanical Engineering, Minor (<https://bulletin.marquette.edu/engineering/mechanical-engineering/mechanical-enginerring-minor/>)

## Graduate Programs

- Biomedical Engineering, ME (<https://bulletin.marquette.edu/graduate/biomedical-engineering-me/>)
- Biomedical Engineering, MS (<https://bulletin.marquette.edu/graduate/biomedical-engineering-ms/>)
- Biomedical Engineering, PHD (<https://bulletin.marquette.edu/graduate/biomedical-engineering-phd/>)
- Civil Engineering, MS (<https://bulletin.marquette.edu/graduate/civil-engineering-ms/>)
- Civil Engineering, PHD (<https://bulletin.marquette.edu/graduate/civil-engineering-phd/>)
- Clinical Immersion in Medical Device Design, Certificate (<https://bulletin.marquette.edu/graduate/clinical-immersion-medical-device-design-certificate/>)
- Electrical and Computer Engineering, MS (<https://bulletin.marquette.edu/graduate/electrical-computer-ms/>)
- Electrical and Computer Engineering, PHD (<https://bulletin.marquette.edu/graduate/electrical-computer-engineering-phd/>)
- Healthcare Technologies Management, MS (<https://bulletin.marquette.edu/graduate/healthcare-technologies-management-ms/>)
- Machine Learning for Engineering Applications, Certificate (<https://bulletin.marquette.edu/graduate/machine-learning-engineering-applications-certificate/>)
- Mechanical Engineering, ME (<https://bulletin.marquette.edu/graduate/mechanical-engineering-me/>)
- Mechanical Engineering, MS (<https://bulletin.marquette.edu/graduate/mechanical-engineering-ms/>)
- Mechanical Engineering, PHD (<https://bulletin.marquette.edu/graduate/mechanical-engineering-phd/>)
- Renewable Energy Technology and Integration, Certificate (<https://bulletin.marquette.edu/graduate/renewable-energy-technology-integration-certificate/>)
- Systems Engineering, Certificate (<https://bulletin.marquette.edu/graduate/systems-engineering-certificate/>)

## College of Engineering Policies

Students in the Opus College of Engineering are expected to comply with the academic requirements and policies listed in the university section (<https://bulletin.marquette.edu/policies/>) of this bulletin, along with all official college regulations. See below Opus College of Engineering policies.

- Absence from Final Exams, Incomplete (I) Grade (<https://bulletin.marquette.edu/engineering/policies/absence-finals-incomplete-grade/>)
- Academic Dismissal/Probation/Academic Alert (CAA) (<https://bulletin.marquette.edu/engineering/policies/dismissal-probation-college-alert/>)
- Academic Integrity (<https://bulletin.marquette.edu/engineering/policies/academic-integrity/>)
- Academic Load (<https://bulletin.marquette.edu/engineering/policies/academic-load/>)
- Accreditation (<https://bulletin.marquette.edu/engineering/policies/accreditation/>)
- Admission Requirements (<https://bulletin.marquette.edu/engineering/policies/admission-requirements/>)
- Articulation Agreements (<https://bulletin.marquette.edu/engineering/policies/articulation-agreements/>)
- Course and Grade Limitations (<https://bulletin.marquette.edu/engineering/policies/course-grade-limitations/>)
- Credit/No Credit (CR/NC) Grading Option (<https://bulletin.marquette.edu/engineering/policies/credit-no-credit-grading-option/>)
- Curriculum Substitution and/or Allowance Petition (<https://bulletin.marquette.edu/engineering/policies/curriculum-substitution-allowance-petition/>)
- Dean's List (<https://bulletin.marquette.edu/engineering/policies/deans-list/>)
- Degrees Offered (<https://bulletin.marquette.edu/engineering/policies/degrees-offered/>)
- Electives (<https://bulletin.marquette.edu/engineering/policies/electives/>)
- Grade Appeals for Engineering Courses (<https://bulletin.marquette.edu/engineering/policies/grade-appeals-engineering-courses/>)
- Repeating Courses (<https://bulletin.marquette.edu/engineering/policies/repeating-courses/>)

- Simultaneous Enrollment in Two Academic Programs (<https://bulletin.marquette.edu/engineering/policies/simultaneous-enrollment-two-academic-programs/>)
- Transfer Credit from Other Programs (<https://bulletin.marquette.edu/engineering/policies/transfer-credit-programs/>)
- Undergraduate Independent Study (<https://bulletin.marquette.edu/engineering/policies/undergraduate-independent-study/>)

## College of Engineering Resources

The following resources are available to College of Engineering students.

### Student Organizations

#### Engineering Student Council

Engineering students are eligible for membership in the Engineering Student Council, composed of the elected officers and one member of the governing board of each activity, fraternal, honorary and professional organization within the Opus College of Engineering.

#### Honor Societies

Engineering students are eligible for membership in the following engineering honor societies: Tau Beta Pi, all-engineering; Chi Epsilon, civil engineering; Eta Kappa Nu, electrical engineering; Pi Tau Sigma, mechanical engineering; Alpha Eta Mu Beta, biomedical engineering; and Upsilon Pi Epsilon, computer engineering. Each year, these societies award membership keys to men and women exhibiting high promise of success.

#### Professional Fraternities/Sororities

Students in the Opus College of Engineering are eligible to join the following professional sorority and fraternities on campus: Alpha Omega Epsilon, professional engineering sorority; Sigma Phi Delta, the international professional engineering fraternity; and Triangle, national fraternity for engineers, architects and scientists.

#### Professional Societies

Student chapters have been established by the American Society of Civil Engineers, Builders Coalition of MU: Student Chapter of Associated General Contractors of America, the Institute of Electrical and Electronics Engineers, the American Society of Mechanical Engineers, Association of Computing Machinery, the Society of Automotive Engineers, National Society of Black Engineers, Engineers Without Borders, the Society of Hispanic Professional Engineers, the Society of Women Engineers, the Institute of Transportation Engineers, the Biomedical Engineering Society, the Solar Energy Society, the Society of Manufacturing Engineers, the Robotics Club and Engineering Knights of St. Patrick, engineering service society.

## The Cooperative Education Program

### Overview

The Cooperative Education Program (co-op) was established at Marquette University in 1919. The program combines in-the-field work experience with the academic program degree requirements for Opus College of Engineering students. Students in this program alternate periods of academic semesters with periods of employment in industry. The industry work experience is technical in nature and provides the opportunity for the student to apply their engineering knowledge and skills. The objective is balanced training; the combination of theory and practical work experience during the early years of professional development. In addition to the formal co-op program, undergraduates may also gain experience through summer internships.

Co-op employment is competitive and available for all engineering majors. All students employed in the co-op program earn an hourly salary. There is a small fee to stay enrolled as a full-time student. Tuition is not charged during full-time work periods, unless the student chooses to enroll in a class. In this case tuition for the class is charged at the per-credit rate in addition to the co-op fee. Students who complete the minimum requirement of three work terms earn enough academic credit to fulfill an engineering technical elective toward the program degree requirements. Most engineering students participate in the co-op and/or internship program prior to graduation.

Student participants have said that the program helps them to clarify their career goals, increase their performance and engagement in the classroom by using their knowledge of industry, form their professional network, and open doors to secure full-time employment once they earn their degree. Students also develop the maturity, poise, communication skills and confidence needed to thrive in a business environment.

Enrollment and participation in the Co-op Program requires that:

1. The student is a full-time, degree-seeking student in the Opus College of Engineering at Marquette University.
2. The student is making satisfactory progress toward their engineering degree and has completed their sophomore-level course work.
3. Students must maintain a minimum GPA of 2.000 or greater to be eligible for and to remain enrolled in the co-op program.
4. The student has taken and passed GEEN 2952 Professional Development for Engineers.
5. The student is able to obtain a co-op job offer from an employer who is approved by the college's Industry Relations Office.
6. The student reports the employment offer to the Opus College of Engineering's Industry Relations Office and follows the co-op enrollment procedure, co-op course registration requirements and satisfies the requirements to earn credit for their work term.

7. The employer, the student and the student's academic adviser agree to a work/school plan that satisfies all degree requirements and the completion of at least three work terms.
8. International students must work with Marquette University's Office of International Education to complete the required employment processes prior to their first day of employment as a co-op employee.

Since the cooperative education program is considered an integral part of a student's education, the co-op student is a full-time student at Marquette University; whether they are in school or at work. When the co-op student is at work, they are under the company's direct supervision. The student is subject to the rules of the company which may include background checks and/or drug screening. Wages are paid directly to the student by the employer. The university does not employ the student, but cooperates with industry in arranging such employment.

## **The Les Aspin Biomedical Internships**

### **Overview**

The Department of Biomedical Engineering in conjunction with the Les Aspin Center for Government at Marquette University offers internships in medical regulatory and public policy issues. The Les Aspin Biomedical Engineering Internships began in Spring 1997 with qualified biomedical engineering undergraduates traveling to Washington, D.C. The venue for the engineering internships is Capitol Hill, the Food and Drug Administration or private industry located in the Washington, D.C., area. In addition to participating in the internship experience, the students take Marquette University classes at the Les Aspin Center for Government, located a few blocks from Capitol Hill and reside nearby in Marquette-owned, furnished apartments. This program is unique in providing undergraduate experience in research and regulatory issues.

## **Education Abroad Programs**

### **Overview**

Engineering students may study abroad with a Marquette-affiliated program, a Marquette-exchange program, a Marquette summer or intersession program or a non-Marquette program. Students are urged to contact the Education Abroad office and the Engineering Academic Advising Center as early as possible for details. See also, this bulletin under Education Abroad. The Education Abroad Resource Center is located in the Holthusen Hall, 4th Floor. For additional information, see the Education Abroad website (<http://www.marquette.edu/abroad/>).

## **Five-Year Combined B.S./M.S. Program**

### **Overview**

Each of the departments in the Opus College of Engineering at Marquette University offers programs, which allow highly qualified students to complete a bachelor of science and master of science degree in five calendar years (six years for students enrolled in the Cooperative Education Program). By increasing course loads slightly in the junior year and/or by taking courses in the summer of the junior and/or senior years, qualified students may be able to complete the B.S. degree on schedule in four years and the M.S. degree at the end of five calendar years.

Students intending to pursue one of these programs should begin planning at the end of the sophomore year. Formal application to the program takes place during the second term of the junior year. See individual departments for details.