



OPUS
College of Engineering

MARQUETTE UNIVERSITY



YOU.
**ENGINEERING A
BETTER WORLD.**

— IMPROVING —
INFRASTRUCTURE

**A WORLD OF
ENGINEERING
CHALLENGES
AWAITS. WHICH
ONES WILL
YOU TACKLE?**

With the skills you learn here, you'll be able to do a lot of things. But first you'll need to figure out which things are really worth doing. In the Marquette tradition of excellence, faith, leadership and service, we'll challenge you to think beyond solutions to implications — the ethical impact of projects and how your work serves the world.

**POWERING THE WORLD'S ELECTRONICS
THROUGH THE DEVELOPMENT OF**

**NANOSCALE
DEVICES**

**IMPROVING RELIABLE ROBOTIC
ASSEMBLY SYSTEMS TO ADVANCE**

**GLOBAL
COMPETITIVENESS**
OF AMERICAN MANUFACTURING ENTERPRISES

**PROMOTING
HEALTH
AND CURING
DISEASE**
THROUGH MEDICAL
IMAGING RESEARCH

— ENSURING THE PLANET CONTINUES TO HAVE —

**CLEAN
WATER**

PAVING THE FUTURE FOR THE

INTERNET OF THINGS

**EXAMINING CRITICAL,
ETHICAL QUESTIONS AROUND
ADVANCING
AI AND
AUTOMATION**

**DEVELOPING SOLUTIONS FOR EFFECTIVE,
AFFORDABLE AND ACCESSIBLE**

**HEALTH
CARE**

EXAMINING ALTERNATIVE FUELS TO

**REDUCE
ENERGY
USED**

FORECASTING THE DEMAND FOR

**NATURAL
GAS**

**DESIGNING
SENSORS**
TO COLLECT IMPORTANT ANALYTICS
FOR OPTIMIZATION OF SYSTEMS

**3-D
VISUALIZATION**
TO BRING REAL-WORLD PROBLEMS TO LIFE

**DEVELOPING
ORTHOPEDIC
SYSTEMS**
— TO ADVANCE PATIENT REHABILITATION —

A FAITH TRADITION THAT VIEWS
EVERYTHING WE DO
AS PART OF
**SOMETHING
BIGGER**



THERE ARE MANY GREAT REASONS TO CHOOSE MARQUETTE.

HERE ARE 7

1 JESUIT HERITAGE: BECAUSE SOME TRUTHS AREN'T FOUND IN TEXTBOOKS.

Like all universities, Marquette encourages students to search for truth. As a Catholic, Jesuit university, we also encourage the use of a wider lens. Here, you'll be challenged to explore faith. Ask the really big questions. And commit to using what you learn for the greater good. That's the core of a Marquette education and the mission we prepare our graduates to live out.

2 THE CO-OP PROGRAM: WHERE PRACTICE PAYS.

Alternate between academic semesters and work terms of full-time employment in industry. Develop technically and professionally under an experienced mentor. Earn a competitive salary and credit toward your degree. The Co-operative Education Program is your path to fulfilling, full-time employment after college.

3 E-LEAD: BECOME A LEADER, BY LEADING.

Become a skilled, people-focused engineering leader in the best Jesuit tradition. Sophomores accepted into the three-year E-Lead — Engineers in the Lead — program complete a combination of leadership courses and engineering experiences that prepare them to be the primary drivers of innovation for the common good. Bonus: They graduate with a concentration in engineering leadership, too.

4 KEEN: ENTREPRENEURS ON THE CUTTING EDGE.

The Kern Entrepreneurial Engineering Network. This collaborative group of U.S. universities — including Marquette — prepares students to identify new technology-based business opportunities that create value for a global society. For you, it's a chance to apply classroom skills to real-world problems and hone your entrepreneurial edge.

5 STUDENT ORGANIZATIONS: NEURAL NETWORKING.

From Alpha Eta Mu Beta (the biomedical engineering honor society) to the Triangle Fraternity (the fraternity for engineers, architects and scientists), plus a wealth of groups, clubs and councils in between, Marquette offers you many opportunities to network, share ideas, and serve with engineering students and alums outside the classroom.

6 ENGINEERING HALL: A COOL HOME AWAY FROM HOME.

With glass walls that integrate form and function, Engineering Hall welcomes you. It's a center of learning in its own right that also happens to offer cutting-edge labs, classrooms and collaborative spaces. It's also a great place for late-night studying, working on projects or just hanging out with friends.

7 SCHOLARSHIPS: THE SUPPORT YOU NEED TO GO ALL THE WAY.

The Opus Scholars Award. The Herdrich Scholars Award. These full-tuition Marquette scholarships are awarded to incoming engineering freshmen with outstanding academic achievement and significant financial need. We offer partial-tuition scholarships, too. If you're talented, driven and ready to change the world, we're here to help.

BY THE NUMBERS

Here's how it all adds up. You do like math, right?

1

DAY YOU START IN YOUR ENGINEERING MAJOR

99

PERCENT OF **MARQUETTE UNDERGRADS** RECEIVE **FINANCIAL AID***

marquette.edu/explore/financial-aid.php

30

PERCENT

OF THE INCOMING FRESHMAN CLASS OF 2018 ARE WOMEN

55+

ENGINEERING FACULTY

Teaching all courses, doing real research

4

TYPICAL NUMBER OF YEARS TO GRADUATE

REQUIRED COURSES: GUARANTEED AVAILABILITY

134

HOURS OF COURSE WORK

MORE EXPERIENCE: BETTER ENGINEERS

75

PERCENT OF STUDENTS IN

CO-OPS OR INTERNSHIPS

One of the highest percentages in the nation

97

PERCENT OF **ENGINEERING GRADS**

who are employed full time are in a job that aligns with their career goals

A CITY OF OPPORTUNITY

Milwaukee offers the excitement of a major metropolis, in a beautiful setting on a Great Lake. It's an easy city to navigate, and Marquette's campus puts you in proximity to enjoy all it has to offer, from our renowned art museum to our eclectic neighborhoods. Cheer on our major league baseball team or rock out at our many music festivals. Marquette's location also offers a short commute to co-op and internship locations at some of the biggest names in business, as well as multiple opportunities to serve those in need.



THE LAKEFRONT

Bike, run or visit the beaches along the shores of Lake Michigan, where you'll also find the Milwaukee Art Museum and outdoor music and cultural festivals, including Summerfest, the world's largest music festival.



NOVEL NEIGHBORHOODS

Neighborhoods like Brady Street, the East Side, Bay View and the Historic Third Ward each boast distinctive personalities and a bevy of boutiques, cafes and galleries.

GAME ON

Home of the Milwaukee Bucks and our own Marquette Golden Eagles basketball, this 714,000-square-foot arena is the centerpiece of a world-class sports and entertainment district in the heart of downtown.



INDUSTRY HOTBED

Co-ops and internships at some of the biggest companies in just about every industry give you ample opportunity to gain experience. GE Healthcare, Briggs & Stratton and Rockwell Automation are just a few major companies headquartered here.



*2017-2018 financial aid includes grants, scholarships, loans and work study.

TALENTED STUDENT ► TRANSFORMATIONAL LEADER

That's the Marquette engineering journey. You'll leave here prepared to rise quickly in your chosen field. And to lead the charge in engineering a better world. A Marquette engineer is sought-after, and our graduates are hired by leading companies all around the country.

DEGREE PROGRAMS

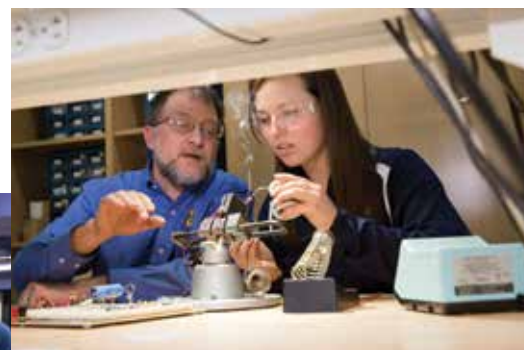
Biomedical Engineering	09
♦ Biocomputing	
♦ Bioelectronics	
♦ Biomechanics	
Civil and Environmental Engineering	11
♦ Civil Engineering	
♦ Environmental Engineering	
Construction Engineering	13
Computer Engineering	15
Electrical Engineering	17
Mechanical Engineering	19

Engineering Graduate Degrees

- Five-year bachelor's/master's program
- Master of Engineering
- Master of Science
- Master of Science in Healthcare Technologies Management
- Doctor of Philosophy

**FOR
THE
GREATER
GLORY
OF GOD**

St. Ignatius of Loyola,
founder of the Society of Jesus



► **SARA'S FAVORITE PLACE ON CAMPUS:**
"The SAE Aero lab in the basement of Haggerty, aka the cave. Our team has created a lot of good memories working together on planes down there."

Music, engineering, life — Sara Knox says, "sometimes you just have to improvise."

SARA KNOX, MECHANICAL ENGINEERING, PRESIDENT, ENGINEERS WITHOUT BORDERS Knowledge and creativity. Both have played a role in Knox's Marquette engineering experience. As an Engineers Without Borders volunteer, she helped bridge a dangerous river crossing between two Guatemalan communities, helping people reach the jobs, market, medical care and school they were cut off from during the rainy season. She also helped design and build a plane with the student-run Society of Automotive Engineers Aero team. "It had a wingspan of approximately 8.5 feet, so it's no small undertaking," she says. And, yes, it flew. What's next after Marquette? A wealth of options. "The most awesome thing about being a mechanical engineer is that everyone needs one."



Jordan Smith goes the distance.

JORDAN SMITH, BIOMEDICAL ENGINEERING, DECATHLETE

He's a full-ride Burke Scholar and Marquette varsity track and field athlete on track to become a doctor. Smith is right on course. An affinity for math and science — especially biology — and a drive to excel as a decathlete got him to Marquette. A co-op internship at GE Healthcare got him interested in medical school. What keeps him going now? "My vision for the kind of difference I'll make in the world as a doctor," he says. "I want to keep my patients in mind at all times and work for their best interest." After all, he adds, "At the end of the day, the relationships and the interactions I have with others are what truly matter."

Biomedical Engineering

Biomedical engineers combine engineering and the health sciences to create life-saving medical technologies. They work at medical device companies, hospitals and research labs, designing imaging systems, orthopedic implants, prosthetics, deep brain stimulators and much more.

Marquette's joint department, created in partnership with the Medical College of Wisconsin, combines the university's renowned engineering education and research with MCW's innovation in medical studies and clinical practice. The collaboration provides an extraordinary foundation for those aspiring to join the next generation of biomedical engineers, scientists and physicians.

MAJOR IN

• **Biocomputing**

Develop software and computer systems that improve health care.

• **Bioelectronics**

Create biomedical instruments for diagnosis and therapy.

• **Biomechanics**

Design devices that help people move better and rehabilitate from injury faster.

Real-world experience

HUMAN PERFORMANCE

You'll build assistive technologies to help people regain or recover function after stroke or from surgery. Marquette is a leader in rehabilitation and assistive technologies.

RESEARCH

Students are mentored by professors at the leading edge of medical research. Working with joint faculty at the nearby Medical College of Wisconsin, students contribute to funded research and new medical discoveries.

VISUALIZATION

Immersed in a unique 3-D visualization lab, our imaging engineers and visualization experts model and simulate medical data in ways that help doctors make better decisions.

GO FORTH AND SET THE WORLD ON FIRE.

St. Ignatius of Loyola

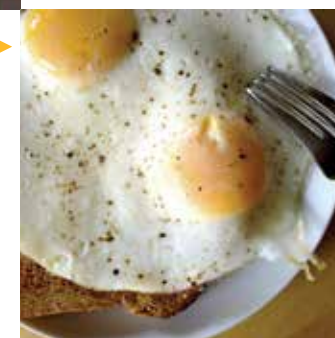
Student projects

ASSISTIVE TECHNOLOGY

Thanks to a sizable grant from the National Institutes of Health, Marquette funds several assistive technology projects each year. One is GoBabyGo, a national initiative to modify small play cars in a way that provides mobility to toddlers with disabilities. A team of Marquette students developed enhancements to the cars, including smoother acceleration and a remote-control device that lets parents and caregivers steer or stop the vehicles. In addition, a university grant is helping pilot a Center for Assistive Technologies, to help get student-developed products into settings where they can help the most people.



JORDAN'S FAVORITE PLACE ON CAMPUS: "The Broken Yolk restaurant. Because who doesn't like a great breakfast?"



Civil and Environmental Engineering

The civil engineering degree program prepares you for a profession that impacts the planet and its people in ways and to extents that few other professions can.

MAJOR IN

◆ Civil Engineering

Design and build structures and systems people need in their environment.

◆ Environmental Engineering

Apply engineering principles to create sustainable solutions.

Real-world experience

STEEL BRIDGE COMPETITION

Through our student chapter of the American Society of Civil Engineers, Marquette students team up to tackle the design, testing and timed construction of a miniature steel bridge for regional competitions.



WATER QUALITY CENTER

Student work focuses on physical, chemical and biological analyses of water, wastewater, soil and sludge.

BRIDGES FOR PROSPERITY AND ENGINEERS WITHOUT BORDERS

Students improve lives while learning and applying their civil engineering knowledge to design and construct infrastructure systems such as bridges and water supply systems in developing countries.



Student projects

CONCRETE CANOE COMPETITION

Build a canoe. Out of concrete. Race it 200 meters. On the water. That's the sink-or-swim assignment the Marquette Concrete Canoe Team takes on annually for the ASCE Great Lakes Regional Conference.

Creative thinking is a must. So is suspension of disbelief. And, crucially, understanding the capabilities of concrete as a construction material. Canoes are judged on aesthetics, structure, quality of mixed concrete designs and racing performance.

CURA PERSONALIS

Latin for "care for the whole person," a tenet of Jesuit spirituality



JENNA'S FAVORITE PLACE ON CAMPUS:

"St. Joan of Arc Chapel. Covered in vines and surrounded by flowers, it looks beautiful in spring, summer and fall. The bubbling fountain completes the peaceful scene."



Jenna Rosenthal knows how to play the angles.

JENNA ROSENTHAL, CIVIL ENGINEERING, MARQUETTE WOMEN'S VOLLEYBALL PLAYER

"Volleyball is all about angles," Rosenthal says. Strategically redirecting the ball. Attacking a shot using the angle created by a) the defenders and b) your position relative to the ball. Almost sounds like engineering homework. As an aspiring athlete and civil engineer, Rosenthal sees additional parallels between the two. "Working with the Zoo Interchange Project road construction team was very similar to working with the Marquette volleyball team," she says. Whether it's redesigning a highway or winning a game, "Both involve a group of people united around a common goal."

Construction Engineering

Construction engineers plan, design and help build everything from skyscrapers to major roadways and bridges. They use their problem-solving and practical business-management skills, as well as their understanding of the law, to plan and manage major construction engineering projects.

Civil engineers design structures. Construction engineers take the next step: using math, science and engineering to convert those plans into realities.

Construction engineers are versatile, working in a rapidly changing project environment to ensure the costs, schedule, quality and safety of a project are on track. It's up to the construction engineer to keep workers safe, meet the client's budget and schedule, and maintain the quality requirements of the project. To do all of that, they need excellent technical skills and outstanding oral and written communication skills.

Real-world experience

**WE ALL
HAVE THE
DUTY TO
DO GOOD.**

Pope Francis



ON-THE-JOB-SITE LEARNING

Field trips and lab and classroom activities expose students to real construction projects and companies throughout southeast Wisconsin. Learning to read plans, visiting projects to learn management practices and interacting with construction professionals on their daily activities are critical parts of the educational process for construction engineers.

◀ **MEGAN'S FAVORITE PLACE ON CAMPUS:** "Wisconsin Avenue, looking toward downtown. It reminds me of what I'm looking forward to after graduation: creating amazing buildings to help make the world better for everyone."

Student projects

EL AGUACATE PEDESTRIAN BRIDGE

Each summer, the Marquette chapter of Engineers Without Borders travels to the rural Guatemalan community of El Aguacate. They first assessed the need for a pedestrian bridge to provide residents safe access to schooling, health-care markets and churches. They designed the bridge back at Marquette, then returned to construct it in 2017. While on location, the team also assessed a project to bring clean drinking water to more than 300 taps, and also checked up on past project sites to evaluate social impact and structural integrity.



WINNER, 2017 EDUCATIONAL AWARD from the National Council of Examiners for Engineering and Surveying

New opportunities, new outlook — Megan Maki's world of possibilities.

MEGAN MAKI, CONSTRUCTION ENGINEERING, PRESIDENT OF MARQUETTE BAND

"With my Marquette degree, I have gained so much more than an engineering education," Maki says. "Many of my classes have taught me more than just what's in the books." Specifically, her eyes were opened to issues related to race, poverty and engineering — not just problems, but solutions as well. "I have more knowledge on tough issues now, and I hope to continue using this knowledge to create a better world," she says. But it wasn't all serious business. Maki also enjoyed the "adrenaline rush" of playing *Ring Out Ahoya* on her trombone at men's basketball games. Balance. Good quality in an engineer. And in life.



Computer Engineering

Computer engineers work on the cutting edge, designing, manufacturing and programming the computers that solve problems for society and industry — hardware and software systems that change all the time.

Computers and microprocessors are found in most modern consumer appliances and in multinational telecommunication networks. Computer engineers build the hardware and software systems that run the internet and the global marketplace.

LIVE WITH ONE FOOT RAISED.

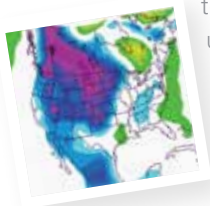
St. Ignatius of Loyola

Real-world experience

GASDAY LAB

The GasDay lab produces GasDay, a software product licensed by Marquette to natural gas utility companies nationwide. Which makes the GasDay lab not only an educational laboratory and research center but also an operating business. Utilities rely on the GasDay application for the essential task of forecasting natural gas demand across their operating areas — today, tomorrow, next month or the coldest day of the winter. Each day, GasDay forecasts about 20 percent of the nation's natural gas demand at more than 30 natural gas utilities.

GasDay was created by Marquette students in the early 1990s. The lab is staffed by more than 30 undergraduate and graduate students studying engineering, mathematics and business.



Student projects

AUTONOMOUS TRACKERS

Students are developing new, robust and lightweight algorithms that allow unmanned air vehicles, or drones, to autonomously follow a target. They aim to design a self-contained system, capable of collecting information from multiple camera-based detection algorithms and computing it onboard — no remote ground station needed.

MORE ACCURATE ROBOTS

While the manufacturing industry's adoption of robotics is growing, smaller companies often cannot afford to invest in or justify the cost of single-task robots. That's one reason a team of Marquette researchers is seeking to expand robotics applications by improving the accuracy of mobile robots. Supported with a \$260,000 grant from the National Institute of Standards and Technology, the researchers want to see robotic arms work in repeated, reliable harmony with automated platforms that move materials.



▲ **THERESA'S FAVORITE PLACE ON CAMPUS:** "Engineering Hall, one of the corners on the second floor. It's quieter over there, so I can do my homework. But I can also watch passers-by on 16th Street."

Knitting and engineering share a common thread, says Theresa Le — the design process.

THERESA LE, COMPUTER ENGINEERING, OPUS SCHOLAR, MASTER KNITTER Identify problem (cold hands), think of a solution (mittens), implement (knit while binge-watching Netflix), test (hopefully they're warm enough). When she's not studying or knitting, Le volunteers as an instructor for the Marquette chapter of the **Girls Who Code** club, which inspires middle school girls to pursue careers in STEM fields historically dominated by men. "I want girls to believe that with their hard work and dedication, they are equally as capable to succeed as anyone else out there." Through Marquette's co-op program, Le landed an internship at Rockwell Automation. After graduation, she'll return to the company as an associate engineer in the Architecture and Software Leadership Development Program.



Electrical Engineering

Electrical engineers are involved in the conception, design and development of every device or system that uses electricity. They develop new sensors, controls systems, and power supplies for electric cars and space vehicles. Electrical engineers design communication networks and sensory and delivery techniques for diabetics to regulate their blood sugar levels. They develop imaging techniques for detecting explosive devices. They design smart robots that can detect and locate survivors in natural disasters.

Real-world experience

CLASS 1,000 CLEAN ROOM

Making modern microelectronic and micromechanical devices requires a pristine environment. In the basement of Marquette's Engineering Hall is a Class 1,000 clean room (fewer than 1,000 half-micron particles permitted per cubic foot of air). Here, students can work with micromechanical and microelectrical devices such as transistors and resistors, while advanced researchers examine more complex topics, like the properties of thin-film material.

Student projects

SOLAR ENERGY FOR SAFER ROADWAYS

Marquette engineers are conducting electrical and mechanical testing of pavers from Solar Roadways, Inc. Designed for horizontal surfaces, the pavers harness solar energy to illuminate road signs, power street lights and melt ice and snow — and they need to be durable enough to withstand repeated freeze/thaw cycles and support heavy vehicles. Pavers that pass muster will be piloted in parking lots and driveways, and eventually could contribute to safer highways and byways.

GE HEALTHCARE

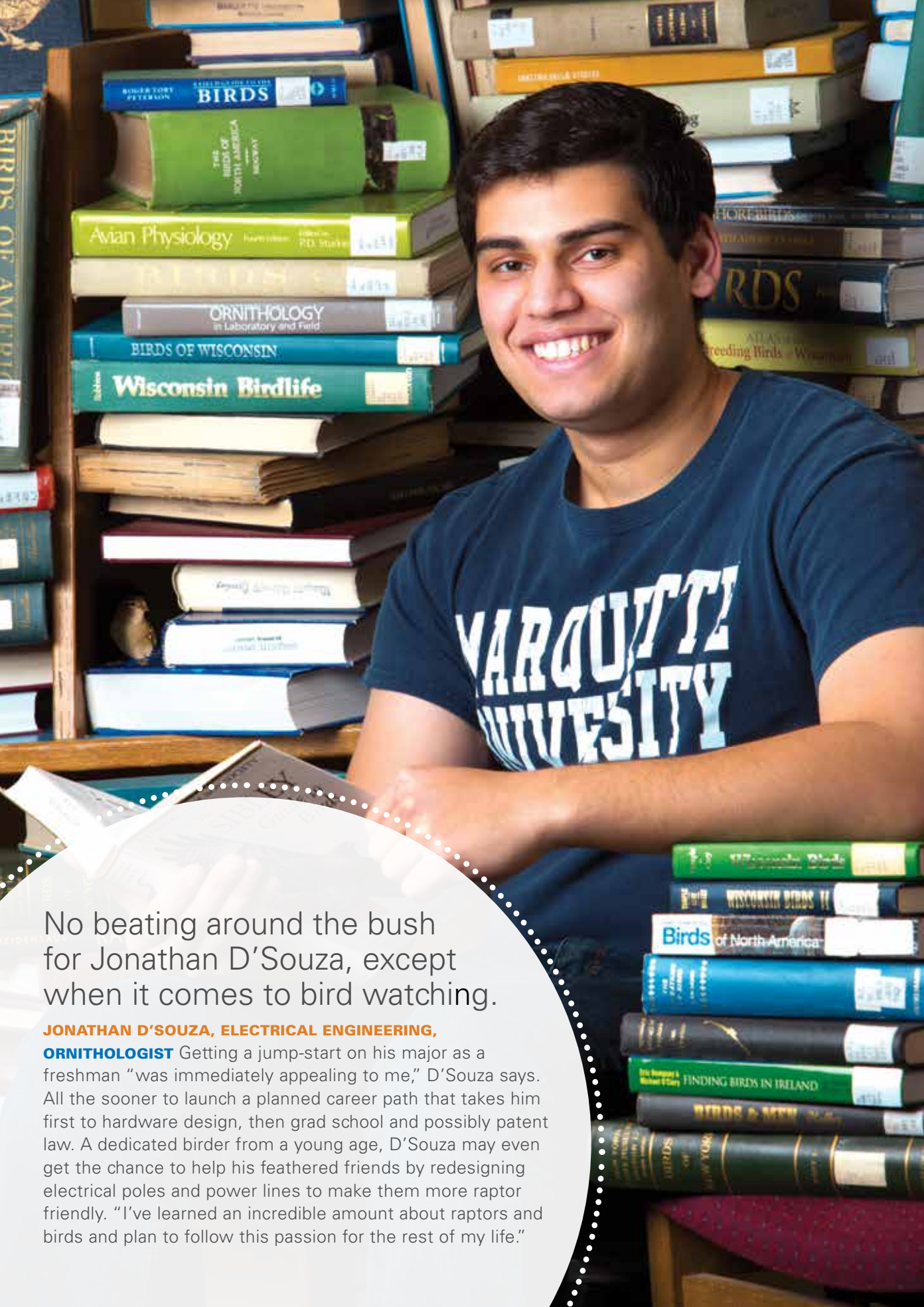
Help devise a method to ensure optimal efficiency in the design and manufacture of highly specialized X-ray tubes used by GE Healthcare, a global leader in computer tomography. The manufacturing processes range from machining, casting, brazing, induction heating, balancing, welding and precision measurement to assembly-level functional testing.

**FIND
GOD
IN
ALL
THINGS.**

St. Ignatius of Loyola



▲ **JONATHAN'S FAVORITE PLACE ON CAMPUS:** "Engineering Hall. The quiet atmosphere, variety of study places, and access to tools and equipment for some classes make it invaluable for getting work done."



No beating around the bush for Jonathan D'Souza, except when it comes to bird watching.

JONATHAN D'SOUZA, ELECTRICAL ENGINEERING, ORNITHOLOGIST Getting a jump-start on his major as a freshman "was immediately appealing to me," D'Souza says. All the sooner to launch a planned career path that takes him first to hardware design, then grad school and possibly patent law. A dedicated birder from a young age, D'Souza may even get the chance to help his feathered friends by redesigning electrical poles and power lines to make them more raptor friendly. "I've learned an incredible amount about raptors and birds and plan to follow this passion for the rest of my life."

Mechanical Engineering

Mechanical engineers conceive, plan, design and direct the manufacture, distribution and operation of things ranging from medical devices to kitchen appliances to robots. They work on energy conversion, environmental control, materials processing and handling, and transportation.

This diverse field of engineering offers loads of interdisciplinary studies and professional options.

SPECIALIZE YOUR MAJOR

Mechanical engineering students can specialize in energy systems, manufacturing systems or mechanical systems and work in our computer-aided design, stress analysis, engine, flexible manufacturing/robotics, materials and ergonomics laboratories.

Real-world experience

MECHATRONICS

It's the integration of physical systems, electronics, controls and computers during the engineering design process. It's also the key to the future because the world's problems are multidisciplinary. Solving them requires engineers who know how to work with their counterparts in all fields.

Students incorporate sensors, actuators, control systems and microprocessors into mechanical systems — not as an afterthought or an add-on, but as part of the design.

Student projects

FLYING AND OFF-ROADING

For regional, national and international competitions sponsored by the Society of Automotive Engineers, teams of Marquette students have built remote-controlled planes and off-road vehicles. The SAE AERO team designs and builds mini-planes that are judged on SAE requirements, design and flight capability, and whether the team accurately predicts how much weight their plane can carry. The SAE Baja Eagle Racing Team started in 2011 and has since built three off-road Baja vehicles. Students have the opportunity to lead the design for the car's every element, and vehicles must pass SAE technical inspection to compete. Eagle Racing clinched its first win in 2017 at a regional race in Michigan.



MEN AND WOMEN FOR AND WITH OTHERS.

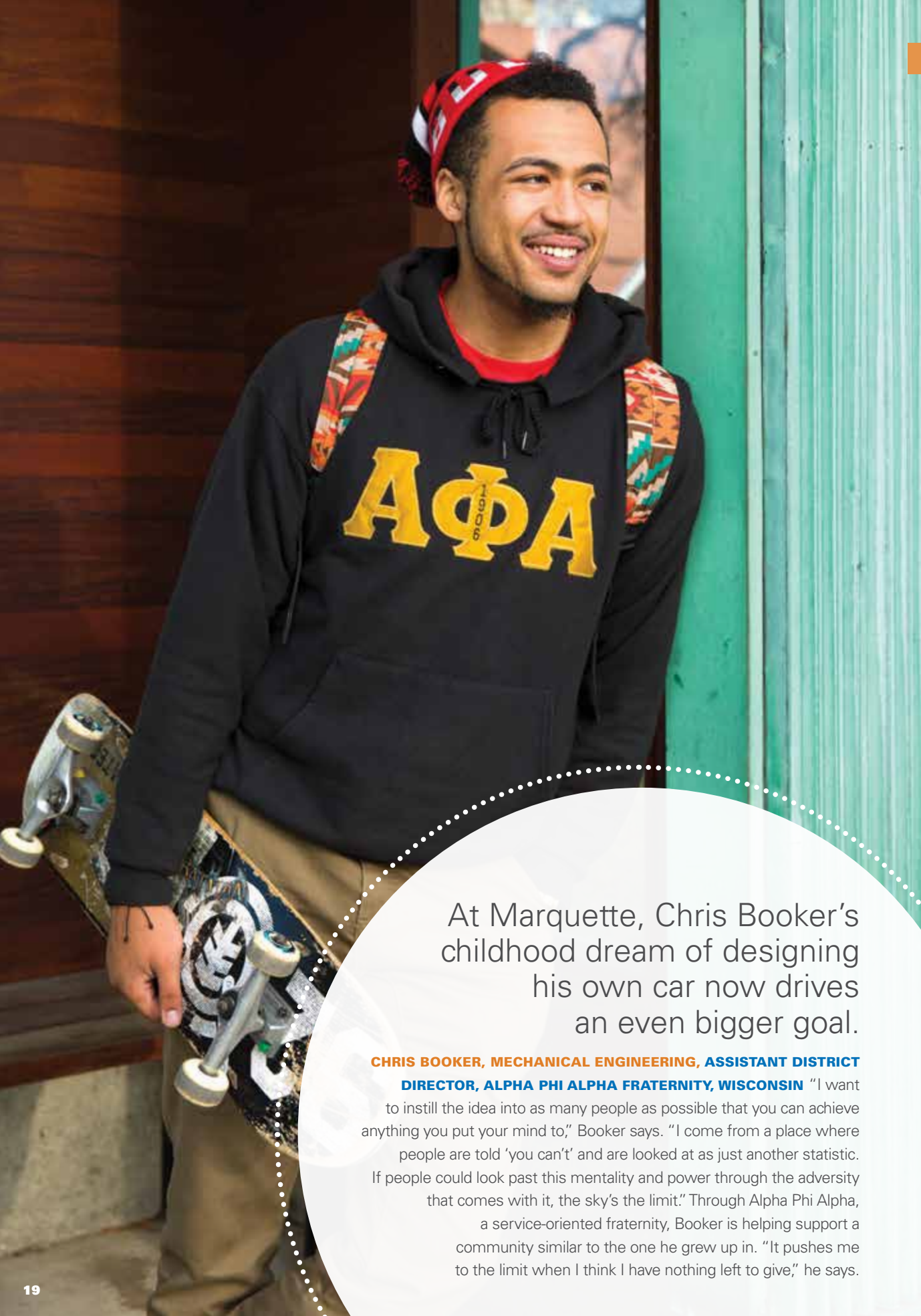


CHRIS' FAVORITE PLACE ON CAMPUS: "Outside the Raynor Memorial Libraries. It's a good place to sit and think. It's also a good spot to see people I know coming from class or going to the library."

At Marquette, Chris Booker's childhood dream of designing his own car now drives an even bigger goal.

CHRIS BOOKER, MECHANICAL ENGINEERING, ASSISTANT DISTRICT DIRECTOR, ALPHA PHI ALPHA FRATERNITY, WISCONSIN

"I want to instill the idea into as many people as possible that you can achieve anything you put your mind to," Booker says. "I come from a place where people are told 'you can't' and are looked at as just another statistic. If people could look past this mentality and power through the adversity that comes with it, the sky's the limit." Through Alpha Phi Alpha, a service-oriented fraternity, Booker is helping support a community similar to the one he grew up in. "It pushes me to the limit when I think I have nothing left to give," he says.



EVEN THE BUILDING HAS A LOT TO TEACH YOU.

Where better to learn engineering than in a masterpiece of engineering? Welcome to your new home, Engineering Hall. Designed entirely around your needs as a student. Designated as one of the most innovative places to experience engineering anywhere.

This place has a green roof, a 10,000-gallon storm water retention tank, an 8-kW solar array, stained and polished concrete floors, 95 percent LED lighting, and a heat recovery chiller. No wonder it was granted **LEED GOLD CERTIFICATION** from the U.S. Green Building Council.

38 LABORATORIES

VISUALIZATION LAB

CAN'T VISUALIZE IT?
SEE MORE ON THE FOLLOWING PAGES

10,000- GALLON STORM WATER RETENTION TANK

WATER QUALITY CENTER

IMPROVE THE QUALITY OF THE WORLD'S WATER THROUGH
PHYSICAL, CHEMICAL AND BIOLOGICAL ANALYSIS
(AND THE OCCASIONAL TASTE TEST)

130

SENSORS BUILT IN TO STUDY
THE STRUCTURAL BEHAVIOR
OF THE BUILDING

GREEN ROOF

ALLOWS STUDENTS TO SEE THE
FIRSTHAND EFFECTS OF SOLAR PANELS
AND WATER RETENTION STORAGE

HOME AWAY FROM HOME (AWAY FROM HOME)

42 COUCHES FOR LOUNGING IN BETWEEN CLASSES,
38 STUDY NOOKS FOR HITTING THE BOOKS,
1 STARBUCKS RIGHT ACROSS THE STREET

CLASSROOMS ARE RIGHT NEXT TO THE LABS SO YOU ARE ALWAYS NEAR THE ACTION

115,000 SQUARE FEET OF SPACE



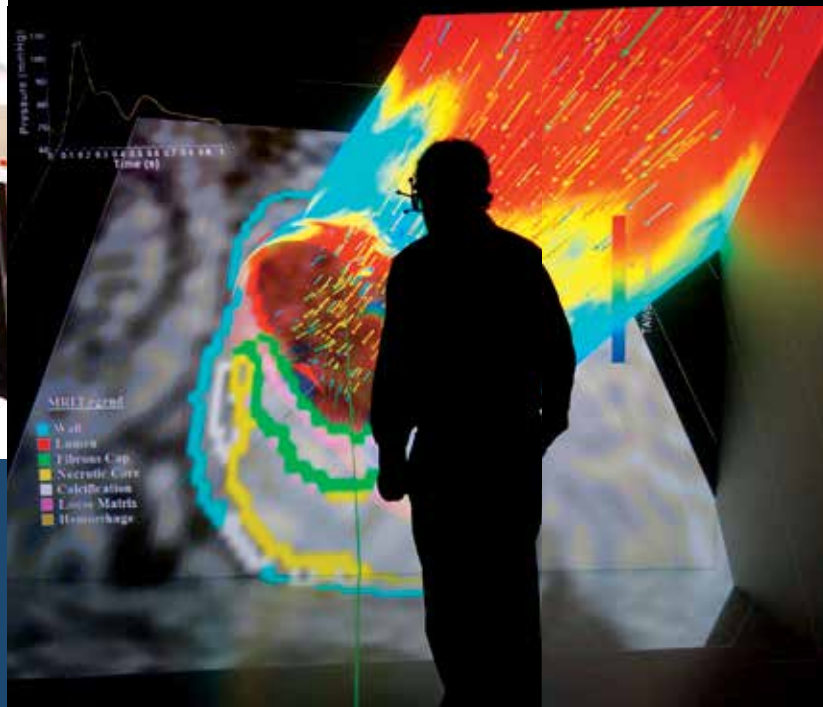
ENGINEERING MATERIALS AND STRUCTURES TESTING LABORATORY

Develop and evaluate traditional and innovative materials across multiple engineering disciplines. Civil engineering: sustainable building materials. Biomedical engineering: implant materials for the human body. Mechanical engineering: components and systems materials. A high-bay section allows for large-scale structural component and subassembly testing.



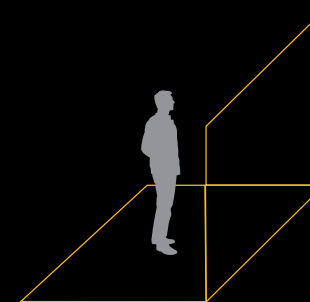
VISUALIZATION LAB

Bring your research to life. Step inside a beating heart. A jet engine. A neural network. With MARVL's large-scale immersive environment — four display surfaces, stereoscopic viewing, motion tracking equipment, surround sound — you can do more than visualize the solution in your head. You can see it working, larger than life.



COMPUTATIONAL FLUID DYNAMICS

Start with a patient's MRI data. Create 3-D animations of atherosclerotic plaques and coronary arteries. See fluids of various colors move in harmony with an audible human heartbeat.



VIEWABLE DIMENSIONS

- Width: 18' 6"
- Height: 9' 3"
- Depth: 9' 3"
- Provides nearly 4K resolution on the front wall and a resolution of 15.7 megapixels
- Surround sound
- Seating for 30



JASKOLSKI DISCOVERY LEARNING LAB

Turn ideas into prototypes. Access cutting-edge technical resources, including advanced computer technology.



ENERGY

Explore alternate energy sources to lower our carbon footprint. Areas of focus include smart power systems, thermal fluids, thermodynamics and shock physics.



MACHINE DESIGN LAB

Do creative, transformative, hands-on, minds-on exploration and investigation with hardware and real-world systems. Experiment with a range of real-world tasks and justify design choices.



▲ **SENSORS AND NANOSCALE DEVICES**

Explore how sensors are crucial to the design and maintenance of all engineering systems. From your car's check engine light to blood sugar monitors to early warning devices for terrorist threats.



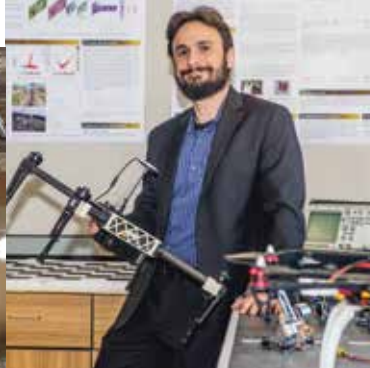
▲ **WATER AND WATER QUALITY**

Tackle the pressing challenge of sharing scarce global water resources. The Water Quality Center explores solutions involving water engineering, water resource allocation and other issues vital to sustaining life in the 21st century.



HUMAN PERFORMANCE AND HEALTH CARE ▶

Study the form and function of the body using state-of-the-art technologies. Learn what goes into the development of diagnostic, therapeutic and assistive technologies in areas devoted to medical imaging, bioinstrumentation and embedded system design.



▲ **ROBOTICS** ▶

Professors and students are exploring ways to expand robotics applications on everything from improving health through the use of prosthetic devices to improving mobile robot accuracy in manufacturing.





MARQUETTE
UNIVERSITY

BE THE DIFFERENCE.

For more information or to plan your
Marquette visit, call 414.288.6720.

marquette.edu/engineering

 [MarquetteEngineering](https://www.facebook.com/MarquetteEngineering)

 [MUEngineering](https://twitter.com/MUEngineering)

 [DeanRopellaMU](https://twitter.com/DeanRopellaMU)

 [marquette_opus_engineering](https://www.instagram.com/marquette_opus_engineering)