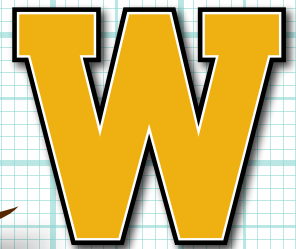
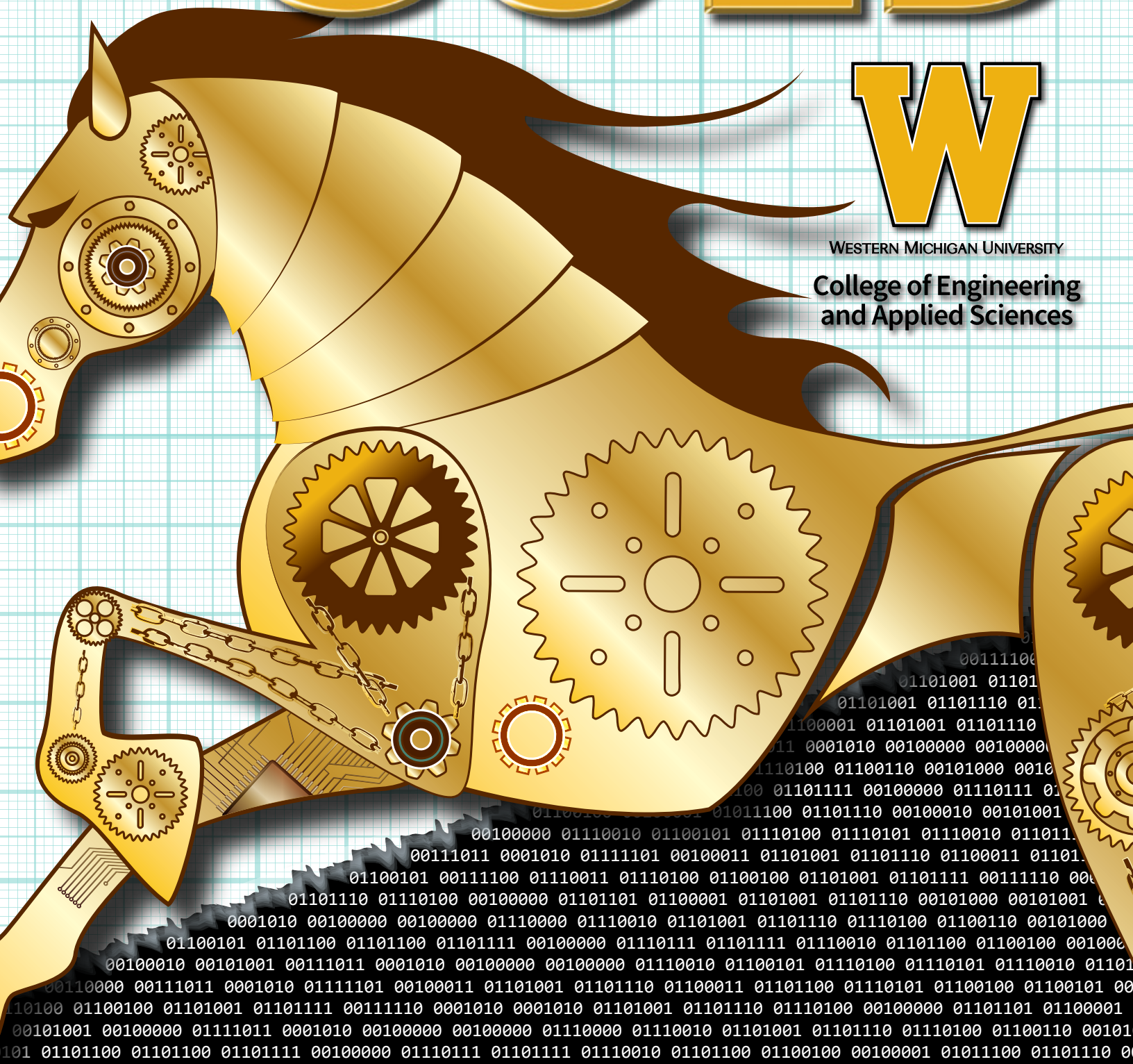


ENGINEERED TO BE GOLD



WESTERN MICHIGAN UNIVERSITY

College of Engineering
and Applied Sciences





Dear Friends,

Welcome to the College of Engineering and Applied Sciences at Western Michigan University. Here, we prepare career-ready graduates for the global marketplace. Our students are imaginative, independent thinkers and creative problem solvers. And our faculty are talented and highly accomplished educators and scholars. Our mantra here at the College of Engineering and Applied Sciences is “Greatness through excellence, one student at a time.”

We offer 14 undergraduate engineering, technology and applied sciences degree programs. We also offer nine accelerated degree programs that allow you to obtain a master’s degree in just one additional year.

Our Parkview 265-acre campus is one of a kind, sharing space in the Business Technology and Research Park with 44 other companies in life sciences, information technology and advanced engineering. Our 343,000 square-foot-facility offers 75 undergraduate and graduate laboratories and more than 20 multimedia state-of-the-art classrooms.

As the demand for engineers, computer scientists and technologists continues to grow, WMU’s College of Engineering and Applied Sciences is committed to teaching skills that are transferable to multiple industries, making our students marketable worldwide.

We’d like to further spark your excitement and interest in the wonderful world of engineering. Our doors are open and we would welcome the chance to show you around. Come visit us and discover your gold.

Best regards,

Houssam Toutanji, PhD
Dean
College of Engineering and Applied Sciences



WESTERN MICHIGAN UNIVERSITY

**College of Engineering
and Applied Sciences**

PATHWAYS

to WMU Engineering and Applied Sciences

Mathematics is the language of Engineering and Applied Sciences, and serves as the basis for where students begin their academic careers.

Bachelor of Science (BS) and Bachelor of Science in Engineering (BSE) programs

- All **Engineering** programs require four (4) Calculus courses.
- **Engineering Technology** programs require a minimum of Calculus I.
- **Computer Science** requires at least 15 credits of Math and Statistics, including Calculus I.
- **Graphic and Printing Science** students are required to take math courses through Pre-Calculus.

Your SAT- or ACT-Math score determines your starting point:

Other factors, such as Advanced Placement, International Baccalaureate, and dual enrollment credits may also be used.

SAT- or ACT-Math Score	WMU Mathematics Placement
SAT-Math 640 and higher OR ACT-Math 27 or higher	Calculus I or higher <i>Student will begin pre-engineering, pre-engineering technology, or computer science curriculum.</i>
SAT-Math 600-639 OR ACT-Math 25-26	Pre-Calculus <i>Student will begin pre-engineering, pre-engineering technology, or computer science curriculum.</i>
SAT-Math 520-599 OR ACT-Math 20-24	Algebra II <i>Student begins CEAS Preparatory program.</i>
SAT-Math below 520 OR ACT-Math below 20	Algebra I or Computational Math Skills <i>Student is placed in Exploratory Advising through the Center for Academic Success Programs at WMU. wmich.edu/exploratoryadvising</i>

* Fall 2018 requirements listed. Subject to change. *

TRANSFER STUDENTS

Understanding the requirements of your discipline is crucial for you to make the right choice.

What will transfer?

We encourage all potential transfer students to meet with a CEAS Academic Advisor and discuss the course offerings at your community college. Advisors are available to help you with the transfer process and program planning.

Many resources are available online:

- Program flowcharts for each major: wmich.edu/engineering/advising/flowcharts
- CEAS transfer guides for Michigan and Illinois Community Colleges: wmich.edu/engineer/advising/communitytransfer

Don't see your institution on the above sites? Simply call the Office of Admissions at 269-387-2000 and ask to speak with a credit evaluator.

Helpful Hints

Do you have AP/IB credits from high school? Request official scores to be sent to WMU (code 1902) so we can award the appropriate credit.

Registration dates to consider as you apply for admission:

Semester	Registration Starts	Apply
Fall	Mid-March	Early Jan.
Spring	Mid-October	September
Summer I	Mid-February	December
Summer II	Mid-February	December

CEAS Transfer Scholarships

Up to 12 scholarship recipients will be selected, and each will receive \$3,000/year, awarded up to four semesters (fall/spring) or until graduation.

Must transfer from a Community College in Michigan or Chicago area with a minimum GPA of 3.5 in transferable courses and completion of at least 26 transferable credit hours to be considered.

Admissions application must be completed and credits evaluated by **February 1st** if entering in fall semester.



"I chose WMU CEAS because of the opportunity, growth, and support that the university offers. WMU gives me the resources to not only be successful in and out of school but also to be proud of my accomplishments. Students here are recognized for their victories and shown the path to finding one's self. I will forever be thankful for being able to be a part of this community."

~ Gaby, Industrial and Entrepreneurial Engineering, Transfer Student

STEP

STEM Talent Expansion Program

The first year of college can be the most challenging to college students, particularly in science, technology, engineering, and mathematics (STEM) programs. WMU has implemented the STEM Talent Expansion Program (STEP) to help students develop the attitudes, discipline, and habits needed to make a successful transition from high school to college.

The main components of STEP are the cohorts, the STEP Student Success Centers, Engineering House, and programs for female students. These programs provide incoming students with the support and resources needed for success.

Incoming freshmen students are placed in cohorts of 15-25 students based on math placement and major, and they take the same 3-5 courses together in fall semester and the same 2-4 courses together in spring semester. Moving as a cohort during the first year allows students to form study groups naturally by seeing the same familiar faces in multiple classes.

The STEP Student Success Centers (SSC) offer free tutoring in all subjects associated with engineering and applied science including math, chemistry, and physics. STEP offers three tutoring locations staffed with student tutors. Two SSCs are located in residence halls including Engineering House (Eldridge/Fox Hall) and French Hall, and one is located at the College of Engineering and Applied Sciences. All locations are available to students who live off-campus as well.

Engineering House, located in Eldridge/Fox Hall, serves as the engineering and applied sciences living/learning community. Engineering House hosts special CEAS-related programming for students and employs two Learning Community Assistants, or LCAs, who are also CEAS students. Students who wish to live in Engineering House have the choice to join the engineering community or the engineering honors community. Students who join these communities will have a roommate or suite mates who are CEAS students or CEAS Honors students. Amenities of Engineering House include on-site tutoring in the SSC, computer lab loaded with engineering software, and programs aimed at encouraging student engagement.

The STEP Program supports students who are struggling academically after their first semester with an Early Intervention program. STEP identifies students who under-perform in critical STEM courses, and STEP program staff outline a personalized academic plan for each student based on the student's academic needs. The STEP director follows up with all students who had meetings to see how the plan is working, if grades are improving, and to check if students need additional help or resources.

31% increase in graduation with the introduction of the STEP Program



MECHANICAL AND AEROSPACE ENGINEERING

Mechanical engineers are found in almost every industry. Students become familiar with design, synthesis, engineering computer applications and mechanical systems.

Aerospace engineers design, develop, test, and help produce aircraft, surface vehicles, spacecraft, missiles, and other systems for inside and outside the atmosphere. They also design and develop hydrofoil ships, deep diving vessels for oceanographic research and high-speed rail-type machines. Boasting one of only two programs in the state, we provide unique experiences for our students. Included in their studies are aerodynamics, structures, propulsion, flight mechanics, stability and control, space propulsion and orbital mechanics.

Students in both programs can take advantage of our state-of-the-art laboratories in advanced thermal systems and heat transfer, thermo-electrics, biomechanics, experimental and computational fluid mechanics, aerodynamics, control systems, fatigue and fracture, advanced composite structures, material science, noise and vibration, motion and control, space flight dynamics and control, space plasmas, advanced vehicle design and simulation, micro and nanotechnology, battery testing, and alternative energy and fuel cells.



"I came to Western because it fit for me. Everyone on campus was extremely welcoming and friendly, and I just knew this would be a great place to call home. I originally missed the deadline for my scholarship interview but they accommodated me and it really showed me that I was actually wanted here."

~ Tayla, Mechanical Engineering



CIVIL AND CONSTRUCTION ENGINEERING

Civil engineers improve and maintain the built environment and develop new materials to construct infrastructures that impact virtually every facet of civilization. Our lives are affected every day by the work of civil engineers, from the water we drink to the roads we ride on. At Western, our civil engineering students bring innovation and improvements to both public and private sectors.

Construction engineers dream and deliver. They plan and manage construction of structures such as highways, bridges, airports, railroads, buildings, dams, and reservoirs. Our students learn the design of temporary structures, quality control, building and site layout, material testing, cost estimating, environmental impact, scheduling, safety, and budgeting. They evaluate buildings to be LEED-certified and manage energy consumption. Faculty members are engaged in a number of research projects that employ state-of-the-art techniques and equipment for assessing the condition of bridges. They also are involved in numerous transportation projects that look at ways to improve the flow of highway traffic and the safety of the public, including drivers and pedestrians.



"I love the atmosphere and the variety of different ways to be involved here at CEAS. The atmosphere is very friendly and everyone is extremely helpful. There are many organizations you can join through CEAS, whether you want to be a part of Concrete Canoe or the National Society of Black Engineers or the Swing Dance Society, you really have your pick."

~ Piper, Civil Engineering



INDUSTRIAL AND ENTREPRENEURIAL ENGINEERING

Industrial and entrepreneurial engineers are educated for the new economy—an economy where entrepreneurs with technical skills have tremendous opportunities and career options. They design, improve, and implement systems that bring together people, materials, and equipment in order to make businesses function in the most efficient way possible. Industrial and entrepreneurial engineers combine industrial engineering knowledge with an entrepreneurial focus on design and innovation. They are well prepared for traditional industrial engineering positions and entrepreneurial careers, either through the start of their own companies or through projects in existing companies.



"WMU has given me so many opportunities to learn both in and outside the classroom. From doing projects where I used my engineering skills in the community, to getting involved in student organization leadership, I have had so many opportunities to be an involved and engaged student."

~ Tessa, Industrial and Entrepreneurial Engineering



ENGINEERING DESIGN, MANUFACTURING, AND MANAGEMENT SYSTEMS

Engineering design technologists work on essential aspects of product development, taking into account functionality, efficiency, manufacturability, and sustainability. Students in this program become proficient in ideation, modeling, analysis, simulation, specification, and virtual prototyping. They learn to apply the fundamentals of processing to plastics machining, rapid prototyping, and design verification. They are also able to design products on several types of CAD systems and use a multitude of analysis systems.

Manufacturing engineering technologists support manufacturing activities by implementing sustainable processing to reduce material and energy consumption and product cost. They bring together people, raw materials, processes, and capital to solve manufacturing problems and create efficient systems of production. Students at Western gain hands-on experience using more than 18,000 square feet of comprehensive industrial equipment.

If you enjoy working in a team-based, technical environment, and if you want to be a leader, **Engineering Management Technology** may be for you. Engineering managers improve the performance of systems, ensure the quality of products, and design better ways of making things. Our program, recognized as one of the best in the country, combines math, chemistry, physics, electronics, computers, and accounting with communication, team building, and the importance of the human dimension in the workplace.



"What I love about WMU are all the avenues for growth, academically and professionally. Western offers so many resources for academic success and opportunities to create a legacy. I'll always cherish the time I invested in the organizations that invested in me."

~ Luis, Engineering Design Technology



ELECTRICAL AND COMPUTER ENGINEERING

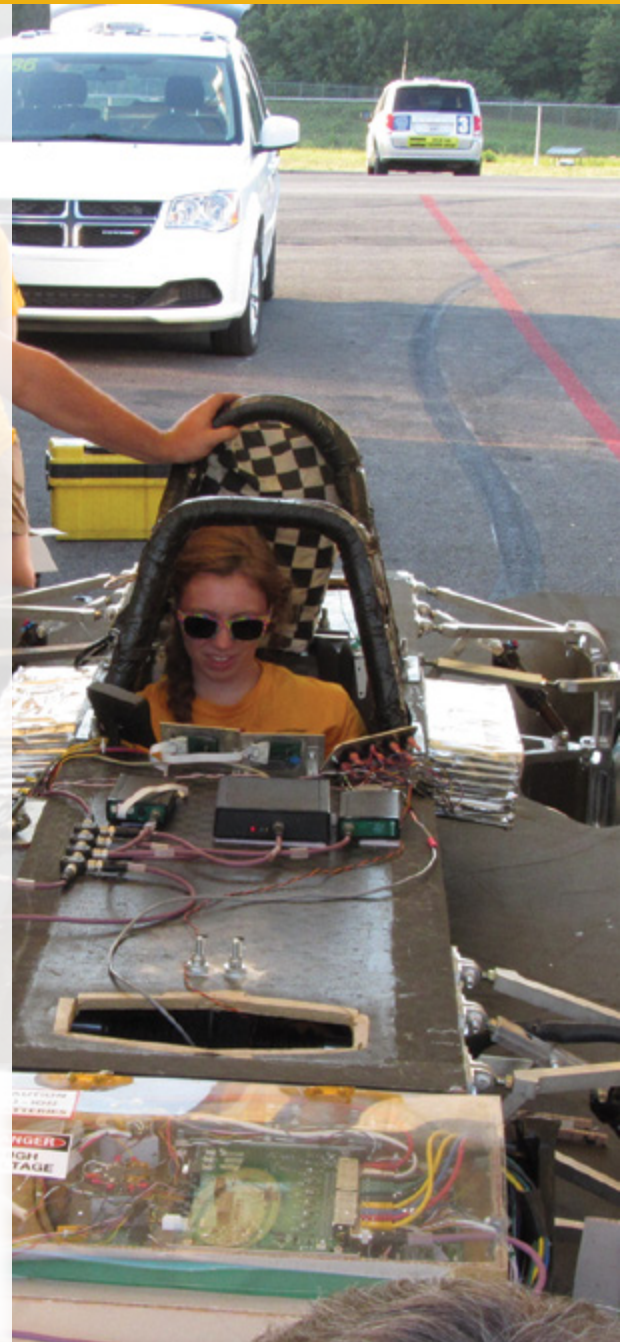
Electrical engineers develop, design, operate, and apply electrical and electronic system components that connect and power our world. Students in this program become familiar with automatic control systems, circuits, communications, digital logic, digital signal processing, electric power and power electronics, electromagnetics, energy conversion, instrumentation, microcomputers, and semiconductor materials and devices.

The computer revolution has had a tremendous effect on civilization, linking people and information together in ways that continue to evolve almost daily. **Computer engineers** impact our world through designing, implementing, and deploying both small-scale and large-scale systems for a wide range of applications. Students study real-time embedded systems, instrumentation, communications, control systems, signal processing, computer architecture, and multi-core/multi-processor systems.



"There are so many opportunities here at CEAS and ways to get involved. I was able to connect with faculty to do research, build a network of other students who share my passions through RSOs, and speak to potential employers. Studying here is genuinely what you make of it."

~ Marie, Electrical Engineering



COMPUTER SCIENCE

Computer scientists study the design, analysis, and development of computer software that is integrated into so many aspects of our lives. Our students get practical training in software development and computing technologies, while learning theoretical foundations of computing. Students do both applications and systems programming, and take courses requiring hands-on experience with web technologies, database systems, algorithm analysis, and design. The 2-semester senior project course has students working in small teams to develop applications and computing solutions for real-world clients.

Students may choose electives from several areas such as:

- artificial intelligence
- machine learning
- computer and network security
- parallel processing
- mobile and cloud computing
- big data and data science

Graduates of the Computer Science program are prepared to continue with graduate work in computing, as well as to work in a wide variety of computing jobs and industries. Our graduates work as application developers, systems administrators, game programmers, network and security specialists, database managers, research support specialists, and more. Given the high demand for Computer Science graduates, students have choices of working anywhere in the country.



"I chose to attend WMU because I want the most complete and thorough program to prepare for my future career as a software developer. The Computer Science department is my ticket to a successful and fulfilling future, and is providing me with the education I need to make a difference."

~ Musaab, Computer Science



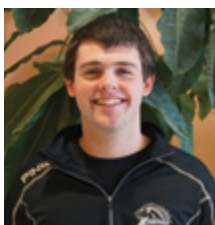
CHEMICAL AND PAPER ENGINEERING

Chemical engineers are involved in almost every industrial process in our society. They discover, design, build, and operate processes that involve changes in the chemical composition, physical nature, and energy content of materials. Students may choose one of four areas of concentration: life science, energy management, pollution prevention and sustainability, and pulp and paper.

Paper engineers make products from trees, plants, or recycled fibers and apply principles of chemical engineering to design, develop, and troubleshoot the papermaking process. New developments in the growth and harvesting of trees—along with emerging projects like bio- fuels and biopolymers—are creating opportunities to replace nonrenewable products. This major emphasizes process design, chemistry, paper properties, paper coating, and recycling. Students may focus on either pulp and paper processes or environmental engineering and sustainability, and take advantage of our four pilot plants and numerous high paying co-ops and internships.

Paper engineering students have a dedicated mentor to assist with academic and career readiness, have ample scholarship offerings, and boast a 100% placement rate upon graduation.

Graphic and Printing Science encompasses the entire graphic arts process. This unique program emphasizes business fundamentals, marketing, sales advertising, web applications, print applications, graphics development, and materials use. Students have three areas of focus to choose from: business, multimedia, and packaging. Students in this program will take technical courses covering all methods of printing, and will work in industry for at least one summer.



"WMU has done an amazing job preparing me for industry and building friendships that will last a lifetime. Friendly peer tutoring and extremely supportive faculty have been instrumental to my success. Additionally, WMU's unique programs, organizations, and opportunities have helped me obtain four internships and over \$43,000 in scholarships by the time I graduate."

~ Stephen, Paper Engineering



ACCELERATED DEGREE PROGRAMS

You can earn both a bachelor's and master's degree in as little as one additional year at Western Michigan University by taking advantage of our Accelerated Degree Programs.

If eligible, you have the opportunity to complete both an undergraduate degree and a master's degree in less time because you may begin taking graduate courses while still an undergraduate.

Once you enter graduate school, you are able to quickly move through the master's degree requirements because you have already taken several graduate classes.

The following programs offer accelerated degree options:

- | | | |
|--------------------------------|---------------------------------|-------------------------------------|
| • Aerospace Engineering | • Computer Engineering | • Industrial Engineering |
| • Chemical Engineering | • Computer Science | • Mechanical Engineering |
| • Civil Engineering | • Electrical Engineering | • Paper and Printing Science |

GRADUATE AND DOCTORAL PROGRAMS

WMU offers graduate and doctoral programs in the following disciplines:

- | | |
|---|---|
| • Aerospace Engineering, MS | • Engineering Management, MS |
| • Chemical Engineering, MSE | • Industrial Engineering, MSE and PhD |
| • Civil Engineering, MSE and PhD | • Manufacturing Engineering, MS |
| • Computer Engineering, MSE | • Mechanical Engineering, MSE and PhD |
| • Computer Science, MS and PhD | • Paper and Printing Science, MS and PhD |
| • Electrical and Computer Engineering, PhD | • Engineering and Applied Sciences, PhD |
| • Electrical Engineering, MSE | |

MS = Master of Science MSE = Master of Science in Engineering

For more information you can contact the department directly, or contact the Graduate College at (269) 387-8212 or grad-info@wmich.edu.



WMU COLLEGE OF ENGINEERING AND APPLIED SCIENCES SCHOLARSHIPS

CEAS Excellence Scholarship

- Must participate in the WMU Medallion Scholarship competition but not have been awarded the scholarship.
- Awards range from \$2,000 - \$5,000 per year for up to four years.

CEAS Multicultural Scholarship

Recipients will receive \$2,000/year for up to four years.

- Available to first year students entering WMU in the fall with a high school cumulative GPA of 3.0 on a 4.0 scale.
- Recipients must live in WMU-affiliated housing in the first year.

CEAS Leadership Scholarship

Awards range from \$1,000 - \$4,000 per year for up to four years.

- Available to first year students entering WMU in the fall with a high school cumulative GPA of 3.0 on a 4.0 scale.
- Recipients must live in WMU-affiliated housing in the first year.

All scholarships require that recipients maintain a minimum grade point (dependent upon which scholarship is awarded) and be enrolled full time in a major in CEAS.

Several other scholarships are available!



"Western is committed to helping all students succeed, from free engineering tutoring 5 nights a week to a massive career fair. I know that my school wants to see me excel in and out of the classroom just as much as I do. I'm a Bronco because I knew I could count on WMU's support system."

~ Grace, Aerospace Engineering



CAREER SERVICES

wmich.edu/engineer/advising/career

Students in the College of Engineering and Applied Sciences have access to a wide variety of services that enable them to pursue excellent jobs and rewarding careers with industry leaders in the region, state, and across the nation.

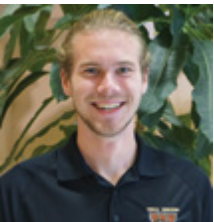
Career Advising: Students can speak with a career advisor about choosing the right pathway, conducting a job or internship search, resumes and cover letters, preparing for job interviews, and job offer negotiations.

Career Programs: To support students in becoming career-ready graduates, numerous programs are available to help them articulate and highlight their coursework, skills, and experiences. Workshops for writing resumes, interview preparation, and networking are just a few programs offered.

Employment Services: Students have opportunities to connect with industry and network with employers during their academic careers. The annual Engineering Expo routinely brings well over 100 employers from across the country to recruit students for internships and professional employment. In addition, The Industry Road Trip Series allows students to tour leading industries throughout the region.

Handshake, the university employment website, provides students and alumni online access to campus job postings, internships, co-ops, part- and full-time job openings, and career development opportunities.

Experiential Education: Internships and cooperative education are valuable opportunities for students to integrate classroom study and practical work experience. Learning through experience enriches a student's education and gives them an edge in their field. We recognize the need for an active alliance with business, industry, and higher education. Our joint efforts provide opportunities for companies to benefit from the talents of our students, while our students benefit from the value of hands-on work experience.



"I have found WMU to be the optimal place to prepare me for my field. We are small enough that I am able to connect personally with many of my instructors, yet large enough that there are countless opportunities to get involved in student organizations, undergraduate research, and campus activities. Plus, Kalamazoo is a fantastic community and excellent location."

~ Austin, Chemical Engineering



STUDENT ENGAGEMENT AND SUCCESS

Success may mean different things to different people, but one common element of student success is engagement.

Engagement with fellow students.

Engagement with faculty.

Engagement with community.

To foster this engagement, the WMU Office of Student Engagement seek help you develop meaningful connections, maximize and develop leadership potential, and foster a culture of excellence.

Research has shown that students who get involved perform better academically and will graduate more frequently. WMU provides an array of activities that engage, empower, and develop students.

WMU Fraternity and Sorority members engage in over 30,000 service hours.

WMU has over 400 registered student organizations, ranging from fun and games to political and religious groups.



"I chose Western Michigan University because of the numerous resources available to students such as tutoring and other success services. I was also impressed with all of the opportunities for students to get involved on campus and in the community through student organizations, internships, and research. These initiatives ensure that the students at Western make the most of their college experience and set a bright path for the future."

~ Sammi, Industrial Engineering



STUDENT ORGANIZATIONS AND SOCIETIES

Get involved! Registered student organizations range from discipline-specific groups to multidisciplinary groups that serve broad interests. Many organizations participate in outreach activities for the local community. Some will compete in design/build competitions that take them all over the country.

Alpha Pi Mu

American Foundry Society (AFS)

American Institute of Aeronautics & Astronautics (AIAA)

- Design-Build-Fly UAV team (DBF)
- Unmanned Aerial Systems (UAS)
- Aerospace Rocketry Committee (ARC)

American Institute of Chemical Engineers (AIChE)

American Society for Engineering Management (ASEM)

American Society of Civil Engineers (ASCE)

- Associated General Contractors
- Concrete Canoe Team
- Institute of Transportation Engineers
- Steel Bridge Team

American Society of Mechanical Engineers (ASME)

Chi Epsilon

Computer Club

Engineers Without Borders (EWB)

Epsilon Mu Eta

Eta Kappa Nu

Graphic Arts Society (GAS)

Innovation Club

Institute of Electrical & Electronics Engineers (IEEE)

Institute of Industrial & Systems Engineers (IISE)

National Society of Black Engineers (NSBE)

Out in STEM (oSTEM)

Paramotoring Association of Western Michigan (PAWM)

Pi Tau Sigma

Society of Automotive Engineers (SAE)

- Baja Racing Team
- Formula Racing Team

Society of Hispanic Professional Engineers (SHPE)

Society of Manufacturing Engineers (SME)

Society of Plastics Engineers (SPE)

Society of Women Engineers (SWE)

Sunseeker Solar Car Team

Tau Alpha Pi

Tau Beta Pi

Technical Association of Graphic Arts (TAGA)

Technical Association of Pulp and Paper Industry (TAPPI)

Theta Tau

Ts'ai Lun

Upsilon Pi Epsilon

Western Aerospace Launch Initiative (WALI)



RESOURCES

Tools for your success

Engineering and Applied Sciences Advising

269-276-3270

wmich.edu/engineer/advising

CEAS Scholarships

269-276-3270

wmich.edu/engineer/scholarships

CEAS Tours

269-276-3270

wmich.edu/engineer/ceastours

STEP Program

269-276-3316

wmich.edu/step

WMU Admissions

269-387-2000

wmich.edu/admissions

Main Campus Tours

269-387-2289

wmich.edu/visit

Financial Aid

269-387-6000

wmich.edu/finaid

Residence Life and Housing

269-387-4735

wmich.edu/housing

Study Abroad

269-387-5890

wmich.edu/studyabroad

Family Engagement

269-387-4820

wmich.edu/families

Office of Student Engagement

269-387-2115

wmich.edu/studentengagement

Military and Veterans Affairs

269-387-4444

wmich.edu/military

Transfer Student Services

269-387-2167

wmich.edu/transfer

Disability Services for Students

269-387-2116

wmich.edu/disabilityservices



**To get ahead
and graduate on time,
you need to commit.**

Commit to a future of innovation,
exploration, and marketable skills at the
**College of Engineering
and Applied Sciences.**

Aerospace Engineering

Chemical Engineering

Civil Engineering

Computer Engineering

Computer Science

Construction Engineering

Electrical Engineering

Engineering Design Technology

Engineering Management Technology

Graphic and Printing Science

Industrial and Entrepreneurial Engineering

Manufacturing Engineering Technology

Mechanical Engineering

Paper Engineering

Western Michigan University is an equal opportunity/affirmative action institution consistent with applicable state and federal laws.

WMU's Carnegie classification is Doctoral University, Higher Research Activity.

All CEAS Majors are accredited by one of the following
Accreditation Board for Engineering and Technology (ABET) Commissions:

- Engineering Accreditation Commission (EAC)
- Engineering Technology Accreditation Commission (ETAC)
- Computing Accreditation Commission (CAC)

Accrediting Council for Collegiate Graphic Communications (ACCGC)

Information about ABET accreditation can be found at www.abet.org
Information about ACCGC accreditation can be found at www.accgc.org