Oh, the things you will do!

**Cornerstone Design**  
**National Competitions**  
**Internships**  
**Undergraduate Research**  
**CAPSTONE DESIGN**  
**Co-op employment**  
**Study Abroad**  
**Student Organizations**  
**Residential Experience**  

On behalf of all our staff, **Welcome, Spartan Engineer!**

You are embarking on a major journey in life. After 13 years of taking courses mostly in common with all of the other students your age, you are now beginning preparation for a profession, and investing time and resources in a college education directed to your specific goals.

Success in Engineering in the 21st century requires breadth beyond classroom studies and a standard curriculum. To reach your goals, the planning starts now. You need to spend your years as a Spartan Engineer developing the building blocks for a career in engineering or a related field and perhaps additional study in graduate school.

Making your plan starts today at your New Student Orientation (NSO) and will continue through your career by interacting with the various units in the office of Engineering Undergraduate Studies (UGS). Our many ways to provide you support and help you broaden your experiences are further described in this handbook. **Keep this book** for your planning and visit our offices to assist you in the many opportunities highlighted above. Our help starts today, in planning your first year of classes

**You are a Spartan Engineer. Welcome and ... Go Green!**

Dr. Amanda Idema  
Assistant Dean for Undergraduate Studies
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## Campus Resources

<table>
<thead>
<tr>
<th>Office/Department</th>
<th>Location</th>
<th>Phone #</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Engineering Academic Advising</td>
<td>C101 Wilson Hall</td>
<td>517-355-6616</td>
</tr>
<tr>
<td>Admissions</td>
<td>250 Hannah Admin. Bldg.</td>
<td>517-355-8332</td>
</tr>
<tr>
<td>Campus Living Resources</td>
<td>1855 Place</td>
<td>1-877-9LIVEON</td>
</tr>
<tr>
<td>Chemistry Department</td>
<td>185 Chemistry</td>
<td>517-355-9715</td>
</tr>
<tr>
<td>CoRe Experience</td>
<td>C101 Wilson Hall</td>
<td>517-355-6616 ext. 2</td>
</tr>
<tr>
<td>Counseling &amp; Psychiatric Services</td>
<td>3rd Floor Olin Health Center</td>
<td>517-355-8270</td>
</tr>
<tr>
<td>Diversity Programs Office (DPO)</td>
<td>1108 EB</td>
<td>517-355-8310</td>
</tr>
<tr>
<td>English Language Center (ELC)</td>
<td>B230 Wells Hall</td>
<td>517-353-0800</td>
</tr>
<tr>
<td>Financial Aid</td>
<td>252 Student Services</td>
<td>517-353-5940</td>
</tr>
<tr>
<td>IAH Department</td>
<td>200 Linton Hall</td>
<td>517-355-9570</td>
</tr>
<tr>
<td>ISS Department</td>
<td>302 Berkey Hall</td>
<td>517-355-9733</td>
</tr>
<tr>
<td>Math Department</td>
<td>C212 Wells Hall</td>
<td>517-353-0844</td>
</tr>
<tr>
<td>Math Learning Center (MLC)</td>
<td>C126A Wells Hall</td>
<td>517-884-7414</td>
</tr>
<tr>
<td>Office for International Student &amp; Scholars (OISS)</td>
<td>105 International Center</td>
<td>517-353-1720</td>
</tr>
<tr>
<td>Physics Department</td>
<td>1312 BPS Building</td>
<td>517-355-9200 ext. 3</td>
</tr>
<tr>
<td>Department of Police &amp; Public Safety (DPPS) – sign up for emergency text alerts</td>
<td>1120 Red Cedar Rd.</td>
<td>517-355-2221</td>
</tr>
<tr>
<td>Registrar’s Office</td>
<td>150 Hannah Admin. Bldg.</td>
<td>517-355-3300</td>
</tr>
<tr>
<td>Education Abroad</td>
<td>109 International Center</td>
<td>517-353-8920</td>
</tr>
<tr>
<td>The Center (internships, co-ops, career services)</td>
<td>C108 Wilson Hall</td>
<td>517-355-5163</td>
</tr>
<tr>
<td>Neighborhood Student Success Collaborative</td>
<td>170 Bessey Hall</td>
<td>517-884-4050</td>
</tr>
<tr>
<td>Women in Engineering (WIE) Student Success</td>
<td>1108A EB</td>
<td>517-432-1354</td>
</tr>
<tr>
<td>Women in Engineering (WIE) K-12 Outreach</td>
<td>1410A EB</td>
<td>517-884-0054</td>
</tr>
<tr>
<td>Writing Center</td>
<td>300 Bessey Hall</td>
<td>517-432-3610</td>
</tr>
</tbody>
</table>
Academic Advising

Who are academic advisors?
Academic advisors are professionals with advanced degrees in counseling, education, university administration and related fields. Academic advisors are dedicated to students’ academic success and are knowledgeable about university policy. We are here to guide you along the way and provide valuable information to help you make good academic decisions.

Please see the current list of academic advisors.

Schedule an advising appointment online.

How often should I meet with my advisor?
- At least once a semester.
- To receive assistance with major selection, schedule planning, test-taking, study skills, utilizing resources, career planning, and much more.
- We encourage you to meet with an advisor in person; while some questions can be handled by email, many issues benefit from a two-way conversation.

Before visiting your advisor, you should:
- Reflect on how you are doing in your classes.
- Review the major/degree requirements for the majors that interest you.
- Review course prerequisites listings and Schedule of Courses.
- Bring a preliminary schedule of courses you intend to take.
- Write down your questions and bring them to your appointment.

2020 - 2021 Academic Calendar
For a complete listing of important dates, please visit the Registrar’s Office website.

Academic Programs Catalog
Students should consult with their advisors to learn which specific requirements apply to their degree programs. Degree requirements are available for viewing online.

Student Handbook
Spartan Life: Student Handbook and Resource Guide is a helpful resource guide to campus programs and services and also includes rules, regulations, rights and responsibilities that have been established in the interest of intellectual and personal development while protecting individual freedoms.
## How many credits to be a Freshman/Sophomore/Junior/Senior?

<table>
<thead>
<tr>
<th></th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0-27 credits</td>
</tr>
<tr>
<td>Sophomore</td>
<td>28-55 credits</td>
</tr>
<tr>
<td>Junior</td>
<td>56-87 credits</td>
</tr>
<tr>
<td>Senior</td>
<td>88+ credits</td>
</tr>
</tbody>
</table>

## Special Note About Advising

Academic advisors are here to connect students with resources to support their success at MSU. Students are encouraged to talk with their advisors about any concerns they may have inside and outside the classroom. Advisors are mandatory reporters, which means that we are legally required to report any disclosures of current or past child abuse/neglect, sexual assault or harassment, and relationship violence to the MSU Office of Institutional Equity and MSU Police. After a report, students will be contacted by a campus official. In most cases, students may choose whether or not to participate further. If students would like to speak with someone confidentially, there are confidential resources on campus that are not held to the same reporting standards.
Admission to the College of Engineering
The College of Engineering has a secondary admissions process. This means that, after arriving at MSU, new students must complete certain courses and earn certain grades in order to be formally admitted to the College of Engineering and their major of choice. Students who are working toward admission to Engineering can declare majors that indicate their field of preference—for example, “Mechanical Engineering Preference.”

In order to enroll in 300 & 400 level engineering courses, students must be formally admitted to the College of Engineering. Students can apply for admission DURING the semester that they expect to meet the following requirements:

- completed the required courses.
- earned at least 28 college credits after matriculating at MSU (AP and Dual Enrollment do not count towards this).
- attained a specific combination grade point average.
- have a minimum of 2.0 in MTH 132 & MTH 133 AND an average GPA of 2.0 in ALL math courses.

The College of Engineering admissions application is available online starting in the second week of each semester.

The application deadlines for each semester are as follows:
Fall semester: Nov. 15.
Spring semester: Apr. 1.
Summer semester: Aug. 1.

Applications will be reviewed during the week after final exams, and students will be notified of their admission status via the Confidential Message system through Stuinfo.

Courses Required for College Admission

- MTH 132 – Calculus 1 (with a grade of at least 2.0).
- MTH 133 – Calculus 2 (with a grade of at least 2.0).
- CEM 141 – General Chemistry OR CEM 151 – General and Descriptive Chemistry (for all majors except Computational Data Science and Computer Science). **CEM 151 is required for Chemical Engineering, Environmental Engineering, and Materials Science majors.**
- PHY 183 or 183B – Physics for Scientists and Engineers 1.
- EGR 100 – Introduction to Engineering Design.
- EGR 102 – Introduction to Engineering Modeling OR CSE 231 – Introduction to Programming 1 (for Computer Engineering, Computer Science and Mechanical Engineers majors only) OR CSE 220 – Programming in C (for Electrical Engineering majors only) OR CMSE 202 – Computational Modeling Tools & Techniques (Computational Data Science majors only).
GPA Required for College Admission

Admission to Engineering majors requires the following combined, or combo, GPA:
- Mechanical Engineering – 3.1.
- Biosystems, Chemical, Civil, Computational Data Science, Computer Engineering, Electrical, Environmental, Materials Science – 2.9.

Admission to the College of Engineering is based on your Combined, or Combo, GPA. Your combined grade point average is the average of your cumulative GPA and your technical GPA.

Your Cumulative GPA is an average of the grades you received for all courses you have taken for credit at MSU. First, multiply the credits for each MSU course you have taken by grade you received to get your points. Then, divide your total points by your total credits to get your cumulative GPA. Example:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Multiplied by</th>
<th>Grade</th>
<th>Equals</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 205</td>
<td>3 credits</td>
<td>times</td>
<td>2.5</td>
<td>=</td>
<td>7.5 points</td>
</tr>
<tr>
<td>CEM 141</td>
<td>4 credits</td>
<td>times</td>
<td>3.0</td>
<td>=</td>
<td>12.0 points</td>
</tr>
<tr>
<td>CEM 161</td>
<td>1 credit</td>
<td>times</td>
<td>4.0</td>
<td>=</td>
<td>4.0 points</td>
</tr>
<tr>
<td>ISS 215</td>
<td>4 credits</td>
<td>times</td>
<td>3.0</td>
<td>=</td>
<td>12.0 points</td>
</tr>
<tr>
<td>MTH 132</td>
<td>3 credits</td>
<td>times</td>
<td>3.0</td>
<td>=</td>
<td>9.0 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15 credits</td>
<td></td>
<td></td>
<td></td>
<td>44.5 points</td>
</tr>
</tbody>
</table>

44.5 (total points) ÷ 15 (total credits) = 2.966 cumulative GPA

Your Technical GPA is an average of the grades you have received for all technical courses, which include most courses taken in the College of Engineering, Natural Science, Biosystems Engineering courses, and selected courses from Lyman Briggs College. You can view a more complete list of technical courses online.

The technical GPA calculation is the same as the Cumulative GPA, except that it only includes your science and engineering related courses. If you have repeated a course, only the most recent grade should be used. In this example, notice that ISS 215 from the list above is not included because it is not technical. Example:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Multiplied by</th>
<th>Grade</th>
<th>Equals</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENT 205</td>
<td>3 credits</td>
<td>times</td>
<td>2.5</td>
<td>=</td>
<td>7.5 points</td>
</tr>
<tr>
<td>CEM 141</td>
<td>4 credits</td>
<td>times</td>
<td>3.0</td>
<td>=</td>
<td>12.0 points</td>
</tr>
<tr>
<td>CEM 161</td>
<td>1 credit</td>
<td>times</td>
<td>4.0</td>
<td>=</td>
<td>4.0 points</td>
</tr>
<tr>
<td>MTH 132</td>
<td>3 credits</td>
<td>times</td>
<td>3.0</td>
<td>=</td>
<td>9.0 points</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11 credits</td>
<td></td>
<td></td>
<td></td>
<td>32.5 points</td>
</tr>
</tbody>
</table>

32.5 (total points) ÷ 11 (total credits) = 2.9545 technical GPA
Degree Requirements

Your engineering degree consists of four main parts:
1. University Requirements (required of every MSU student).
2. College Requirements (required of all Engineering students).
3. Major Requirements (set of courses just for your major).
4. General Electives (non-major courses to help you reach your total graduation credits).

There are also opportunities to add optional concentrations in most majors, minors within or outside the College of Engineering, and additional majors.

1. University Requirements

Writing
All MSU students must complete two writing courses.
- WRA 101 Tier 1 level (generally taken during the first year).
- One at the Tier 2 level (fulfilled through 300/400 level major courses).

Integrative Studies in Social Sciences (ISS)
All MSU students must complete two ISS courses. These courses can be completed at any time during the undergraduate program.
- One ISS 200-level course.
- One ISS 300-level course (completion of 28 credits and ISS 200-level).

Integrative Studies in Arts and Humanities (IAH)
All MSU students must complete two IAH courses. These courses can be completed at any time during the undergraduate program.
- IAH 201-210 (prerequisite is WRA 101).
- IAH 211 or higher (prerequisite is IAH 201-210).

Integrative Studies Diversity Requirement
MSU undergraduates must complete courses in at least two of three diversity categories ("D", "N" & "I") as part of their IAH and/or ISS requirements. "N" – emphasizes national diversity; "I" – emphasizes international and multicultural diversity and "D" – emphasizes both national and international/multicultural diversity.

Bioscience
- MOST of the engineering majors allow for any of the following: BS 161, ENT 205, IBIO 150, MMG 141, MMG 201, PLB 105, PSL 250.
- Environmental Engineering, Chemical Engineering, & Biosystems Engineering majors must take BS 161.
- Biomedical Concentrations: Need BS 161.
2. College of Engineering Requirements

Design & Computing Requirements
As part of the CoRe Experience academic program, first-year engineering students are introduced to the team design process and analytical tools used in the engineering profession. These courses immerse students in hands-on engineering activities from their first days on campus.

All majors take EGR 100 – *Introduction to Engineering Design.*
Team-based, interdisciplinary projects will be used to introduce students to the principles of engineering design processes. Teamwork, oral and written communication, career preparation, engineering ethics and other topics will also be discussed.

One technical computing class must be taken, depending on your intended major:
- **EGR 102 – *Introduction to Engineering Modeling.* Students will learn how to systematically identify and deconstruct engineering problems using tools such as advanced spreadsheets and engineering software applications such as MATLAB. Students will analyze various engineering systems, through the use of a variety of mathematical models. For students in Applied Engineering Sciences, Biosystems Engineering, Civil Engineering, Chemical Engineering, Environmental Engineering, and Materials Science.

- **CMSE 202 – *Computational Modeling Tools & Techniques.* CMSE 202 is a programming course geared toward Computational Data Science. It covers computational modeling focusing on standard methods and tools used for modeling and data analysis. Topics may include statistical analysis, symbolic math, linear algebra, simulation techniques, and data mining. **Student must have completed CMSE 201 prior to taking CMSE 202**. For students in Computational Data Science.

- **CSE 231 – *Introduction to Programming 1.* CSE 231 is an introduction to programming course. Using the Python language, ”students will learn how to design, implement, and test programs to solve problems such as those in engineering, mathematics and science. For students in Computer Science, Computer Engineering and Mechanical Engineering.

- **CSE 220 – *Programming in C.* CSE 220 is a programming course geared toward electrical engineering. It covers basics of programming in C, including data types, operators, control, functions, arrays, pointers, file processing, testing and debugging. For students in Electrical Engineering.
Mathematics

Over the course of your studies, you are expected to display competency in calculus.

**MTH 132** - Calculus 1.
**MTH 133** - Calculus 2.
**MTH 234** - Multivariable Calculus.
**MTH 235** - Differential Equations (not required for CSE major).

Math courses are the backbone of all Engineering majors. Your math placement dictates where you will start in your math course sequence. All students **MUST** take the Math Placement Exam prior to attending New Student Orientation. Your math placement will determine how many courses you must take before you can enroll in MTH 132.

Here is information about math course sequences based on the Math Placement Exam score:

<table>
<thead>
<tr>
<th>Exam Score</th>
<th>Math Course Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td><strong>MTH 103A</strong> (College Algebra 1)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 103B</strong> (College Algebra 2)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 114</strong> (Trigonometry)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 132</strong> (Calculus 1)</td>
</tr>
<tr>
<td>10-11</td>
<td><strong>MTH 103</strong> (College Algebra)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 114</strong> (Trigonometry)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 132</strong> (Calculus 1)</td>
</tr>
<tr>
<td>12-18</td>
<td><strong>MTH 116</strong> (College Algebra &amp; Trigonometry)</td>
</tr>
<tr>
<td></td>
<td><strong>MTH 132</strong> (Calculus 1)</td>
</tr>
<tr>
<td>19+</td>
<td><strong>MTH 132</strong> (Calculus 1)</td>
</tr>
</tbody>
</table>

You can access the [Math Placement Exam](#) online.

**Note:** Although all students should take the Math Placement Exam prior to coming to New Student Orientation, placement into math courses at MSU is determined by a number of factors. Those factors include Math Placement Exam score, ACT/SAT score, AP or IB credit, and dual enrollment/transfer credit. You should speak with your advisor to discuss your appropriate math course placement as it pertains to these other factors.
**Chemistry**

All engineering students (except CDS and CSE majors) are required to complete at least one introductory course in general chemistry, usually taken during the freshman year.

**CEM 141** – General Chemistry.

**CEM 151** – General and Descriptive Chemistry.
- Required for Chemical Engineering, Environmental Engineering, and Materials Science and Engineering.

**Special Note for Chemical Engineering and Materials Science and Engineering Majors:** Please keep in mind these courses are only offered once a year.
- **CEM 151** – Fall Only.
- **CEM 152** – Spring Only.
- **CEM 351** – Fall Only.
- **CEM 352** – Spring Only.
- **CEM 355** – Spring Only.

**Physics**

All engineering students are expected to develop an understanding of certain fundamental principles of physics as a prerequisite to future engineering coursework.

- **PHY 183** – Physics for Scientists and Engineers 1.
- **PHY 184** – Physics for Scientists and Engineers 2.

**PHY 231** and **PHY 232** are not calculus-based Physics courses and by themselves do **not** fulfill the College of Engineering Physics requirements. If you have test/dual enrollment credit for these courses, you will also need the “bridge” courses for the calculus components.

- **PHY 231 + PHY 233B = PHY 183.**
- **PHY 232 + PHY 234B = PHY 184.**

**3. Major Requirements**

Major requirements differ across the 11 majors. Specific courses can be found on the online [curriculum guides](#). Some courses count in several majors, so if you are undecided, look for courses that count in multiple majors.

**4. General Electives**

Engineering degrees require 120 or 128 credits, depending on the major. Course requirements for your major will not total 120/128, so you get to fill those remaining credits with **general electives**. You can “spend” your elective credits any way you wish, but know that they are a part of your degree.
Miscellaneous Academic Options

Biomedical Engineering at MSU

What do biomedical engineers do?
Biomedical engineers develop devices and procedures that solve medical and health-related problems. Biomedical engineers develop new processes, materials, and devices which can be used in the prevention, detection, and treatment of disease, patient rehabilitation, and overall health.

Where is biomedical engineering at MSU?
Biomedical engineering solutions require knowledge of an underlying engineering discipline. At MSU, students choose an engineering major first and then select biomedical electives as part of the major curriculum. The biomedical engineering concentration may be added to the following six engineering disciplines: Biosystems, Chemical, Computer, Electrical, Materials Science, or Mechanical Engineering.

Students interested in biomedical engineering should speak with their academic advisor early in their careers, as the biomedical concentration has specific bioscience requirements.

1. Biomedical Concentration with Biosystems Engineering
Biosystems engineers identify and solve problems at the interface of engineering and biology. In the biomedical area, Biosystems Engineering students have opportunities for undergraduate research in areas such as microbial modeling and biosensors for rapid detection of pathogens. In this application area, biosystems engineers find employment with pharmaceutical/healthcare companies, medical supply companies, and federal agencies, as well as continuing their studies in medical, veterinary, and graduate school.

2. Biochemical/Biomedical Concentrations with Chemical Engineering
Historically, chemical engineers have designed devices, pharmaceutical processes, and artificial organs (such as the artificial kidney). Chemical engineers are making significant contributions in computational and functional genomics, biosensors, cell and tissue engineering, biomolecular engineering, gene therapy, metabolic engineering, high-throughput drug screening, and drug formulation and delivery.

3. Biomedical Concentration with Electrical and Computer Engineering
Electrical and Computer Engineering students can take courses in the areas of bio-imaging and biomedical applications of signals and systems, and are given opportunities to conduct independent research with faculty in the areas of biomedical engineering. With the department’s focus on developing physical systems and data analysis methods for biomedical applications, some of the current research includes: modeling of physiological systems, cardiovascular physiology, biomedical ultrasonics, medical imaging, neural engineering, development of implantable devices and biomedical signal processing.
4. Biomedical Materials Concentration with Materials Science & Engineering
Biomedical materials engineers create new materials and devices that are used to treat diseases and repair damaged tissues by combining their knowledge and skills in engineering materials design with biology and chemistry. They may conduct research in areas such as tissue engineering (creating new tissues like bone and muscle) and implant development (like total knee and hip replacements). It also serves for the design of devices used in various medical procedures, such as screws and plates used in orthopedics. Some will specialize in orthopedics and sports medicine, while others will work in areas such as implant design and manufacturing.

5. Biomedical Concentration with Mechanical Engineering
Mechanical engineers combining biomedical engineering are trained in biomechanical engineering and find employment designing, for example, prosthetics, artificial joints, automotive safety equipment, robotics for telemedicine, heart valves, left ventricle assist devices, and the whole range of medical devices. Research by biomechanical engineers includes studying the strength of bones and soft tissues, the motion of cells, the kinematics of human motion, and the flow of blood.
Environmental Engineering at MSU

*What do Environmental and Ecosystems Engineers do?*

Environmental and ecosystems engineers integrate physical, chemical, biological, mathematical, and engineering principles to address environmental problems. They advance fundamental understanding of human impacts on the environment and the environment’s response to these impacts.

Examples of engineering for the environment:
- water and wastewater treatment.
- treatment and prevention of diffuse source pollution.
- industrial pollution control.
- groundwater and hazardous waste site remediation.
- constructed wetlands and vegetative buffers.
- green process engineering.
- air pollution monitoring, control, and permitting.
- ecosystems restoration and adaptation to climate change impacts.
- conversion of waste to resources.

*What are Environmental and Ecosystems Engineering Majors?*

**B.S. in Environmental Engineering**

The Environmental Engineering major prepares students with a solid background in chemical, biological, and physical processes, allowing them to analyze, design, and manage environmental systems and associated infrastructure, such as water supplies, wastewater treatment facilities, air pollution control systems, surface and groundwater resources, and landfills.

**B.S. in Biosystems Engineering (with Ecosystems Engineering Concentration)**

The Biosystems Engineering major (with ecosystems engineering concentration) prepares students to analyze, design, and control systems and processes with critical biological components, with a focus on natural resources, such as ecosystems restoration, treatment wetlands, watershed management, biomass conversions, or other biologically-centered challenges.

**B.S. in Chemical Engineering (with Environmental Engineering Concentration)**

The Chemical Engineering major (with environmental engineering concentration) prepares students to design and operate manufacturing facilities that chemical-physically-biologically transform raw materials to finished products, with a focus on environmentally friendly processing that reduces pollution and maximizes benefit.
Computer Science Cognate Possibilities

Computer Science majors are required to complete a 15-credit cognate. Students can meet the cognate requirement by taking a sequence of four courses in a foreign language, taking five pre-selected business-focused courses, or by taking 15 credits outside of the College of Engineering in a focus area the student selects, with 6 of the 15 credits being at the 300-400 level.

The following are examples of areas students could focus on for their cognate. Each example lists two initial courses a student could take to start their cognate. Students will need to complete more courses in the future for a total of at least 15 credits to meet the cognate requirement.

<table>
<thead>
<tr>
<th>Entrepreneurship and Innovation</th>
<th>Diversity and Global Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESHP 190: The Art of Starting.</td>
<td>AAAS 100: Race and Community.</td>
</tr>
<tr>
<td>CAS 114: Creativity and Entrepreneurship.</td>
<td>ANP 201: Intro to Cultural Anthropology.</td>
</tr>
<tr>
<td><strong>Psychology</strong></td>
<td><strong>Math</strong></td>
</tr>
<tr>
<td>PSY 101: Intro to Psychology.</td>
<td>MTH 299: Transitions.</td>
</tr>
<tr>
<td><strong>Environment/ Sustainability</strong></td>
<td><strong>Criminal Justice</strong></td>
</tr>
<tr>
<td>CSUS 200: Intro to Sustainability.</td>
<td>CJ 110: Intro to Criminal Justice.</td>
</tr>
<tr>
<td><strong>Media and Information</strong></td>
<td><strong>Business</strong></td>
</tr>
<tr>
<td>MI 101: Understanding Media.</td>
<td>EC 201/202: Intro to</td>
</tr>
<tr>
<td>MI 201: Intro to Media and Info Tech.</td>
<td>Micro/Macroeconomics.</td>
</tr>
<tr>
<td></td>
<td>ACC 230: Survey of Accounting.</td>
</tr>
</tbody>
</table>


**Additional Minors**

*University Minors*

MSU has a number of minors available to students. See the Academic Programs Catalog for an [updated list of minors](#).

*Minor in Computer Science*

The academic minor in Computer Science will provide a foundation in Computer Science. Students wanting to complete the minor must apply to the Department of Computer Science at the time of completion of CSE 231 and CSE 260 and have an average of at least 3.0 for those two courses combined. Enrollment may be limited. Permission is required to take more than 18 CSE credits.

[Requirements and application for the CSE minor](#) are available online.

*Minor in Energy*

The Minor in Energy, administered by the College of Engineering, provides students with a foundation in energy science that focuses on topics of fundamental physical principles guiding energy generation, utilization, conservation, engineering applications and the impact of energy within a societal and geological context. Students gain a perspective in energy science that is applicable to many disciplines and highly interdisciplinary. It offers opportunities for students to prepare to work in industry, research, or government, as well as preparation for graduate studies in energy science.

[Application form for the Minor in Energy](#) and [requirements for the Minor in Energy](#) can be found online.

*Minor in Materials Science*

The Minor in Materials Science and Engineering provides students with a basic foundation in materials science that is applicable to many disciplines. The minor also offers opportunities for students to work in industry, research, or government, as well as to prepare for graduate study in materials science.

Students who plan to complete the requirements for the minor must complete an online application to the Department of Chemical Engineering and Materials Science. To be accepted into the minor, the student must be admitted into the College of Engineering. Enrollment for some MSE courses may be limited.

[Requirements and application for the MSE minor](#) are available online.
Sample Schedule Planning Worksheets

Remember that your math placement will tell us where you will be starting with a number of courses. Listed below are sample first- and second-year schedules for the possible starting points in math. Schedules will vary based on your Engineering major preference. You should speak with an academic advisor to discuss the best scheduling options for you.

**MTH 103A placement**

<table>
<thead>
<tr>
<th>First Year</th>
<th>Spring</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Spring</strong></td>
<td><strong>Summer</strong></td>
</tr>
<tr>
<td>WRA 101 — 4 credits</td>
<td>MTH 103B — 3 credits</td>
<td>MTH 114 — 3 credits</td>
</tr>
<tr>
<td>ISS 200-level — 4 credits</td>
<td>Bioscience — 3 credits</td>
<td></td>
</tr>
<tr>
<td>MTH 103A — 3 credits</td>
<td>IAH 201-210 — 4 credits</td>
<td></td>
</tr>
<tr>
<td>Elective — 3 credits</td>
<td>Elective — 3 credits</td>
<td></td>
</tr>
<tr>
<td><em>Total — 14 credits</em></td>
<td><em>Total — 13 credits</em></td>
<td><em>Total — 3 credits</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>MTH 132 — 3 credits</td>
<td>MTH 133 — 4 credits</td>
</tr>
<tr>
<td>EGR 100 — 2 credits</td>
<td>PHY 183 — 4 credits</td>
</tr>
<tr>
<td>CEM 141 — 4 credits</td>
<td>ISS 300-level — 4 credits</td>
</tr>
<tr>
<td>Major course — 3 credits</td>
<td>EGR 102 — 2 credits</td>
</tr>
<tr>
<td><em>Total — 12 credits</em></td>
<td><em>Total — 14 credits</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MTH 103 placement</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>WRA 101 — 4 credits</td>
</tr>
<tr>
<td>ISS 200-level — 4 credits</td>
</tr>
<tr>
<td>MTH 103 — 3 credits</td>
</tr>
<tr>
<td>Bioscience — 3 credits</td>
</tr>
<tr>
<td>EGR 100 or elective — 2-3 credits</td>
</tr>
</tbody>
</table>
### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 133 — 4 credits</td>
<td>MTH 234 — 4 credits</td>
</tr>
<tr>
<td>EGR 102 — 2 credits</td>
<td>PHY 184 — 4 credits</td>
</tr>
<tr>
<td>PHY 183 — 4 credits</td>
<td>ISS 300-level — 4 credits</td>
</tr>
<tr>
<td>Major course — 3-4 credits</td>
<td>Major course — 3-4 credits</td>
</tr>
<tr>
<td><strong>Total — 13-14 credits</strong></td>
<td><strong>Total — 15-16 credits</strong></td>
</tr>
</tbody>
</table>

### MTH 116 placement

<table>
<thead>
<tr>
<th>First Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>ISS 200-level — 4 credits</td>
</tr>
<tr>
<td>MTH 116 — 3 credits</td>
</tr>
<tr>
<td>CEM 141 — 4 credits</td>
</tr>
<tr>
<td>CEM 161 — 1 credit</td>
</tr>
<tr>
<td><strong>Total — 12 credits</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Spring</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 132 — 3 credits</td>
</tr>
<tr>
<td>WRA 101 — 4 credits</td>
</tr>
<tr>
<td>Bioscience — 3 credits</td>
</tr>
<tr>
<td>EGR 100 — 2 credits</td>
</tr>
<tr>
<td><strong>Total — 12 credits</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Summer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 133 or PHY 183 — 4 credits</td>
</tr>
<tr>
<td><strong>Total — 4 credits</strong></td>
</tr>
</tbody>
</table>

### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 234 — 4 credits</td>
<td>MTH 235 — 3 credits</td>
</tr>
<tr>
<td>IAH 201-210 — 4 credits</td>
<td>PHY 184 — 4 credits</td>
</tr>
<tr>
<td>PHY 183 — 4 credits</td>
<td>ISS 300-level — 4 credits</td>
</tr>
<tr>
<td>Major course — 3-4 credits</td>
<td>Major course — 3-4 credits</td>
</tr>
<tr>
<td><strong>Total — 15-16 credits</strong></td>
<td><strong>Total — 14-15 credits</strong></td>
</tr>
</tbody>
</table>

### MTH 132+ placement

<table>
<thead>
<tr>
<th>First Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
</tr>
<tr>
<td>ISS 200-level — 4 credits</td>
</tr>
<tr>
<td>MTH 132 — 3 credits</td>
</tr>
<tr>
<td>CEM 141 — 4 credits</td>
</tr>
<tr>
<td>CEM 161 — 1 credit</td>
</tr>
<tr>
<td>EGR 100 — 2 credits</td>
</tr>
<tr>
<td><strong>Total — 14 credits</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Spring</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 133 — 4 credits</td>
</tr>
<tr>
<td>WRA 101 — 4 credits</td>
</tr>
<tr>
<td>PHY 183 — 4 credits</td>
</tr>
<tr>
<td>EGR 102 — 2 credits</td>
</tr>
<tr>
<td><strong>Total — 14 credits</strong></td>
</tr>
</tbody>
</table>
### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTH 234 — 4 credits</td>
<td>MTH 235 — 3 credits</td>
</tr>
<tr>
<td>IAH 201-210 — 4 credits</td>
<td>Bioscience — 3 credits</td>
</tr>
<tr>
<td>PHY 184 — 4 credits</td>
<td>ISS 300-level — 4 credits</td>
</tr>
<tr>
<td>Major course — 3-4 credits</td>
<td>Major course — 3-4 credits</td>
</tr>
</tbody>
</table>

*Total — 15-16 credits*  
*Total — 13-14 credits*  

---

**Academic Resources**
Academic Assistance
There are many Engineering and University resources available (free of cost!) to help you with the transition to an advanced and scholarly way of thinking and writing. Those resources include, but are not limited to:

- Your academic advisor.
- Chemistry Help Room, Rooms 81 and 83 Chemistry Building.
- CoRe tutors and Peer Leaders in the South Neighborhood.
- Guided Learning Center (GLC), 1109 Engineering Building.
- Math Learning Center.
- Neighborhood Engagement Centers.
- Writing Center, 300 Bessey Hall.

Diversity Programs Office (DPO) and Guided Learning Center (GLC)
The DPO is proud to support and provide resources for all students in Engineering. The DPO offers the following services, free of charge!

- Provide students with skills and strategies to navigate through engineering admissions to graduation.

The Guided Learning Center offers academic assistance in math, science and engineering courses through one-on-one and/or small group tutoring sessions.

- Professional development.
- Resource materials.
- Speakers, trips, events, and programs.
- Opportunities for students to network with faculty, staff, and career professionals.
- A freshman/sophomore course, Preparing for Academic Excellence and Professional Development, (EGR 160). Course topics include how to get admitted to the College of Engineering, resume writing, interviewing, and study skills. Practicing engineers also come to class and discuss professional development.

These services are made possible through cooperation with other Engineering and MSU departments, the volunteerism of our alumni and friends, and generous grants and gifts resulting from partnerships with numerous corporations and non-profit organizations. For more information, please visit the DPO website at or call us at (517) 355-8310.

The DPO Staff-
Kyle Foster, Director.
Elizabeth Burbatt, Educational Program Coordinator.
Ciera Trice, Program Assistant.
Robin Smith, Administrative Assistant.

CoRe Experience
The College of Engineering First-Year CoRe Experience is an integrated program designed around the success of early engineering students. The CoRe Experience consists of both academic and co-curricular activities. The mission of the CoRe Experience is to provide
early engineering students with unmatched learning opportunities within a supportive community that encourages academic, personal, and professional achievement, foster life-enriching connections between students and their peers, faculty members, advisors, and corporate representatives, cultivate students’ skills that encourage lifelong learning, and demonstrate to students the critical roles of engineers in contributing to society. For more information, please visit the CoRe Experience website or call us at (517) 355-6616 Ext. 2.

CoRe Staff:
Timothy Hinds, Director.
Carmellia Davis-King, Co-Curricular Director.
Jenahvive Morgan, Academic Director.
Debjani Sarkar, Academic Specialist.
Jason Smith, Academic Specialist.
Aimee Reynolds, Office Assistant III.
David Wolff, Project Labs Coordinator.

Women in Engineering Program (WIE)
The Women in Engineering Program (WIE) encourages and supports students of all backgrounds to pursue careers in engineering. While our particular emphasis is assisting women students, we collaborate with others in the college and university to provide an environment that is conducive to all students’ success, providing opportunities for academic, personal and professional growth. WIE programs include mentoring opportunities, outreach programs, community engagement and connection to important resources. WIE also supports the Society of Women Engineers, MSU Women in Computing and Phi Sigma Rho, three very active student organizations in the College of Engineering. For more information, please visit the Women in Engineering website.

In achieving its goals, the Women in Engineering program does not unlawfully discriminate. All events and programs are open to students of all genders.

WIE Staff-
Judy Cordes, Director of Women in Engineering for Student Success.
Sandy Christlieb, Assistant Director of Women in Engineering for Student Success.
Teresa VanderSloot, Director of Women in Engineering for Recruitment and K-12 Outreach.
Geralynn Phelps, Assistant Director, Women in Engineering, Recruitment and K-12 Outreach.

Student Organizations
- MSU student organizations.
- International-specific student groups.
- College of Engineering student organizations.
**Scholarship Information**
The College of Engineering administers a variety of scholarships from corporate and private donors totaling approximately $600,000 per year. The engineering awards are generally based on academic excellence and are available for both incoming and returning students. For returning students, online scholarship applications will be available the first week of classes in the spring semester and will be due on the last day of February. Decisions are made by early summer. For further information, please visit the [engineering scholarship website](#).

**Engineering Education Abroad**
At MSU, we take pride in being a leader in education abroad. In the College of Engineering, we strive to help our students prepare to compete in this growing global climate. One of the many ways to do this is to study abroad during the course of your studies here at State. Education abroad options include year-long, semester, and summer stay options.

We recommend that students who plan to go abroad begin the planning process with their advisor early on in their academic careers. It is advisable to reserve at least one elective, IAH or ISS requirement for use while abroad if students intend to study abroad.

Besides Engineering-specific programs, you can also choose from other MSU-sponsored programs. The Education Abroad Office is located in 109 International Center, (517) 353-8920.

For more information on Engineering specific programs, please visit the [Engineering Education Abroad website](#), stop by G55 Wilson Hall, or call us at (517) 432-2012.

*Education Abroad Staff -
Maggie Blair-Ramsey, Education Abroad Coordinator.*
The Center
Experience Engineering Careers
(517) 355 – 5163 / The Center’s website / careers@egr.msu.edu

The Center Staff:
Bernadette Friedrich, Director of Student Engagement.
Garth Motschenbacher, Director of Employer Engagement.
Kyle Liechty, Co-op/Intern Coordinator.
Rachel Mangiavellano, Career Consultant.
Kylie Kenyon, Project/Event Coordinator.
The Center staff can help you:

- Identify a Career Path
- Improve your Resume
- Prepare for Interviews
- Professional Development
- Make Connections
- Find Co-ops & Internships
- Identify Research Opportunities

Contact Rachel, your first year career advisor, to get started leonerac@egr.msu.edu

**IMPORTANT EVENTS**

- **Local Job & Internship Fair (Sept.)**
  For on-campus & local part time jobs!

- **Freshmen Extravaganza (Sept.)**
  Learn about our partner companies and what you can do with your major at this informal mixer.

- **Engineering Co-op/Intern Exchange (Sept.)**
  Connect with companies offering nationwide engineering co-ops & internships

- **Engineering Expo (Feb.)**
  Gain knowledge of companies, interact with alumni, network with professional engineers, and get the “insider” information.

For more details and a list of companies attending search in Handshake.

---

**GETTING STARTED WITH**

1. **Fill out your profile.** Some information will already be in your profile. Check to be sure all this information is correct, fill out the remainder of your profile, and complete the Career Interest Questionnaire.

2. **Upload a Resume.** You’ll likely want to have a public resume available for employers to see. This will also help you complete your Handshake profile.

3. **Take Handshake for a spin!** Start searching for jobs and companies you might be interested in. Take a look at peer submitted reviews under employer accounts along with interviewing tips.

4. **Ask your peers questions.** Check out trending questions under Q&A or submit a question to be answered.

MSU.joinhandshake.com
THE CENTER

EXPERIENTIAL EDUCATION PROGRAM

What is Experiential Education?

Experiential Education represents all forms of career-related work experience that integrate in your college coursework. For the MSU College of Engineering, we focus on two major areas, internships and cooperative education (co-op). We incorporate both under the Experiential Education Program.

The Experiential Education Program includes a series of courses that more specifically represent the growth of the students’ professional responsibilities, technical knowledge, and ABET Outcomes.

**EGR 193 Intro to Experiential Education** is a one credit course for first year engineering students. Students reflect on previous experience and learn to explore future opportunities. They will be guided in exploring their post-graduation professional options. You must have been employed in a paid, supervised, evaluated, career-related position the summer prior to MSU to be eligible for this course.

**EGR 391 Engineering Experiential Education I** is a one credit course designed to enhance a student’s technical experience in their 1st work term by simulating opportunities for all aspects of professional development and assessment of expectations. Areas of focus are based on the student’s individual technical position and include professional communication, establishing expectations, and learning from failures.

**EGR 392 Engineering Experiential Education II** is a one credit course designed to enhance current technical experience in their 2nd work term for all aspects of professional development and assessment of expectations. Areas of focus are based on the student’s technical position and include goal setting, being mindful for professional success, and understanding diversity and inclusion.

**EGR 493 Advanced Engineering Experiential Education I** is a one credit course designed to enhance a student’s technical experience in their 3rd work term by simulating opportunities for all aspects of professional development and assessment of expectations. Areas of focus are based on the student’s technical position and include professional ethics, economies and lifelong learning.

**EGR 494 Advanced Engineering Experiential Education II** is a one credit course designed to enhance a student’s experiential education in their 4th or 5th work term by simulating opportunities for all aspects of professional development and assessment of expectations. Areas of focus are based on the student’s technical position and include project management, work life balance, and value propositions.

The Tuition of each Experiential Education course is covered by a college of engineering scholarship.

Students who complete three of the courses from EGR 391 through EGR 494, may have the option to waive a technical elective in their major. Those students who complete three will also receive a notation on their transcript and the option to wear Experiential Education cords at Graduation.

QUESTIONS?

Contact Bernadette, the Experiential Education Director, today!

friedric@egr.msu.edu

$
Engineering Degree Programs and Major Requirements

The information listed here is current as of Fall 2020. **Students** are expected to know departmental policies and course prerequisites and are **ultimately responsible** for accurately completing degree requirements.

**Applied Engineering Sciences (AES)**
Broad foundation across all engineering majors with a business component; students choose from business law, computer science, packaging, supply chain management, technical sales or media and information concentrations.
Work in: EGR management, procurement, sales, marketing, IT, and logistics management.
- [Applied Engineering Sciences degree requirements](#).
- [Applied Engineering Sciences curriculum flowchart](#).
- [Applied Engineering Sciences departmental website](#).

**Biosystems Engineering (BE)**
Broad biological component, food processing & ecosystems.
Work in: food quality & safety, renewable bioenergy, consulting and regulatory agencies.
- [Biosystems Engineering degree requirements](#).
- [Biosystems Engineering curriculum flowchart](#).
- [Biosystems Engineering departmental website](#).

**Chemical Engineering (ChE)**
Chemistry & engineering applied to full-scale industrial production.
Work in: pharmaceuticals, bioenergy, consumer products.
- [Chemical Engineering degree requirements](#).
- [Chemical Engineering curriculum flowchart](#).
- [Chemical Engineering departmental website](#).

**Civil Engineering (CE)**
Transportation, structures, infrastructure design and management.
Work with: roads, bridges, water, structures, construction, & infrastructure.
- [Civil Engineering degree requirements](#).
- [Civil Engineering curriculum flowchart](#).
- [Civil Engineering departmental website](#).

**Computational Data Science (CDS)**
Extracting value from large volumes of information; data acquisition, processing, and analysis.
Work in: information technology, health care, financial services, manufacturing, & telecommunications.
- [Computational Data Science degree requirements](#).
- [Computational Data Science curriculum flowchart](#).
- [Computational Data Science departmental website](#).
Computer Engineering (CpE)
Hardware & software; make computers smaller & faster.
Work as: computer & embedded systems architects, real-time system design.
  • Computer Engineering degree requirements.
  • Computer Engineering curriculum flowchart.
  • Computer Engineering departmental website.

Computer Science (CSE)
Software design & development; applications, databases, graphics, big data, & networks.
Work in: Application and system development, cybersecurity, artificial intelligence, social networks, game development, & project management.
  • Computer Science degree requirements.
  • Computer Science curriculum flowchart.
  • Computer Science departmental website.

Electrical Engineering (EE)
Integrated circuits, robotics & control, power, lasers, & materials.
Work in: nanotechnology, fiber optic communication systems, automotive & aerospace industries.
  • Electrical Engineering degree requirements.
  • Electrical Engineering curriculum flowchart.
  • Electrical Engineering departmental website.

Environmental Engineering (ENE)
Water and wastewater treatment, air quality, landfills and solid waste, permitting and regulation, hazardous waste cleanup, and protection of the environment.
Work in: consulting, government agencies, and industry.
  • Environmental Engineering degree requirements.
  • Environmental Engineering curriculum flowchart.
  • Environmental Engineering departmental website.

Materials Science & Engineering (MSE)
Develop new materials & the processes to create them.
Work with: metals & ceramics, plastics, & polymers (non-metals).
  • Materials Science degree requirements.
  • Materials Science curriculum flowchart.
  • Materials Science departmental website.

Mechanical Engineering (ME)
Anything with motion or moving parts, design.
Work in: aerospace, automotive, manufacturing, & energy systems.
  • Mechanical Engineering degree requirements.
  • Mechanical Engineering curriculum flowchart.
  • Mechanical Engineering departmental website.