WHAT IS BIOMEDICAL ENGINEERING?

A biomedical engineer is not merely an engineer who has taken a few courses in biology; nor is he or she a physiologist with some training in physics. A biomedical engineer brings together traditional engineering principles with the life sciences in a completely integrated fashion. The result is an engineer who views the human body as a complex system, its diseases and injuries as breakdowns in that system, and medical interventions as design alternatives for the repair of the system.

Biomedical engineers work closely with other members of the medical and health care professions to solve clinical problems by designing systems that will improve patient outcomes and quality of life while reducing the cost of medical care to society.

OPPORTUNITIES AFTER GRADUATION

What awaits you after graduating with a BME degree from Wayne State? Nothing less than the world! BME has the fastest rate of projected employment growth of all fields of engineering, with an expected 72% increase in jobs between 2008 and 2018 according to the National Bureau of Labor Statistics. And job opportunities will expand globally as well as within the US.

Nationally, BME graduates pick the next step in their education or career in about equal proportions. One third head to grad school, one third to medical or dental school, and one third seek employment immediately after graduation. Opportunities for BME grads are found in medical device and pharmaceutical companies, government agencies, hospitals, and the growing biotechnology sector. From Fortune 500 companies to small, start-up ventures, students with a degree in BME have more options available to them every day.

Wayne State’s BME program prepares our graduates for all three paths. Connections to clinical medicine give pre-med students an early window into their future profession. Students interested in graduate school have the opportunity to conduct research starting as a freshman, giving them a significant head start when applying for admission and funding. And every student will be introduced to the modern tools and skills that industry expects for its new hires. Using the BME Design Labs that are integrated throughout the program, students will have the chance to tackle real world BME problems and build their engineering skills over their 4 years.
### Why Wayne State for BME?

**HISTORY**
- One of the oldest, continuously active programs in the US
- An integral part of Wayne State since 1939

**CLINICAL MEDICINE**
- Department has active collaborations between engineers and clinicians
- Affiliations with five major hospitals within walking distance of campus and several others in SE Michigan
- Students have multiple opportunities to interact with the individuals who will use their designs -- both patients and clinicians
- Opportunities to shadow physicians provides a fuller understanding of how BME is applied in the clinical arena
- Externships before senior year link students’ capstone design projects to a clinical field

**REAL WORLD SKILLS**
- Experience in the BME Design Lab every semester exposes students to industry tools for design, analysis, communication, and teamwork
- Built upon program history, experiential internships, and job opportunities
- Producing job-ready students prepared to hit the ground running on Day One

**RESEARCH OPPORTUNITIES**
- Students will have high level research opportunities in the College of Engineering and School of Medicine, starting in their freshman year
- Students can become full and active members of their research groups
- Undergraduate research can result in publications and presentations at national and international conferences

### BME Program Curriculum

Undergraduate students in BME may select one of 3 concentrations:
- Biomechanics
- Biomaterials
- Biomedical Instrumentation

Each student completes a core program of engineering and science before selecting their concentration in the junior year. The outline of the curriculum includes:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Credits</th>
</tr>
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<tbody>
<tr>
<td>Mathematics and Physical Science</td>
<td>32 cr</td>
</tr>
<tr>
<td>Biological and Physiological Science</td>
<td>14 cr</td>
</tr>
<tr>
<td>English and Technical Communication</td>
<td>10 cr</td>
</tr>
<tr>
<td>General Education</td>
<td>18 cr</td>
</tr>
<tr>
<td>Core Engineering</td>
<td>26 cr</td>
</tr>
<tr>
<td>Core Biomedical Engineering</td>
<td>17 cr</td>
</tr>
<tr>
<td>BME Concentration</td>
<td>15 cr</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>132 cr</strong></td>
</tr>
</tbody>
</table>

Students interested in continuing to medical or dental school after graduation can integrate these requirements into their program. This requires approximately 9 additional credits of course work, focusing on physics labs and additional chemistry.

### Admissions Requirements

- Apply to Wayne State, complete the BME secondary application (bme.wayne.edu/bsbme), and submit supporting documents.
- Requirements from high school: minimum GPA of 3.5 and minimum Math ACT score of 29.
- Transfer students should have a minimum 3.5 GPA in math/science courses. Minimum prerequisites are provided at bme.wayne.edu/bsbme.
- Apply by January 15 for full scholarship

### Program Highlights

The Wayne State BME Program provides a solid foundation in engineering, augmented with significant biomedical content.

How are we different from other BME programs?

Small Cohort Program: The curriculum is designed to be completed as a cohort, with a maximum of 40 students per group. This builds a team that will work together from day one through graduation.

Early Introduction to BME Challenges: Starting in week one of the program, students will be introduced to current BME problems and will work in teams to develop solutions. BME Design Labs will have students continuously apply their newfound engineering knowledge to clinically relevant challenges. Often, these projects will be introduced by partner physicians or clinical clients.

Opportunities for Honors and Advanced Studies: BME students are encouraged to complete their degree with Engineering and/or University Honors, which provides a chance for more in-depth exploration of their chosen field. Students can also apply to the AGRADE Program and earn an MS in BME with only one additional year of study.

Join the team with a history of changing the world!