

# BIOENGINEERING INNOVATION AND DESIGN, MASTER OF SCIENCE IN ENGINEERING

## Bioengineering Innovation and Design, Master of Science in Engineering

The Center for Bioengineering Innovation and Design (CBID), housed in the Department of Biomedical Engineering, focuses on the design aspect of Biomedical Engineering. This exciting program gives students opportunities to design, develop, build, and test devices that solve some of the most pressing problems facing clinicians today.

The mission of CBID is to:

- Improve human health by developing medical devices that solve important clinical problems
- Educate a new generation of medical device engineers and fellows
- Facilitate technology transfer and industry collaboration

In the graduate program CBID students will learn to identify clinical needs and innovate a novel solution to solve that clinical problem. Working in teams, students work closely with engineering faculty and physicians throughout the medical institution to come up with device ideas, build prototypes, research intellectual property, learn about the regulatory process, write business plans, and present their designs to fellow students, faculty, and outside advisors.

Undergraduate students in BME can also become involved in medical device design by joining an undergraduate design team which works on solving clinical problems by designing innovative devices.

Incorporated in all the BME design curriculum is a focus on technology commercialization. All students, graduate and undergraduate, will interact with clinical and corporate sponsors and have experiences that promote the development of leadership, communications, and marketing skills, thus helping to ensure our graduates' professional success.

The CBID M.S.E. is a one-year program lasting from May through the following May. Please see our website (<https://cbid.bme.jhu.edu/>) for more information on our programs.

## Curriculum

The Center for Bioengineering Innovation and Design MSE program is intended for a student with an undergraduate degree in an engineering discipline and who also may have industry or research experience. The 12-month program begins at the start of summer and runs continuously through the fall and spring semesters. Students will graduate with a Master of Science in Engineering (MSE) in Bioengineering Innovation and Design degree in late May at the Homewood campus commencement. Students must complete 46-48 approved credits for degree completion.

Note: the curriculum is subject to change.

Code	Title	Credits
<b>Required Courses</b>		
<i>Summer Courses</i>		14

EN.580.601	Special Topics in Bioengineering Innovation and Design	1
EN.580.608	Identification and Validation of Medical Device Needs	6
EN.580.610	Intro to Business for Healthcare Innovation & Design	3
EN.580.618	Identification and Validation of Global Health Needs	4
<i>Fall Courses</i>		12
EN.580.602	Special Topics in Bioengineering Innovation and Design	1
EN.580.611	Medical Device Design and Innovation	4
EN.580.619	Bioengineering Innovation and Design - Global Health	4
EN.580.645	Business of Healthcare Innovation & Design II	3
<i>Spring Courses</i>		11
EN.580.603	Special Topics in Bioengineering Innovation & Design	1
EN.580.612	Medical Device Design and Innovation	4
EN.580.614	Evidence Generation for the Medical Device Innovator	2
EN.580.620	Principles and Practice of Global Health Innovation and Design	4

### Additional Electives

<i>Technical Electives</i>		6-8
A minimum of two technical (engineering/math) electives <sup>1</sup>		
<i>Business Electives (choose one of the two following options)</i>		8-10
Completion of the full CBID business course sequence		
EN.580.610	Intro to Business for Healthcare Innovation & Design	
EN.580.645	Business of Healthcare Innovation & Design II	
EN.580.614	Evidence Generation for the Medical Device Innovator	
Completion of EN.580.610 and EN.580.645 plus one full semester business course or two half-semester business courses		

<sup>1</sup> All coursework must be taken at the graduate level with the exception of approved 400 level courses that have no graduate versions. 100-300 level courses are not permitted for degree credit at any time.