



# Biomedical Engineering

*Biomedical engineers design technology to improve health care. Gonzaga's new degree program blends engineering and computer science with courses in biology, human physiology, and biochemistry, making it one of the most interdisciplinary degrees offered at Gonzaga.*

## THE PROGRAM

Biomedical Engineering is the study and application of engineering and design to medicine in order to create new solutions and improve health care. Students learn the foundational sciences and design techniques used by engineers, while also learning the complexity of the human body and biological systems. This combines into capstone experiences in design and analysis, training students to be able to measure, analyze, and design for the human person. This is all uniquely framed in Gonzaga University's missional commitment to the dignity of the human person, social justice, and diversity, to cultivate intercultural competence and global engagement, and to provide solidarity with the poor and vulnerable and care for the planet.

## THE MAJOR

Gonzaga's Biomedical Engineering degree is a 4-year, 134-credit degree program that provides a broad foundation in the basics of math, physics, chemistry, and biology through the early years. This allows students to specialize through technical electives in their junior and senior years. Areas to pursue include medical electronics, medical imaging, medical device design, biochemistry, biology, and human physiology, enabling students to pursue their specific interests within the medical industry. This engineering curriculum is interwoven with Gonzaga's core curriculum, providing students a diverse experience in writing, philosophy, ethics, religion, and global studies. Graduates use their knowledge in science, engineering, and mathematics to design new solutions and solve problems in the medical field and in their communities.

## CAREER OPPORTUNITIES

Biomedical careers span a wide range of options from working in hospitals to research labs, device manufacturers to medical clinics. There are opportunities in business and sales, design, research, and clinical work. Graduates find jobs anywhere from large, established companies to immersing start-ups. Gonzaga's Biomedical Engineering program also provides a strong foundation for entering the medical industry or continuing education through graduate studies.



## FACILITIES

The Gonzaga School of Engineering and Applied Science is proud to offer students cutting-edge lab experiences that complement and reinforce their classroom studies. Along with physics, biology, and chemistry labs, students have hands-on experiences in dedicated course laboratories. This includes a professionally-staffed shop that uses modern fabrication equipment to build components and assemblies for projects, student computer labs, and maker spaces. The Biomedical Engineering program has close ties with the College of Arts and Sciences and the School of Health Sciences, providing students with experience in research and laboratory courses across campus. Gonzaga has also partnered with the UW School of Medicine to bring medical expertise and experiences to the Gonzaga campus.

## CURRICULUM

The following curriculum details the course requirements for each semester. In addition to these courses, all students must take the Fundamentals of Engineering Examination prior to graduation:

### First Year

General Chemistry I (and Lab)  
First Year Seminar  
Calculus - Analytical Geometry I  
Communication and Speech Reasoning  
Writing  
Calculus - Analytical Geometry II  
Information Flow in Biological Systems  
Information Flow in Biological Systems Lab  
Intro to Mechanical Engineering Design  
Human Nature

### Third Year

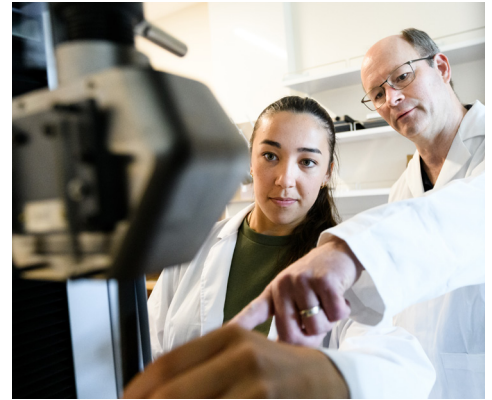
Organic Chemistry I (and Lab)  
Anatomy and Physiology I (and Lab)  
Circuit Analysis I (and Lab)  
1st Core Broadening: (History, Literature, Social and Behavioral Science)  
Physics II (and Lab)  
Bio-Thermo/Fluid Science (or) Thermal Science  
Technical Elective  
2nd Core Broadening (History, Literature, Social and Behavioral Science)

### Second Year

Calculus - Analytical Geometry III  
Physics 1 (and Lab)  
Statics  
Intro to Python (or) Programming for Engineers  
Energy Flow in Biological Systems  
Ordinary Differential Equations  
Statistics for Experiment  
Dynamics  
Ethics Elective  
World or Comparative Religion

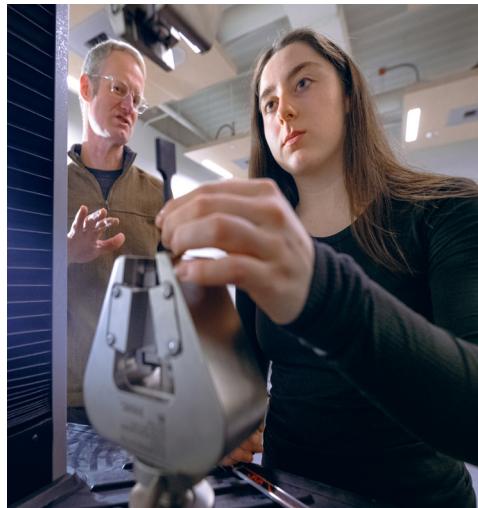
### Fourth Year

Senior Design Project I  
System Dynamics and Control (or) Intro to Control Systems  
Biotransport  
3 Technical Electives  
Biomedical Signals (or) Signals and Systems  
Fundamentals of Engineering Examination  
Senior Design Project II  
Model of Biomed Systems (and Lab)  
FDA Regulations and Ethics  
Core Integration Seminar



## SENIOR DESIGN

Student teams of three to four students are advised by a faculty member and an industry liaison engineer to solve real-world problems for their year-long senior design capstone project. This culminating design project allows students to apply what they have learned in a real engineering project under the mentorship of experts in the field.



## FACULTY CONTACT

**Brandon Sargent, Ph.D.**  
DIRECTOR OF BIOMEDICAL  
ENGINEERING  
SARGENTB@GONZAGA.EDU

FOR MORE INFORMATION:  
[gonzaga.edu/biomed](http://gonzaga.edu/biomed)

**GONZAGA**  
UNIVERSITY