

# BIOMEDICAL ENGINEERING (BME)

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## **BME 101 Fundamentals of Biomedical Engineering**

3 cr. Undergraduate.

A system approach to physiology, cell physiology and transport, major organ systems, cardiovascular system, biomedical signal processing, biomechanics, biomedical engineering design.

**Prerequisites:** Math 221(C) or Math 231(C).

**Last Taught:** Spring 2018, Fall 2017, Spring 2017, Fall 2016.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 302 Analysis and Modeling of Dynamic Systems**

4 cr. Undergraduate.

Modeling and analysis of mechanical, electrical, electromechanical, fluid, and physiological systems; laboratory experiments.

**Prerequisites:** MechEng 101(P), ElecEng 234(P), and Physics 210(P).

**Course Rules:** Jointly offered with & counts as repeat of MechEng 302.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 305 Introduction to Engineering Biomechanics**

3 cr. Undergraduate.

Introduction to engineering biomechanics principles applied to the musculoskeletal system and human body for analysis of human movement.

**Prerequisites:** BioSci 203(P) & BME 302/MechEng302(P).

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 310 Biomedical Signals and Systems**

3 cr. Undergraduate.

Introduction to principles of biosignals and system of the human body. Time-domain analysis of Biosignals, Biosensing, Bio-electric signals, Electrocardiogram (ECG), muscle electromyogram (EMG), EEG, etc.

**Prerequisites:** BME 302(P).

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 320 Engineering of Biomedical Devices I**

3 cr. Undergraduate.

Physiological and biomechatronic systems, sensors and actuators, signal processing, hearing aid and implants.

**Prerequisites:** jr st, BME 101(P), ElecEng 234(P), MechEng 101(C), Physics 210(P).

**Last Taught:** Spring 2018, Fall 2017, Spring 2017.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 325 Engineering of Biomedical Devices II**

3 cr. Undergraduate.

Feedback and control systems, visual prostheses, heart assist and replacement devices, respiratory aids, active and passive prosthetic limbs.

**Prerequisites:** jr st, Bio Sci 203(P), BME 320(P).

**Last Taught:** Spring 2018, Fall 2017.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 385 Introduction to Biomaterials**

3 cr. Undergraduate.

Introduction to the fundamentals of biomaterials including ceramics, metals, and polymers. Important issues in the selection, design, manufacturing, and evaluation of biomaterials. Current applications, and emerging technologies.

**Prerequisites:** jr st, MatlEng 201(P).

**Course Rules:** Jointly offered with & counts as repeat of MatlEng 385.

**Last Taught:** Spring 2018, Spring 2017.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 495 Biomedical Instrumentation Laboratory**

3 cr. Undergraduate.

Characteristics of measurement systems, experiment planning, sensor and system calibration, measurement of basic quantities, first and second order systems, data acquisition and processing, experimental projects.

**Prerequisites:** BME 325 (P), MechEng 469 (C).

**Course Rules:** BME 495 and MechEng 495 are jointly offered and count as repeats of one another.

**Last Taught:** Spring 2018, Spring 2017.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 585 Advanced Biomaterials**

3 cr. Undergraduate/Graduate.

Theory and application of advanced biomaterials including cardiovascular devices, orthopedic applications, drug delivery systems, biosensors, and tissue engineering.

**Prerequisites:** sr st; MatlEng 385(P) or BME 385(P); or cons instr.

**Course Rules:** Jointly offered with & counts as repeat of MatlEng 585.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 595 Capstone Design Project**

4 cr. Undergraduate.

Introduction to design process and ethics; Students work in teams to plan, design, and test in a simulated real-world environment; formal oral and written reports.

**Prerequisites:** sr st; BME 495(P).

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 599 Senior Thesis**

1-3 cr. Undergraduate.

Independent research under the direction of a faculty member; submission of a written thesis required. 3 cr total required.

**Prerequisites:** sr st & cons instr.

**Course Rules:** May be retaken to max of 3 cr.

**Current Offerings:** <http://uwm.edu/schedule>

## **BME 690 Topics in Biomedical Engineering:**

3 cr. Undergraduate/Graduate.

Specific topics, credits, and any additional prerequisites will be announced in the Schedule of Classes each time the course is offered.

**Prerequisites:** jr st.

**Course Rules:** May be retaken w/chg in topic to max of 9 cr.

**Last Taught:** Spring 2018, Fall 2017, Spring 2017.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 699 Independent Study**

1-3 cr. Undergraduate.

In consultation with a faculty advisor, student will develop the study plan on a topic related to biomedical engineering.

**Prerequisites:** jr st; cons instr & CEAS Associate Dean.

**Course Rules:** May be retaken to 6 cr max.

**Last Taught:** Summer 2017.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 720 Machine Perception**

3 cr. Graduate.

Fundamentals of computer vision and graphics, fundamentals of human-machine interaction, object sensing and tracking, virtual/augmented reality, automatic human behavior analysis, and biomedical applications.

**Prerequisites:** grad st.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 733 Sensors and Systems**

3 cr. Graduate.

Physical principles and working of sensors, interfacing, and sensor networks.

**Prerequisites:** grad st; ElecEng 305 or cons. instr.; Jointly offered with & counts as repeat of ElecEng 733 & MechEng 733.

**Last Taught:** Fall 2017.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 888 Candidates for Degree**

0 cr. Graduate.

Available for graduate students who must meet minimum credit load requirement.

**Prerequisites:** grad st.

**Course Rules:** Fee for 1 cr assessed.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 890 Special Topics:**

3 cr. Graduate.

Lectures on special topics in biomedical engineering. Variable content course. Specific topics and any additional prerequisites will be announced in the schedule of classes each time the course is offered.

**Prerequisites:** grad st

**Course Rules:** May be repeated w/ chg in topic to 9 cr max.

**Last Taught:** Fall 2017.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 990 Masters Thesis**

1-9 cr. Graduate.

Masters Thesis

**Prerequisites:** grad st; cons instr

**Last Taught:** Fall 2017.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 998 Doctoral Thesis**

1-12 cr. Graduate.

Doctoral thesis is a part of degree requirements.

**Prerequisites:** grad st; cons instr & grad prog committee.

**Course Rules:** Re-takeable up to 99 credits.

**Current Offerings:** <http://uwm.edu/schedule>

**BME 999 Advanced Independent Study**

1-3 cr. Graduate.

Advanced Independent Study

**Prerequisites:** grad st & cons instr.

**Last Taught:** Spring 2018.

**Current Offerings:** <http://uwm.edu/schedule>