

BME2105: INTRODUCTION TO BIOMEDICAL ENGINEERING

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Introduction to Biomedical Engineering

Subject Code

BME - Biomedical Engineering

Course Number

2105

Academic Unit

Biomedical Engineering (BME)

College/School

College of Biomedicine (BD)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to present a broad but rigorous overview of the field of biomedical engineering to undergraduate students in this major. The course will focus on the common theme of engineering analysis and design of biological systems. Students will learn about biotechnology fundamentals, basic human physiology, and knowledge of healthcare and wellness, with an emphasis on engineering and problem solving approaches.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe basic concepts of biomedical engineering and their connection with the spectrum of human activity.	x		
2	Describe the basic working principles of different systems in human body and the healthcare related problems.		x	
3	Explain engineering systems in biomedical area by introducing appropriate scientific, technological and managerial elements in healthcare related practices/industries.		x	
4	Analyze the professional, ethical and social responsibilities related to issues in biomedical engineering.	x		

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Lecture	Students will develop an understanding of the key concepts related to biomedical engineering.	1, 2, 3, 4	3 hrs/week
2	Tutorial	Students will expand and consolidate their understanding of the materials taught in lectures. Students will discuss key concepts related to homeworks and the group project.	1, 2, 3, 4	1 hr/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Midterm Test	1, 2, 3, 4	30	-	No
2	Group Project	2, 3, 4	30	-	Yes
3	Assignment	1, 2, 3	10	-	Yes

Continuous Assessment (%)

70

Examination (%)

30

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Assessment Rubrics (AR)**Assessment Task**

1. Midterm Test

Criterion

Ability to explain in details and with accuracy about the important concepts and theory of different biomedical engineering system.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

2. Group Project

Criterion

Ability to utilize the materials taught in lectures to analyze and develop a novel biomedical engineering system.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

3. Assignment

Criterion

Ability to explain in details and with accuracy about the important concepts and theory of different biomedical engineering system.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

4. Examination

Criterion

Ability to explain in details and with accuracy about the important concepts and theory of different biomedical engineering system.

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Bioengineering
- Biomedical Engineering
- Biomaterials
- Cell and Tissue Engineering
- Biomechanics
- Biomedical Imaging
- Artificial Organs
- Genetic Engineering
- Biological Systems
- Healthcare Industry
- Medical Device Management
- Professional Ethics for Biomedical Engineer

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	W. Mark Saltzman. Biomedical Engineering: Bridging Medicine and Technology. Part of Cambridge Texts in Biomedical Engineering. Publication Date: June 29, 2009.
2	John Denis Enderle, Joseph D. Bronzino & Susan M. Blanchard, Introduction to Biomedical Engineering, Academic Press, 2005. (http://books.google.com/books?id=_yV3DqIU-tkC&dq=isbn:0122386620).