BME3016: BIOMEDICAL ENGINEERING CAD

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Biomedical Engineering CAD

Subject Code
BME - Biomedical Engineering
Course Number
3016

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
BME2016 Biomedical Engineering CAD

Exclusive Courses
Nil

Part II Course Details

Abstract

The aim of this course is to introduce students the basic concepts and use of Computer Aided Drawing/Design (CAD) in the biomedical engineering field. Upon successful completion of this course, students should acquire the following learning outcomes:

(i) Use the medium of drawings in engineering communications;

(ii) Describe the general principles involved in the use of engineering drawing;

(iii) Demonstrate skills in interpreting, and producing engineering drawings accurately and efficiently;

(iv) Demonstrate skills in computer-aided-draughting to produce detailed 2D and 3D drawings; and Design biomedical engineering products using CAD tools, with engineering drawings as the medium of effective communication with colleagues in a community for the students' future career.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Apply the medium of drawings in engineering communications.			x	
2	Describe the general principles involved in the use of engineering drawing.			x	
3	Demonstrate skills in interpreting and producing engineering drawings accurately and efficiently.			x	
4	Demonstrate skills in computer-aided-draughting to produce detailed 2D and 3D drawings.			x	
5	Design biomedical engineering products using CAD, with engineering drawings as the medium of effective communication with colleagues in a community for the students' future career.			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 key concepts, such as orthographic projection, etc., related to engineering communications and drawing. Students will engage in engineering drawing practice using CAD software tools.	1, 2, 3	3 hrs/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Tests	1, 2, 3, 5	60	3 in-class tests during the semester	No
2	Lab assignments	3, 4, 5	20	4 computer-based drawing assignments	No
3	Project	3, 4, 5	20	1 project about biomedical product for presentation	No

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

Tests

Criterion

1.1 Ability to use the medium of drawings in engineering communications.

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
Tests

Criterion
1.2 Ability to describe the general principles involved in the use of engineering drawing.

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
Tests

Criterion
1.3 Ability to demonstrate skills in interpreting, and producing engineering drawings accurately and efficiently.

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
Lab Assignments

Criterion
2.1 Ability to demonstrate skills in interpreting, and producing engineering drawings accurately and efficiently.

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
Lab Assignments

Criterion
2.2 Ability to demonstrate skills in computer-aided-draughting to produce detailed 2D and 3D drawings.

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
Project

Criterion
3.1 Ability to design a biomedical product by using CAD.

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
Project

Criterion
3.2 Ability to communicate the product details with others by using CAD in the presentation.

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
Use of Computer for Engineering Design Drawing. Conventional Representation of Standard Features. Orthographic Projection: 1st and 3rd angle. Isometric View and Oblique Projection. Standard Symbols on a Working Drawing. Dimensioning and tolerance applications. Sectioning. Assembly Drawing. Solid Modelling. 2D and 3D computer-aided-draughting software.

Reading List

Compulsory Readings

	Title
1	Bertoline, G., Wiebe, E., Hartman, N., Ross, W., Fundamentals of Graphics Communication, 7th edition, McGraw Hill, 2018.

Additional Readings

	Title
1	Giesecke, F.E., Mitchell, A., Spencer, H.C., Hill, I.L., Dygdon, J.T., Novak, J.E., Loving, R.O., Lockhart, S., Johnson, C., Technical Drawing with Engineering Graphics, Pearson.
2	M.A. Parker and F. Pickup, Engineering Drawing with Worked Examples, Part 1, Stanley Thornes Ltd.
3	Chen T. G. et al, Gaoli, Engineering Graphics, 2015.