

BME8130: BIOMEDICAL SAFETY AND RISK ASSESSMENT

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Biomedical Safety and Risk Assessment

Subject Code

BME - Biomedical Engineering

Course Number

8130

Academic Unit

Biomedical Engineering (BME)

College/School

College of Biomedicine (BD)

Course Duration

One Semester

Credit Units

3

Level

R8 - Research Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

MBE6117/BME6117 Biomedical Safety and Risk Assessment

Exclusive Courses

Nil

Part II Course Details

Abstract

This course introduces the important elements of biosecurity and bio/medical-safety. Students will be provided with an overview of the bio-safety practices, equipment, and facilities for the safe and secure handling of biological samples and dangerous pathogens in a laboratory setting. Related topics such as biorisk management, biocontainment, bio-safety levels, bio-hazard symbols, risk assessment, bloodborne or airborne pathogens and toxins, bio-terrorism and food safety will be covered.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the basic concepts of bio/medical-safety bio-security, biorisk management, biocontainment, bio-terrorism, and food safety.	x		
2	Apply the concepts of biorisk management, biocontainment, and risk assessment to analyse some practical problems.		x	x
3	Select relevant knowledge elements and technologies to obtain solutions for some common problems towards biorisk management of pathogens and toxins.		x	
4	Demonstrate reflective practice in an engineering context.		x	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	Lectures	Describe the concepts of bio/medical-safety bio-security, biorisk management, biocontainment, bio-terrorism, and food safety.	1, 2	39 hours
2	Assignment	Require students to solve a problem based on the major concepts of biorisk management, biocontainment, and risk assessment etc. covered in the lectures	1, 2	NA

3	Mini-project	Require students to identify one biosafety related event through a literature review and analyse a possible solution to overcome the problems	3, 4	NA
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Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Midterm test	1, 2	10	-	No
2	Assignment	1, 2	15	-	Yes
3	Mini-project	3, 4	15	-	Yes

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Assessment Rubrics (AR)**Assessment Task**

Midterm test

Criterion

Describe the basic concepts of bio/medical-safety, biosecurity, biorisk management, and biocontainment etc. and apply them to analyse some practical problems.

Excellent

High

Good

Significant

Fair

Moderate

Marginal

Basic

Failure

Not even reaching marginal levels

Assessment Task

Assignment

Criterion

Identify and solve a problem based on the major concepts of biorisk management, biocontainment, and risk assessment etc.

Excellent

High

Good

Significant

Fair

Moderate

Marginal

Basic

Failure

Not even reaching marginal levels

Assessment Task

Mini-project

Criterion

Identify one bio/medical-safety related event through a literature review.
Analyse the cause(s) of the event and propose a control and prevent method.

Excellent

High

Good

Significant

Fair

Moderate

Marginal

Basic

Failure

Not even reaching marginal levels

Assessment Task

Examination

Criterion

Describe the major concepts of bio/medical-safety, biosecurity, biorisk management, and biocontainment etc.
Identify biohazardous conditions to be considered in the design and/or operation of a laboratory; ability to conduct a risk assessment

Excellent

High

Good

Significant

Fair

Moderate

Marginal

Basic

Failure

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Bio/medical-safety: Bio-security and Bio-terrorism
- Biohazard: A biological agent or condition, individual risk, and institutional risk
- Biorisk Management: Risk Assessment, Biocontainment, and Risk Communication
- Biosafety Levels: Risk Group
- Lab Biosafety Practices and Techniques
- Laboratory Facilities and Design: Local Codes of Practice, Safety Equipment
- Biosafety Events: Laboratory-Acquired Infections (LAIs)
- Bioterrorism and Food Safety
- Biosafety laws: regulations and ordinance

Reading List

Compulsory Readings

Title	
1	Biosecurity : Understanding, Assessing, and Preventing the Threat Burnette, Ryan Hoboken : Wiley, 2013

Additional Readings

Title	
1	Laboratory biosafety manual (Third edition), World Health Organization 2004
2	Responsible life sciences research for global health security, World Health Organization 2010