

**City University of Hong Kong
Course Syllabus**

**offered by
Department of Biomedical Engineering
with effect from Semester A 2022 / 2023**

Part I Course Overview

Course Title:	Biomedical Safety and Risk Assessment
Course Code:	BME8130
Course Duration:	1 Semester
Credit Units:	3
Level:	R8
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites : <i>(Course Code and Title)</i>	Nil
Precursors: <i>(Course Code and Title)</i>	Nil
Equivalent Courses: <i>(Course Code and Title)</i>	MBE6117/BME6117 Biomedical Safety and Risk Assessment
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. 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.

2. Course Intended Learning Outcomes (CILOs)

No.	CILOs	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe the basic concepts of bio/medical-safety, bio-security, biorisk management, biocontainment, bio-terrorism, and food safety.		✓		
2.	Apply the concepts of biorisk management, biocontainment, and risk assessment to analyse some practical problems.			✓	✓
3.	Select relevant knowledge elements and technologies to obtain solutions for some common problems towards biorisk management of pathogens and toxins.			✓	
4.	Demonstrate reflective practice in an engineering context.			✓	✓

* If weighting is assigned to CILOs, they should add up to 100%.

N.A.

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 self-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.

3. Teaching and Learning Activities (TLAs)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lectures	Describe the concepts of bio/medical-safety, bio-security, biorisk management, biocontainment, bio-terrorism, and food safety.	✓	✓			39 hours
Assignment	Require students to solve a problem based on the major concepts of biorisk management, biocontainment, and risk assessment etc. covered in the lectures	✓	✓			NA
Mini-project	Require students to identify one biosafety related event through a literature review and analyse a possible solution to overcome the problems			✓	✓	NA

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 40%						
Midterm test	✓	✓			10%	
Assignment	✓	✓			15%	
Mini-project			✓	✓	15%	
Examination: 60%						
Examination	✓	✓	✓	✓	60%	Duration: 2 hours
					100%	

* The weightings should add up to 100%.

For a student to pass the course, at least 30% of the maximum mark for both coursework and examination should be obtained.

5. Assessment Rubrics

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Midterm test	Describe the basic concepts of bio/medical-safety, biosecurity, biorisk management, and biocontainment etc. and apply them to analyse some practical problems.	High	Significant	Basic	Not even reaching marginal levels
2. Assignment	Identify and solve a problem based on the major concepts of biorisk management, biocontainment, and risk assessment etc.	High	Significant	Basic	Not even reaching marginal levels
3. Mini-project	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.	High	Significant	Basic	Not even reaching marginal levels
4. Examination	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	High	Significant	Basic	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Midterm test	Describe the basic concepts of bio/medical-safety, biosecurity, biorisk management, and biocontainment etc. and apply them to analyse some practical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Assignment	Identify and solve a problem based on the major concepts of biorisk management, biocontainment, and risk assessment etc.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Mini-project	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.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	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	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. 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

2. Reading List

2.1 Compulsory Readings

1.	Biosecurity : Understanding, Assessing, and Preventing the Threat, Burnette, Ryan, Hoboken : Wiley, 2013
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2.2 Additional Readings

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