

City University of Hong Kong
Course Syllabus

offered by
Department of Biomedical Engineering
with effect from Semester A 2024/25

Part I Course Overview

Course Title:	<u>Biomedical Safety and Risk Assessment</u>
Course Code:	<u>BME6117</u>
Course Duration:	<u>1 semester</u>
Credit Units:	<u>3 credits</u>
Level:	<u>P6</u>
Medium of Instruction:	<u>English</u>
Medium of Assessment:	<u>English</u>
Prerequisites : <i>(Course Code and Title)</i>	<u>Nil</u>
Precursors: <i>(Course Code and Title)</i>	<u>Nil</u>
Equivalent Courses: <i>(Course Code and Title)</i>	<u>MBE6117/BME8130 Biomedical Safety and Risk Assessment</u>
Exclusive Courses: <i>(Course Code and Title)</i>	<u>Nil</u>

Part II Course Details

1. Abstract

(A 150-word description about the course)

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)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

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, biosecurity, 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 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.

3. Learning and Teaching Activities (LTAs)

(LTAs designed to facilitate students' achievement of the CILOs.)

LTA	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)

(ATs are designed to assess how well the students achieve the CILOs.)

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

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

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

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

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	<p>Identify one bio/medical-safety related event through a literature review.</p> <p>Analyse the cause(s) of the event and propose a control and prevent method.</p>	High	Significant	Basic	Not even reaching marginal levels
4. Examination	<p>Describe the major concepts of bio/medical-safety, biosecurity, biorisk management, and biocontainment etc.</p> <p>Identify biohazardous conditions to be considered in the design and/or operation of a laboratory; ability to conduct a risk assessment</p>	High	Significant	Basic	Not even reaching marginal levels

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

1. Keyword Syllabus

(An indication of the key topics of the course.)

- 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

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

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

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

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