

**City University of Hong Kong
Course Syllabus**

**offered by Department of Mechanical and Biomedical Engineering
with effect from Semester B 2017 / 18**

Part I Course Overview

Course Title:	Bio-safety and Security
Course Code:	MBE4103
Course Duration:	1 semester
Credit Units:	3 credits
Level:	B4
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>	Nil
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

Introduction to biosafety and biosecurity. Overview of the biosafety practices, equipment, and facilities for the safe and secure handling of dangerous pathogens in a laboratory setting. Related topics can be discussed, such as zoonoses and animal hazards; bloodborne pathogens; viral vectors; bioterrorism; food bio-safety; human pathogens and toxins.

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 biosafety, biosecurity, bioterrorism, and food safety.		✓		
2.	Analyse relevant knowledge and technologies to obtain solutions for some common problems in detection and monitoring of bio-related hazards such as pathogens, toxins, and viruses.			✓	
3.	Integrate the principles of biosafety, biosecurity, bioterrorism, and food safety to analyse some practical problems.			✓	✓
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)

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

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture	Explain key concepts about various biosafety levels and hazardous conditions, laboratory safety and control.	✓	✓	✓		2 hrs/week (except for the 2 weeks with Laboratory Work)
Tutorial	To discuss some biosafety problems and questions as well as identify a group-based project.	✓	✓	✓	✓	1 hr/week
Group-based Project	Students will have the opportunity to participate in the learning tasks of the mini-project activities. For the mini-project, a brief outline of the work topic(s), effective team work and expected report-writing will be provided emphasizing opportunities for discovery and innovation inherent in this student activity.	✓	✓	✓	✓	
Laboratory Work	Group activities which involve various laboratory sessions related to Biosafety.	✓			✓	3 hrs/week for 2 weeks

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: 60%						
Mid-term Test	✓	✓			10%	
Mini-project		✓	✓	✓	20%	
Assignment	✓	✓			10%	
Lab Reports			✓	✓	20%	2 reports to be submitted
Examination: 40% (duration: 2 hours)						

* The weightings should add up to 100%.

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.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Mid-term Test	Ability to Explain the basic concepts of biosafety and biosecurity.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Mini-project	Capacity for Self-directed Learning to understand the principles, methodology and applications of bio-safety and control.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Assignment	Ability to Explain the basic concepts of biosafety and biosecurity.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Lab Reports	Ability to Explain the methodology and procedures of various experimental works.	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Examination	Ability to Explain in Detail various issues and technical aspects of biosafety and biosecurity.	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

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

- Biosafety: biological safety level
- Biosecurity: risk group
- Bioterrorism: biohazard and biomaterial
- Food biosafety: pathogens and toxins, viral vectors

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.	Fleming, Diane O. and Hunt, Debra A., Biological Safety: Principles and Practices, Amer Society for Microbiology, 4 th Edition, 2006.
2.	Burnette, Ryan, Biosecurity: Understanding, Assessing, and Preventing the Threat, Wiley, 2013.

2.2 Additional Readings

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