

**City University of Hong Kong  
Course Syllabus**

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

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**Part I Course Overview**

**Course Title:** Biomedical-safety and Risk Assessment

**Course Code:** MBE6117

**Course Duration:** 1 semester

**Credit Units:** 3 credits

**Level:** P6

**Medium of Instruction:** English

**Medium of Assessment:** English

**Prerequisites :**  
*(Course Code and Title)* Nil

**Precursors:**  
*(Course Code and Title)* Nil

**Equivalent Courses:**  
*(Course Code and Title)* Nil

**Exclusive Courses:**  
*(Course Code and Title)* Nil

## Part II Course Details

### 1. Abstract

This course introduces the important elements of bio/medical-safety and risk assessment and provides an overview of the bio-safety practices, equipment and facilities for the safe and secure handling of bio samples and dangerous pathogens in a laboratory setting. Related topics, such as bio-hazardous history, bio-safety level, hazardous sign, risk assessment, bloodborne or airborne pathogens, bio-terrorism, food 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.	<b>Describe</b> the basic concepts of bio/medical-safety, bio-security, risk assessment, bio-terrorism, and food safety.		✓		
2.	<b>Apply</b> the concepts of bio/medical-safety and risk assessment to analyse some practical problems.			✓	✓
3.	<b>Select</b> relevant knowledge elements and technologies to obtain solutions for some common problems towards control and monitor of bio-related hazards such as pathogens, toxins, and viruses.			✓	
4.	<b>Demonstrate</b> reflective practice in an engineering context.			✓	✓
		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	
<b>Lectures</b>	Describe the concepts of bio/medical-safety, bio-security, risk assessment, control method and monitoring technologies, bio-terrorism, and food safety	✓	✓			<b>33 hours</b>
<b>Assignment</b>	Require students to solve a problem based on the major concepts of bio/medical-safety, risk assessment, etc. covered in the lectures	✓	✓			<b>NA</b>
<b>Mini-project</b>	Require students to identify one bio-safety related event through literature survey and analyse a possible solution to overcome the problems			✓	✓	<b>NA</b>
<b>Laboratory</b>	Identifying bio/chemical reagents and practice safe handling and disposal of bio/chemical waste to enhance the overall management of a laboratory	✓	✓			<b>6 hours</b>

### 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	✓	✓			10%	
Mini-project			✓	✓	15%	
Lab work quiz	✓	✓			5%	
Examination: 60% (duration: 2 hours)						
					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/assignment	<b>Describe</b> the basic concepts of bio/medical-safety and risk, and <b>apply</b> them to analyse some practical problems.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Assignment	<b>Solve</b> a problem based on the major concepts of bio/medical-safety, risk assessment	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Mini-project	<b>Ability</b> to identify one bio/medical-safety related event through literature survey. <b>Analyse</b> the causes of the event and <b>propose</b> a control and prevent method.	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Lab work quiz	<b>Identify</b> bio/chemical reagents and practice of safe handling and disposal of bio/chemical waste for managing relevant laboratory	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Examination	<b>Ability</b> to describe the major concepts on bio/medical-safety, risk, food safety, etc. <b>Ability</b> to identify different bio-hazardous conditions to be considered in designing and/or operation of a laboratory; ability to conduct 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**

*(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
- Biosafety Levels: Risk Group
- Lab Practices and Techniques: Local codes of practice, Safety Equipment
- Laboratory Facilities and Design
- Biosafety Events: Laboratory Acquired Infections

**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
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**2.2 Additional Readings**

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

1.	Laboratory bio Safety manual (Third edition), World Health Organization
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