

## Course Syllabus

**offered by Department of Chemistry  
with effect from Semester A 2020/21**

This form is for the completion by the Course Leader. The information provided on this form is the official record of the course. It will be used for the City University's database, various City University publications (including websites) and documentation for students and others as required.

Please refer to the Explanatory Notes on the various items of information required.

**Prepared / Last Updated by:**

Name:	<u>Dr. Terrence Lau</u>	Academic Unit:	<u>Department of Biomedical Sciences</u>
Phone/email:	<u>3442 9327 / chiklau@cityu.edu.hk</u>	Date:	<u>26 May 2020</u>

**City University of Hong Kong  
Course Syllabus**

**offered by Department of Chemistry  
with effect from Semester A 2020/21**

---

---

**Part I Course Overview**

<b>Course Title:</b>	Microbiology
<b>Course Code:</b>	CHEM2013
<b>Course Duration:</b>	1 semester
<b>Credit Units:</b>	3 credits
<b>Level:</b>	B2
<b>Proposed Area:</b> <i>(for GE courses only)</i>	<input type="checkbox"/> Arts and Humanities <input type="checkbox"/> Study of Societies, Social and Business Organisations <input type="checkbox"/> Science and Technology
<b>Medium of Instruction:</b>	English
<b>Medium of Assessment:</b>	English
<b>Prerequisites:</b> <i>(Course Code and Title)</i>	CHEM1200/BCH1200 Discovery in Biology (for normative 4-year students) or A Level Biology (for advance standing I students)
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	BCH2013 Microbiology
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil



### 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	5	6	
Lectures and tutorials	Teaching and learning will be primarily based on interactive lectures and tutorials with activities designed to develop the discovery attitude in relation to microbes' role in our daily lives, along with complementary in-class and on-line discussions where students will be able to be involved in small group sharing, so they can learn to describe and discuss the related subject matters.	✓	✓	✓	✓			
"Ask a Question" exercise, written assignments and scientific journal article review	Appropriate "Ask a Question" exercise, written assignments, scientific journal article review will be implemented for the students to develop their appraisal, analytical and oral and written communication skills.				✓	✓		
Problem-based learning activities and oral presentations	Problem-based learning activities and oral presentations will be organised for the students to practise their skills in identification of learning issues, analysis and synthesis of collected information, application of synthesised information to solve problems and presentation.					✓	✓	

### 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	5	6		
Continuous Assessment: <u>45%</u>								
Tests	✓	✓	✓	✓			5%	
Written assignments, scientific journal article review	✓	✓	✓	✓	✓		10%	
PBL contribution, including oral presentations						✓	15%	
"Ask a Question" activity, in-class and online discussions, including discovery activities	✓	✓	✓	✓	✓		15%	
Examination: <u>55%</u> (duration: 3 hours)								
* The weightings should add up to 100%.							100%	

Starting from Semester A, 2015-16, students must satisfy the following minimum passing requirement for courses offered by CHEM:

**"A minimum of 40% in both coursework and examination components."**

## 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. Tests	To verify the stat of students' learning progress	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Written assignments, scientific journal article review	Encourage students to think critically by allowing them to review and criticize the current scientific article	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. PBL contribution, including oral presentations	To challenge students to collaborate communicate and working together to solve problem as a team	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. "Ask a Question" activity, in-class and online discussions, including discovery activities	Ability to understand the materials in lectures and asking questions from critical thinking	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Examination	To test students' application of material taught in class and evaluate their performance	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.)*

- 1) Microbial diversity of archaea, bacteria, fungi, protists, viruses
  - physiological diversity (chemoorganotroph, chemolithotroph, phototroph, heterotroph, autotroph)
  - microbial systematics (phenotypic, genotypic, phylogenetic analysis)
- 2) Microbial growth
  - exponential growth
  - measuring microbial growth
  - environmental factors affecting growth
- 3) Microbial ecology
  - methods in microbial ecology (isolation, T-RFLP, DGGE)
  - how microbes interact with each other
  - descriptions of major microbial habitats
  - biofilms
- 4) Industrial microorganisms and products for the health and food industry
- 5) Microbial interactions with humans
  - normal microbial flora
  - microbial diseases (airborne, vectorborne, waterborne, foodborne, direct contact transmitted)
- 6) Microbial growth control
  - physical antimicrobial control
  - chemical antimicrobial control
  - antimicrobial drugs, in particular antibiotics and their mode of action
- 7) Microbial secondary metabolism and secondary metabolites
  - polyketides and acetate pathways
  - terpenoids and mevalonate and methylerythritol phosphate (MEP) pathways
  - peptide biosynthesis

**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.	
2.	
3.	
...	

**2.2 Additional Readings**

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

1.	Fungal Biology, J.W. Deacon (Blackwell Publishing Limited, 2006)
2.	Brock Biology of Microorganisms, Michael T. Madigan, John M. Martinko, David Stahl and David P. Clark (13 <sup>th</sup> ed., Benjamin Cummings, 2010)
3.	Medicinal Natural Products: A Biosynthetic Approach; Paul M. Dewick (John Wiley & Sons, Ltd, 3 <sup>rd</sup> Edition). The electronic version of the textbook is available from the CityU Library: <a href="https://onlinelibrary.wiley.com/doi/book/10.1002/9780470742761">https://onlinelibrary.wiley.com/doi/book/10.1002/9780470742761</a>

Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

<b>GE PILO</b>	<b>Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)</b>
PILO 1: Demonstrate the capacity for self-directed learning	
PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology	
PILO 3: Demonstrate critical thinking skills	
PILO 4: Interpret information and numerical data	
PILO 5: Produce structured, well-organised and fluent text	
PILO 6: Demonstrate effective oral communication skills	
PILO 7: Demonstrate an ability to work effectively in a team	
PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues	
PILO 9: Value ethical and socially responsible actions	
PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation	

*GE course leaders should cover the mandatory PILOs for the GE area (Area 1: Arts and Humanities; Area 2: Study of Societies, Social and Business Organisations; Area 3: Science and Technology) for which they have classified their course; for quality assurance purposes, they are advised to carefully consider if it is beneficial to claim any coverage of additional PILOs. General advice would be to restrict PILOs to only the essential ones. (Please refer to the curricular mapping of GE programme: [http://www.cityu.edu.hk/edge/ge/faculty/curricular\\_mapping.htm](http://www.cityu.edu.hk/edge/ge/faculty/curricular_mapping.htm).)*

- A. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

<b>Selected Assessment Task</b>