

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:

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**City University of Hong Kong
Course Syllabus**

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

Part I Course Overview

Course Title:	Diversity of Life and Microbiology Laboratory
Course Code:	CHEM2070
Course Duration:	1 semester
Credit Units:	2 credits
Level:	B2
Proposed Area: <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
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: <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)
Precursors: <i>(Course Code and Title)</i>	CHEM2013/BCH2013 Microbiology, CHEM2067/BCH2067 Diversity of Life and Evolution
Equivalent Courses: <i>(Course Code and Title)</i>	BCH2070 Diversity of Life and Microbiology Laboratory
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to provide students with competent skills to discover different life forms in the natural environment including microbes, and deal with these specimens, living and preserved, from collection to design of protocols for detailed examination. This will include basic study and hands-on practice of the following:

- principles of microscopy and the different microscopic techniques;
- discovery fieldtrip, collection and treatment of live and preserved specimens;
- documentation and presentation of observations.

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.	Use compound and stereomicroscopes with competence and application of different light microscopy techniques to examine biological specimens.			✓	
2.	Master the technique of discovery of specific groups of microbes (e.g. bacteria, fungi, single-cell algae and protists), animals and plants and their collection from the environment for the purpose of laboratory investigation.			✓	
3.	Perform laboratory procedures to prepare samples of living and preserved plant, animal and microbe (e.g. bacteria, fungi, single-cell algae and protists) specimens to study their morphology and relate these features to their functions whenever applicable.			✓	✓
4.	Make relevant and clear records of laboratory activities to document procedures and observations to reflect thorough understanding of the topic under investigation.		✓	✓	✓
		100%			

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

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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	
Video presentation and hands-on laboratory class	Video presentation and hands-on laboratory class on the use of compound and stereo microscopes using different light microscopy techniques to examine live and preserved specimens. Students will be working individually.	✓				
Field trips	Field trips to an appropriate ecological sites will be organised for students to discover how the different life forms exist in the natural environment and collect life specimens in groups for laboratory investigation whenever necessary or possible. Relevant government regulations in relation to collection of specimens in the wild will be explained.		✓			
Laboratory exercises	Laboratory exercises involving the examination of representative plant and animal kingdoms and the microbes using different microscope techniques. Students will be working in groups.			✓		
Report writing	Video presentations and readings will be assigned to help students to learn and develop the skills necessary to write a fieldtrip and /or a laboratory report including laboratory log book entries and biological drawings.				✓	

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: <u>100%</u>						
Laboratory Class Performance (logbooks, skills demonstration, participation in class activities, attendance)	✓				40%	
Fieldwork / Group Presentation / Laboratory Reports		✓	✓	✓	50%	
Quizzes	✓		✓	✓	10%	
Examination: <u>0%</u> (duration: --)						
* 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. Laboratory Class Performance (logbooks, skills demonstration, participation in class activities, attendance)	Capacity for self-directed learning to comprehend and explain in detail with accuracy the knowledge of biodiversity and microbiology	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Fieldwork / Group Presentation / Laboratory Reports	Ability to apply the knowledge of and techniques for biodiversity and microbiology in field study	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Quizzes	Ability to explain skill and microscopy techniques for microbiology and diversity	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.)

Principles of microscopy and their applications.

Laboratory safety.

Aseptic techniques.

Differentiation of different bacterial groups – staining and biochemical methods.

Morphological and functional characteristics of

- Single-cell algae (diatoms, dinoflagellates, green algae), protists (protozoa, macro-algae)
- Major fungal groups (chytrids, zygomycetes, ascomycetes and basidiomycetes) and chromists
- Non-vascular plants (bryophytes, mosses)
- Vascular non-seed plants (whisk ferns, club mosses, horsetails, ferns)
- Vascular plants (conifers, flowering plants)
- Invertebrate animals (selected key phyla)
- Vertebrate animals (from fish to mammals)

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.	
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2.2 Additional Readings

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

1.	Practical Skills in Biology. Allan Jones, Rob Reed and Jonathan Weyers. 4 th ed. 2007. Pearson / Benjamin Cummings.
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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:

GE PILO	Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)
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.)

- 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.

Selected Assessment Task