

## 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**

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**Part I Course Overview**

<b>Course Title:</b>	Plant Physiology
<b>Course Code:</b>	CHEM3074 (and CHEM3074A)
<b>Course Duration:</b>	1 semester
<b>Credit Units:</b>	4 (3) credits
<b>Level:</b>	B3
<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>	CHEM2067/BCH2067 Diversity of Life and Evolution
<b>Precursors:</b> <i>(Course Code and Title)</i>	Nil
<b>Equivalent Courses:</b> <i>(Course Code and Title)</i>	BCH3074 (and BCH3074A) Plant Physiology
<b>Exclusive Courses:</b> <i>(Course Code and Title)</i>	Nil

**Note: CHEM3074A does not contain any practical component, and has a credit unit value of three (3).**

## Part II Course Details

### 1. Abstract

(A 150-word description about the course)

In this course, students will:

- Examine the principles of important physiological processes and metabolic functions of major plant groups;
- Explain the inter-relationship of structure and function of major plant groups in relation to their environment importance;
- Apply their knowledge to physiological experiments to gain practical laboratory experience (for CHEM3074 only).

### 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 <sup>#</sup>	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Describe various important physiological processes in higher plants to acquire energy and nutrients, including photosynthesis, nutrient and water uptake, and gaseous exchange, and explore the implications for their structure and function.	40%	✓	✓	
2.	Explain the structure, processes and importance of internal communication, control, reproduction and development in plants.	35%	✓	✓	✓
3.	Design a stress tolerant strategy for use in plant biotechnology based on stress physiology.	25%	✓		✓
		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	
Group activities, tutorial presentation, practical classes and discussion	In large and small group activities, tutorial presentation, practical classes and web-based discussion, students will examine structure and function of photosynthesis, water and nutrient uptake, and gaseous exchange processes, and their adaptations.	✓	✓		
Group sessions, tutorial assignment and presentation, problem-based learning, practical classes	Students in large and small group sessions, tutorial assignment and presentation, problem-based learning, practical classes will investigate action and function of transportation and translocation, hormones, development and reproduction processes in higher plants.	✓	✓		
Group activities, written assignments and presentations	Students will undertake large and small group activities, written assignments and presentations to examine the responses of plants under various stressors and the potential uses of these responses in plant biotechnology.			✓	

### 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	CHEM3074	CHEM3074A	
Continuous Assessment: <u>40%</u> (40% for CHEM3074A)						
Short quizzes	✓	✓		5	10	
Tutorial assignments and presentation	✓	✓		15	25	
Problem-based learning	✓		✓	4	5	
Practical classes and practical reports	✓	✓		16	--	(for CHEM3074 only)
Examination: <u>60%</u> (duration: 3 hours)						
* The weightings should add up to 100%.				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. Short quizzes	understanding of the topics and reading materials; correctness of interpretation of data	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Tutorial assignments and presentation	understanding of key issues related to the topics and reading materials; ability to explain the concepts and materials; application of knowledge in solving real life problems	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Problem-based learning	developing insightful/innovative ideas; application of knowledge in solving real life problems	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Practical classes and practical reports	Conducting laboratory work; correctness of interpretation and analysis of experimental data; ability to explain and discuss the results	High	Significant	Moderate	Basic	Not even reaching marginal levels
5. Examination	Completeness and correctness of calculations/answers; correctness of interpretation and analysis of experimental data; application of knowledge in solving real life problems; logic of argumentation and intelligent use of course content/ original thinking	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.)*

Photosynthesis and translocation of photoassimilates  
Gaseous exchange, water uptake and transportation  
Hormones, movement, morphogenesis, photoperiodism and dormancy  
Reproduction, seed germination and development  
Physiology of plants under stress  
Plant biotechnology

**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.	Sinha, Rajiv K. (Rajiv Kumar) (2014) Modern Plant Physiology (2nd edition), Oxford, UK: Alpha Science International Ltd.
2.	Taiz L. and Zeiger E. (2015) Plant Physiology and Development (6th edition), Sunderland, MA: Sinauer Associates Inc., USA.
3.	Willey, Neil (2016) Environmental Plant Physiology, New York, NY: Garland Science.
4.	Li, Jiayang, Li, Chuanyou and Smith, Steven M. (editors) (2017) Hormone Metabolism and Signaling in Plants. London, UK: Academic Press, an Imprint of Elsevier.
5.	Hopkins W.G. and Norman P.A. Huner (2009) Introduction to Plant Physiology (4th ed.), Wiley, New York.
6.	Stern K.R., Bidlack J.E. and Jansky S.H. (2008) Introductory Plant Biology (11th ed.), McGraw Hill International Edition.
7.	Heldt, H.W. (2011) Plant Biochemistry, Amsterdam: Boston [Mass.]: Academic, Translation of the 4th German Ed.
8.	Relevant websites

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).)*

B. 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>