

Course Syllabus

offered by Department of Chemistry
with effect from Semester B 2017/18

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: TBA _____ Academic Unit: Department of Chemistry _____

Phone/email: TBA _____ Date: 30 November 2017 _____

**City University of Hong Kong
Course Syllabus**

**offered by Department of Chemistry
with effect from Semester B 2017/18**

Part I Course Overview

Course Title:	Photochemistry
Course Code:	BCH8142
Course Duration:	1 semester
Credit Units:	3 credits
Level:	R8
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>	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)

This course is a postgraduate taught course tailored for postgraduate research students only.

In this course students will:

- explore and apply the basic principles of photochemistry;
- analyze and interpret photoeffects of coordination chemistry;
- identify and apply the photochemical reactions of certain classes of organic compounds;
- explain examples of the effects of photochemistry in nature and in various applications.

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.	Demonstrate an understanding of excited states and apply group theory to photochemical problems	20%	✓		
2.	Explain natural and anthropogenically derived photochemical phenomena	20%	✓	✓	
3.	Describe and apply photochemical reactions of certain homologous series of organic compounds	20%	✓	✓	
4.	Analyze, discuss, conduct and defend their own investigation into a photochemical phenomenon	20%		✓	✓
5.	Critically evaluate photochemical theories and literature	20%		✓	✓
		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	5	
Group activities	Students will learn through large group activities exploring problems and calculations in photochemistry	✓					
Lectures, videos and web-based teaching methods	Lectures, videos and web-based teaching methods will enable students to develop experience in recognizing and explaining natural and anthropogenically derived photochemical phenomena		✓				
Group activities and tutorials	Large and small group interactive questioning and tutorials will provide opportunities for students to select and apply photochemical reactions of certain homologous series			✓			
Oral presentations	Student-centred learning and student oral presentations will form the basis for this activity where a specific aspect of photochemistry is explored in detail				✓		
Literature review	Students will independently review current theories and experiments in photochemistry critically and both give and receive feedback based these insights from the current literature					✓	

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		
Continuous Assessment: <u>30%</u>							
Assignment				✓		5%	
Short Tests	✓	✓	✓			10%	
Presentation				✓		15%	
Examination: <u>70%</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 BCH courses:

“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. Assignment	Ability to analyse and solve problems relevant to photochemistry	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Short Tests	Ability to analyse and solve problems relevant to photochemistry	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Presentation	Ability to analyze, discuss, conduct and defend their own investigation into a photochemical phenomenon	High	Significant	Moderate	Basic	Not even reaching marginal levels
4. Examination	Ability to demonstrate an understanding of excited states and apply group theory to photochemical problems, to explain natural and anthropogenically derived photochemical phenomena, and to describe and apply photochemical reactions of certain homologous series of organic compounds	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.)

Basic principles of photochemistry: photophysical processes and photodissociation. Absorption and emission of radiation. Nature of color.

Photochemical reactions of organic compounds.

Photochemistry and spectroscopy of transition metals and rare earths. Charge transfer photochemistry. Molecular emission. Energy transfer processes.

Kinetics of photophysical processes. Reactions of excited species: photochemical reactions. Techniques in photochemistry.

Lasers. Optical materials.

Atmospheric photochemistry. Photosynthesis.

Vision. Photoimaging. Photochromism and chemiluminescence. Solar energy storage. Photopolymerisation. Supramolecular photochemistry: photomolecular devices. Photomedicine.

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.	Photochemistry, C.E. Wayne and R.P. Wayne. Oxford University Press. New York, 1996.
2.	Principles and Applications of Photochemistry, R.P. Wayne. Oxford University Press. New York, 1988.
3.	Supramolecular Photochemistry, Ed. Vincenzo Balzani, NATO ASI Series. Reidel, Dordrecht, 1987.
4.	Elements of Inorganic Photochemistry, G.J. Ferraudi. Wiley. Canada, 1988.
5.	Principles of Photochemistry. J.A. Barltrop and J.D. Coyle. Wiley. New York, 1978.
6.	Surface Photochemistry. ed. M. Anpo. Wiley, 1996.
7.	Introduction to Organic Photochemistry. J.D. Coyle. Wiley, 1998.
8.	Photochemistry and Photophysics of metal complexes. D.M. Roundhill. Plenum, New York, 1994.
9.	The Physics and Chemistry of Colour, K. Nassau. Wiley, 2001.
10.	Lasers in Chemistry, D.L. Andrews. Springer-Verlag, 1986.
11.	Modern Molecular Photochemistry, N.J. Turro. University Science Books, Mill Valley, California, USA, 1991.

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:

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.)

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.

Selected Assessment Task