

Course Syllabus

**offered by Department of Chemistry
with effect from Semester A 2020/2021**

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 2020/2021**

Part I Course Overview

Course Title:	Principles of General Chemistry
Course Code:	CHEM1300
Course Duration:	1 semester
Credit Units:	3 credits
Level:	B1
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>	BCH1100 Chemistry
Exclusive Courses: <i>(Course Code and Title)</i>	CHEM1101 Introduction to Chemistry GE1357 Introduction to Chemistry

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to provide an introduction to the fundamental concepts in chemistry to undergraduate students major in chemistry and related disciplines, and prepare them to study more advanced chemistry courses.

Upon completion of this course, students should be able to:

- demonstrate an understanding of the basic concepts and principles of Chemistry,
- observe simple chemical reactions and understand their nature,
- gain knowledge and skills regarding chemistry experiments and awareness of common hazards.

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.	Describe the concept of atoms, molecules, and ions, neutrons, protons and electrons, the periodic table, chemical formula. Rationalize the electronic structures of atoms, ions, and molecules and chemical compounds through the formation of ionic and covalent bonds and explain their physical and chemical properties.	20%	✓	✓	
2.	Use organic nomenclature. Understand different types of chemical bond in organic chemistry. Describe and apply the concepts of molecular polarity and intermolecular forces in correlation with boiling and melting points of compound.	20%	✓	✓	
3.	Apply the principles of stoichiometry and moles and relate these to mass balance, empirical and molecular formula, and chemical equation. Realize the states of matter.	20%	✓	✓	
4.	Apply the principles of chemical kinetics to evaluate the reaction rate and evaluate equilibrium constants in chemical equilibria and predict the equilibria position with Le Châtelier's principle.	20%	✓	✓	
5.	Realize the classification of acids and bases. Understand the oxidation and reduction reactions.	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	
Lectures, interactive questioning and tutorials, and videos	Enable students to recognize the basic knowledge and concepts and the relationship between them, and give them practice in explaining these to peers.	✓					
Lectures, interactive questioning and tutorials, and laboratory sessions videos	Enable students to acquire the basic knowledge and concepts in inorganic and organic chemistry and give them practice in explaining these to peers. Allow students to carry our laboratory experiments.		✓				
Lectures, interactive questioning and tutorials, and videos	Enable students to recognize the basic knowledge and concepts and the relationship between them, and give them practice in explaining these to peers.			✓			
Lectures, interactive questioning and tutorials, and laboratory sessions videos	Enable students to appreciate the basic knowledge and concepts embedded in real-world issues with significant chemical context, and give them practice in explaining these to peers. Allow students to carry our laboratory experiments.				✓		
Lectures, interactive questioning and tutorials, and laboratory sessions videos	Enable students to realize the basic knowledge and concepts and the relationship between them, and give them practice in explaining these to peers. Allow students to carry our laboratory experiments.					✓	

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>							
Tutorials and assignments, online learning, peer reviewed quizzes, discussion	✓	✓	✓	✓	✓	15%	
Laboratory work and reports	✓	✓	✓	✓	✓	15%	
Examination: <u>70%</u> (duration: 2 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. Tutorials and assignments, online learning, peer reviewed quizzes, discussion	Capacity for self-directed learning to understand the basic principles of chemistry Ability to apply basic knowledge and important concepts of chemistry for rationalization and to solve chemical problems	High	Significant	Moderate	Basic	Below marginal level
2. Laboratory work and reports	Ability to apply basic knowledge and important concepts of chemistry to explain in detail chemical phenomena	High	Significant	Moderate	Basic	Below marginal level
3. Examination	Ability to apply basic knowledge and important concepts of chemistry for rationalization and to solve chemical problems	High	Significant	Moderate	Basic	Below marginal level

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 Concepts in Chemistry
Atoms, Ions, and Molecules
Periodic Table
Electronic Structure of Atoms
Chemical Bonding: Ionic and Covalent
Stoichiometry: Calculations with Chemical Formulas and Equations
States of Matters: Gases, Liquids, and Solids
Chemical Kinetics and Equilibrium
Thermochemistry
Acids and Bases
Oxidation and Reduction
Inorganic and Organic Chemistry
Electrochemistry

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.	“Chemistry: The Central Science”, 13th Edition, T. L. Brown, H. E. LeMay, Jr., B. E. Bursten, C. J. Murphy, P. M. Woodward, M. W. Stoltzfus, Pearson Education Limited Hall (ISBN 9781292057712)
2.	“Introduction to Chemistry – A Conceptual Approach”, 2nd Edition, R. C. Bauer, J. P. Birk, P. S. Marks, McGraw-Hill (ISBN 9780070172623)
3.	“Chemistry in Context: Applying Chemistry to Society”, 6th Edition, L. P. Eubanks, C. H. Middlecamp, C. E. Heltzel, S. W. Keller, McGraw-Hill (ISBN 9780071270137)
4.	“Chemistry”, 9th Edition, S. S. Zumdahl, S. A. Zumdahl, Brooks/Cole Cengage Learning (ISBN 9781133611097)

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