香港城市大學
City University of Hong Kong

SYL

Course Syllabus

offered by Department of Chemistry
with effect from Semester A 2023/2024

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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Part I Course Overview

Course Title:	Introduction to Chemistry
Course Code:	CHEM1101
Course Duration:	1 semester
Credit Units:	3 credits
Level:	B1
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	GE1357 Introduction to Chemistry
Exclusive Courses: *(Course Code and Title)*	CHEM1300 Principles of General Chemistry

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to provide basic chemistry concepts to university students without or with minimal background in chemistry and convey its importance in daily life through discussions on current issues with significant emphasis on chemical context.

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

a. demonstrate an understanding of the basic concepts and principles of Chemistry,
b. appreciate Chemistry and realize its importance and applications in daily life.

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 and naming, acids and bases, states of matter, chemical reactions.	25%	✓	✓	
2.	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.	15%	✓	✓	
3.	Discuss the basic principles of chemistry embedded within current real-world issues, such as quality of air and water, global warming, acid rain, energy resources, plastics, foods and drugs.	30%	✓	✓	✓
4.	Discover real-life examples and applications related to the basic principles of chemistry.	30%	✓	✓	✓
	** If weighting is assigned to CILOs, they should add up to 100%.*	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	
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 videos	Enable students to acquire the basic knowledge and concepts in inorganic and organic chemistry and give them practice in explaining these to peers.		✓			
Lectures, interactive questioning and tutorials, and laboratory demonstrations	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.			✓		
Laboratory sessions Lectures, group discussions and literature surveys	Students are divided into groups in laboratory sessions to discover real-life examples and applications in different activities which are related to basic concepts of chemistry. Lectures, group discussions and literature surveys will provide support to 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.				✓	

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: 50%						
Tutorials and online assignments	✓	✓	✓	✓	20%	
Laboratory work and reports	✓	✓	✓	✓	15%	
Group discussions and online quizzes	✓	✓	✓	✓	15%	
Examination: 50% (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 online assignments	Capacity for self-directed learning to understand the basic principles of chemistry	High with active participation in all tutorials and able to correctly answer all online assignments	Significant with active participation in most tutorials and able to correctly answer most of the online assignments	Moderate with active participation in some tutorials and able to correctly answer some of the online assignments	Basic with active participation in a few tutorials and able to correctly answer a few online assignments	Below marginal level without active participation in most tutorials and unable to answer most online assignments
2. Laboratory work and reports	Ability to practise basic chemistry experiments and apply basic knowledge and important concepts of chemistry to explain in detail chemical phenomena	High with active participation in all lab sessions and able to demonstrate excellent understanding of the principles and practices of various selected chemical phenomena	Significant with active participation in all lab sessions and able to describe and explain the principles and practices of various selected chemical phenomena	Moderate with active participation in most lab sessions and able to describe and explain some key principles and practices of selected chemical phenomena	Basic with active participation in a few lab sessions and able to describe and explain a few key principles and practices of selected chemical phenomena	Below marginal level without active participation in most lab sessions and unable to describe and explain most key principles and practices of selected chemical phenomena
3. Group discussions and online quizzes	Ability to apply basic knowledge and important concepts of chemistry for rationalization and to solve chemical problems	High with active participation in all group discussions and able to demonstrate excellent understanding of various discussed chemistry topics	Significant with active participation in all group discussions and able to describe and explain various discussed chemistry topics	Moderate with active participation in most group discussions and able to describe and explain some discussed chemistry topics	Basic with active participation in a few group discussions and able to describe and explain a few discussed chemistry topics	Below marginal level without active participation in most group discussions and unable to describe and explain most discussed chemistry topics
4. Examination	Ability to apply basic knowledge and important concepts of chemistry for rationalization and to solve chemical problems	High demonstrate excellent understanding of basic chemistry principles and able to correctly answer most of the examination questions	Significant able to correctly answer substantial number of the examination questions	Moderate able to correctly answer some of the examination questions	Basic able to correctly answer a few of the examination questions	Below marginal level unable to correctly answer most of the examination questions

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.)

Fundamental Concepts:
Atoms, Ions, and Molecules
Periodic Table
Electronic Structure of Atoms
Chemical Bonding: Ionic and Covalent
States of Matters: Gases, Liquids, and Solids
Examples of Daily-Life Chemistry
The Air we breathe
Protecting the ozone layer and chemistry of global climate change
Water for life
Neutralizing the treat of acid rain
World of polymer and plastic
Molecules of life and design of drugs
Nutrition – food for thought
Energy from combustion and from electron transfer

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 in Context: Applying Chemistry to Society", 6th Edition, L. P. Eubanks, C. H. Middlecamp, C. E. Heltzel, S. W. Keller, McGraw-Hill (ISBN 9780071270137)
2.	"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 (ISBN 9781292057712)
3.	"Introduction to Chemistry – A Conceptual Approach", 2nd Edition, R. C. Bauer, J. P. Birk, P. S. Marks, McGraw-Hill (ISBN 9780070172623)
4.	"Chemistry", 9th Edition, S. S. Zumdahl, S. A. Zumdahl, Brooks/Cole Cengage Learning (ISBN 9781133611097)

Annex
(for GE courses only)

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