

**City University of Hong Kong
Course Syllabus**

**offered by Department of Chemistry
with effect from Semester A 2022/23**

Part I Course Overview

Course Title:	Chemical Safety and Advanced Instrumentation for Research
Course Code:	CHEM8011M
Course Duration:	1 semester
Credit Units:	2 credits
Level:	R8
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>	BCH8011M Chemical Safety and Advanced Instrumentation for Research
Exclusive Courses: <i>(Course Code and Title)</i>	Nil

Part II Course Details

1. Abstract

The course will enable students to develop their knowledge and capability in conducting risk assessment and dealing with the chemical safety issues in the research laboratory. Students will also be able to discover for themselves how selected advanced and widely used research techniques and instrumental methods in chemistry can be applied to their own research studies.

2. Course Intended Learning Outcomes (CILOs)

No.	CILOs [#]	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	A2	A3
1.	Identify different types of chemical hazards	21%	✓		
2.	Conduct risk assessment in their research project and laboratory	33%	✓	✓	✓
3.	Demonstrate an understanding of the basic concepts and working principles of the selected spectroscopic techniques	24%	✓	✓	
4.	Apply different spectroscopic techniques in their research project	22%	✓	✓	✓
		100%			

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)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lectures	Explain key concepts such as organic spectroscopy, types of chemical hazards and chemical risk assessment.	✓	✓	✓	✓	14
Independent Studies	Require students to conduct risk assessment on their research projects/experiments.	✓	✓	✓		14
Assignment	Require students to apply various spectroscopic techniques for chemical identification and characterization.		✓	✓	✓	6
Group Discussions	Critically assess hazards in the experiments and discuss procedures that minimize the risks.	✓	✓		✓	12

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: <u>100%</u>						
Written Assignment		✓	✓		40%	
Oral Presentation	✓	✓		✓	30%	
Attendance	✓	✓		✓	30%	
Examination: <u>0%</u> (duration: --)						
					100%	

Students are required to submit all assignments and the risk assessments of their research laboratory and experiments to their supervisors and ALERT lab managers. Students are also required to present their major types of experimental procedures related to their research project and the corresponding risk assessment in the group meetings. Students are also required to attend all group meetings.

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

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Written Assignment	Ability to apply various spectroscopic techniques for chemical identification and characterization.	High	Significant	Basic	Not even reaching marginal levels
2. Report / Oral Presentation	Ability to conduct risk assessment on their research projects/experiments.	High	Significant	Basic	Not even reaching marginal levels
3. Attendance/ Discussion	Ability to critically assess hazards in the experiments and discuss procedures that minimize the risks.	High	Significant	Basic	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Written Assignment	Ability to apply various spectroscopic techniques for chemical identification and characterization.	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Report / Oral Presentation	Ability to conduct risk assessment on their research projects/experiments.	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Attendance/ Discussion	Ability to critically assess hazards in the experiments and discuss procedures that minimize the risks.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information

1. Keyword Syllabus

- Chemical Safety
- Risk assessment
- Chemical instrumentation

2. Reading List

2.1 Compulsory Readings

1.	
2.	
3.	
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2.2 Additional Readings

1.	Principles of instrumental analysis, 6 th ed. (Eds: D. A. Skoog, F. J. Holler, S. R. Crouch), Thomson, 2007
2.	Spectrometric Identification of Organic Compounds, 7 th ed. (Eds.:R. M. Silverstein, F. X. Webster, D. J. Kiemle), Wiley, Hoboken, 2005
3.	Chemical safety in the laboratory (Ed: S. K. Hall) Boca Raton, Lewis, 1994
4.	Chemical safety matters, (IUPAC), Cambridge University Press, Cambridge, 1992