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:	Introduction to Scientific Research
Course Code:	CHEM8010M
Course Duration:	2 semesters
Credit Units:	2 credits
Level:	R8
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)*	BCH8010M Introduction to Scientific Research
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

The course is designed for students enrolled in the PhD programmes to train them in acquiring the necessary skills of practicing research scientists via discovery-based study activities.

2. Course Intended Learning Outcomes (CILOs)

No.	CILOs[#]	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes		
			A1	*A2*	*A3*
1.	Identify and define the issues of significance in a given subject area by conducting literature research	20%	✓	✓	
2.	Review and critique the body of knowledge from literature of the given subject area	20%	✓	✓	
3.	Apply such knowledge to formulate the research methodology for a research project	30%		✓	✓
4.	Participate in the regular meetings with supervisors and lab members to report progress and exchange ideas	30%	✓	✓	✓
		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. Learning and Teaching Activities (LTAs)

LTA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lectures	Students will explain key concepts in scientific research methodologies.	✓	✓	✓		6
Independent Studies	Students will carry out critical evaluation of research methodologies in selected literatures.	✓	✓	✓		26
Group Discussions	In large and small group critical evaluation tasks and debates students will discuss and critically evaluate research strategies and methodologies adopted by other research teams in various disciplines of Biology, Biochemistry, Chemistry, Chemical Biology and Materials Sciences according to their publications.		✓	✓	✓	20

4. Assessment Tasks/Activities (ATs)

Assessment Tasks/Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: 100%						
Written Assignment	✓	✓	✓		50%	
Oral Presentation		✓	✓		30%	
Attendance				✓	20%	
Examination: 0% (duration: --)						
					100%	

Students are required to submit written research proposals to their supervisors, comprising of areas of research projects, literature research, and designs of experiments. Students are also required to present literature research and research proposals in regular group meetings. Students are required to attend group meetings regularly.

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 before Semester A 2022/23 and in Semester A 2024/25 & thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Written Assignment	Demonstration of understanding of the scientific literature and the formulation of research proposals.	Demonstration of excellent understanding of the scientific literature and the formulation of research proposals. Thorough identification of important issues in the subject areas and design experiments based on reviewing of the current literature. Showing strong evidence of original thinking.	Demonstration of good understanding of the scientific literature and the formulation of research proposals. Ability to identify various issues in the subject areas and design experiments based on reviewing of the current literature.	Demonstration of adequate understanding of the scientific literature and the formulation of research proposals. Ability to design experiments based on reviewing of the current literature.	Only able to briefly describe some scientific principles in the research proposals. Ability to propose appropriate experiments for the research proposals.	Fail to produce relevant research proposals to demonstrate the understanding of the backgrounds of the selected field of studies. Fail to derive relevant experiments for the research proposals.
2. Written and Oral Presentation	Communication of research ideas in professional and efficient ways.	Ability to communicate ideas professionally, effectively and persuasively via written and oral presentations.	Ability to communicate ideas effectively and persuasively via written and oral presentations.	Ability to communicate ideas effectively via written and oral presentations.	Demonstration of some ability in communicating research ideas with peers.	Fail to communicate research ideas effectively.
3. Attendance	Attending lectures and various small/large group discussion activities.	90% attendance or above	75% < Attendance < 89%	60% < Attendance < 74%	50% < Attendance < 59%	Less than 50% attendance

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
1. Written Assignment	Demonstration of understanding of the scientific literature and the formulation of research proposals.	Demonstration of excellent understanding of the scientific literature and the formulation of research proposals. Thorough identification of important issues in the subject areas and design experiments based on reviewing of the current literature. Showing strong evidence of original thinking.	Demonstration of good understanding of the scientific literature and the formulation of research proposals. Ability to identify various issues in the subject areas and design experiments based on reviewing of the current literature.	Only able to briefly describe some scientific principles in the research proposals. Ability to propose appropriate experiments for the research proposals.	Fail to produce relevant research proposals to demonstrate the understanding of the backgrounds of the selected field of studies. Fail to derive relevant experiments for the research proposals.
2. Written and Oral Presentation	Communication of research ideas in professional and efficient ways.	Ability to communicate ideas professionally, effectively and persuasively via written and oral presentations.	Ability to communicate ideas effectively and persuasively via written and oral presentations.	Demonstration of some ability in communicating research ideas with peers.	Fail to communicate research ideas effectively.
3. Attendance	Attending lectures and various small/large group discussion activities.	95% attendance or above	72% < Attendance < 94%	50% < Attendance < 71%	Less than 50% attendance

Part III Other Information

1. Keyword Syllabus

- Conducting and presenting literature research
- Writing and presenting a research proposal
- Participating in group meetings

2. Reading List

2.1 Compulsory Readings

Nil.

2.2 Additional Readings

1.	Goodlad, S, 1996: Speaking Technically. Imperial College Press, 112pp.
2.	Holtom, D and E Fisher, 1999: Enjoy Writing Your Science Thesis or Dissertation! Imperial College Press, 278pp.
3.	Yang, J T, 1995: An Outline of Scientific Writing. World Scientific, 160pp