

# CHEM4022: ENVIRONMENTAL TOXICOLOGY

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## Effective Term

Semester A 2022/23

## Part I Course Overview

### Course Title

Environmental Toxicology

### Subject Code

CHEM - Chemistry

### Course Number

4022

### Academic Unit

Chemistry (CHEM)

### College/School

College of Science (SI)

### Course Duration

One Semester

### Credit Units

4

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Nil

### Precursors

Nil

### Equivalent Courses

BCH4022 Environmental Toxicology

### Exclusive Courses

Nil

## Part II Course Details

### Abstract

In this course, students will:

- examine problems caused by various environmental toxicants and their fate
- be provided with practical experience in conducting in toxicity tests
- develop knowledge and techniques in the management of environmental toxicants

**Course Intended Learning Outcomes (CILOs)**

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Describe and evaluate the problems caused by various environmental toxicants and their fate in the environment				
2	Compare and contrast the various laboratory techniques used in quantitative assessment of environmental toxicants				
3	Critically evaluate, using case studies and group presentations, various management techniques adopted in the management of environmental toxicants				

**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 real-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.

**Teaching and Learning Activities (TLAs)**

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Group activities	Teaching and learning will be primarily based around large and small group activities examining problems caused by various environmental toxicants and their fate in the environment	1

2	Practical sessions	Teaching and learning will be based on small group practical sessions laying the basis for various laboratory techniques used in quantitative assessment of environmental toxicants. Students will be able to experience these laboratory techniques themselves under guidance.	2	
3	Group activities, written assignments and presentations	Teaching and learning will be primarily by large and small group activities, written assignments, and presentations related to various management techniques adopted in the management of environmental toxicants.	3	

**Assessment Tasks / Activities (ATs)**

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)	
1	Tutorial Assignments and Quizzes	1, 3	50	Continuous Assessment (50%): - Tutorial Assignments and Quizzes - Group Presentations - Practicals
2	Group Presentations	3		
3	Practicals	2		

**Continuous Assessment (%)**

50

**Examination (%)**

50

**Examination Duration (Hours)**

3

**Additional Information for ATs**

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.”

**Assessment Rubrics (AR)****Assessment Task**

Tutorial Assignments and Quizzes

**Criterion**

understanding of the topic and reading materials; correctness of interpretation and analysis of experimental data

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Group Presentations

**Criterion**

Understanding of the topic and material; completeness of the presentation; logic of the presentation structure; clarity of talk; appropriate use of photos and figures in the illustration of concepts; ability to discuss the presented topic

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Practicals

**Criterion**

Correctness of interpretation and analysis of experimental data; understanding of the topic and reading materials; application of knowledge in solving real life problems

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

Examination

**Criterion**

Completeness and correctness of calculations/answers; correctness of interpretation and analysis of experimental data; application of knowledge in solving real life problems; logic of argumentation and intelligent use of course content/ original thinking

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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## Part III Other Information

### Keyword Syllabus

#### Environmental Toxicants and Their Fates

Types, sources, properties of environmental toxicants.  
Fate, effects and interaction of environmental toxicants.  
Bio-accumulation and bio-magnification.  
Carcinogenicity, mutagenicity and teratogenicity.  
Toxic mechanisms, dose-response relationship.  
Responses at various levels of biological organization.

#### Toxicity Tests and Bioassay

Qualitative and quantitative biological assessment of environmental toxicants including principles and objectives, concepts and terminology, methodology, test organisms, conducting the tests, data analysis and reporting.  
Use of test results for various environmental management purposes.

#### Management of Environmental Toxicants

International Conventions, National and Local Legislations.  
Case studies (Hong Kong, Regional and Global).

## Reading List

### Compulsory Readings

Title	
1	Nil

### Additional Readings

Title	
1	To be provided, as required, in lectures and tutorials.