THE EDUCATION UNIVERSITY OF HONG KONG

Course Outline

Part I

Programme Title : Bachelor of Education (Honours) (Science)
Programme QF Level : 5
Course Title : Industrial Chemistry: Environmental & Technology
Course Code : SCC3006
Department : Science and Environmental Studies
Credit Points : 3
Contact Hours : 39
Pre-requisite(s) : Nil
Medium of Instruction : English
Course Level : 3

Part II

The University's Graduate Attributes and seven Generic Intended Learning Outcomes (GILOs) represent the attributes of ideal EdUHK graduates and their expected qualities respectively. Learning outcomes work coherently at the University (GILOs), programme (Programme Intended Learning Outcomes) and course (Course Intended Learning Outcomes) levels to achieve the goal of nurturing students with important graduate attributes.

In gist, the Graduate Attributes for Undergraduate, Taught Postgraduate and Research Postgraduate students consist of the following three domains (i.e. in short "PEER & I"): • **P**rofessional **E**xcellence; • **E**thical **R**esponsibility; **&** • **I**nnovation.

The descriptors under these three domains are different for the three groups of students in order to reflect the respective level of Graduate Attributes.

The seven GILOs are:
1. Problem Solving Skills
2. Critical Thinking Skills
3. Creative Thinking Skills

4a. Oral Communication Skills
4b. Written Communication Skills

5. Social Interaction Skills
6. Ethical Decision Making
7. Global Perspectives

1. Course Synopsis

This course is to provide participants an understanding of the knowledge and application of industrial chemistry. Important industrial processes such as the Haber process, chloroalkali

reaction, and methanol manufacturing process are covered in the course. Participants will learn an in-depth understanding of chemical kinetics, including activation energy and catalysis. In addition, students should be able to evaluate the role of chemistry in society through social, economic and environmental considerations of industrial processes and to develop concepts and understanding of green chemistry for the management and control of the impact of industrial processes on our environment. The course thus equips participants with the essential concepts and knowledge to teach the module of industrial and environment chemistry and technology, (either in Chemistry, Combined Science or Integrated Science) and topics in Elective Part – Industry Chemistry at senior secondary level.

2. Course Intended Learning Outcomes ($CILO_s$) *Upon completion of this course, students will be able to:*

$CILO_1$: Demonstrate knowledge and understanding of the fundamental principles in industrial chemistry and their environmental issues in relation to everyday life;

$CILO_2$: Show in-depth understanding of the significance of chemistry and technology in industrial sector and their social, economic and environmental impacts;

$CILO_3$: Incorporate the acquired scientific knowledge related to industrial chemistry and for effective teaching of the secondary Science subject into their teaching practice.

3. Content, CILOs and Teaching & Learning Activities

Course Content	CILOs	Suggested Teaching & Learning Activities
<u>Importance of industrial processes:</u> - development of synthetic products - for modern ways of living - conversion of raw materials to consumer products as illustrated by the production of fertilisers; - applications of principles of electrochemistry in industry as exemplified by the processes in the chloroalkali industry; - advancement of industrial processes as exemplified by the conversion of methane to methanol; - social, economic and environmental considerations of industrial processes	$CILO_{1,2,3}$	Mini-lecture, group discussion, student presentation, demonstration and experiments

Catalysis and industrial processes - meaning and characteristics of catalyst and relation between activation energy and catalysis	CILO1,2,3	Mini-lecture, group discussion, student presentation, demonstration and experiments
Green chemistry - principles of green chemistry; - green chemistry practices	CILO1,2	Mini-lecture, group discussion, student presentation, demonstration and experiments

4. Assessment

Assessment Tasks	Weighting (%)	CILO
(a) Assignment Lab report	30%	*CILO1,2,3*
(b) Group report (3000 words)	30%	*CILO1,2,3*
(c) Examination	40%	*CILO1,2,3*

5. Use of Generative AI in Course Assessments

Please select one option only that applies to this course:

☐ ***Not Permitted***: In this course, the use of generative AI tools is not allowed for any assessment tasks.

☑ ***Permitted***: In this course, generative AI tools may be used in some or all assessment tasks. Instructors will provide specific instructions, including any restrictions or additional requirements (e.g., proper acknowledgment, reflective reports), during the first lesson and in relevant assessment briefs.

6. Required Text(s)

Nil

7. Recommended Readings

Andreas J., Peter W. (2013). Chemical Technology: An Integral Textbook, Wiley Heaton, C.A., (1996). An Introduction to Industrial Chemistry, Springer

John A. Tyrell (2014). Fundamentals of Industrial Chemistry: Pharmaceuticals, Polymers, and Business, Wiley.

Mark A. B. (2013). Industrial Chemistry. De Gruyter Graduate

Warren K. L. (2013). Outlines of Industrial Chemistry: A Text-Book for Students, Frank Hall Thorp,

8. Related Web Resources

Nil

9. Related Journals

Nil

10. Academic Honesty

The University upholds the principles of honesty in all areas of academic work. We expect our students to carry out all academic activities honestly and in good faith. Please refer to the Policy on Academic Honesty, Responsibility and Integrity (https://www.eduhk.hk/re/uploads/docs/00000000001633679892454 8BbN5). Students should familiarize themselves with the Policy.

11. Others

Nil

Last updated: Aug 2025