

City University of Hong Kong

**Information on a Course
offered by School of Energy and Environment
with effect from Semester A in 2014 /2015**

Part I

Course Title: Wastewater Engineering and Water Quality Assessment

Course Code: SEE8221

Course Duration: One semester

No. of Credit Units: 3

Level: R8

Medium of Instruction: English

Prerequisites: Nil

Precursors: Nil

Equivalent Courses: SEE6213 Wastewater Engineering and Water Quality
Assessment

Exclusive Courses: Nil

Part II

1. Course Aims:

The course aims to provide students with the fundamental knowledge on wastewater engineering processes as well as the analytical techniques involved in assessing water quality. State-of-the-art processes in wastewater treatment will also be covered in the course.

2. Course Intended Learning Outcomes (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)

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

No	CILOs	Level of Importance
1	Identify and classify the different sources of wastewater and their requirement for treatment depending on their discharge or final utilisation.	1
2	Describe and perform various analysis of water and wastewater quality assessment.	1
3	Design the various physical and chemical unit operations for wastewater treatment.	1
4	Design the various biological unit operations for wastewater treatment.	1
5	Describe the principles of various advanced oxidation processes, concepts of water recycling and desalination.	1

3. Teaching and Learning Activities (TLAs)

(designed to facilitate students' achievement of the CILOs)

CILO No.	TLAs	Hours/week (if applicable)
CILO 1	Lectures; Tutorials	3
CILO 2	Lectures; Tutorials; Lab-based experiment	3
CILO 3	Lectures; Tutorials; Lab-based experiment	3
CILO 4	Lectures; Tutorials	3
CILO 5	Lectures; Lab-based project; Oral presentation	3

4. Assessment Tasks/Activities

(designed to assess how well the students achieve the CILOs)

CILO No.	Type of Assessment Tasks/Activities	Weighting (if applicable)	Remarks
CILO 1	Quiz (5%); Assignments (10%);	15%	
CILO 2	Quiz (5%); Assignments (10%); Lab	25%	

	report (10%)		
CILO 3	Quiz (5%); Assignments (10%); Lab report (10%)	25%	
CILO 4	Quiz (5%); Assignments (10%)	15%	
CILO 5	Project report (15%); Oral presentation (5%)	20%	

Coursework: 100%

5. **Grading of Student Achievement:** Refer to Grading of Courses in the Academic Regulations (Attachment) and to the Explanatory Notes.

Grade A

The student completes all assessment tasks/activities and the work demonstrates excellent understanding of the scientific principles and the working mechanisms. He/she can thoroughly identify and explain how the principles are applied to wastewater engineering. He/she is able to communicate ideas effectively and persuasively via written texts and/or oral presentation.

Grade B

The student completes all assessment tasks/activities and can describe and explain the scientific principles. He/she provides a detailed evaluation of how the principles are applied to wastewater engineering. He/she is able to communicate ideas effectively via written texts and/or oral presentation.

Grade C

The student completes all assessment tasks/activities and can describe and explain some scientific principles. He/she provides simple but accurate evaluations of how the principles are applied to wastewater engineering. He/she can communicate ideas clearly in written texts and/or in oral presentations.

Grade D

The student completes all assessment tasks/activities but can only briefly describe some scientific principles. Only some of the analysis is appropriate to show how the principles are applied to wastewater engineering. He/she can communicate simple ideas in writing and/or in oral presentations.

Grade F

The student fails to complete all assessment tasks/activities and/or cannot accurately describe and explain the scientific principles. He/she fails to identify and explain how the principles are applied to wastewater engineering. He/she is weak in communicating ideas and/or the student's work shows evidence of plagiarism.

Part III

Keyword Syllabus:

Composition and classification of wastewater
Analytical techniques in water quality assessment

Physical unit operations – sedimentation, flocculation, flotation

Chemical unit operations – aeration, pH, chlorination, ion exchange

Biological treatment – aerobic/anaerobic treatment, activated sludge, trickling filter

Advanced oxidation processes – ozone, UV, Fenton, photo-Fenton, photocatalysis

Water recycling and desalination

Recommended Reading:

Metcalf and Eddy /Aecom, Wastewater Engineering: Treatment and Resource Recovery 5th Edition, McGraw-Hill International Edition, 2014.