

City University of Hong Kong

**Information on a Course
offered by Department of Biology and Chemistry
with effect from Semester A in 2012 / 2013**

Part I

Course Title:	Pollution Monitoring
Course Code:	BCH6105
Course Duration:	One Semester
No. of Credit Units:	Three
Level:	P6
Medium of Instruction:	English
Prerequisites:	Nil
Precursors:	Nil
Equivalent Courses:	Nil
Exclusive Courses:	Nil

Part II

Course Aims:

In this course, students will develop an overview of air and water monitoring in Hong Kong and elsewhere, and consider the theoretical and practical aspects of the design and execution of pollution monitoring programmes, with particular reference to modern pollution-monitoring technologies. On completion of this course, students should be able to demonstrate an understanding of air and water monitoring programmes in Hong Kong and elsewhere, and be able to design and implement pollution monitoring programmes on a local scale using latest technologies.

Course Intended Learning Outcomes (CILOs)

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

No.	CILOs
1.	Evaluate air and water quality objectives and standards in Hong Kong and elsewhere.
2.	Develop experimental designs and sampling strategies for monitoring programmes and to evaluate their effectiveness in pollution monitoring.
3.	Evaluate the applications of Geographic Information Systems (GIS), remote sensing and telemetry, and mathematical modelling techniques in pollution monitoring.
4.	Interpret pollution monitoring data in a meaningful way to generate a general picture of the ecological status of the monitored site involved.

Teaching and learning Activities (TLAs)

(Indicative of likely activities and tasks designed to facilitate students' achievement of the CILOs. Final details will be provided to students in their first week of attendance in this course)

ILO No	TLAs
CILO 1	Through lectures and tutorial sessions (the latter in small groups) students will examine and evaluate the rationale behind environmental standards developed in Hong Kong and internationally.
CILO 2	In lectures involving case studies, and in small group laboratory and tutorial sessions, students will evaluate monitoring methods based upon physico-chemical and biological monitoring at individual, population and community levels, developing an understanding of the limitations of each in environmental monitoring, and apply their knowledge in the design of practicable pollution monitoring programmes to suit specific monitoring applications
CILO 3	Through involvement in lectures and tutorials, students will be exposed to the principles of GIS, remote sensing, telemetry and modelling, and develop an understanding of the benefits and limitations of these techniques.
CILO 4	Through tutorial sessions, small group oral presentations, and an individual written assignment, students will utilise case histories of pollution monitoring to demonstrate their ability to interpret current and past pollution monitoring data.

The TLAs provided above are indicative of the likely activities that students will undertake in this course. Final details of the individual course components, including large and small group teaching sessions, case studies, discussions and oral presentations, will be provided in the student course documents distributed at the commencement of, or during, the course as relevant.

Assessment Tasks/Activities

(Indicative of likely activities and tasks designed to assess how well the students achieve the CILOs. Final details will be provided to students in their first week of attendance in this course)

ILO No	Type of assessment tasks/activities
CILO 1	In the end-of-course examination, students will evaluate environmental standards in Hong Kong, and show their ability to compare, contrast and evaluate local standards with those in place elsewhere.
CILO 2	In small-group laboratory reports, tutorial sessions and in the end-of-course examination, students will be evaluated on their ability to describe, develop and design environmental monitoring programmes, including the use and relevance of physical and biological monitoring techniques that may be

	involved.
CILO 3	In the end-of-course examination, students will apply the appropriate range of principles, applications, processes and methodologies to examples used in Geographic Information Systems (GIS), remote sensing and telemetry, and mathematical modelling techniques utilised in pollution monitoring.
CILO 4	Small group presentations of literature findings and independent analyses of literature data on selected topics and themes on pollution monitoring, an individual written tutorial assignment and the end-of-course examination will be used to assess students' ability to interpret monitoring data, and to suggest improvements which may make pollution monitoring more effective.

The Assessment Tasks and Activities provided above are indicative of those that students will undertake in this course. Final details of the individual assessment, including short quizzes, tutorial assignments, discussions, case reports, role play exercises, oral presentations and end-of-course examination, will be provided in the student course documents distributed at the commencement of the course.

Starting from Semester B, 2002-03, students must satisfy the following "Minimum Passing Requirement" for BCH courses:

"A minimum of 30% in coursework as well as in examination, in addition to a minimum of 40% in coursework and examination taken together".

Grading of Student Achievement: Refer to Grading of Courses in the Academic Regulations for Taught Postgraduate Degrees.

Grading will be based on students' performance in assessment tasks/activities. Allocation of marks will be as follows: Coursework (including laboratory reports, tutorial assignments and oral presentations), 30%; Examination (3 hrs), 70% (see above table under Assessment Tasks/Activities).

Grade descriptions

The following description is indicative of the grading criteria adopted for assessment purposes:

- A. Student completes all assessment tasks/activities and can demonstrate excellent synthesis of the principles, processes, methodologies, problems and limitations related to various aspects of pollution monitoring in detail. Provides a comprehensive analysis of real-life environmental problems in a complex situation in Hong Kong or elsewhere, with clarity of explanations, logical and advanced justifications, and creative/personal interpretations and view points. Shows evidence of demonstrated use of a range of pollution monitoring techniques appropriately with originality in thought, argument or application, with effective oral and written communication.
- B. Student completes all assessment tasks/activities and can describe and explain principles, processes, methodologies, problems and limitations related to various aspects of pollution monitoring with a high degree of accuracy and thoroughness. Provides a detailed, critical analysis of real-life problems in the Hong Kong environment or elsewhere using appropriate environmental pollution monitoring techniques, with accurate, clear explanations and appropriate justifications. Shows ability in integration of concepts, analysis techniques and applications via clear oral and written communication.
- C. Student completes all assessment tasks/activities and can describe and explain some key principles, processes and methodologies related to various aspects of pollution monitoring. Provides simple but accurate explanations and basic justifications for how pollution monitoring assessment techniques are applied in real-life environmental problems in Hong Kong or elsewhere. Shows evidence of use of oral and written communication clearly.

- D. Student completes all assessment tasks/activities but only can briefly describe isolated principles, processes, methodologies, problems and limitations related to various aspects of pollution monitoring. Demonstrates limited ability in analysis and justification of real-life environmental problems in Hong Kong or elsewhere, with a lack of integrated understanding of applications of pollution monitoring techniques as a whole. Can communicate simple ideas accurately in writing and orally.
- F. Student fails to complete all assessment tasks/activities and/or cannot accurately describe and explain relevant principles, processes, methodologies, problems and limitations related to various aspects of pollution monitoring. Cannot provide appropriate analysis and satisfactory justifications to real-life environmental problems in Hong Kong or elsewhere, and may show evidence of plagiarism or inability to communicate ideas.

Part III

Keyword Syllabus:

- Air and water quality objectives and standards in Hong Kong.
- Experimental designs and sampling strategies of pollution monitoring programmes. Monitoring physico-chemical parameters. Biological monitoring at individual, population and community levels. Limitations in environmental monitoring.
- Applications of Geographic Information Systems (GIS), remote sensing and telemetry, and mathematical modelling techniques in pollution monitoring.
- Analysis and interpretation of pollution-monitoring data.
- Case studies in Hong Kong, China and overseas.

Recommended Reading:

Text(s):

Connell, D.W., Lam, P.K.S., Richardson, B.J. & Wu, R.S.S. (1999). *Introduction to Ecotoxicology*. Blackwell Science Ltd., Oxford. 170pp.

Online Resources:

As directed by instructors

Teaching Pattern:

Duration of course: 1 semester

Suggested lecture/tutorial/laboratory mix:

Lectures: 25H

Tutorials: 5H

Laboratory sessions: 12H