A POLYTECHNIC INSTITUTION

Course Outline

School of Manufacturing, Electronics and Industrial Processes
Program: Chemical Sciences
Option:

CHSC 3413
Environmental Sampling and Analysis

Start Date:	January, 2006				**End Date:**	May, 2006			
Total Hours:	60	**Total Weeks:**	20		**Term/Level:**	4	**Course Credits:**	4.5	
Hours/Week:	3	**Lecture:**	1	**Lab:** 2	**Shop:**		**Seminar:**		**Other:**

Prerequisites

Course No.	Course Name
CHEM 2201	General Chemistry 2

CHSC 3413 is a Prerequisite for:

Course No.	Course Name

■ Course Description

This laboratory course surveys suitable methods of examining many types of water, wastewater, and materials related to control of water quality, soil quality, and others. Typical industrial pollution problems related to local industries are discussed during laboratory periods and special attention is given to proper sampling techniques. A selection is made from the following analysis of field samples: cyanide, pesticides, arsenic, mercury, nitrogen (ammonia, nitrate, organic), oxygen (DO, BOD, COD), surfactants, phosphate, proteins, carbohydrates, lignin, phenols, oil and grease, solid and turbidity, total hardness, and heavy metals.

■ Detailed Course Description

To provide the students with the ability to collect, process and analyze typical water, wastewater, sediments, soil samples and other sample matrix according to standard laboratory techniques.

■ Evaluation

Final Examination	35%	Comments:
Laboratory	30%	
Test(s)	25%	
Assignments	10%	
TOTAL	100%	

■ Course Learning Outcomes/Competencies

Upon successful completion, the student will be able to:

- collect representative samples of air, soil, water, and wastewater by using proper sampling techniques.
- apply appropriate laboratory procedures to process collected air, soil, water, and wastewater samples.
- apply selected analytical chemistry techniques to determine common pollutants in collected samples.
- understand the concepts of quality control and quality assurance procedures.

■ Course Learning Outcomes/Competencies (cont'd.)

- solve problems and correctly complete calculations related to method presented in this course.
- identify and explain the analysis steps for each of the methods given in the course laboratory manual.

■ Verification

I verify that the content of this course outline is current.

Authoring Instructor — Date: Feb 10/06

I verify that this course outline has been reviewed.

Mark McDonald — Program Head/Chief Instructor — Date: Feb 10, 2006

I verify that this course outline complies with BCIT policy.

Dean/Associate Dean — Date: 2006/02/13

Note: Should changes be required to the content of this course outline, students will be given reasonable notice.

■ Instructor(s)

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■ Learning Resources

Required:

Notebook, laboratory coat, and safety glasses.

Recommended:

1. Sawyer and McCarty. 1978. *Chemistry for Environmental Engineering* (3rd ed.), QP 31.2 S28 1978 (on reserve).
2. Manahan. 1991. *Environmental Chemistry* (5th ed.).
3. APHA, AWWA, WPCF. 1989. *Standard Methods for the Examination of Water and Wastewater* (17th ed.), QD 142 A5.
4. Csuros, Maria. *Lab Manual: Environmental Sampling and Analysis.*

■ Information for Students

(Information below can be adapted and supplemented as necessary.)

The following statements are in accordance with the BCIT Student Regulations Policy 5002. To review the full policy, please refer to: http://www.bcit.ca/~presoff/5002.pdf.

Attendance/Illness:
In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with his/her instructor or Program Head or Chief Instructor, indicating the reason for the absence. Prolonged illness of three or more consecutive days must have a BCIT medical certificate sent to the department. Excessive absence may result in failure or immediate withdrawal from the course or program.

Academic Misconduct:
Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited and will be handled in accordance with the 'Violations of Standards of Conduct' section of Policy 5002.

Attempts:
Students must successfully complete a course within a maximum of three attempts at the course. Students with two attempts in a single course will be allowed to repeat the course only upon special written permission from the Associate Dean. Students who have not successfully completed a course within three attempts will not be eligible to graduate from their respective program.

■ Information for Students (cont'd.)

Examination Procedures:
The examination room must be clear of all articles such as coats, briefcases, knapsacks, etc. Students should only be allowed to enter the room with items related to the writing of the exam (i.e., calculators, textbooks in the case of an open book exam, etc.).

Attendance Requirement:
Students must attend all lecture and laboratory sessions. (See BCIT Policy and Procedures: Policy 5201 – Attendance.)

■ Assignment Details

TBA.

Schedule

Date	Outcome/Material Covered
January 10	Introduction to Environmental Sampling and Analysis 1 (lecture)
January 17	Introduction to Environmental Sampling and Analysis 2 (lecture)
January 24	Start and Complete COD (Chemical Oxygen Demand) Start BOD
January 31	Complete BOD Start and Complete Carbohydrates
February 7	Protein
February 14	Cyanide
February 21	Arsenic
February 28	Tannin and Lignin
March 7	**Midterm Exam**
March 13–17	**Spring Break**
March 21	Surfactant
March 28	Phosphate
April 4	Nitrate
April 11	Start Oil and Grease and Hydrocarbon Start Solids and Turbidity
April 18	Complete Oil and Grease and Hydrocarbon Complete Solids and Turbidity
April 25	Total Hardness
May 2	Alkalinity and pH Calcium Carbonate Saturation
May 9	**Review**
May 16	**Final Exam**