

**REM 445 – Fall 2012**  
**ENVIRONMENTAL RISK ASSESSMENT OF HAZARDOUS CHEMICALS**

*COURSE OUTLINE*

**INSTRUCTOR:** Dr. Adrian deBruyn, REM (adebruyn@sfu.ca)

**TEACHING ASSISTANT:** Tao Eastham, REM (teastham@sfu.ca)

The objective of this course is to provide students with theory and practical experience in the area of **applied environmental toxicology**. The course will cover (i) theoretical principles of environmental distribution and toxicity of pollutants, (ii) practical techniques for the assessment of the environmental behaviour, toxicity and ecological & human health risks of contaminants in the environment, and (iii) a critique of current environmental management practices in Canada. Students apply these techniques in a class project. The course material is essential for those expecting to be involved in pollution-related issues.

**CONTENT:**

1. ENVIRONMENTAL BEHAVIOUR OF CHEMICALS: Environmental partitioning, kinetics of environmental distribution, mass balance, mechanisms of transport & transformation, fugacity, environmental modelling
2. EXPOSURE ASSESSMENT: Mechanisms of chemical uptake & elimination in organisms, bioaccumulation, trophic transfer and biomagnification, structure-activity relationships
3. HAZARD & EFFECTS ASSESSMENT: Toxicity of chemical pollutants in organisms, dose-response relationships, toxicity of mixtures of chemicals, ecotoxicity, carcinogenesis
4. RISK ASSESSMENT: Risk quotients, quantitative and probabilistic risk assessment
5. CONTAMINANT MANAGEMENT: Application of scientific principles in current environmental management practices and regulations in Canada, development of standards & human consumption guidelines, environmental quality criteria, monitoring, risk assessment, effluent regulations and others

**FORMAT:** One lecture and one tutorial per week. Tutorials include computer labs and group discussions.

**SCHEDULE:** Thursday, 10:30 - 12:20 (lecture); multiple tutorials

**REQUIRED READINGS:**

The course will make extensive use of "Principles of Environmental Toxicology" by S.F. Zakrzewski, ACS Professional Reference Book, and "Multimedia Environmental Models" by D. Mackay, Lewis Publishers. Books are available in the SFU bookstore. In addition, the course will refer to a number of scientific papers, which will be distributed at the beginning of the course.

**EVALUATION:**

Students are evaluated based on two assignments (20% and 35% of the final mark), one term project (30%), and class/tutorial participation (15%).