Instructor: Associate Professor, Linda Schweitzer  
Office: 289 SEB (Science and Engineering Building)  
Office hours: MW 230-5:30PM unless noted; also by appointment or after class  
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Prereqs: Bio 111, 113; Chem 234  
Textbook: none  
Course Materials: Regulatory Guidance Documents available on web  
Course Notes handed out in class and posted on Moodle (replaces WebCT)

Grading and Assessment: Straight Scale (e.g, 95%-100% = 4.0).  
Quizes (2): 20% each. Final Exam: 25%. Homework: 20% In-Class activities: 15%  
Attendance not graded. Make-ups only with prior permission (or certified emergencies)

Important Dates:  
Sept. 4: last day SAIL registration; class begins  
Final Exam: Dec. 12 (Wed.) 7-10 PM

Related ENV Courses: not required, but helpful  
368 Haz Materials Regulation, 452 Pollution Prevention, 461 Env Law and Policies  
484 Toxicology

What is Toxic Substances Control?  
TSC is a multifaceted approach to reducing toxic substances and reducing exposure to them in the environment, home, and occupational settings. The most important strategy in reducing exposure to toxic substances is by reducing their manufacturing, transportation, use and disposal. The mantra of the environmental movement is, “Reduce, Reuse, Recycle….in that order”. Implied within, is replacement of toxic substances with less toxic alternatives.

Goal: To protect human and ecological health; instill ethics, concern and competency for future practitioners in industry or environmental field dealing with toxic substances

Learning Objectives – conduct quantitative and qualitative human and ecological risk assessments; examine case studies and be able to critically evaluate industrial processes and offer meaningful alternatives to the generation of toxic substances and hazardous wastes; understand the role of the regulatory agencies; understand basic environmental laws and citizen’s rights

This course will focus mostly on risk assessment, specifically methods of Human and Ecological Risk Assessment according to Federal and State (not necessarily Michigan) Regulatory Guidance documents. This course was designed to address issues pertinent to TSC without too much redundancy with the other related courses listed above, but there will be some discussion of pollution prevention and source reduction. Select environmental laws and policies will be discussed, and basic concepts in toxicology will be presented as they relate to the risk assessment process.
Topics (Schedule will tentatively follow this order)

I. Introduction to Toxic Substances: Chemicals of concern - Examples:
   Aromatic and Aliphatic Hydrocarbons, halogenated and unhalogenated of many types
   Inorganic chemicals - metals
   Atmospheric: airborne particles and their properties, radon, VOCs
   Those classified by physiochemical properties or Material Safety Data Sheets (MSDS)
   Emerging chemicals of interest: endocrine-disrupting compounds, pharmaceuticals &
   personal care products, Nanoparticles/Nanotechnology, bioaccumulating & persistent

II. Persistence, occurrence, general concepts of fate and transport
   Where and how are chemicals generated? What happens to them?
   Chemical releases to air, water, land. Resources on the web.

III. Basic concepts
   source reduction and waste minimization, replacements, best management practices,
   major environmental laws

IV. Toxicological Considerations for human and ecological risk assessment:
   Dose-response relationships, thresholds, risk factors, reproductive toxicants, carcinogens,
   and other endpoints; bioavailability, bioaccumulation, biomagnification

V. The Risk Assessment Process
   1. Exposure Assessment
   2. Human Health Risk Assessment
   3. Ecological Risk Assessment
   4. Remedial Action

VI. Ethics, Advocacy, Citizen’s Civil Actions, Right-to-Know
   Corporate ethics [“The Corporation”]; Environmental justice movement,
   environmental advocacy groups

Policy on Academic Misconduct
   The University's regulations that relate to academic misconduct will be fully enforced.
   Any student suspected of cheating will be referred to the Academic Conduct Committee.
   Students found guilty of academic misconduct may face suspension or permanent
   dismissal.