GRADUATE-LEVEL COURSE EOH 2122

SPRING TERM 09-10
TRANSPORT AND FATE OF ENVIRONMENTAL AGENTS
SYLLABUS

Course Director: Conrad (Dan) Volz, DrPH, MPH, Assistant Professor. This **3-credit** course is intended for public health students who may have taken few college-level chemistry and perhaps no physics classes. Pre-requisite: EOH 2121, or equivalent (e.g. EOH 2309) as determined by the instructor.

Textbook: Chemical Fate and Transport in the Environment by H.F. Hemond & E.J. Fechner-Levy, Academic Press, 2nd Ed. (2000).

Schedule: 2 classes per week from 5pm to 6:20pm on Mondays and Wednesdays, Room A216 PH

Instructor's Office Hours: By Appointment on Wednesday mornings from 8am to 11am. Book with Dr. Volz's Administrative Assistant, Sara Gillooly, seg14@pitt.edu.

Contact Information:

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Description: This course presents in a quantitative fashion the passage, transformation and eventual fate of various biological, chemical and physical agents through the environment, home and occupational settings. Included are consideration of atmospheric transport, surface and groundwater sediments, indoor transport and ventilation, chemical degradation, bioaccumulation and movement through food chains. The material is presented in an intuitive fashion rather than within a rigorously mathematical framework. This approach is intended to address students who may simply require a basic literacy in environmental transport and fate processes in addition to those who will ultimately be pursuing a degree in environmental science.

Objectives: The goal is to teach students from diverse backgrounds both to not only understand relevant concepts, but also be able to work quantitative problems, employing practical numerical models, dealing with the transport and fate of environmental agents.

Grades: Based on class participation (10%), homework problems (30%), and a midterm and final examination (each 30%).

Content: The following topics will be covered in the lectures and the material will be reinforced by assigning weekly sets of homework problems.

Week 1:	1. Introduction – advection, dispersion, transformation.
	2. Free energy and chemical equilibria.
Week 2:	3. Chemical kinetics versus equilibria.
	4. Distribution between phases.
Week 3:	5. Physical transport in surface waters.
	6. Air-water exchange.
Week 4:	7. Characteristics of surface waters.
	8. Abiotic chemical transformations.
Week 5:	9. Dissolved Oxygen and Introduction to Biotransformation
	10. Biotransformation and Biodegradation including Bioconcentration
Week 6	Catch-up on Problems and Research Lectures- Chain of Causation of Water Related Problems
Week 7	Review for Midterm Exam and the Midterm Exam
Week 8	Physics of groundwater movement
Week 9	Flow in the Unsaturated Zone, Flow of Nonaqueous Phase Liquids
Week 10	Retardation and Biodegradation
Week 11	The Atmosphere, Stability and Circulation
Week 12	Transport and Removal of Agents in the Atmosphere
Week 13	Atmospheric Reactions and Global Climate Change
Week 14	Approaches to modeling the atmosphere
Week 15	Review and Final Examination

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Posting of Lectures and Homework Assignments: All lectures with accompanying homework assignments are presented at http://www.chec.pitt.edu. Go to the site, click on Info for Experts and then Academic Courses-click on EOH 2122: Transport & Fate of Environmental Agents to find lectures. Lectures will be updated frequently, so check back for updates over the course of the class.

Academic Integrity: All Students are expected to comply with the University of Pittsburgh's Policy on Academic Integrity. http://www.pitt.edu/~graduate/ai1.html Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an examination, including dictionaries and programmable calculators.

Disabilities: If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and the Disability Resources and Services, http://www.drs.pitt.edu.

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