

CEE 204 – Introduction to Environmental Assessment and Remediation

Catalog data: **20-CEE-204.** *Introduction to Environmental Assessment and Remediation*. 3 ug. cr. Principles of biochemistry and organic chemistry needed for environmental site assessment and remediation strategies.

Textbook: Readings and notes posted on Blackboard and other resources provided by guest lecturers. Optional reference: *Chemistry for Environmental Engineering and Science*, 5th ed, C.N. Sawyer, P.L. McCarty, and G.F. Parkin, McGraw-Hill Companies, Inc., New York, NY, 2003.

Instructor: **Dr. Margaret J. Kupferle**, Assistant Professor,
Department of Civil and Environmental Engineering,
701H ERC, 513-556-3329, Margaret.Kupferle@uc.edu
(with other Environmental Engineering and Science program faculty)

Goals: Introduce the basic principles of biochemistry and organic chemistry needed for environmental site assessment and remediation strategies, illustrating current issues in environmental engineering using a case study approach. Introduce second year civil and environmental engineering students to the environmental engineering faculty and areas of specialization related to environmental chemistry.

Lecture topics:	Introduction	Environmental Issues – water, wastewater and water pollution control, industrial and hazardous wastes, air pollution and global environmental change Risk Assessment – USEPA guidelines, 4-step process
	Organic Chemistry	Aliphatic Compounds – hydrocarbons, alcohols, aldehydes, ketones, acids, esters, ethers, halogenated, nitrogen-containing, cyclic, sulfur-containing Aromatic Compounds – hydrocarbons, phenols, alcohols, aldehydes, ketones, acids, nitrogen-containing Heterocyclic Compounds Behavior of Organics in Environment/Engineered Systems Exam I (25% final grade ~October 11th)
	Biochemistry	Biochemical reactions – enzymes, cofactors, temperature effects, pH, major and trace elements, biodegradation Food-Related Organic Compounds – carbohydrates, fats, oils, waxes, proteins, amino acids General Biochemical Pathways Energetics and Bacterial Growth Xenobiotic Organic Compounds – detergents, pesticides, endocrine-disrupting compounds, pharmaceuticals Novel Biotransformations Molecular Biology and Genetic Engineering Exam II (25% final grade ~November 1st)
	Current Issues and Case Study Topics	Microbes and Infectious Disease Modes of Exposure to Contaminated Drinking Water Pollution Prevention/Industrial Waste Management Industrial Air Pollution and Control Organic Air Pollutants: VOCs, PAHs, Dioxins Water Treatment and Advanced Oxidation Technologies Electrochemical Treatment of Wastewater Remediation of Hazardous Materials Exam III (25% final grade – December 6th, 8-10 am)

Grading: 75% exams (3 exams total)
20% regulated contaminant project (3 parts total)
5% “current environmental issues” presentation
