

EESD32 – CONTAMINANT FATE IN TERRESTRIAL ENVIRONMENTS
-20008-09-

Instructor: Prof. MJ Simpson

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Office hours: to be announced OR by appointment (email at least 24 hours in advance for an appointment)

LECTURE: Thursdays from 10am-12pm in room BV 340

COURSE DESCRIPTION

This course will present fundamental chemical concepts and reactions that occur in soils with emphasis on contaminant behavior. Students will learn the basics of soil chemistry and how these processes relate to quantities, attenuation, sequestration, and movement of ions, heavy metals, and organic molecules in terrestrial environments.

COURSE PREREQUISITES

Students must have successfully completed EESB05 (Principles of Soil Science) AND CHMB55 (Environmental Chemistry) before taking this course.

RECOMMENDED TEXTBOOK

“Environmental Soil Chemistry”, second edition. 2003. Donald L. Sparks. Academic Press, USA (available from the UTScarborough bookstore).

GRADE BREAKDOWN

Computer modeling assignment (Due: Oct 16th)	15%
Method of Analysis discovery assignment (Due: Nov 6th)	15%
Contaminants in Soil discovery assignment (Due: Nov 27th)	15%
Midterm Test (Oct 30th)	20%
Comprehensive Final Exam	35%

LECTURE NOTES

Lecture notes are available via the intranet. Files are posted in *.pdf format and you will require Adobe Reader to open the files (available free of charge at www.adobe.com).

COURSE EMAIL POLICY

Email is not an effective way of teaching. Email inquiries regarding course materials will not be answered. If you have questions, then please come and see me during office hours or make an appointment to see me.

NOTES:

Late assignments will not be accepted and assigned a grade of zero.

Plagiarism will not be tolerated. Students are expected to submit **individual work** for grading. It is an academic offense to plagiarize and those who do, will be subjected to University procedures.

LECTURE SCHEDULE

Date	Topic	Associated Readings in Textbook
September 11th	Course orientation Introduction to chemical processes in soil environments Review of soil minerals and soil organic matter chemistry	Chapters 1, 2 and 3
September 18th	Review of soil minerals and soil organic matter chemistry (continued) Soil solution and solid phase equilibria	Chapter 4
September 25th	Soil solution and solid phase equilibria (continued)	
October 2nd	Ion exchange processes in soil	Chapter 6
October 9th	Kinetics of chemical processes Redox chemistry of soils	Chapter 7 Chapter 8
October 16th	Chemistry of saline and sodic soils	Chapter 10
October 23rd	Sorption phenomena in soils	Chapter 5
October 30th	Midterm examination (in class)	
November 6th	Methods of analysis used to assess soil contamination	Supplemental information to be posted
November 13th	Organic chemicals in soil	Supplemental information to be posted
November 20th	Organic chemicals in soil (continued) Heavy Metals in soil	Supplemental information to be posted
November 27th	Heavy metals in soil (continued)	