

**"CONTAMINANTS HYDROGEOLOGY"**  
**(EESD02H3)**

**Instructor:** Dr. Silviya Stefanovic

**Lecture:** Monday 7–10pm; BV355

**Office:** SW-648

**Office hours:** Monday 6-7pm  
Friday 3-4pm

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**Intent of the course:**

Natural hydrochemical processes; the use of major ions, minor ions, trace metals and environmental isotopes in studying the occurrence and nature of ground water flow. Point and non-point sources of ground water contamination and the mechanisms of contaminant transport.

**Prerequisite:** At least 1 full credit in Environmental Science at the C-level.

**Breadth Requirement:** Natural Sciences

**Text:**

“Contaminant Hydrogeology”, C. W. Fetter, 2008, 2nd Edition, Prentice Hall.

**Lecture notes:**

The lecture slides will be posted in \*.pdf format on the Blackboard. You will require Adobe Reader to open the files (available free of charge at [www.adobe.com](http://www.adobe.com)).

**Course email policy:**

Email is not an effective way of teaching and email inquiries regarding course materials will not be answered. Dr. Stefanovic will be available during designated office hours to answer questions regarding course material. If you have questions, then please see instructor during office hours – this time is for you so please do not hesitate to use it.

<b>Grading:</b>	Assignments (3)	40% (Ass. #1- 10%, Ass#2 and 3- 15 % each)
	Seminar	15%
	Participation	5%
	Final Examination:	40%

**Assignments:**

You will have three group assignments (maximum 2 students per group) during the term. You will be able to access the problem sheets on the Blackboard at the times detailed below. More details on the assignments will be circulated during the term.

<i>Topic</i>	<i>On the Blackboard</i>	<i>Submission Due</i>
Assignment #1	Jan.27 <sup>th</sup>	Feb.3 <sup>rd</sup>
Assignment #2	Feb.10 <sup>th</sup>	Feb.24 <sup>th</sup>
Assignment #3	Mar.3 <sup>rd</sup>	Mar.17 <sup>th</sup>

### Seminar:

Teams of maximum two students will each be assigned a specific subsection of the studied major contaminant hydrogeology area. Each team will need to review at least ONE recent research paper (from the last 10 years) and to prepare a short power point presentation (15 min) of these reviews (findings). The rest of student will need to submit hand written summary of the presentation for participation mark.

### Final Exam:

The final examination is worth 40% of the final grade for the course. It will be a combination of "fill-in-the-blanks", short answer questions and calculations.

The final exam will draw from lectures and student's presentations and includes lecture notes and any material presented in the classroom. Information from the textbook and other resources not directly covered in class will not be tested on exams. More details about the exams will follow.

### Other Course Policies:

Late assignments will not be accepted and assigned a grade of zero. Extensions will be granted ONLY with medical note or under exceptional circumstances. You instructor must be informed about that immediately.

Plagiarism will not be tolerated. Each group is expected to submit **individual work** for grading. It is an academic offense to plagiarize and those who do, will be subjected to University procedures (see the University calendar).

### Lecture topics:

1. Introduction, ground rules, expectations and course structure.  
Introduction to Contaminant Hydrogeology;  
**Video:** The Nature of Earth: Introduction to Geology Jan. 6<sup>th</sup>
2. Types and sources of the contamination; Groundwater Chemistry Jan. 13<sup>th</sup>
3. Principles of Groundwater Flow Jan.20<sup>st</sup>
4. Capture Curve Analysis  
*Assignment #1 – Tutorial* Jan.27<sup>th</sup>
5. Contaminant Partitioning in the Subsurface Environment Feb. 3<sup>rd</sup>
6. Transport of Passive Contaminants  
*Assignment #2 – Tutorial* Feb.10<sup>th</sup>
7. **FAMILY DAY. UNIVERSITY CLOSED** Feb.17<sup>th</sup>
8. Transport of Reactive Contaminants Feb.24<sup>th</sup>
9. *Assignment #3 – Tutorial*  
Problem Set Solving (tutorial) Mar.3<sup>th</sup>
10. Abiotic and Biotic Contaminant Transformations in Subsurface Waters Mar.10<sup>th</sup>
11. Isotope Hydrology and Applications in Hydrogeology Mar.17<sup>th</sup>
12. Climate Change Impacts on Groundwater Quality Mar. 24<sup>th</sup>
13. Course Review Mar. 31<sup>st</sup>

*I will follow this schedule as closely as possible, but things being what they are, some of these topics may "overflow" over into other time slots.*