

Remediation of Soils and Groundwater

Fall 2025

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Course organization

- Lecture: 2 periods
 - Presentation of material, quantitative examples
- Problem session: 2 periods
 - Preparation for exam and for project
 - Should have worked on the problem before the session
 - Work together in groups
 - Present material to rest of class
 - Not: the time to look at the problems for the first time
 - Not all homework assignments will be explicitly discussed in class
- Project: throughout the semester

Course organization

- Project:
 - Groups of 2-4 (self-assembled)- set by Sept 17th
 - Assigned raw data about a contaminated site
 - Summary of the relevant data => October 8th
 - **Present case study on a remediated site (assigned) => October 15th**
 - Selection of remediation strategy => November 12th
 - **Report => January 9th**
- **Final exam:** Dec 3rd, 3 periods, course notes allowed (but not homework)
- **Project presentation:** exam period, 20 minutes of presentation and 10 minutes of questions
- Grade distribution: 10% case study, 30% report, 20% presentation, 40% final exam
- In bold: graded assignments/exams

Course organization

- Project:
 - Identify the contamination (concentration, location)
 - Consider the best strategy for remediation
 - Design the remediation strategy
 - Be quantitative! All data are not available but make assumptions and provide a quantitative design
 - Estimate the cost (input from engineering firm and US website)
 - Detailed questions about the design at the oral presentation
 - Three deliverables: data summary, selected strategy and report
 - Case study presentation (for another site) part of the grade
 - Field trip to soil processing center

Course organization

- Data summary (not graded):
 - Provide an organized summary of the data so that it is easy to access them.
 - Go through the document(s) provided and extract the relevant data: contaminant types, concentrations, and locations (including depth).
 - Beneficial to map the contaminants
 - This assignment is due by 5p on October 8th (not graded).
 - You will receive feedback within 2 weeks. No feedback will be provided if the document is turned in late.

Course organization

- Selection of remediation strategy (not graded):
 - Present the remediation strategy you selected for your site.
 - Why did you select it, where and when will you implement it?
 - This assignment is due by 5p on November 12th (not graded).
 - You will receive feedback within 2 weeks. No feedback will be provided if the document is turned in late.

Course organization

- Report (graded):

- The report should be 15-20 pages (plus appendices, if relevant).
- Include a brief description of the site and the contaminants and any particular challenges.
- Summarize your remediation approach and how it would be applied to this site, highlight your major findings and recommendations and clearly outline the advantages and disadvantages of the approach you are considering for this site.
- Be quantitative in your design.
- You will need to make assumptions about the site, state those assumptions and use them for your calculations.
- The report needs to be clearly structured, and information should be organized in a logical manner.
- The report is due January 9th by 5p as an electronic version sent by email to the instructor. No excuses (short of hospitalization) will be accepted. Penalty for late submission.

Course organization

- Case study presentation (graded):
 - Each group will present part of a case study (of a remediated site)
 - Assignments will be provided once the groups are formed
 - An example presentation will be given on October 1st
 - An oral presentation will be given by each group (on October 15th).
 - You will receive the document two weeks before you are due to present, so October 1st.

Schedule

- First 11 weeks, lecture, problem session, field trip, exam preparation, and project:
 - Contaminant properties
 - Microbial processes and their monitoring
 - Physicochemical monitoring
 - Vapor phase processes
 - Land and soil treatment and soil washing
 - Adsorption
 - In situ groundwater bioremediation
 - Physicochemical remediation and barriers
- Last 3 weeks, exam and project