ENE-662 – 851: Site Remediation

(3 credits)

Lectures Asynchronous Online Course

Instructor Maria Coler
Anytime: By Appointment
Virtual
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Office Hours: Mon: 6-7P

Prerequisite Undergraduate Civil or Environmental Engineering degree

Required Textbook

Reading materials are provided on the website.

Other Recommended Texts & Reading

"Exposure," by Robert Bilott; Dramatized in the Movie, Dark Waters.
"A Civil Action," by Jonathan Harr; Dramatized in the movie, A Civil Action.

Course Description *(from NJIT's course catalog)*

This course will provide students with an understanding of how to assess and remediate a brownfield site in the State of New Jersey: from conducting a Preliminary Assessment to constructing a conceptual site model to choosing a remediation strategy. Emerging contaminants and the concepts of resilient and sustainable remediation are explored. In addition, the course contextualizes brownfields in the broader sustainability movement by providing a broad legislative overview and the evolution of public awareness of the ubiquity of brownfield sites.

http://catalog.njit.edu/undergraduate/newark-college-engineering/civil-environmental/civil-engineering-bs/

Course Objectives (General)

By the end of this course, the student will be able to:

Course Topic 1: the legislative and historical contexts in the United States and the State of New Jersey which define a brownfield and regulate the assessment and remediation of brownfield sites. Learn why brownfields are the building blocks of a sustainable future.

Course Topic 2: Learn the fundamentals of constructing a conceptual site model (CSM) in the State of New Jersey: from the Preliminary Assessment, to the site investigation, to the remedial investigation. A CSMs defines the source, nature, extent, fate and transport of contaminants in the environment. You will learn the iterative approach to constructing an effective CSM.

Course Topic 3: Understand the role of the CSM in conducting a feasibility study and selecting the appropriate remediation strategy.

Course Topic 4: Become familiar with ex-situ and in-situ remediation technologies often employed at contaminated sites.

Course Topic 5: Become familiar with the emerging contaminants affecting the brownfield industry and the various federal and state regulations.

Course Topic 6: Learn about the concept of ecological uplift and how brownfields are serving as the sites of clean energy redevelopment projects.

POLICIES & PROCEDURES

Academic Integrity: It is expected that NJIT's University Code on Academic Integrity will be followed in all matters related to this course. Refer to NJIT's Dean of Students website to become familiar with the Code on Academic Integrity and how to avoid Code violations.

https://www.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf

Communication: All communications should be via email, unless otherwise specified.

Lectures/Class: Students must be present for the first lecture

Handouts: Handouts will be made available online.

Homework: Students are expected to read all course materials.

Homework Format: N/A

Late Homework: N/A

Homework Solutions: N/A

Exams: Students can use course materials for certain quizzes and exams.

Calculation of Course Grade: A weighted average grade will be calculated as follows:

Describe how your assignments, exams, quizzes, projects, etc. are weighted.

Homework	N/A
In-Class Quizzes	15%
Mid-Term	40%
Final	45%
Extra Credit	Up to 20% of Lowest Quiz Score

The minimum requirements for final letter grades are as follows:

A = 90%, B+ = 85%, B = 80%, C+ = 75%, C = 70%, D = 65%, F < 65.0%

Grades will not be curved.

Instructor Commitment: You can expect the Instructor to be courteous, punctual, organized, and prepared for lecture and other class activities; to answer questions clearly; to be available during office hours or to notify you beforehand if office hours are moved; to provide a suitable guest lecturer or pre-recorded lecture when they are traveling or unavailable; and to grade uniformly and consistently.

Students with Documented Disabilities: NJIT is committed to providing students with documented disabilities equal access to programs and activities. If you have, or believe that you may have, a physical, medical, psychological, or learning disability that may require

accommodations, please contact the Coordinator of Student Disability Services located in the Center for Counseling and Psychological Services, in Campbell Hall, Room 205, (973) 596-3414. Further information on disability services related to the self-identification, documentation and accommodation processes can be found on the webpage at: (http://www.njit.edu/counseling/services/disabilities.php)

Course Schedule: Include a table with a preliminary schedule including estimated exam dates, course topics, project dates, etc.

BROWNFIELDS AS THE BUILDING BLOCKS OF A SUSTAINABLE FUTURE: LEGISLATION, INVESTIGATION, AND REMEDIATION

Date	Quiz/Exam	Assignment	Description of Session	Lecturer	Reading Materials
Class 1		Read documents	Awareness + Action in the U.S.: Brownfields as the Building Blocks of a Sustainable Future	MC	EPA Documents + WH.gov documents+ Waterfront Alliance Article (Federal Environmental Laws, and IRA + BIL)
Class 2		Read documents	Lessons from the Environmental Canon: "Silent Spring," "Love Canal," "A Civil Action," "Exposure", "Sites Unseen."	MC	Excerpts from: "Silent Spring," "Love Canal," "A Civil Action," "Sites Unseen," "Exposure" Excerpts and Outlines.
Class 3		Read documents	Site Remediation in New Jersey: Spill Act, SRRA, ARCCS, Technical Requirements for Site Remediation	MC	SRRA, ARCCS, TRSR
Class 4			New Jersey Guidance Documents : A Survey of Topics	MC	Select Guidance Docs
		Read documents	History, Environmental Legislation, New Jersey Site Remediation Framework		
	Quiz (7.5%)		**Quiz: Legislative History**		
Class 5		Read documents	Building a CSM: Starting with Due Diligence--NJ Preliminary Assessment v. Phase I ESA	MC	Preliminary Assessment Guidance + ASTM Standard Practice for Phase I ESAs
Class 6		Read documents	Building a CSM: SI/RI- Strategy and Purpose	MC	Soil and Groundwater Investigation Guidance Documents
Class 7		Read documents	Building a CSM: SI/RI- Investigation Techniques	MC + Guest	PPT and Other Documents
Class 8	**Mid-Term: 40%**		**Mid-Term Exam: Build a CSM for a Case Study**	**MC**	
Class 9		Read documents	Feasibility Studies + Ex-situ Remediation	MC	PPT + NJDEP Guidance + Other Documents
Class 10		Read documents	Insitu Remediation Technologies: Part I	MC + Guest	PPT + Other Documents
Class 11		Read documents	Insitu Remediation Technologies: Part II	MC + Guest	PPT + Other Documents
Class 12			Sustainable Remediation	MC + Guest	PPT + Other Documents
	Quiz: 7.5%	Read documents	**Quiz: Choose a Remedy for a Case Study and Explain Why.**		
Class 13		Read documents	Emerging Contaminants	MC + Guest	PPT + ITRC Documents
Class 14		Read documents	Regenerative Remediation + Green Energy Projects on Brownfield Sites	MC + Guest	PPT + ITRC Documents
Class 15	**Final Exam: 45%**		**Final Exam: All Topics Covered in Classes 1-15.**		
	Extra Credit: 20 pts max on lowest quiz grade		**1000-1500 Word Essay: Topics TBD: Send Essay Topic by Class 10**		

CEE Mission, Program Educational Objectives and Student Outcomes

The mission of the Department of Civil and Environmental Engineering is:

- to educate a diverse student body to be employed in the engineering profession
- to encourage research and scholarship among our faculty and students
- to promote service to the engineering profession and society

Our Program Educational Objectives are reflected in the achievements of our recent alumni:

1. Engineering Practice: Alumni will successfully engage in the practice of civil engineering within industry, government, and private practice, working toward safe, practical, resilient, sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.
2. Professional Growth: Alumni will advance their technical and interpersonal skills through professional growth and development activities such a graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as business and law through further education.
3. Service: Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Our Student Outcomes are what students are expected to know and be able to do by the time of their graduation:

1. an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies