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CE 647-101: Geotechnical Aspects of Solid Waste

Jay Meegoda

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Meegoda, Jay, "CE 647-101: Geotechnical Aspects of Solid Waste" (2018). *Civil and Environmental Engineering Syllabi*. 29.
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JOHN A. REIF, JR. DEPARTMENT OF
**CIVIL AND ENVIRONMENTAL
ENGINEERING**



CE 647 Geotechnical Aspects of Solid Waste
Section: 101

Fall 2018

Text: None, just class notes

Reference Books:

- Solid Waste Engineering-A Global Perspective, third edition by W.A. Worrel, P. A. Vesilind and C. Ludwig, Cengage Learning, ISBN-13:978-1-305-63520-3
- Geotechnology of Waste Management; by Issa S. Oweis and Raj P. Khera; Publishers, Brooks/Cole, Thomson Learning, ISBN: 0534-94524-4
- Landfill Notes by David J. Elton and John J. Bowders, Jr. 2004
- X. Qian, Robert M. Koerner, Donald H. Gray; Geotechnical Aspects of Landfill Design and Construction; Prentice Hall. ISBN: 0-13-012506-7
- Hari D. Sharma, Sangeeta P. Lewis; Waste Containment Systems, Waste Stabilization, and Landfills; by John Wiley and Sons, ISBN: 0-471-57536-4
- Koerner, R. (1998) Designing with Geosynthetics, 5th ed., Prentice-Hall, NJ.
- McBean, E.A. Rovers, R.A., Farquhar, G.J. (1995) Solid Waste Landfill Engineering and Design, Prentice Hall PTR, NJ.
- Noble, G. (1992) Siting Landfills and Other LULUs, Technomic Publishing Co. Lancaster, PA.
- Tchobanoglous, G, Theisen, H. and Vigil, S. (1993) Integrated Solid Waste Management. McGraw-Hill, New York, NY.

Instructor: Dr. Jay N. Meegoda, Ph.D, PE, 221 Colton Hall, 973-596-2464,
Fax: 973-596-5790, meegoda@njit.edu, homepage: <http://web.njit.edu/~meegoda/>
Office Hours: M and R 10:30-11:30, W: 4:00 to 6:00 PM and any other time
when I am in my office.

Prerequisite: A successfully completed undergraduate course in soil mechanics during past 5 years.

Week	Topic
1-2	Introduction, Sustainable Waste Management
2-3	Regulations, Siting, Permitting and Design Consideration
4	Waste Acceptance, Deposition and Compaction

5-7	Detection and Control of Contamination, Liner Design, Construction and Testing
8	Midterm
9	Slope Stability, Settlement and Seismic Stability
10	Cover Design
11	Landfill Gas Generation and Collection
12	Leachate Generation, Collection, Design of Leachate Collection System Treatment and Recirculation
13	Landfill Post-construction Monitoring, Landfill Closure and Redevelopment
14	Term Paper presentation
15	Final Examination

In this class we will be designing an actual landfill with filed data

- Homework is due at the beginning of each class meeting.
- You are encouraged to ask questions about the homework in class.
- Students are responsible for chapter and problems.

Term Paper and Presentation:

- Submit topic for presentation on 09/26/2018
- Submit a list of references and an outline of the presentation on 10/10/2018.
- Term Paper must be submitted on 11/28/2018.
- Date of presentation will be 12/12/2018.
- Outline of the presentation must be distributed to the class before the presentation.

Some suggested student projects/topics for term paper

- Management of Waste
- Siting/Permitting
- Design Considerations
- Liner Design
- Leakage Detection Design
- Slope Stability, Foundation & Waste Settlement
- Landfill Construction
- Landfill Operation
- Seismic stability
- Final Cover
- Erosion control
- Evaluation after construction
- Case Histories
- Landfill Failures
- Landfill Mining
- Landfill Gas Management
- Bioreactor Landfill Design
- Composting

A typical paper might contain (as appropriate):

- Introduction to the subject

- History of the subject
- Current solutions to the problem
- Need for further work on the problem
- New ideas for the problem

Grading

- Homework 10%
- Midterm 30%
- Final 30%
- Paper and Presentation 30%

Note: The NJIT Honor Code will be upheld, and that any violations will be brought to the immediate attention of the Dean of Students.

Also, students will be consulted by the instructor for modifications or deviations from the syllabus.