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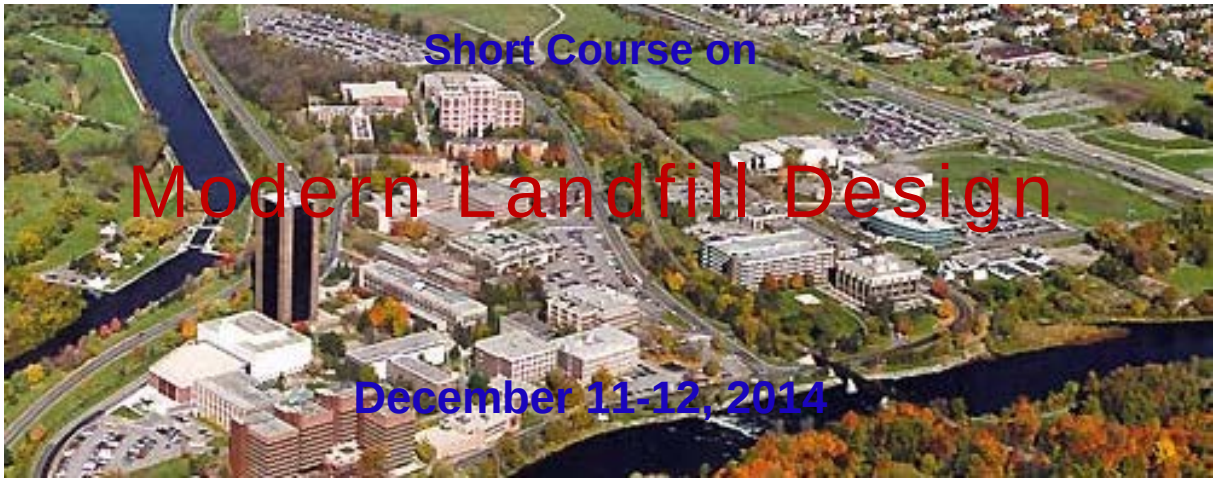

The Department of Civil and Environmental Engineering of Carleton University is pleased to announce a Short Course on Modern Landfill Design, to be held at Carleton University on Dec. 11-12, 2014.

Course description

This short course will focus on the analysis and design of municipal solid waste landfills to minimize contamination of ground water. Most engineers with responsibility for design and construction of containment and barrier systems need a working understanding of basic concepts to gain confidence in dealing with a variety geoenvironment related problems that they encounter on engineering projects. This course is designed so that participants can better understand modern landfills and learn from experts in geoenvironmental engineering on how to design a safe and sustainable landfill. All key concepts and guidelines will be explained and emphasis will be placed on the practical application of the information provided.

Who should attend?

This course would be beneficial to all environmental and civil engineering practitioners and especially to those involved in the design, approval and maintenance of landfills and any other hydraulic barrier systems, such as: civil, municipal, environmental and construction engineers, consulting engineers, plans review personnel in municipalities, public works professionals, plant engineers, who are involved with containment systems, technicians and specialists, geologists and earth scientists, environmental engineers who want to understand landfills or any other hydraulic containments. The course will be of value both for those who are new to landfills as well as to those who have experience with landfills.

Registration

Click here for online registration (http://forms.carleton.ca/engineeringanddesign/cee-events/short-course-on-modern-landfill-design). If you'd like to register with a cheque or bank draft please complete the registration form shown on the last page.

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Modern Landfill Design – Short Course Program

Day 1	Thursday December 11, 2014
08:00 – 08:30	**Welcome and Course Introduction**
08:30 – 10:00	**Municipal solid waste** Municipal solid waste composition and management, engineering properties of waste
10:00 – 10:30	**Break and Discussion**
10:30 – 12:00	**Landfill site investigation** Landfill site investigation, site selection, and subsurface investigation, principles of situating the landfill, blowout, and excavation.
12:00 – 13:00	**Lunch**
13:00 – 14:30	**Landfill leachate** Landfill leachate generation, volume and composition of leachate, HELP program, cover design, long-term performance of cover.
14:30 – 15:00	**Break and Discussion**
15:00 – 16:30	**Landfill liners** Landfill barrier systems: compacted clay liners (CCL), geosynthetic clay liners (GCL), geomembranes, leachate compatibility.
Day 2	**Friday December 12, 2014**
08:30 – 10:00	**Contaminant transport** Contaminant transport modelling, POLLUTE program, integration of hydrogeology with design.
10:00 – 10:30	**Break and Discussion**
10:30 – 12:00	**Leachate collection system** Design of Leachate Collection Systems (LCS), clogging.
12:00 – 13:00	**Lunch**
13:00 – 14:30	**Gas collection system** Bioreactor landfills, Landfill gas, gas collection system.
14:30 – 15:00	**Break and Discussion**
15:00 – 16:30	**Monitoring and contingency plan** Landfill stability analysis, Landfill control and maintenance, operation development and environmental monitoring, contingency measures.
16:30 – 17:00	**Adjournment**

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After participating in this course you will be able to:

- understand the principles of landfill design, and identify issues and challenges associated with the design of landfills and other barrier systems.
- determine appropriate site exploration and laboratory characterization programs suitable for landfill projects.
- prescribe design requirements that are consistent with the environmental provisions in the national and provincial standards.
- your comprehensive understanding of many of the basic concepts of landfill design to increase your effectiveness on your projects where contaminant migration is involved, and demonstrate your newly acquired skills if you are working in a support capacity in geoenvironmental engineering practice.

Course Instructors

Dr. **Paul Van Geel** is a Professor of Environmental Engineering and the chair of the Department of Civil and Environmental Engineering at Carleton University. Dr. Van Geel's research efforts have focused on site remediation and waste management. Dr. Van Geel has also been Chair of the Ottawa Geotechnical Group, a local group of 90+ geotechnical/geoenvironmental engineering. He was an invited speaker for INSIGHT's Canadian Waste Management Conference - Exploring Best Practices in Sustainable Waste Management, which included invited presentations by Mr. Rod Bryden of Plasco Energy and Mr. John Foden of the Canadian Energy-From-Waste Coalition; all waste-to-energy technologies.

Dr. **Paul Simms** is an Associate Professor of Geo-environmental Engineering at the Department of Civil and Environmental Engineering. He is a well-known researcher in geo-environmental engineering and most his research works are focused on unsaturated soil mechanics and mine waste management. He is the recipient of the 2011 research achievement award from Carleton University, and received research grants from NSERC, OCE, oil sand and mining companies.

Dr. **M.T. Rayhani** is an Associate Professor of Geotechnical Engineering and the director of Geo-engineering Research Group in the Department of Civil and Environmental Engineering at Carleton University. His research areas include geotechnical aspects of landfill design, soil and foundation improvement solutions for seismic resistant design, and advanced foundation design. He is the author of over 50 publications in different areas of geo-engineering, and is a member of CGS, OGG, ASCE, ISMFE, and a Registered Professional Engineer in the Province of Ontario. He has been involved in over 20 engineering projects around the world and has experience in foundation investigation and design, landfill barrier systems, embankment dams and slope stability.

Special Feature

You will receive a copy of the course notes that you will find very useful on your projects.

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A Short Course – Modern Landfill Design
Carleton University, Dec. 11-12, 2014
Course Registration Form

Name:_____Title:_____

Organization:_____

Address:_____

City:_____Province/State_____Postal code:_____

Phone:_(____)_____Fax: (____)_____ Email:_____

Regular registration fee before November 30, 2014:	$650.00 + tax
Late registration fee after November 30, 2014:	$690.00 + tax
Student registration fee:	$600.00 + tax
Parking for two days (optional): 2 days × $10:00/day	$20.00
Total payment:	$ ----------

Fee covers two days of instruction, course notes, break refreshments, breakfasts and lunches.

Registration: Please go to (http://forms.carleton.ca/engineeringanddesign/cee-events/short-course-on-modern-landfill-design) for online registration, or fill out this form and mail it to the address below along with a cheque or bank draft payable to **Carleton University**.

Contact: Modern Landfill Design Short Course
Department of Civil and Environmental Engineering
3432 Mackenzie Building, Carleton University
1125 Colonel By Drive, Ottawa, Ontario, K1S 5B6
Tel: (613) 520 2600 (1228)
Fax: (613) 520 3951
Email: payal_chadha@carleton.ca

Accommodation: Participants are responsible for making their own arrangements. For a list of hotels in the Ottawa area please go to www.ottawahotels.com, or visit http://housing.carleton.ca/.

Directions: For a campus map please go to http://www1.carleton.ca/campus/. For directions on how to get to Carleton University please go to: http://carleton.ca/campus/directions/.