Course identification	
Course name:	GEOTECHNICAL DESIGN WITH GEOSYNTHETICS
Prerequisites:	Undergraduate Geotechnical Engineering Courses
Lecture hours:	09:00 – 12:00 Thursday

Instructor			
Instructor:	Marolo C. Alfaro, PEng, PhD		
Contact information:	Room E1-368, Phone: 474-8155, alfarom@cc.umanitoba.ca		
Office hours:	By Appointment		

# **Course description and learning outcomes**

The objective of this course is to provide an introduction to geosynthetic applications in civil engineering practice. The course offers a list of wide-ranging topics including: definitions by product type and function; applications; design and construction techniques; specification; and recent studies. It will reference the chapter on geosynthetics contained in the 4th Edition of the Canadian Foundation Engineering Manual and recent design manuals available in North America.

# Course web site

Your Jump Portal Server

# Textbook

## References

- (1) Holtz, R.D., Christopher, B.R. and Berg, R.R., *Geosynthetic Engineering* (1st Edition), BiTech Publishers, British Columbia, 1997.
- (2) Shukla, S.K. (Editor), Handbook of Geosynthetic Engineering, Thomas Telford Ltd., London, 2012.
- (3) Koerner, R.M., *Designing with Geosynthetics* (5<sup>th</sup> Edition), Prentice Hall, New Jersey, 2005.
- (4) Canadian Geotechnical Society, *Chapter 23: Geosynthetics, Canadian Foundation Engineering Manual* (4th Edition), BiTech Publishers, British Columbia, 2006.
- (5) Sarsby, R.W. (Editor), *Geosynthetics in Civil Engineering*, CRC Press, Cambridge, 2007.

## Assignments/projects/exams

There will be a two-hour *mid-term examination* and a three-hour *final examination*. Numerical problems and/or project works will be assigned regularly. They have to be submitted one week after being assigned (unless specified). Late assignments will not be accepted. Answers/solutions will be discussed after the assignments are marked. Please understand the importance of conscientiously completing assignments as an aid to understanding the course work and preparing for the examinations. The grading of this course will be based on the following scheme:

Assignments Mid-term Exam		20% 30%
Final Exam		50%
	Total	100%

Detailed course content					
	Course Contents I	Lecture Sessions			
1.	Overview of Geosynthetics in Geotechnical Engineering Works	0.5			
2.	Geosynthetics Properties and Test Methods	1.5			
3.	Design of Reinforced Soil Structures and Fills3.1Reinforced Soil Walls3.2Reinforced Slopes3.3Reinforced Embankments on Soft Foundations	5			
4.	<ul> <li>Design of Filtration and Drainage Works</li> <li>4.1 Geosynthetics in Subsurface Drainage Systems</li> <li>4.2 Geosynthetics in Foundation Improvement</li> </ul>	3			
5.	<ul> <li>Design of Lined-Waste Containment Facilities</li> <li>5.1 Geosynthetics in Waste Containment Systems</li> </ul>	2			
	Total	12 (30 lecture hours)			