School of Engineering, University of Guelph
ENGG*4370: URBAN WATER SYSTEMS DESIGN

Course Outline – Winter 2013

Calendar Description:

Estimation of water quantity and quality needed for urban water supply and drainage. Design of water supply, pumping systems, pipe networks and distributed storage reservoirs from analysis of steady and transient, pressurized and free surface flow. Rates of generation of flows and pollutants to sanitary and storm sewers, design of buried pipe and open channel drainage systems with structures for flow and pollution control. Modelling of water systems for sustainable urban development.

Prerequisites:

Prerequisites: ENGG*2230, ENGG*3650

Objectives:

At the successful completion of this course, the student will have demonstrated the ability to:

(i) Apply the laws of conservation of mass, energy and momentum to the analysis of hydraulic conditions in pipes flowing full or partially full

(ii) Apply knowledge of design considerations and employ software to design water distribution and wastewater collection systems

(iii) Translate an understanding of the effects of urbanization on the urban hydrologic cycle to specification of stormwater management requirements

(iv) Utilize knowledge of a broad suite of stormwater management alternatives to perform preliminary screening given design constraints and criteria

(v) Integrate preventative design techniques into engineering solutions.

Faculty:

Andrea Bradford, PhD., P.Eng.
Room 1342, Thornbrough Building.
Office Hours: please arrange an appointment by email
e-mail: abradfor@uoguelph.ca

Teaching Assistant: Sarah Ash

Class Times and Locations:

Lectures	Tuesday	1:00 – 2:20	Room 227 MACK
	Thursday	1:00 – 2:20	Room 227 MACK
Tutorial	Friday	11:30 – 1:20	Room 2313 THRN

Scheduled classes will be the principal venue to provide feedback on tests and assignments and to answer questions on modeling and the project. Students are welcome to email questions in advance of class meetings.

Students engaged in lectures and tutorials, and who have made an effort to keep up with the course material, will be given priority for access to the instructor and TA outside of scheduled course meetings. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed so that consideration may be given if appropriate.

Course Organization and Proposed Schedule (subject to adjustment):

Week	Lecture Content	Design Lab
1	Course Outline Hydraulics for Water Distribution Systems	Introduction to EPANet
2	Design Considerations for WDS NO CLASS JAN 17	EPANet Practice Tutorial
3	Water Network Analysis, Quality, Storage Facilities Open Channel Hydraulics Review Partial Pipe Hydraulics	EPANet Practice Tutorial
4	WW Design Considerations Sanitary Sewer Design Example	**Test 1** Handout Hydrology Review
5	Hydrology Review/Urban Hydrology Gutter, Inlet, Storm Sewer Design Effects of Urbanization	Introduction to EPASWMM / EPA SWMM Runoff
6	**Test 2** Stormwater Management (SWM) Objectives. Overview of SWM Practices *Better Site Design, Pollution Prevention* Screening Level Design	EPA SWMM Conveyance Introduction to Term Project
7	Design Criteria Ponds/Wetlands Wet Pond Design/Routing Pond Routing Example	Term Project
8	Lot-level Controls Infiltration Design Bioretention Design	EPA SWMM Detention Ponds / Continuous Simulation
9	Review SWM Objectives/Design Criteria Bioswale Design	EPA SWMM LID
10	Catch up / Review Laws and Regulations **Test 3**	Term Project
11	Combined Sewers and CSOs Corrosion, Maintenance	Holiday
12	Dual Conveyance Systems Integrated Urban Water Management	Term Project

Suggested Reference Book if Needed: Chin, D.A., 2013. *Water-Resources Engineering.* 3rd Edition. Prentice Hall. 962 pp.

Courselink/D2L: Some of lecture material will be made available. Links to other resources will be provided.

Course Evaluation:

Tests	55%
Project	45%

Important Dates

Test 1: Fri. Feb. 1 (during tutorial)
Test 2: Tues. Feb. 12 (during class)
Test 3: Thurs. March 21 (during class)
Final Report: Monday, April 15, 4 pm

Please Note:

The Regulations concerning Academic Misconduct as outlined in the University of Guelph, Undergraduate Calendar for 2012-2013 will be strictly enforced.

Disclaimer:

The instructor reserves the right to change any or all of the above in the event of appropriate circumstances, subject to University of Guelph Academic Regulations.