

ENGG*2550 Water Management

Winter 2014



(Revision 0: January 6, 2014)

1 INSTRUCTIONAL SUPPORT

1.1 Instructor

Instructor: Andrea Bradford, Ph.D., P.Eng.
Office: THRN 1342, ext. 52485
Email: abradfor@uoguelph.ca
Office hours: By appointment

1.2 Lab Technician

Not applicable

1.3 Teaching Assistant

<u>GTA</u>	<u>Email</u>	<u>Office Hours</u>
Rachael Marshall	rmarsh01@uoguelph.ca	TBA

2 LEARNING RESOURCES

2.1 Course Website

Course material, news, announcements, and grades will be regularly posted to the ENGG*2550 Courselink site. You are responsible for checking the site regularly. Most lectures will be conducted using a document camera or computer projector. Selected lecture notes will be provided on Courselink but students are expected to provide further annotation and may need to take full notes on some topics.

2.2 Required Resources

There is no course textbook. Required readings will be assigned throughout the term.

2.3 Recommended Resources

Supplemental readings will be recommended throughout the term.

2.4 Additional Resources

Will be provided as needed.

2.5 Communication & Email Policy

Please use lectures and lab sessions as your main opportunity to ask questions about the course. Major announcements will be posted to the course website. **It is your responsibility to check the course website regularly.** As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its student.

3 ASSESSMENT

3.1 Dates and Distribution

News Critique: 20%

Wed. Feb. 26, in class

Presentation/Abstract: 20%

Abstract and main sources (5%): Wed. Mar. 5, in class

Presentation (15%): Scheduled in weeks 10 and 11

Assignments: 30%

Assignment 1 Part 1: Wed. Jan.15, in class

Assignment 1 Part 2: Wed. Jan 22, in class

Assignment 1 Part 3: Wed. Jan 29, in class

Assignment 1 Part 4: Wed. Feb. 5, in class

Assignment 2 Part 1: Wed. Feb. 12, in class

Assignment 2 Part 2: Wed. Mar. 12, in class

Final Exam: 30%

Friday, April 11, 7:00 – 9:00 pm, Room TBA on Webadvisor

3.2 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. See the undergraduate calendar for information on regulations and procedures for Academic Consideration:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make

alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml>

Passing grade: In order to pass the course, students must obtain a grade of 50% or higher.

Late Assignments: Late submissions of assignments will not be accepted.

4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.1 Calendar Description

The influence of fundamental engineering and hydrologic principles on the choices available for management of water on a watershed basis is demonstrated for representative techniques used in management for water supply, irrigation, flood control, drainage and water pollution control. Selected problems are studied to reveal the technical, environmental, legal, jurisdiction, political, economic and social aspects of water management decisions.

Prerequisite(s): CHEM*1040 or CHEM*1310

4.2 Course Aims

The main goals of this course are to (1) provide an introduction to water resources, impacts associated with human activities, and water resources engineering and management tools and techniques that can be used to mitigate impacts; (2) develop critical thinking through the examination of technical, environmental, socio-political and economic dimensions of water resources challenges; and (3) develop oral and written communication skills.

4.3 Learning Objectives

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

1. Describe watershed management principles and techniques
2. Analyze the multiple dimensions of global water management issues
3. Explain the physical, chemical and biological attributes of water resources – groundwater, lakes, rivers and wetlands
4. Perform quantitative analyses of water resources and the effects of human activities on these water resources
5. Describe the tools and techniques used in water management
6. Apply knowledge of tools and techniques to develop solutions to water management challenges
7. Give examples of effective water policies
8. Communicate the results of critical evaluations of water resources issues and proposed solutions

4.4 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1, 3, 4, 5	Assignments, Exam
2. Problem Analysis	-	-
3. Investigation	-	-
4. Design	-	-
5. Use of Engineering Tools	-	-
6. Communication	8	Assignments, Presentation
7. Individual and Teamwork	-	-
8. Professionalism	-	-
9. Impact of Engineering on Society and the Environment	2, 3, 4, 6, 7	Assignments, Presentation
10. Ethics and Equity	-	-
11. Economics & Project Management	-	-
12. Life-Long Learning	2	-

4.5 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.6 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

4.7 Relationships with other Courses & Labs

Previous Courses:

CHEM*1040 or CHEM*1310

Follow-on Courses:

ENGG*3650: Hydrology

ENGG*3590: Water Quality

ENVS*3060: Groundwater

5 TEACHING AND LEARNING ACTIVITIES

5.1 Timetable

Lectures:

Monday	1:30 – 2:20	MACK 308
Wednesday	1:30 – 2:20	MACK 308
Friday	1:30 – 2:20	MACK 308

5.2 Lecture Schedule

Week	Lecture Topics	Learning Objectives
1	Fundamental water management concepts and themes for the course Properties of water. Inter-relationship of land, air and water systems. Inter-relationship of quality and quantity. Competing demands and the multiple dimensions of water management - social, economic and ecologic. Water budgets. Unintended consequences.	1, 2
2	Water Supply and Demand Management Groundwater and surface water sources. Alternative supplies. Water quantity and quality requirements. Demand management. International challenges.	1, 2
3	Introduction to Watershed Management Delineation of watersheds. Hydrological cycle within watersheds. Important principles of watershed management. Effects of human activities. Tools for watershed management.	1, 5
4 & 5	Rivers Hydrology, hydraulics, fluvial geomorphology, water quality. Low water response. Flood management. Environmental flows. Stream restoration.	3, 4
6	Groundwater and Surface Water: A Single Resource The subsurface environment. Groundwater flow. Groundwater – surface water interactions. Introduction to geochemistry. Source Protection.	3, 4
READING WEEK		
7	Water Policy – Ontario and International Examples	7
8	Wetlands Wetland types and functions. Wetland hydrology. Wetland policy. Wetland protection and restoration.	3, 4
9	Lakes Physical, chemical, and biological characteristics of lakes. Thermal stratification. Buffering capacity. Nutrient cycles. Eutrophication. Lake Winnipeg Case Study.	3, 4

10	Presentations – Innovative Treatment Technologies On-site systems. Constructed wetlands. Wastewater reclamation and reuse. Stormwater management. Groundwater remediation.	5, 6, 8
11	Presentations – Innovative Tools	5, 6, 8
12	Integrated Management and Climate Change Adaptation	1, 2, 3, 5, 6

5.3 Other Important Dates

Monday, January 6, 2014: First Class

February 17 – 21, 2014: Reading week, no classes

Friday, March 7, 2014: Last day to drop classes – 40th class day

Friday, April 4, 2014: Last class

6 LAB SAFETY

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

7 ACADEMIC MISCONDUCT

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

7.1 Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
<http://www.academicintegrity.uoguelph.ca/>

Please also review the section on Academic Misconduct in your [Engineering Program Guide](#).

The School of Engineering has adopted a Code of Ethics that can be found at:
<http://www.uoguelph.ca/engineering/undergrad-counselling-ethics>

8 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible

For more information, contact CSD at [519-824-4120](tel:519-824-4120) ext. 56208 or email csd@uoguelph.ca or see the website:
<http://www.uoguelph.ca/csd/>

9 RECORDING OF MATERIALS

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

10 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:
<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>