

**Urban Water and Wastewater Systems: Integrated Planning and Management**  
**ERS316 FINAL Course Outline**  
**Fall 2016**

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<b>Office:</b>	EV2 2038
<b>Office Hours:</b>	Tuesdays 9:30 to 11:30 <i>or by appointment</i>
<b>Seminar Time and Location:</b>	Fridays 12:30pm – 2:20pm in AL 211
<b>Teaching Assistant:</b>	Evan Andrews: e3andrew@uwaterloo.ca
<b>Location and Office hours:</b>	EV2-2067, by appointment

\*Students must hand in a hard copy of all course assignments\*

## **COURSE DESCRIPTION, CONTENT AND STRUCTURE**

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### **Course Description**

This is an elective course designed for senior students interested in urban environmental issues, with a focus on water services (drinking, waste, safety). Students may have previous knowledge of water issues, for example, from completing ERS 111. This seminar extends concepts learned in ERS 265 (Water History), complements ERS 365 (Water Governance) and is a useful foundation for a senior thesis (ERS 411) or interdisciplinary graduate studies on water issues. For those students who have a strong interest in the topic, but do not have the background knowledge, this course will offer a comprehensive understanding about urban water issues.

### **Content**

We focus on urban water management using North America, Australia, Western Asia and the Global South as illustrative systems or cases. Our starting premise is that changing climate conditions will increase the likelihood of extreme events (e.g., urban flooding and drought) and requirements for new water management approaches. We examine the development and maintenance of urban water and wastewater systems, along with demand and supply management planning, efficiency mechanisms, development and equity concerns.

### **Course Structure**

- Readings are the foundation of this course. Readings must be done **BEFORE** the assigned class meeting.
- Seminar discussions, videos, and guest lectures provide an overview of key concepts and highlight important ideas from the readings.
- In-class activities are cumulative and critical to your success in this course because they lead to deep learning (i.e., depth and breadth). You'll need to apply what you've learned from both the seminar notes and readings material to effectively participate in-class discussions and activities.

## COURSE OBJECTIVES

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By the end of each **week** you will be able to.....

1. Articulate and summarize the key concepts from the readings and class time. These summaries will be assessed and will reinforce the key concepts throughout the semester in preparation for the final case study.
2. Express the key concepts using different modes to organize your thoughts.

By the end of the **term** you will be able to....

1. Identify and describe municipal water and wastewater systems and their subcomponents.
2. Explain, using case examples, how climate change influences water management components at a municipal scale.
3. Assess the benefits and problems associated with water efficiency technologies, techniques in different municipal applications, e.g., residential and Industrial-Commercial-Institutional) and contexts, e.g., North America vs. Global South cities.
4. Recognize and evaluate the positions, assumptions and conventions within the water management literature by dissecting specific debates, e.g., supply vs. demand paradigms; water pricing and social equity, etc.

## COURSE MATERIAL

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**Required Textbook:** Yudelso, Jerry (2010). *Dry Run: Preventing the next urban water crisis*. New Society Publishers. Available at the Campus Bookstore.

**Required Readings:** In addition to the textbook, weekly readings will be posted to the course's LEARN website.

**Recommended Textbook:** Hay, Iain and Philip Giles (2014). *Communicating in Geography and Environmental Sciences: Canadian Edition*. Available at the Campus Bookstore.

**\*\*Weekly required readings are an essential component for the lecture and seminar discussions. Required readings must be done BEFORE the assigned class\*\***

## COURSE ASSIGNMENTS

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Assignment	Total Value	Due Date
Short Reading Analysis x 3	30%	Sept 23; Oct 28; Nov 11 (10% each) Hard copy due beginning of class and upload to LEARN <b>before</b> class (i.e. before 12:30pm)
In-class quiz	10%	Oct 21st (in-class)
Case Study Assignment (Group Assignment)	35%	a) Case study outlines and group work plan (10%) Due Oct 7 <sup>th</sup> Hard copy due beginning of class and upload to LEARN <b>before</b> class (i.e. before 12:30pm)
		b) Final Case study (25%) Due Nov 18 <sup>th</sup> Hard copy due beginning of class and upload to LEARN <b>before</b> class (before 12:30pm)
Final Test	25%	Dec 2 <sup>nd</sup> (in-class)

**COURSE PLAN AND READINGS SCHEDULE**

<b>Lecture #</b>	<b>Weekly Content</b>	<b>Assignment</b>
Lecture 1 (Sept 9)	Admin and course review: context, structure readings, classroom logistics, etc. Introduction: The big picture	
Lecture 2 (Sept 16)	Seminar Concept(s): Urban Water History Readings: -Yudelson, Chapter 1 -Video: How the earth changed history (water)	
Lecture 3 (Sept 23)	Seminar Concept(s): patterns and crises in urban water use Readings: -Yudelson, Chapters 2 and 3 -Required Readings posted on LEARN -Video: Journey on Planet Earth Urban Explosion	<b>Reading Analysis#1 Due Sept 23</b> Hard copy due beginning of class and upload to LEARN before class
Lecture 4 (Sept 30)	Seminar Concept(s): Components of urban water and wastewater infrastructure Readings: -Yudelson, Chapter 4 -Required Readings posted on LEARN -Video: Liquid Assets: Urban water mgmt. and infrastructure	
Lecture 5 (Oct 7)	Seminar Concepts(s): Industrial, Commercial and Institutional (ICI) water efficiency Guest: Dan Meagher, Region of Waterloo efficiency programing Readings: -Yudelson, Chapters 5 -Required Readings posted on LEARN	<b>Case Study Outline Due Oct 7</b> Hard copy due beginning of class and upload to LEARN before class (i.e. before 12:30pm)
Oct 14	<b>Reading Week: NO ERS 316 class</b>	
Lecture 6 (Oct 21)	Seminar Concepts(s): residential water efficiency Readings: -Yudelson, Chapter 6 -Required Readings posted on LEARN	<b>Quiz (In-Class)</b>
Lecture 7 (Oct 28)	Seminar Concept(s): Blue and Gray Water Guest Lecture: TBD Readings: - Yudelson Chapters 7 and 8 -Required Readings posted on LEARN	<b>Reading Analysis #2 Due Oct 28</b> Hard copy due beginning of class and upload to LEARN before class
Lecture 8 (Nov 4)	Seminar Concept(s): Brown and black water Guest Lecture: TBD Readings: -Yudelson Chapters 9 and 10 -Required Readings posted on LEARN	
Lecture 9 (Nov 11)	Seminar Concept(s): Green water and 'new' water supplies Guest Lecture: TBD Readings: - Yudelson, Chapters 11 and 13 -Required Readings posted on LEARN	<b>Reading Analysis #3 Due Nov 11</b> Hard copy due beginning of class and upload to LEARN before class
Lecture 10 (Nov 18)	Seminar Concept(s): Preventing the next urban water crisis Readings: -Yudelson, Chapter 15 -Required Readings posted on LEARN	<b>Nov 18th – Final Case Study Due</b> – Hard copy due beginning of class and upload to LEARN before 12:30pm
Lecture 11 (Nov 25)	Course wrap-up and test review	
Lecture 12 (Dec 2)	<b>Final Test – In Class</b>	

## ASSIGNMENT DESCRIPTIONS

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***For the reading analysis and case study assignments, the full assignment descriptions, instructions and evaluation rubrics will be posted on LEARN.***

**Reading Analysis:** In preparation for class discussions and for your final test, you are asked to submit three short reading analysis assignments (500 words each) over the course of the term. The purpose of the reading analysis assignments is to identify and distill key ideas, concepts and arguments presented across the readings and class discussions to provide reflection and critique on the material presented.

**Group Case Study:** The purpose of this assignment is to apply the concepts learned in class on urban water and wastewater management in a real-world context by developing a case study that demonstrates how the University of Waterloo can decrease its water footprint and be more water efficient. Students will work in groups of three and will select one building on campus as their case study. The assignment will consist of two parts:

- (i) A 2-3 page report outline that: identifies your case study selection, provides a detailed (bulleted) outline and structure for your report, provides a sample of references, identifies group members (three individuals), and a group work plan.
- (ii) A final case study analysis – details to be posted on LEARN.

**Quiz and Final Exam:** This course involves both a quiz and a final in-class test. The quiz will include material presented to that date, and the final test will be cumulative, including all material up until the course review. The quiz and final test will take place during lecture time.

## ASSIGNMENT SUBMISSION AND LATE POLICY

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**All assignments must be submitted in hardcopy at the beginning of class AND uploaded to the LEARN dropbox BEFORE the beginning of class (i.e. before 12:30pm) on the day they are due.**

Unless you have made advance arrangements with me based on medical or family emergencies, late assignments will be penalized at **Five Percent (5%) of the value of the assignment per day, including Saturday and Sunday**. I will only accept late assignments more than five days after the due date under exceptional circumstances and with advance notice.

## THE STUDENTS' RESPONSIBILITIES

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**Laptop Policy:** Please use your laptops for taking course-related notes during class. Please refrain from surfing, chatting, downloading video, social network sites etc. Research has shown that all students who multi-task during seminars retain less information (Hemebrooke and Gay 2003) and achieve lower final grades (Ellis et al., 2010).

**Communication:** It is your responsibility to check the course web page for information and updates. Also, as per university regulations, e-mail is the official route of communication between the University and its students. You are required to check your uwaterloo.ca e-mail account

regularly (at least once per day). If you use another e-mail service, it's your responsibility to ensure that mail sent to your university account is forwarded.

**When You Cannot Meet A Course Requirement:** When you find yourself unable to meet an in-course requirement because of medical, psychological or compassionate reasons, *please advise me in writing* (preferably by e-mail), with your name, student ID number, and e-mail contact information. Where possible, this should be done in advance of the assignment due date, but otherwise as soon as possible after the due date. As a rule, you must provide appropriate documentation, for example, a note from your doctor indicating the dates during which you were ill, and describing the severity of your illness. You are required to attend (and participate in) all of the class meetings and field trips. Assignments must be submitted in LEARN on the designated day and time.

**Manage Your Time Carefully:** Pressure of work alone is not an acceptable reason for seeking an extension without penalty. See the undergraduate calendar for additional information on regulations and procedures for Academic Consideration.

## ACADEMIC INTEGRITY AND UNIVERSITY POLICIES

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**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/). Students who are unsure what constitutes an academic offence are requested to visit the on-line tutorial at: <http://www.lib.uwaterloo.ca/ait/>

**Research Ethics:** Please also note that the 'University of Waterloo requires all research conducted by its students, staff, and faculty which involves humans as participants to undergo prior ethics review and clearance through the Director, Office of Human Research and Animal Care (Office). The ethics review and clearance processes are intended to ensure that projects comply with the Office's Guidelines for Research with Human Participants (Guidelines) as well as those of provincial and federal agencies, and that the safety, rights and welfare of participants are adequately protected. The Guidelines inform researchers about ethical issues and procedures which are of concern when conducting research with humans (e.g. confidentiality, risks and benefits, informed consent process, etc.). If the development of your research proposal consists of research that involves humans as participants, the please contact the course instructor for guidance and see: [www.research.uwaterloo.ca/ethics/human/](http://www.research.uwaterloo.ca/ethics/human/)

**Notes for Students with Disabilities:** AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

**Mental Health:** The University of Waterloo, the Faculty of Environment and our Departments consider students' well-being to be extremely important. We recognize that throughout the term students may face health challenges - physical and / or emotional. Please note that help is

available. Mental health is a serious issue for everyone and can affect your ability to do your best work. Counselling Services ([www.uwaterloo.ca/counselling-services](http://www.uwaterloo.ca/counselling-services)) is an inclusive, non-judgmental, and confidential space for anyone to seek support. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.

**Religious Observances:** Please inform the instructor at the beginning of term if special accommodation needs to be made for religious observances that are not otherwise accounted for in the scheduling of classes and assignments.

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70 - Student Petitions and Grievances, Section 4, [www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm). When in doubt, please contact your Undergraduate Advisor for details.

**Discipline:** A student is expected to know what constitutes academic integrity, to avoid committing academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties, check Guidelines for Assessment of Penalties, [www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm)

**Appeals:** A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 – (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals). See: [www.adm.uwaterloo.ca/infosec/Policies/policy72.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm)

**Consequences of Academic Offences:** A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>

Within ENV, those committing academic offences (e.g. cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties which may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion.

Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>

ENV students are strongly encouraged to review the material provided by the university's Academic Integrity office (see: <http://uwaterloo.ca/academicintegrity/Students/index.html>).

**Plagiarism Detection Software (Turnitin):** Plagiarism detection software (Turnitin) may be used to screen assignments in this course. This may be done to verify that use of all materials and sources in assignments is documented. Students will be given an option if they do not want to have their assignment screened by Turnitin. In the first week of the term, details will be provided about arrangements and alternatives for the use of Turnitin in this course.

**Unclaimed Assignments:** Unclaimed assignments will be retained until one month after term grades become official in Quest. After that time, they will be destroyed in compliance with UW's [confidential shredding procedures](#).