Urban Water and Wastewater Systems: Integrated Planning and Management
ERS316 Course Outline
Fall 2021

Course Instructor:	Shefaza Esmail
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Office:	EV2 2008
Office Hours:	Tuesdays 3pm – 4pm *or by appointment*
Tutorial Time and Location:	Tuesdays 10:30am, 11:30am, 1:30pm
Teaching Assistant:	Kevin Easton, Katie Pita
Location and Office hours:	By email: kevin.easton@uwaterloo.ca, kpita@uwaterloo.ca

COURSE DESCRIPTION, CONTENT AND STRUCTURE

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 course 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 and wastewater systems.

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, water issues.

Course Structure
Readings are the foundation of this course. Readings must be done **BEFORE** the assigned class meeting. Tutorial discussions, videos, and hands-on/virtual activities 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 will need to apply what you have learned from both the tutorials and reading material to effectively participate in class discussion and activities. Perusall will be used as an online reading and engagement tool.

COURSE OBJECTIVES

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

Required Textbook: Yudelson, Jerry (2010). *Dry Run: Preventing the next urban water crisis*. New Society Publishers. Available at the Campus Bookstore and through Perusall. We will use Perusall for this course.

Required Readings: In addition to the textbook, weekly readings will be posted to the course's Perusall site.

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

COURSE ASSESSMENTS

Assessment*	Due Date	Weight of Final Grade
Reflection	Sept 13th	5%
Perusall Participation	Throughout term	10%
Individual Assignments	Varied (see schedule below)	3*10% = 30%
Group Project	Nov. 19th	30%
Final Test	Dec 6 – 7th	25%

***Full assessment descriptions, instructions and evaluation rubrics will be posted on LEARN.**

COURSE PLAN AND READINGS SCHEDULE

Week	Content	Readings/Videos	Assessment
Sept 8 – 10	Admin, course review, structure, and expectations Introduction: The Big Picture	Always check Perusall for additional readings for each week	Reflection (Due Sept 13)
Sept 13 – 17	Urban Water History	Yudelson Chapter 1	
Sept 20 – 24	Patterns and Crises in Urban Water Use	Yudelson Chapters 2 and 3	Individual Assignment 1 (Due Sept 24)
Sept 27 – Oct 1	Components of Urban Water and Wastewater Infrastructure	Yudelson Chapter 4	
Oct 4 – 8	Industrial, Commercial, and Institutional (ICI) Water Efficiency	Yudelson Chapter 5	Individual Assignment 2 (Due Oct 8)
Oct 11 – 15	READING WEEK		
Oct 18 – 22	Residential Water Efficiency	Yudelson Chapter 6	
Oct 25 – 29	Blue and Gray Water	Yudelson Chapters 7 and 8	Individual Assignment 3 (Due Oct 29)
Nov 1 – 5	Brown and Black Water	Yudelson Chapters 9 and 10	
Nov 8 – 12	Green Water and "New" Water Supplies	Yudelson Chapters 11 and 13	
Nov 15 – 19	Preventing the Next Urban Crisis	Yudelson Chapter 15	Group Project (Due Nov 19th)
Nov 22 – 26	Group Project Presentations		
Nov 29 – Dec 3	Final Test Preparation		
Dec 6 – 7	FINAL TEST		

ASSIGNMENT SUBMISSION AND LATE POLICY
All assignments must be submitted to the LEARN dropbox BEFORE the day and time they are due. There is a 72-hour grace period on all assignments during which time a late penalty will not be applied. After this grace period late assignments will be subject to 10% of the assignment mark. Late assignments will only be accepted up to 1 week after the due date.

In cases of medical and family emergencies or other extenuating circumstances, ensure that you contact the instructor/TA in advance, so they are aware of your circumstances. Use this information to help you make informed choices.

THE STUDENTS' RESPONSIBILITIES

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

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. [Check the Office of Academic Integrity for more information.]

Grievance: A student who believes that a decision affecting some aspect of their university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for their actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on

categories of offences and types of penalties, students should refer to <u>Policy 71, Student Discipline</u>. For typical penalties, check <u>Guidelines for the Assessment of Penalties</u>.

Appeals: A decision made or penalty imposed under <u>Policy 70, Student Petitions and Grievances</u> (other than a petition) or <u>Policy 71, Student Discipline</u> may be appealed if there is a ground. A student who believes they have a ground for an appeal should refer to <u>Policy 72, Student Appeals</u>.

Note for students with disabilities: <u>AccessAbility Services</u>, 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.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.