

**The University of Winnipeg**  
**Department of Geography**  
**Water Resources, GEOG-3408(3) - 001**  
**2020 Winter Term - January 7-April 2, 2020**  
**Tu and Th from 10:00 – 11:15 a.m. in Room 5L24**

**COURSE OUTLINE**

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**INSTRUCTOR:** Candi Bezte

**Email:** [c.bezte@uwinnipeg.ca](mailto:c.bezte@uwinnipeg.ca) (please email me through Nexus for all course-related matters to avoid going into my junk folder!)

**Office:** 2RC034

**Ph:** (204) 786-9319

**TEXTBOOK:**

Holden, J.E., 2014. *Water Resources an Integrated Approach*. Routledge. New York, New York. 371 pp. ISBN: 978-0-415-60282-2. Available at the University of Winnipeg Bookstore.

**NEXUS**

I will use the U of W Nexus platform to distribute all course materials online, such as lecture PowerPoints, course notes, assignments, practice exam questions, and important announcements and dates, so please check the site often. Nexus also provides a very good e-mail system and will form the principle way that we'll communicate outside of class. **Please send emails regarding this course through Nexus and not to my U of W email address – thank you!**

**How to get to the Nexus website?** Once you are registered in the course your name will be entered into the Nexus class list for the course and you will have access to the course material on the Nexus site. Go to <https://nexus.uwinnipeg.ca> to log onto the Nexus site.

**Student Nexus Support:**

Contact the Help Desk

Phone: 204-786-9149

Email: [servicedesk@uwinnipeg.ca](mailto:servicedesk@uwinnipeg.ca) or in person at Uplink – in 4C32B (the glass fishbowl in the 4<sup>th</sup> floor cafeteria).

**Library Services**

Circulation and Borrowing (help with barcodes) (204) 786-9808 or [circulation@uwinnipeg.ca](mailto:circulation@uwinnipeg.ca)

Contact the Reference Department (204) 786-9815 or [reference@uwinnipeg.ca](mailto:reference@uwinnipeg.ca)

Library's research page with useful links <http://library.uwinnipeg.ca/help-with-research/index.html>

**COURSE DESCRIPTION**

Welcome to Water Resources! This course deals with what is arguably, the most important substance on Earth. Course content includes a global and local assessment of water quantity, distribution and quality. We'll start with a brief assessment of what water is (physical/chemical properties), how it moves (the hydrologic cycle), types and sources of water (ground/surface/renewable), uses of water

and how these uses pollute water (i.e., agriculture, industry, municipalities, recreation, energy creation, dams, diversions), issues of too much (floods), not enough (droughts), water and health, society, economics and how climate change may affect both water quality and quantity. We'll address some issues of global scarcity, potential conflict, consider whether water should be a human right or an economic commodity and look at existing water rights and policy. Some examples we'll discuss include the Columbia River Treaty and the South-North Water Diversion project in China and more local issues such as Churchill River Diversion and Lake Winnipeg Regulation and their impacts – assessing both the environmental as well as the sociological effects on various Indigenous communities. We'll also talk about where our drinking water comes from (Shoal Lake), how we treat it, our wastewater and how we treat it (or not), the eutrophication of Lake Winnipeg and its numerous causes, the issue of water pollution at Grassy Narrows and how all Canadians don't seem to have the same access to clean water – where are those boil water advisories anyway? We'll also learn about water footprints and how to calculate them, virtual water trading, and methods to estimate future water demands and how they may be met.

PREREQUISITES: GEOG-1102(3) or permission of instructor.

### **COURSE OBJECTIVES**

The primary objectives of this course are to:

- introduce students to local and global water issues from a scientific and sociological perspective;
- build awareness of pressing and emerging water issues;
- develop an understanding of the social, political and economic contexts within which water issues occur;
- develop organizational, analytical and synthesis skills while conducting an independent literature research project; and
- develop communication skills through group discussion and individual (pecha kucha) presentations.

### **COURSE EVALUATION**

Lecture PowerPoints, additional readings, assignment instructions, study help, sample exam questions and marking rubrics will be posted on Nexus. All students must check the course site on Nexus every week and make use of any provided online resources as instructed. Progressive learning and participation in class discussions are essential for successful completion of this course.

### **Basic Assignment Formatting and Submission:**

The Literature Review includes a table (with 5 journal references) and a 2-page synthesis (Times New Roman 12-point font or Calibri 11-point font; 1.5 line spacing and 1-inch margins on all sides). Once the literature review is complete, each student will be required to present a pecha kucha, which is a timed slide show where 20 slides are shown for 20 seconds each, which can be a challenging but fun thing to do. The pecha kucha will be based on the same topic as the literature review. Pecha kucha presentations will take place over the last three classes of the course.

Another assignment involves the calculation of a water footprint for an item of your choice, with the final results to be shared with the class.

Hard copies (printed) are to be handed in for both assignments; pdfs of research articles used should be provided through Nexus (assignment folders will be created).

Penalty for late submissions will be 10% per day, unless other arrangements have been made with the instructor for extenuating circumstances.

Your final grade will be based on your three above-mentioned assignments, a midterm and a final exam as per the following table.

Assessment	Details	% of Final Mark	Date
Assignment 1	Literature Review Summary - Table and 2 Page Synthesis	20%	Thurs. Feb. 13/2020
Midterm	In class/closed book, ~ 75 mins.	25%	Tues. Feb. 25/2020 – in class
Assignment 2	Water Footprint	10%	Thurs. Mar. 5/2020
Assignment 3	Pecha Kucha Presentation (20 slides/20 seconds/slide)	10%	Thurs. Mar. 26, Tues. Mar. 31 or Thurs. Apr. 2
Final Exam	In class/closed book, ~ 150 mins.	35%	Thurs. Apr. 9/2020 – 9:00 a.m. – 12:00 p.m. in 5L24

- The midterm and final exam may include any combination of multiple choice, fill-in-the-blank, short answer and long answer questions.
- **Detailed instructions for all assignments will be posted on Nexus.**

### Exams

Students are expected to show picture identification when writing a test or examination.

### OTHER IMPORTANT DATES:

Date	Event
Mon. Jan. 7/2020	First day of lecture
Feb. 16-22/2020	Reading Week
Fri. Mar. 13/2020 *	<b>Final date</b> to withdraw without academic penalty
Fri. Apr. 2/2020	Last day of the course

\* If you are thinking of withdrawing from the course, I encourage you to contact me first. There may be a way to help you through any difficulties you may be having.

## DEPARTMENT OF GEOGRAPHY GRADING SCHEME

A+	90 - 100	C+	65 - 69
A	85 - 89	C	58 - 64
A-	80 - 84	D	50 - 57
B+	75 - 79	F	< 50
B	70 - 74		

Please note that the University does not have a standardized numerical grade conversion scale for each letter grade and the table above provides tentative guidelines. Unofficial grades based on these cut-offs do not necessarily correspond to the official final grades awarded by the university administration. The Departmental Review Committee or the Senate retain the right to modify grading cut-offs, as such, grades posted by the instructor are not final until approved by the University Administration.

### CLASS CANCELLATION

If the course instructor deems it is necessary to cancel a class due to exceptional circumstances, you will be informed via Nexus email. The departmental assistant and Chair/Dean will also be notified so that class cancellation forms can be posted outside of classrooms.

### CHECK YOUR EMAIL

It is your responsibility to regularly check your University of Winnipeg email to ensure you receive timely correspondence from the University and for this course, please be sure to regularly check your Nexus email and announcements posted on Nexus.

### COURSE TOPICS AND SCHEDULE

The schedule below provides a list of topics that we'll attempt to cover in this course. Students are expected to study materials posted, read the relevant components of the textbook or other assigned readings and be prepared to take part in class discussions. Visit Nexus regularly for course information. Please note that the schedule below may be revised based on the progress of the class and other factors. Also note that **there will be some topics included in the PowerPoints that do not appear in the textbook** and that **we may not get to all of the topics listed below and/or the order may be subject to change.**

Topic	Approximate Dates
<b>Introduction</b> <ul style="list-style-type: none"><li>• Course outline</li><li>• Literature review expectations</li><li>• What are water resources?</li><li>• Canadian identity based on water (reading/discussion)</li></ul>	January 7, 9
<b>Chapter 1 – Water Fundamentals and an Overview</b> <ul style="list-style-type: none"><li>• The nature of water (physical/chemical properties)</li><li>• Importance for life</li><li>• Role in society</li><li>• Global demand, spatial distribution/consumption</li><li>• Read/Discuss India's water crisis and drought and food</li></ul>	January 14,16

security in Asia	
<b>Chapter 2 – The Changing Water Cycle</b> <ul style="list-style-type: none"> <li>• The global water cycle</li> <li>• Linking water and energy</li> <li>• Uncertainties in the global water cycle</li> <li>• Impacts of land management on the water cycle</li> <li>• Climate change impacts on the water cycle</li> <li>• Read/Discuss the Dust Bowl of the 1930s, the Sahel Drought</li> <li>• Discuss Water Footprint Assignment (assigned reading and part of Chapter 12)</li> </ul>	January 21,23, 28
<b>How Land Management Affects River Flow</b> <ul style="list-style-type: none"> <li>• What is a watershed?</li> <li>• Impacts of land management on water flow</li> <li>• Flooding</li> <li>• Modification of river channels</li> <li>• Read/Discuss the impacts of river flow and sediment reduction on the Indus Delta.</li> <li>• Effects of hydroelectric development in northern Manitoba</li> <li>• What happened to the Aral Sea?</li> </ul> Read Pages 49-50, 63-64, 66-67, 72-73 (portions of Chapter 3)	January 30, Feb. 4
<b>Chapter 4 – Surface Water Quality</b> <ul style="list-style-type: none"> <li>• Water uses and water quality deterioration</li> <li>• Point and non-point sources</li> <li>• Effects of Agriculture, urbanization, acid mine drainage, atmospheric pollution</li> </ul>	February 6, 11
<b>Assignment 1 Due – Literature Review Table and Synthesis Report</b>	February 13
<b>Chapter 6 – Aquatic Ecosystems</b> <ul style="list-style-type: none"> <li>• Types of aquatic ecosystems and ecosystem services</li> <li>• Human modification and management of aquatic systems</li> <li>• Effects of land use alteration, pollution</li> <li>• Discussion of eutrophication in Lake Winnipeg, aquatic invasive species, mercury pollution and the community of Grassy Narrows</li> </ul>	February 13, 27
<b>Reading Week</b>	February 16-22
<b>Midterm (25%) ~ 75 Minutes (topics covered up to Feb. 13)</b>	February 25 In Class (5L24)
<b>Chapter 8 - Water and Health</b> <ul style="list-style-type: none"> <li>• History of water and health</li> <li>• Infectious and waterborne diseases</li> <li>• Health effects of floods, droughts, hurricanes, and tsunamis</li> <li>• Read/Discuss Hurricane Katrina and Earthquake/Tsunami effects on Tohoku Japan (pages 251-252).</li> </ul>	March 3
<b>Assignment 2 Due – Water Footprint</b>	March 5
<b>Potable and Wastewater Treatment</b> <ul style="list-style-type: none"> <li>• An overview of Chapter 9</li> </ul>	March 5,10

<ul style="list-style-type: none"> <li>• Where does our water come from, how is it treated?</li> <li>• How is our sewage treated – need to upgrade</li> <li>• Read/Discuss Shoal Lake 40 and where are the boil water advisories? (assigned reading)</li> </ul>	
<b>Chapter 7 – Water Demand, Planning and Management</b> <ul style="list-style-type: none"> <li>• Sources of demand and demand estimation</li> <li>• Trends in water demand</li> <li>• Tackling rising demand through resource planning and efficiency</li> <li>• Resilience</li> </ul>	March 12
<b>Water and the Economy (Parts of chapter 10)</b> <ul style="list-style-type: none"> <li>• Water within the economy</li> <li>• Water pricing</li> <li>• Valuation techniques for water resources</li> <li>• Is water a human right or a tradable good?</li> </ul>	March 17
<b>Water Conflict, Law and Governance (parts of Chapter 11)</b> <ul style="list-style-type: none"> <li>• Property rights, transboundary issues, types of water conflicts</li> <li>• Future conflicts</li> <li>• Read/Discuss topics addressed in boxes – conflicts through consumptive use (India), pollution (Rhine), relative distribution (Ganges) and absolute distribution (Jordan)</li> </ul>	March 19
<b>Virtual Water Flow – China Example; Course Wrap up</b>	March 24
<b>Assignment 3 Due (pecha kucha presentations – 10%)</b>	March 26, 31 or April 2
<b>Final Exam (35%) - ~ 150 Minutes</b>	April 9, 9:00 a.m. -12:00 p.m. in 5L24

## ACADEMIC REGULATIONS AND POLICIES

It is your responsibility to become familiar with the information on Academic Regulations and Policies of the 2019-20 Calendar which can be found on the University's website

<https://www.uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>. This section covers classroom regulation, grading, transcripts, challenge for credit, academic standing, student discipline (academic and non-academic misconduct), appeals including grade appeals, University Policies and Codes, graduation.

Pay particular attention to:

Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf> and

Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>

A summary of important information regarding Academic Misconduct follows:

**Forms of Academic Misconduct:**

- **Plagiarism:** includes presenting other people's published or unpublished work in part or as a whole as your own. This includes material from lab manuals, essays, journal articles, books, etc. Plagiarism also refers to submitting the same work in more than one course without both instructors' permission and to the situation where two or more students submit identical (or nearly identical) work for evaluation when the work was to be completed individually (p 10).
- **Cheating:** includes copying another person's answer on a test, communicating with another person during a test or exam, consulting unauthorized sources (incl. written and electronic sources), obtaining a copy (all or part) of a test/exam/assignment before it is officially available, purchasing tests, essays or other assignments and submitting the work as your own (p 10).
- **Improper Academic/Research practices** include: fabricating or falsifying results, using other peoples' research findings without permission, misrepresenting research results or methods, referring to non-existent sources or investigators, contravening the University's Policy and Procedures on Research Integrity (p 10). **Obstructing academic activities of another person;** for example interfering with another person's access to pertinent resources or information to gain academic advantage (p 10).
- **Impersonation:** both impersonation of another individual or allowing someone to impersonate you (p 10).
- **Falsification or Modification of an Academic Record:** including tests, transcripts, letters of permission, etc. (p 10).
- **Aiding and Abetting Academic Misconduct** (p 10).

**Penalties for Academic Misconduct:**

Penalties for academic misconduct include, but are not limited to:

- Written warning
- Lower or failing grade on an assignment or test
- Lower or failing grade in a course
- Denial of admission or readmission to the University
- Forfeiture of University awards or financial assistance
- Suspension from the University for a specified period of time
- Withholding or rescinding a U of W degree, certificate or diploma
- Expulsion from the University

**Procedures for Academic Misconduct:**

All allegations of academic misconduct must be reported initiating a process which involves several steps. These include procedures involving the instructor of the course in which the misconduct is alleged to have occurred, the Departmental Review Committee, and the Senate Academic Misconduct Committee. See pages 11 through 16 for a detailed description of the procedures. These pages also outline the Appeals process regarding Academic Misconduct.

Students facing a charge of academic or non-academic misconduct may choose to contact the University of Winnipeg Students' Association (UWSA) where a student advocate will be available to answer any questions about the process, help with building a case, and ensuring students have access to support. For more information or to schedule an appointment, visit their website at [www.theuwsa.ca/academic-advocacy](http://www.theuwsa.ca/academic-advocacy) or call 204-786-9780.

### **VOLUNTARY WITHDRAWAL**

\*\*You must formally withdraw from a course. If you simply stop going to classes, you may receive an "F" on your transcript.

**Please note that withdrawing before the VW date does not necessarily result in a fee refund.**

**Please note March 13, 2020 is the voluntary withdrawal deadline for this course**

- ❖ **Misuse of Filesharing Sites.** Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.
- ❖ **Avoiding Copyright Violation.** Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor /presenter before photographing or recording slides, presentations, lectures, and notes on the board.
- ❖ **Research Ethics.** Students conducting research interviews, focus groups, surveys, or any other method of collecting data from any person, including a family member, must obtain the approval of the appropriate ethics committee before commencing data collection. Exceptions are research activities in class as a learning exercise. For submission requirements and deadlines, see <http://www.uwinnipeg.ca/research/human-ethics.html>.
- ❖ All students, faculty and staff have the right to participate, learn and work in an environment that is free of harassment and discrimination. **The UW Respectful Working and Learning Environment Policy** may be found online at [www.uwinnipeg.ca/respect](http://www.uwinnipeg.ca/respect).
- ❖ **Students with documented disabilities**, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 786-9771 or [accessibilityservices@uwinnipeg.ca](mailto:accessibilityservices@uwinnipeg.ca) to discuss appropriate options. All information about a student's disability or medical condition remains confidential <http://www.uwinnipeg.ca/accessibility>
- ❖ **Students may choose not to attend classes or write examinations on holy days of their religion**, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of



religious holidays can be found in the 2018-19 Undergraduate Academic Calendar.

- ❖ **UWinnipeg promotes a scent-free environment. Please be respectful of the needs of classmates and the instructor by avoiding the use of scented products while attending lectures.** Exposure to perfumes and other scented products (such as lotion) can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities.