ORIGINAL COURSE IMPLEMENTATION DATE: April 2008
REVISED COURSE IMPLEMENTATION DATE: September 2017
COURSE TO BE REVIEWED: (six years after UEC approval) May 2020
Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: GEOG 303	**Number of Credits:** 4 Course credit policy (105)
Course Full Title: Environmental Hydrology **Course Short Title (if title exceeds 30 characters):**	
Faculty: Faculty of Social Sciences	**Department (or program if no department):** Geography and the Environment

Calendar Description:
This course will investigate hydrological processes, the impact of climate change on the hydrological cycle, water resource management and concerns of water quality. The impact of human use on the hydrology of a region will be addressed.

Note: Field trips outside of class time will be required. Please refer to the department website for field trip scheduling information.

Prerequisites (or NONE):	One of the following: GEOG 201, GEOG 202, or GEOG 219/BIO 219.
Corequisites (if applicable, or NONE):	
Pre/corequisites (if applicable, or NONE):	

Equivalent Courses (cannot be taken for additional credit)
Former course code/number:
Cross-listed with:
Equivalent course(s):
Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit
Transfer credit already exists: ☐ Yes ☒ No

Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No (if yes, fill in transfer credit form)

Resubmit revised outline for articulation: ☐ Yes ☒ No

To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 90

Typical structure of instructional hours:

Lecture hours	25
Seminars/tutorials/workshops	
Laboratory hours	35
Field experience hours	30
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours: Student directed learning	
Total	**90**

Special Topics
Will the course be offered with different topics?
☐ Yes ☒ No

If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 25

Expected frequency of course offerings (every semester, annually, every other year, etc.): Once every 3 years

Department / Program Head or Director: Steven Marsh	**Date approved:**	December 2016
Faculty Council approval	**Date approved:**	January 2017
Campus-Wide Consultation (CWC)	**Date of posting:**	March 17, 2017
Dean/Associate VP: Jacqueline Nolte	**Date approved:**	January 2017
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	March 24, 2017

Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Articulate the processes involved in the hydrologic cycle.
2. Apply hydrologic principles to explain the hydrology of a specific environment, both qualitatively and quantitatively.
3. Predict the response of a specific hydrologic environment to climate change.
4. Apply physical and human geographic perspectives to address complex hydrologic and environmental issues.
5. Apply appropriate geographic skills and techniques (data collection and analysis, mapping, GIS, etc) to solve real-world problems.
6. Appreciate indigenous perspectives of the water and land;
7. Demonstrate numerical, written and, verbal competency in the scientific arena,
8. Use professional, ethical and respectful communication to work effectively and productively in team settings.
9. Utilize communication strategies to report findings to multiple audiences;
10. Critically reflect upon your learning from individual and group interactions, in-class discussions, field work and related research.

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

Instructional methods include lectures and/or problem-based learning strategies, laboratory (or data collection/analysis) activities, self-directed learning, and field trips.

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☒

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Davie, T. Davie, T.	Fundamentals of Hydrology. (2nd edition or most recent edition)	☐	Routledge	2008
2.	Han, D.	Concise Hydrology	☐	Dawei Han and Ventus Pub.	2010
3.	Arnell, N.	Hydrology and Global Environmental Change	☐	Prentice Hall	2001
4.	Ward, AD, Trimble, SW, Burckhard, SR and Lyon, JG	Environmental Hydrology (3rd Edition)	☐	CRC Press	2015
5.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

There may be a fee for field trip transportation and accommodation costs, if applicable.

Typical Evaluation Methods and Weighting

Final exam:	%	Assignments:	30%	Midterm exam:	%	Practicum:	%
Quizzes/tests:	%	Lab work:	15 %	Field experience:	%	Shop work:	%
Reflective journal:	15%	Presentation:	20%%	Poster:	20%	Total:	1000%

Details (if necessary):

Typical Course Content and Topics

Traditional course delivery:

The course may be offered using a traditional delivery method that uses lectures, lab exercises, discussion of journal articles, and field trips. Course breakdown is as follows:

Week 1 – Course introduction
Week 2 – The Hydrologic Cycle
Week 3 – Precipitation
Week 4 – Evaporation
Week 5 – Storage
Week 6 – Run-off
Week 7 – Streamflow analysis and modelling
Week 8 – The Unit hydrograph
Week 9 – Water quality
Week 10 – Water resource management

Week 11 – Climate change and the hydrological cycle
Week 12 – Student presentations and posters
Week 13 – Student presentations and posters

Lab exercises will be in the format of primary data collection and analysis activities. These activities will be assessed as formal lab exercises/reports. Students will be involved in all aspects of the data collection and analysis process. The lab content for the course is as follows:

1. Project design (Week 1)
2. Project implementation (Week 2)
3. Data collection (Weeks 3-8) – students will be collecting data on precipitation, evaporation, run-off, soil moisture, temperature, humidity, and other parameters as appropriate
4. Data analysis (Weeks 4-10) – analysis of the collected data will occur in conjunction with continued data collection activities and be completed following collection period

Course delivered using PBL:
This course may also be offered using a modified problem-based learning strategy and as such much of the learning and content of the course will be largely determined by the students. Students will be introduced to a real-world problem at the beginning of the course and will then be responsible for determining the strategies and content required to meet the course learning outcomes while answering the posed question. Depending on the problem, fieldtrips to the study site will be arranged. Short mini lessons on key topics will be given by the instructor to guide the students' learning with the remainder of the content resulting from student investigation of the topic. The instructor will facilitate the learning environment and provide key direction, mini lessons, and background information. The content covered will mirror that covered in a traditional course model but organization will be somewhat fluid and a weekly breakdown is not possible (due to the PBL delivery mode). Topics to be covered (although not in necessarily in this order):

- Properties of water
- The hydrological cycle
- Water balance
- Watershed analysis
- Hydrological processes (precipitation, evaporation, infiltration, interception, soil moisture, run-off)
- Water quality
- Managing water resources
- Human impacts on the hydrological cycle
- Climate change and the hydrological cycle

Data Collection and analysis activities (similar to labs):
Students will be required to undertake primary data collection and analysis activities to answer the posed question. They will be involved in the following activities which will be assessed in a manner similar to traditional labs (equivalent to eight labs) but will also be incorporated into the final project write-up. The data collection and analysis activities are:

1. Project design (Week 1)
2. Project implementation (Week 2)
3. Data collection (Weeks 3-8) – students will be collecting data on precipitation, evaporation, run-off, soil moisture, temperature, humidity, and other parameters as appropriate
4. Data analysis (Weeks 4-10) – analysis of the collected data will occur in conjunction with continued data collection activities and be completed following collection period